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vii. Aim, Objective and Hypotheses (if any).
viii. Literature Review (Theoretical, Conceptual and Empirical)
ix. Methodology
x. Results and Discussion of Findings.
xi. Conclusion and Recommendations

xii. References

Note: All tables and figures (where necessary) must be included in the body and must be clearly titled

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Entrepreneurial Practices and Performance of Federal Ministries in Nigeria

By

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Abstract
According to literature, whereas entrepreneurial practices has been favourable within the public service in most developed countries, there is the dearth of proof of its positive influence on the performance of public sector organizations in developing countries. This study analysed the impacts of entrepreneurial practices (i.e., innovativeness, proactiveness and autonomy) on the performance (i.e., improved internal process, successful change-management, and service quality delivery) of Nigerian Federal Ministries. Structured questionnaire was administered to 264 administrative and executive cadre officers in six Federal Ministries across six States in South-South region of Nigeria. Quantitative data were obtained from 236 usable copies of the questionnaire. Descriptive statistics were generated with the aid of Statistical Package for Social Sciences (SPSS) version 26.0. For inferential statistics, the Partial Least Square-Structural Equation Modelling (PLS-SEM) was deployed to test the hypothesized relationships using the Analysis of Moment Structure (AMOS) 23.0. The findings show that entrepreneurial practices have a significant and positive correlation with performance of Federal Ministries in South-South region of Nigeria. Based on these findings, it was recommended that government should genuinely and actively integrate entrepreneurial practices with the traditional structures and processes of Federal Ministries in South-South region of Nigeria. This study contributes to the body of research on public entrepreneurship, and enhances our knowledge of the impacts of entrepreneurial practices on the performance of public sector organizations (more specifically in developing countries like Nigeria).

Key Words: Public-Sector, Public Entrepreneurship, Innovativeness, Proactiveness, Autonomy, Organizational Performance, Federal Ministries, Nigeria.

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1. Introduction

Civil service institutions are typically considered a "fundamental cornerstone" of most nations and/or governance regimes (Lee, 2000). And their performance is a phenomenon that continues to provoke interest among governmental officials like public leaders, policy-makers and public managers (Quah, 2018). This, of course, is evident in their "rich-menu" of activities, including (1) influencing and implementing public policy decisions (2) providing public goods and services and (3) administrating regulatory tasks (Galnoor & Oscer, 2015; Joshi & Carter, 2015; Schiavo-Campo & Sundaram, 2001). Civil service denotes not just the main "permanent administrative" body of

workforce in government employment (Hardy, 2006; Rao, 2015), but also the institutional framework and set of rules ingrained in political and administrative customs and culture (Reichard & Schröter, 2021). Through a vast array of activities that are woven into the very fabric of society (Galnoor & Oscer, 2015), civil service institutions shape virtually every aspect of a nation‘s daily life (Rasul & Rogger, 2016). From garbage disposal to security activities! from national functions to foreign policy and relations (Diefenbach, 2011; Galnoor, 2001). Indeed, society depends on "high-performing" civil service institutions for the accomplishment of future investments, development objectives, socio-economic revitalization, infrastructural and human capital growth, progress and prosperity (Adamolekun, 2002, 2018; Rao, 2015). High-performing civil service institutions are characteristically well aligned for purpose (Lorsh, 1970), effective and efficient (Profiroiu, 2001), adaptive to change (Aldrich, 2007; Anderson, 1999), and capable of delivering on key public objectives (Chandler & Hanks, 1993; Plachek & Ochrana, 2018; Shepherd, 2003). They always find the right balance between their internal resources and competences and external expectations (Lorsh, 1970; Lupton et al., 1977).

The sad fact is that Federal Ministries, which constitute the central and main structural entity of the Nigerian civil service (Office of Secretary to Government of the Federation, 2022), have a commanding characteristic that is inconsistent with the formal definition of "high-performing routines" (Adejuwon, 2012; Fatile & Adejuwon, 2018). Practically speaking, over the previous 30 years, Nigerian Federal Ministries have been characterized by an endless pattern of spectacular underperformance or lack of performance altogether (Adegoroye, 2006; Adejuwon, 2012; Mayomi, 2020). Particularly, in terms of lack of operational efficiency and effectiveness (Abdulla, 2007; Ayeni, 2002; Etuk, 1992; Mayomi, 2020), inability to change and adapt with the times (Ake, 2015; Mayomi, 2020), and low quality public service delivery (Abdulla, 2007; Adegoroye, 2006; Ezeani, 2014; Mayomi, 2020). The result is reflected in far-reaching social, economic, and political misfortunes and continuing challenges (Olaopa, 2009). For example, from activities that inhibits the flowering of the commercial-sector to activities that make life for the generality of Nigerians less-worth-living (Offu et al., 2018; Olaopa, 2009). Still, evidence suggests that successful reform (*see* Shepherd, 2003) could change the current state of affairs and give Nigerian Federal Ministries the long-overdue makeover they need for better performance (Fatile & Adejuwon, 2018). Consequently, governments have been paying more and more attention to understanding how to successfully reform Federal Ministries in order to improve their performance (Magbadelo, 2016). In particular, for over three decades, there have been evident governmental initiatives to reform Nigerian Federal Ministries in order to address their ongoing underperformance and failures (Fatile & Adejuwon, 2018; Magbadelo, 2016; Oyelaran-Oyeyinka, 2006; Salisu, 2001).

Yet, in line with reported findings on civil service reforms in developing countries (e.g., Crook, 2010; Repucci, 2012; Shephered, 2003), effectively reforming Federal Ministries in Nigeria continue to be an unsuccessful endeavor (Ake, 2015; Salisu, 2001). In other words, the numerous reform initiatives (*see* Magbadelo, 2016) have made fruitless attempts to improve, revive, and stabilize Federal Ministries' performance (Salisu, 2001; Sekwat, 2002). As a result, Federal Ministries' astounding failures, along with their disastrous repercussions continue to exist (Adejuwon, 2012; Kuye & Akinwale, 2020). It is true that the situation has reached a breaking point, and experts have correctly anticipated that it is likely to spiral out of control (Mayomi, 2020). From a practical standpoint, the majority of Nigerians now seriously doubt the efficacy of the country's' civil service reform initiatives. As Nigerians continue to demand that civil service institutions (more specifically, Federal Ministries) perform better, political authorities and other governmental officials are under intense pressure to find reform strategies that will work (Fatile &

Adejuwon, 2018; Salisu, 2001). Yet, in this lack of remedial measures, they have not given the idea of "stimulating entrepreneurial practices (i.e. innovativeness, proactiveness and autonomy) within Federal Ministries" much thought; and to initiate reforms associated with it.

The purpose of this study is to determine whether promoting entrepreneurial practices within Nigerian Federal Ministries will improve their performance. Nigerian Federal Ministries provide an unexplored and fruitful setting to investigate the phenomenon of public sector entrepreneurship. The study has three research objectives:

(1) To ascertain the correlation between innovativeness and Federal Ministries' performance (i.e., improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria.
(2) To ascertain the correlation between proactiveness and Federal Ministries' performance (i.e., improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria.
(3) To ascertain the correlation between autonomy and Federal Ministries' performance (i.e., improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria.

The rest of the paper is organized as follows. We discuss the theoretical background on public entrepreneurship in section two. In section three we outline the study's methodology. In the fourth section we provide a discussion of the results concerning the phenomenon of public entrepreneurship in Nigerian Federal Ministries and its possible effects on their performance; and wrap off by going over the study's implications, limitations, and potential future research areas. The fifth section of the paper is the conclusion.

2. Theoretical Background and Hypotheses

Entrepreneurship has been commonly linked with the private-sector (Ramamurti, 1986; Zerbinati & Souitaris, 2005). As a result, entrepreneurship in public sector organizations is reckoned to be contradictory, as entrepreneurial practices and administrative bureaucracies are deemed two worlds' apart or mutually exclusive worlds (Duncan et al., 1988; Rastoka et al., 2022). Simply put, the argument amongst some scholars (e.g. deLeon & Denhardt, 2000; Du Gay, 2000; Rhodes & Wanna, 2008) is that entrepreneurship will not work in the public-sector. However, this is contrary to abundant empirical evidence suggesting that entrepreneurial practices will (and do) work in public sector organizations (Berneir & Hafsi, 2007; Borins, 2014; Covin & Miller, 2014; Cullen et al., 2018; Kuratko et al., 2014; Weiss, 2014). According to Dhliwayo et al. (2017), widespread agreement suggests that the public sector can be as entrepreneurial as the private sector is. Carnes et al. (2019) pointed out that there are unmistakable similarities between public sector entrepreneurship and private sector entrepreneurship. Borins (2014) noted that government can, do, and will be innovative; and that government innovation persists. Berneir and Hafsi (2007) stressed that entrepreneurship in the public sector is "alive and well".

Public entrepreneurship is simply defined as the process of stimulating entrepreneurial practices inside public sector organizations (Diefenbach, 2011; Morris et al., 2008; Roberts & King, 1991). Within the context of this study, public entrepreneurship rests on the New Public Management (NPM) theory (Osborne & Gaebler, 1992). The NPM theory places a strong emphasis on improving the performance delivery of public organizations in terms of efficiency and public-users/citizens satisfaction by introducing private-sector style of management and establishing market conditions for public-service delivery (Diefenbach, 2011; Osborne & Gaebler, 1992;

Savoie, 2003). In particular, the fundamental component of "NPM-type" reform advocates for promoting entrepreneurial methods in public sector organizations (Diefenbach, 2011; Osborne & Gaebler, 1992). For the purposes of this study, we consider the phenomenon of public entrepreneurship along three main dimensions, including (1) *Innovativeness*—predisposition to encourage novel-thinking, generate original ideas, implement creative ideas, try novel solutions, and offer creative problem-solving as an aspect of organizations' culture (Caruana et al. 2002; Lumpkin & Dess, 1996) (2) *Proactiveness*—propensity to be forward-thinking and forward-looking, envision and learn about the future, be pioneering and creative, plan and act in advance, embrace change, and adapt properly as an aspect of an organization's culture (Diefenbach, 2011; Lumpkin & Dess, 1996; Rauch *et al*., 2009) and (3) *Autonomy*—in a sense of adequate operational freedom, flexibility, and discretion in performing work as an aspect of organizations' culture (Covin & Slevin, 1991; Diefenbach, 2011; Lumpkin & Dess, 1996).

While we conclude that there is sufficient empirical evidence (e.g. Cullen et al. 2018; Rastoka et al. 2022; Weiss, 2021) to support the claim that public entrepreneurship is "alive and well" (Berneir & Hafsi, 2007), most of the evidence presented stem from public organizations in Western developed countries (for example, Bernier & Hafsi, 2007; Diefenbach, 2011; Fox, 2005; Kim, 2010b; Link, 2016, to name a few), with insufficient evidence from public organizations in developing countries that includes Nigeria (Coa & Shi, 2021; Wei, 2022). Thus, to fill this gap, we focus our study to address three research questions: What is the correlation between innovativeness and Federal Ministries' performance (i.e., improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria? What is the correlation between proactiveness and Federal Ministries' performance (i.e., improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria? And, what is the correlation between autonomy and Federal Ministries' performance (i.e., improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria?

2.1 Innovativeness and Public Organizational Performance

Considerable evidence suggests a significant and positive correlation between innovativeness and higher standards of performance in public sector organizations (e.g., Arnold, 2019; Fox, 2005; Karnsomdee, 2022; Kim, 2010a, 2010b; Rastoka et al. 2022; Weiss, 2014). The findings of Rastoka et al. (2022) show that innovativeness is one of the essential public entrepreneurship factors that will contribute to enhance the quality of public health-care institutions. Similar findings have been observed by Alosani et al (2020) showing that the performance of public organizations is significantly and favorably impacted by innovation. Alosani and colleagues (Alosani, Yusoff, & Dhaafri, 2020) pointed out that putting innovative strategies and methods into practice would be necessary to maximize public organizational performance. Closely related to these findings, Tanesab and Park (2020) observed that they found a strong correlation between organizational work performance and organizational innovation. In a related vein, Mafini's (2015) findings suggest that innovation and performance in public sector organizations have a very strong positive link. These findings are consistent with results from other studies showing that innovativeness has a significantly positive effect on the performance of public sector organizations (Damanpour et al, 2009; Gieske et al. 2016; Kim, 2010b; Sirola et al. 2022). In support of these findings, Walker et al. (2010) noted that public organizations employ innovations to enhance the services they provide to citizens and public-users, with the overarching goal of raising quality of life and creating stronger, more cohesive communities. Thus, to replicate and verify initial findings that associate enhanced public organizational performance with innovativeness, we suggest:

Hypothesis 1: *There is a significantly positive correlation between innovativeness and Federal Ministries' performance (i.e. improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria*.

2.2 Proactiveness and Public Organizational Performance

Various research streams have focused on establishing, empirically, that entrepreneurial practices (specifically regarding proactiveness) contribute to organizational performance (Alosani et al. 2020; Min & Oh, 2020; Rastoka et al. 2022). A study by Kim (2010b), in which the impact of entrepreneurial characteristics on public organization performance was examined, showed that been proactive improves organizational performance. As the study suggested, among three dimensions of public entrepreneurship, including innovativeness and risk-taking, proactiveness is the most important factor for attaining improved public organizational performance. Min and Oh (2020) showed that public managers' proactive behavior is a significant precedent for successful organizational performance. The work of Sirola et al (2022) showed that there is a statistically significant and positive association between proactiveness and the self-reported performance of city administrations. The result of the study carried out by Rastoka et al. (2022) demonstrated that being proactive is one of the key factors of public entrepreneurship that will improve the standard of public health-care institutions. These results are in agreement with those of other studies that demonstrate that proactiveness greatly improves public organizations' performance (Bernier & Hafsi, 2007; Borins, 2000; Kearney et al. 2008; Kim, 2010b; Rauch et al. 2009). In support of such findings, it is implied that most accomplishments within public sector organizations are initiated and driven by individuals who display opportunity-seeking, forward-looking (Rauch et al. 2009), first-mover (or fast-follower) behaviour (Borins, 2000). Consequently, to replicate and verify initial findings that associate enhanced public organizational performance with proactiveness, we suggest:

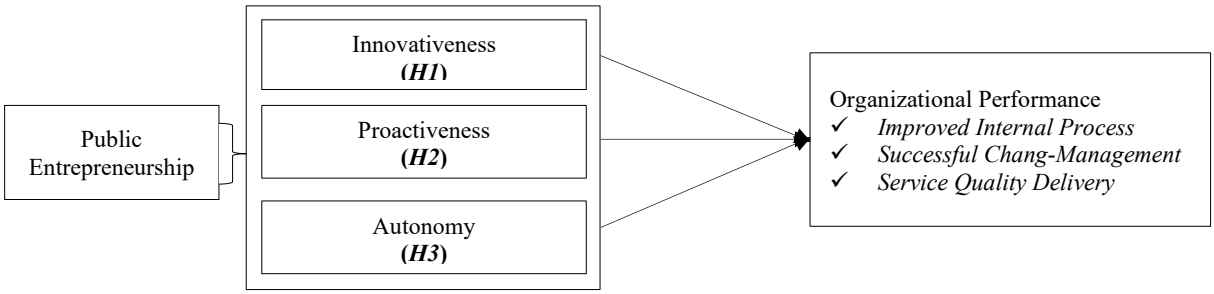
Hypothesis 2: *There is a significantly positive correlation between proactiveness and Federal Ministries' performance (i.e. improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria*.

2.3 Autonomy and Public Organizational Performance

Evidence is increasing that operational autonomy and organizational performance in the public service have positive relationship (Aubert & Bourdeu, 2012; Gore, 1993; Han & Hong, 2019; Thompson, 2000; Mostafa et al. 2015). In 2017, Rasul et al's investigation of the bureaucratic practices under which civil servants operate in Nigeria and Ghana showed that there is a robustly positive link between civil servants' autonomy/discretion and organizational performance. Park and Rainey (2008) demonstrated that workplace autonomy increases workers' motivation for public service, which in turn leads to higher levels of public service performance. In the public service, Tensay and Singh (2020) discovered that autonomy has a significant role in influencing employee engagement and organizational performance. The work by Silva and Rosa (2023) showed a positive and statistically significant correlation between autonomous motivation and task performance of public servants. Han and Hong (2019) pointed out that practices that empower federal employees have been shown to have a favorable impact on organizational performance. Taking everything into account, these findings suggest a significant and positive correlation between operational autonomy/discretion and organizational performance in the public service. Accordingly, to replicate and confirm initial findings that associate improved public organizational performance with autonomy, we suggest:

Hypothesis 3: *There is a significantly positive correlation between autonomy and Federal Ministries' performance (i.e. improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria*.

Figure 1: Hypothesized relationship between Public Entrepreneurship and Public Organizational Performance



3. Research Methods

3.1 Research Setting

Using a framework derived from the "Organization Stream Analysis" technique (Collins & Porras, 2002), we identified three categories of Federal Ministries in Nigeria: (1) Low impact Ministries (2) Medium impact Ministries and (3) High impact Ministries. We decided to study the six identified Federal Ministries whose daily operations have 'high impact' on the basic functioning of Nigerian society. Among them are: (1) education (2) health (3) labour & employment (4) petroleum resources (5) power, and (6) works & housing. We concentrated on the six Federal Ministries across the six States in South-South region of Nigeria, including Akwa Ibom State, Bayelsa State, Cross-River State, Delta State, Edo State, and Rivers State. Among the six Federal Ministries we chose, we designated senior (i.e., administrative and executive) cadre officers to be survey respondents. Because of their extensive understanding of the realities, real-world experiences, and challenges involved in overseeing the daily operations of their respective Ministries, we were more inclined to trust their input.

3.2 Sample design and Sampling technique

The simple random sampling technique was used in this study to provide a sample size across the six selected Federal Ministries in South-South region of Nigeria. Although the six Federal Ministries involved in the study were selected using the "Organization Stream Analysis" framework, the simple random sampling technique was considered appropriate to ensure that the selected Federal Ministries had an equal chance of being in the sampling frame. Thus, the samples produced using the simple random sampling technique was adequately representative, and with minimum sampling bias (Asika, 2015). We received a cumulative list of 428 administrative and executive cadre officers (being an aggregate sum from the six selected Federal Ministries in South-South region of Nigeria) from insiders of the Federal Civil Service Commission (FCSC). Accordingly, a total of 264 representative samples were selected from the population of 428 administrative and executive cadre officers (being an aggregate sum from the six selected Federal Ministries in South-South region of Nigeria). The selection of 264 administrative and executive cadre officers was determined using Krejcie & Morgan's (1970) sample size determination formula. A vitally-important point: Whereas the actual calculated sample size (S) is 203, in order

to accommodate anticipated discrepancies (e.g. non-responses, missing values, etc.), we increased the sample size by adding 30% to the calculated sample size to arrive at an Adjusted Sample Size (Sadj) of 264 (Isreal, 1992; Naing, et al., 2006; Silva, 2018).

3.3 Data Collection Procedures

Data reported in this study were collected through a structured questionnaire. The data were gathered from senior (i.e. administrative & executive) cadre officers in the six selected Federal Ministries (across the six states in South-South region of Nigeria). A total of 264 copies of structured questionnaire were distributed to the study respondents. Among the 264 copies that were distributed, only 244 copies (92%) were retrieved. Again, out of the 244 copies that were retrieved, 8 copies (3%) were characterized by invalid and/or missing responses, and thus were removed. All in all, 236 copies (89%) of the distributed and retrieved questionnaires were found valid and thus used in the statistical analysis.

3.4 Measures

3.4.1 Public Entrepreneurship (PUEP) measures

Three dimensions of public entrepreneurship (i.e. innovativeness, proactiveness, and autonomy) were assessed using survey questionnaire covering 19 items. In particular, whereas innovativeness (INNS) had five items, proactiveness (PROS) had seven items, and autonomy (AUTY) had seven items. The measurement items employed in this study were adapted from established scales on entrepreneurial orientation (EO) and public entrepreneurship (Diefenbach, 2011; Covin et al. 2020; Lumpkin et al. 2009). The 19 items measuring PUEP dimensions were to be rated by respondents on a 5-point Likert Scale, with a scoring range of "1 = Strongly Disagree" to "5 = Strongly Agree" (Likert, 1932).

3.4.2 Measuring Organizational Performance (ORPE) of Federal Ministries

Three indicators of organizational performance (i.e. improved internal process, successful change-management, and service quality delivery) were assessed using survey questionnaire covering 17 items. Specifically, whereas improved internal processes (IIPS) had six items, successful change-management (SCMT) had four items, and service quality delivery (SQDY) had seven items. The measurement items utilized in this study were adapted from established scales on organizational performance (Fox, 2005; Kim, 2004). The 17 items measuring ORPE indicators were to be rated by respondents on a 5-point Likert Scale, with a scoring range of "1 = Strongly Disagree" to "5 = Strongly Agree" (Likert, 1932).

3.5 Data analysis

Descriptive statistics were generated with the aid of Statistical Package for Social Sciences (SPSS) version 26.0. For inferential statistics, the Partial Least Square-Structural Equation Modelling (PLS-SEM) was deployed to test the hypothesized links using the Analysis of Moment Structure (AMOS) 23.0. In order to apply the Structural Equation Modelling (SEM), the study estimated both the measurement model and the structural model.

Table 1: Demographic Characteristics of Sample (n = 236)

Educational Qualification

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	First Degree/Equivalent	201	85	85	85
	Master's Degree	28	12	12	97
	Doctorate	7	3.0	3.0	100.0
	Total	236	100.0	100.0	

Gender

		Frequency	%	Valid %	Cumulative %
Valid	Male	144	61.0	61.0	61.0
	Female	92	39.0	39.0	100.0
	Total	236	100.0	100.0	

Age

		Frequency	%	Valid %	Cumulative %
Valid	20 - 35 years	45	19.1	19.1	19.1
	36 - 50 years	167	70.8	70.8	89.8
	51 years and above	24	10.2	10.2	100.0
	Total	236	100.0	100.0	

Source: *Research Data (SPSS Output), 2023.*

Table 2: Cumulative Descriptive Statistics on Public Entrepreneurship (PUEP)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Innovativeness	236	1	5	2.79	.841
Proactiveness	236	1	5	2.82	1.060
Autonomy	236	1	5	2.78	1.062
Public Entrepreneurship	**236**	**1**	**5**	**2.80**	**.864**
Valid N (listwise)	236				

Source: *Author's Field Survey (2023) —SPSS Version 26.0 Output Extracts*

In **Table 2**, the statistics on the aggregate items on Public Entrepreneurship is shown. The results indicate that Public Entrepreneurship had low score ($\bar{x}$ = 2.80, σ = 0.864). The important implication of this fact is that Public Entrepreneurship phenomenon is not actively and significantly present in Federal Ministries in South-South region of Nigeria. Put differently, it is largely absent.

Table 3: Cumulative Descriptive Statistics on Organizational Performance (ORPE)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Improved Internal Process	236	1	5	2.92	.992
Successful Change-Manageme	236	1	5	2.87	.924
Service Quality Delivery	236	1	5	2.89	.932
Organizational Performance	**236**	**1**	**5**	**2.89**	**.799**
Valid N (listwise)	236				

Source: *Author's Field Survey (2023) —SPSS Version 26.0 Output Extracts*

In **Table 3**, the statistics regarding the total number of items on Organizational Performance is shown. The findings show that Organizational Performance had low score ($\bar{x} = 2.89$, $\sigma = 0.799$). The important implication of this fact is that respondents are of the opinion that Federal Ministries in South-South region of Nigeria have ineffective and inefficient operations which is followed by, and reflected in overall organizational underperformance.

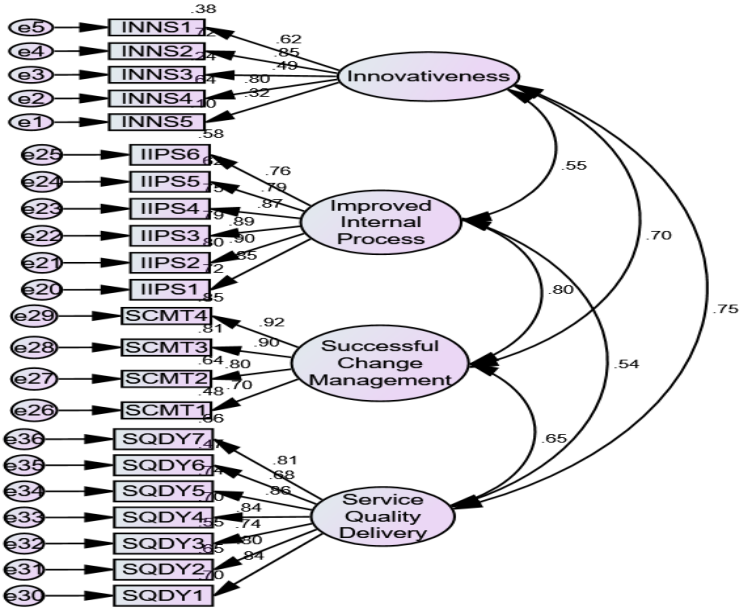
3.6 Measurement Model

3.6.1 Three Factor Model Goodness-of-Fit

Model fit was tested using Chi-Square goodness of fit (CMIN), Difference of Freedom (DF), p-value (P), Normed Fit Index (NFI), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean-Square Error of Approximation (RMSEA). The double headed arrow between two latent variables indicates their covariance relationship. The single headed arrow from the latent variable to the indicator represents the factor loading (i.e., the contribution of indicator to the latent variable). The value closer to 1 indicates that the contribution is more.

3.6.2 Measurement Model Analysis of Innovativeness and Measures of Organizational Performance

Figure 2: Factor Loading for Innovativeness and Measures of Organizational Performance



***Source*:** *AMOS 23.0 output on Research Data, 2023*

Table 4: Measurement Model Analysis of Innovativeness and Measures of Organizational Performance

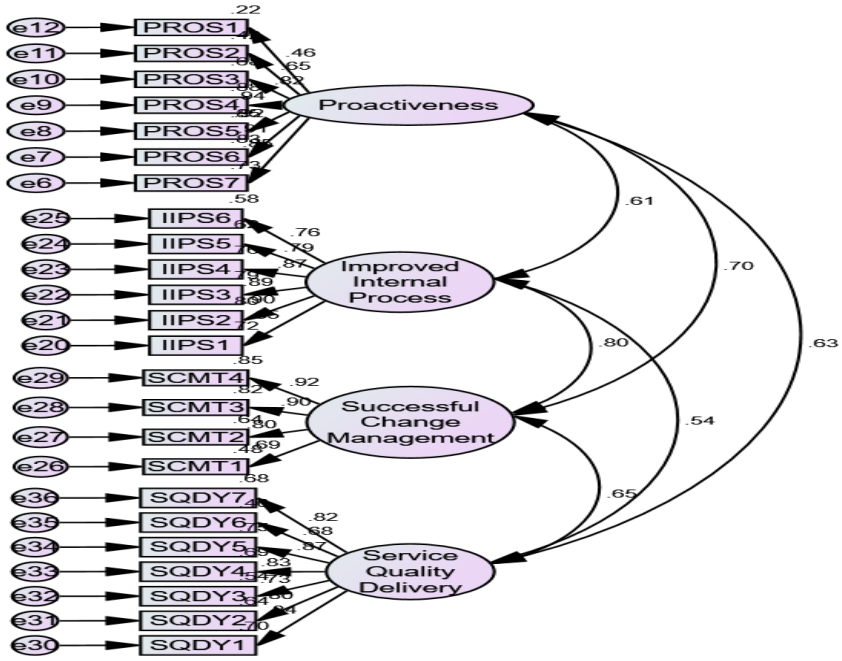
Model	Chi-Square (df)	χ^2/df	NFI	CFI	TLI	RMSEA
Innovativeness, Improved Internal Process, Successful Change-Management, and Service Quality Delivery	1005.812 = (206df)	4.883	.926	.966	.960	.006

Source: *AMOS 23.0 output on Research Data, 2023*

From **Table 4**, the result for the Chi-Square goodness of fit test indicates an acceptable-fitting model, χ^2/df = 4.883, $p < 0.05$. The model has a discrepancy of 1005.812, with 206df. The NFI, CFI and TLI are consistent with conventional thresholds for an acceptable fitting model, with values greater than 0.90. The RMSEA = 0.006, which falls below .05 (close fit). Thus, the RMSEA based on our model suggests that the model is a close fit.

3.6.3 Measurement Model Analysis of Proactiveness and Measures of Organizational Performance

Figure 3: Factor Loading for Proactiveness and Measures of Organizational Performance



Source: *AMOS 23.0 output on Research Data, 2023*

Table 5: Measurement Model Analysis of Proactiveness and Measures of Organizational Performance

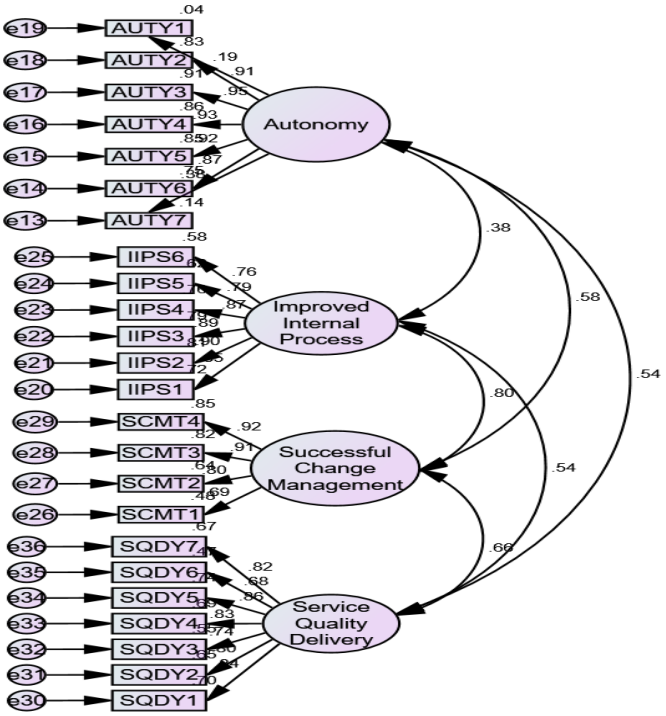
Model	Chi-Square (df)	χ^2/df	NFI	CFI	TLI	RMSEA
Proactiveness, Improved Internal Processes, Successful Change-Management, and Service Quality Delivery	1168.045 = (252df)	4.635	.904	.909	.919	.031

Source: *AMOS 23.0 output on Research Data, 2023*

From **Table 5**, the result for the Chi-Square goodness of fit test indicates an acceptable-fitting model, χ^2/df = 4.635, $p < 0.05$. The model has a discrepancy of 1168.045, with 252 degrees of freedom. The NFI, CFI and TLI are consistent with conventional thresholds for an acceptable fitting model, with values greater than 0.90 (0.904, 0.909 and 0.919 respectively). The RMSEA = 0.031, which falls below .05 (close fit). So, the RMSEA based on our model suggests that the model is an excellent fit.

3.6.4 Measurement Model Analysis of Autonomy and Measures of Organizational Performance

Figure 4: Factor Loading for Autonomy and Measures of Organizational Performance



Source: *AMOS 23.0 output on Research Data, 2023*

Table 6: Measurement Model Analysis of Autonomy and Measures of Organizational Performance

Model	Chi-Square (df)	χ^2/df	NFI	CFI	TLI	RMSEA
Autonomy, Improved Internal Process, Successful Change-Management, and Service Quality Delivery	1268.717 = (250df)	5.075	.909	.911	.922	.032

Source: *AMOS 23.0 output on Research Data, 2023*

From **Table 6**, the result for the Chi-Square goodness of fit test indicates an acceptable-fitting model, χ^2/df = 5.075, $p < 0.05$. The model has a discrepancy of 1268.717, with 250 degrees of freedom. The NFI, CFI and TLI are consistent with conventional thresholds for an acceptable fitting model, with values greater than 0.90 (0.909, 0.911 and 0.922 respectively). The RMSEA = 0.032, which falls between .05 (close fit) and .10 (poor fit). So, the RMSEA based on our model suggests the model represents a close fit.

Reliability Test

Notably, the consistency was assessed using Cronbach's (1951) Alpha Coefficient. In this study, the Cronbach's Alpha reliability level was set at 0.7.

Table 7: Reliability Test

Constructs		Number of Items	Cronbach's Alpha
Public Entrepreneurship	Innovativeness	5	0.768
	Proactiveness	7	0.927
	Autonomy	7	0.905
Organizational Performance	Improved Internal Process	6	0.936
	Successful Change-Management	4	0.896
	Service Quality Delivery	7	0.724

Source: *SPSS 26.0 output on Research Data, 2023*

Based on our statistical analysis, we came to the conclusion that the Cronbach's Alpha reliability scores for each of the constructs were higher than 0.7. The important implication of this fact is that the constructs are all reliable.

Table 8: Convergent and Discriminant Validity of Constructs

Latent Variables	Average Variance Extracted (AVE)	Square Root of AVE
Innovativeness	0.582	**0.763**
Proactiveness	0.626	**0.791**
Autonomy	0.654	**0.809**
Improved Internal Process	0.730	**0.855**
Successful Change-Management	0.671	**0.819**
Service Quality Delivery	0.590	**0.768**

Source: *Microsoft Excel Computation of AMOS 23.0 Output on Research Data, 2023*

Moving to convergent and discriminant validity of constructs: Each construct's average variance extracted (AVE) was greater than 0.5, which suggests convergent validity. The square roots of AVE (in bold) with values above 0.7, demonstrate the constructs' discriminant validity. Therefore, it is observed that altogether the constructs met the criteria for convergent validity and discriminant validity.

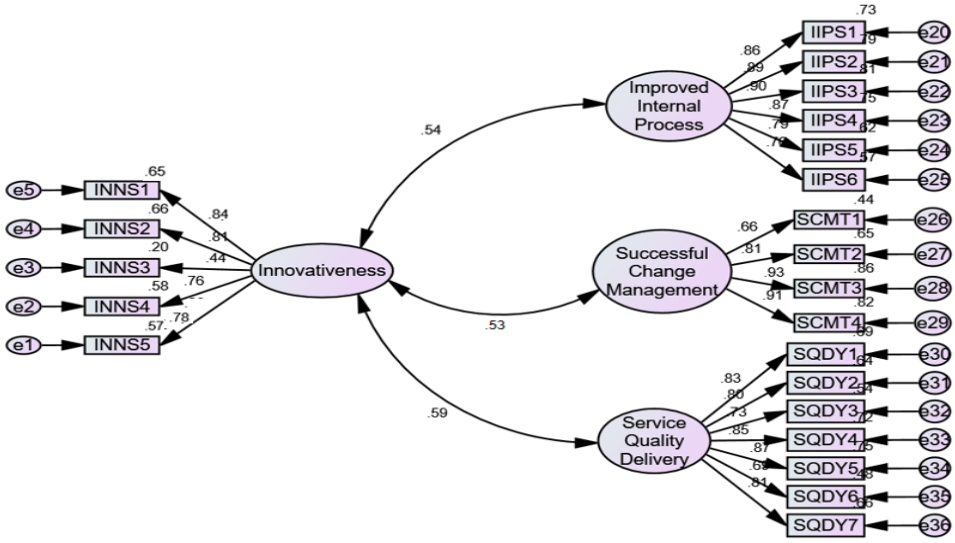
3.7 Test of Hypotheses

Partial Least Squares–Structural Equation Modelling (PLS-SEM) was utilized in the analysis, with the help of SPSS-AMOS 23.0. Path Coefficients (β values) of .10 to 0.29, .30 to .49 and .50 to 1.0 are weak, moderate, and strong Path Coefficients respectively. In addition, hypotheses with *p*-values less than 0.05 'level of significance' were accepted, whereas those above 0.05 were rejected. The coefficients of determination (R^2 or predictive accuracy) were identified. R^2 values for endogenous variable are assessed as: 0.00 to 0.25 (Weak), 0.26 to 0.50 (Moderate), ≥ 0.75 (Substantial).

3.7.1 Test of Hypothesis 1

Hypothesis 1: *There is a significantly positive correlation between innovativeness and Federal Ministries' performance (i.e., improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria*.

Figure 5: Hypothesis 1



Source: *AMOS 23.0 output on Research Data, 2023*

Table 9: Test of Hypothesis 1

Hypothesis			***β***	***p***	***R²***
Innovativeness	<-->	Improved Internal Process	0.543	0.000	0.295
Innovativeness	<-->	Successful Change-Management	0.534	0.000	0.285
Innovativeness	<-->	Service Quality Delivery	0.591	0.000	0.349

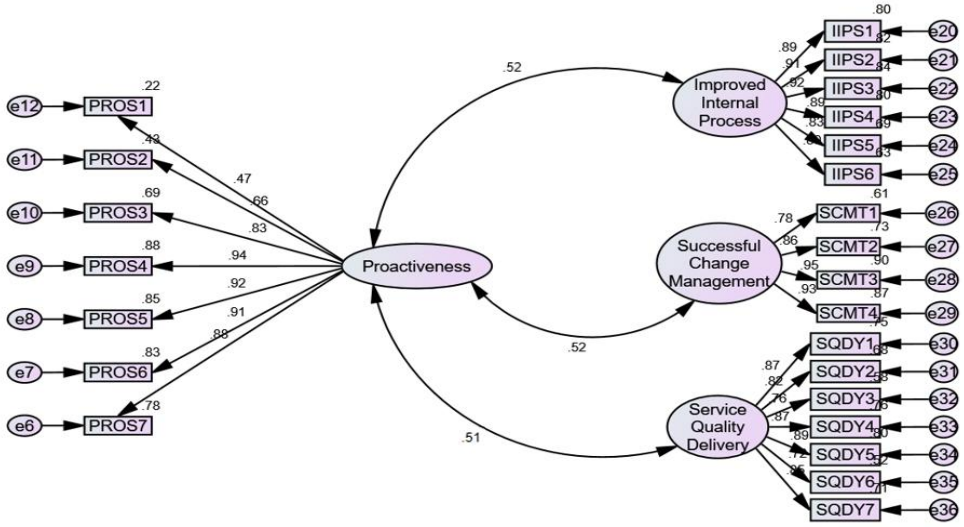
Source: *SPSS-AMOS Version 23.0 Output, 2023*

The path relationship analysis presented in **Figure 5** and presentation in **Table 9** indicates that there are positive, strong and significant paths between Innovativeness and Organizational Performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY), where (**IIPS**, $\beta = 0.543$, $p = 0.000$, $R^2 = 0.295$; **SCMT**, $\beta = 0.534$, $p = 0.000$, $R^2 = 0.285$; and **SQDY**, $\beta = 0.591$, $p = 0.000$, $R^2 = 0.349$). The covariance between Innovativeness and Organizational Performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY) is estimated to be 0.543 for IIPS, 0.534 for SCMT, and 0.591 for SQDY. The covariance between Innovativeness and Organizational Performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY) is significantly different from zero (p=0.000) at the 0.05 level of significance (2-tailed). The coefficient of determination is 0.295 for IIPS (which implies that a unit change in Innovativeness will lead to a 29.5% change in Improved Internal Process), 0.285 for SCMT (which implies that a unit change in Innovativeness will lead to a 28.5% variation in Successful Change-Management), and 0.349 for SQDY (which implies that a unit change in Innovativeness will lead to a 34.9% change in Service Quality Delivery). Considering this, the study therefore restates that *there is a significantly positive correlation between Innovativeness and Federal Ministries' performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY) in South-South region of Nigeria*.

3.7.2 Test of Hypothesis 2

Hypothesis 2: *There is a significantly positive correlation between Proactiveness and Federal Ministries' performance (i.e., improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria*.

Figure 6: Hypothesis 2



Source: *AMOS 23.0 output on Research Data, 2023*

Table 10: Test of Hypothesis 2

Hypothesis			***β***	***p***	***R^2***
Proactiveness	<-->	Improved Internal Process	0.523	0.000	0.274
Proactiveness	<-->	Successful Change-Management	0.519	0.000	0.269
Proactiveness	<-->	Service Quality Delivery	0.515	0.000	0.265

Source: *SPSS-AMOS Version 23.0 Output, 2023*

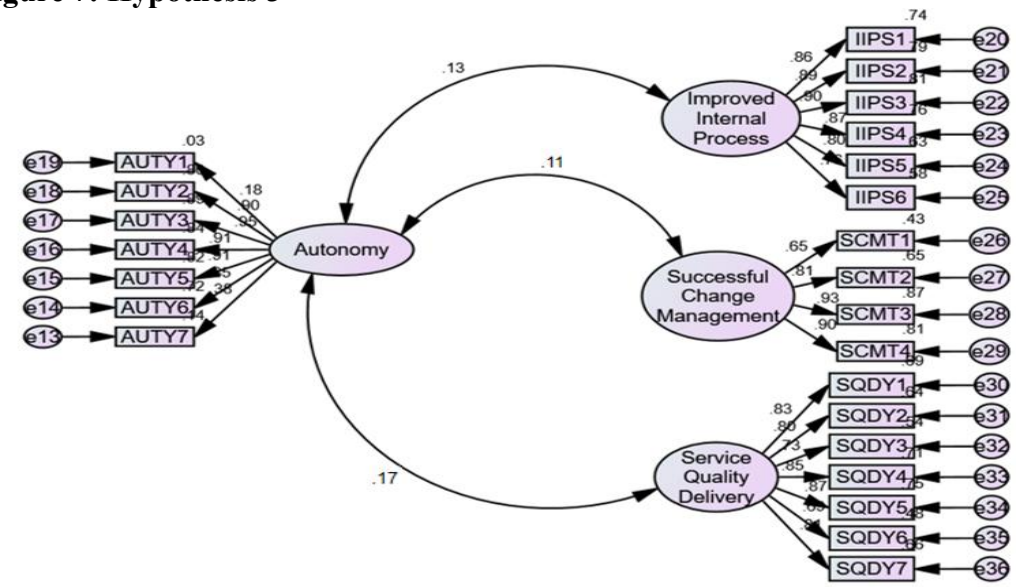
The path relationship analysis presented in **Figure 6** and presentation in **Table 10** indicates that there are positive, strong and significant paths between Proactiveness and Organizational Performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY), where (**IIPS**, $\beta = 0.523$, $p = 0.000$, $R^2 = 0.274$; **SCMT**, $\beta = 0.519$, $p = 0.000$, $R^2 = 0.269$; and **SQDY**, $\beta = 0.515$, $p = 0.000$, $R^2 = 0.265$). The covariance between Proactiveness and Organizational Performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY) is estimated to be 0.523 for IIPS, 0.519 for SCMT, and 0.515for SQDY. The covariance between Proactiveness and Organizational Performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY) is significantly different from zero (p=0.000) at the 0.05 level of significance (2-tailed). The coefficient of determination is 0.274 for IIPS (which implies that a unit change in Proactiveness will lead to a 27.4% change in Improved Internal Process), 0.269 for SCMT (which implies that a unit change in Proactiveness will lead to a 26.9% variation in Successful Change-Management), and 0.265 for SQDY (which implies that a unit change in Proactiveness will lead to a 26.5% change in Service Quality Delivery). Considering

this, the study therefore restates that *there is a significantly positive correlation between Proactiveness and Federal Ministries' performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY) in South-South region of Nigeria.*

3.7.3 Test of Hypothesis 3

Hypothesis 3: *There is a significantly positive correlation between Autonomy and Federal Ministries' performance (i.e., improved internal process, successful change-management and service quality delivery) in South-South region of Nigeria*.

Figure 7: Hypothesis 3



Source: *AMOS 23.0 output on Research Data, 2023*

Table 11: Test of Hypothesis 3

Hypothesis			***β***	***p***	***R^2***
Autonomy	<-->	Improved internal process	0.128	0.002	0.016
Autonomy	<-->	Successful change management	0.107	0.019	0.011
Autonomy	<-->	Service quality delivery	0.166	0.003	0.028

Source: *SPSS-AMOS Version 23.0 Output, 2023*

The path relationship analysis presented in **Figure 7** and presentation in **Table 11** indicates that there is positive and significant path between Autonomy and Organizational Performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY), where (**IIPS**, $\beta = 0.128$, $p = 0.002$, $R^2 = 0.016$; **SCMT**, $\beta = 0.107$, $p = 0.019$, $R^2 = 0.011$; and **SQDY**, $\beta = 0.166$, $p = 0.003$, $R^2 = 0.028$). The covariance between Autonomy and Organizational Performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY) is estimated to be 0.128 for IIPS, 0.107 for SCMT, and 0.166 for SQDY. The covariance between Autonomy and Organizational Performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY) is significantly different from zero (p=0.02 at the 0.05 level of significance (2-

tailed) for IIPS, (p=0.019 at the 0.05 level of significance (2-tailed) for SCMT, and (p=0.003 at the 0.05 level of significance (2-tailed) for SQDY. The coefficient of determination is 0.016 for IIPS (which implies that a unit change in Autonomy will lead to a 1.6% change in Improved Internal Process), 0.011 for SCMT (which implies that a unit change in Autonomy will lead to a 1.1% variation in Successful Change-Management), and 0.028 for SQDY (which implies that a unit change in Autonomy will lead to a 2.8% change in Service Quality Delivery). Considering this, the study therefore restates that *there is a significantly positive correlation between Autonomy and Federal Ministries' Performance (i.e. improved internal process-IIPS, successful change-management-SCMT, and service quality delivery-SQDY) in South-South region of Nigeria.*

4. Discussion

The results supported all three hypotheses. Specifically, first, the findings revealed that innovativeness will significantly and positively affect the performance (i.e. improved internal process, successful change-management, and service quality delivery) of Federal Ministries in South-South region of Nigeria. Such findings is vitally-importance because it implies that with an innovative climate and culture (including receptiveness to new ideas, novel-thinking and problem-solving, taking initiatives, doing things differently, trying new solutions, focusing on outcomes, and pursuing novel programs and services, *etc.*) Nigerian Federal Ministries will improve their performance. In particular, with a climate and culture of innovativeness, Nigerian Federal Ministries will be more likely to: (1) develop new methods/strategies, enhance operational structures, improve workflow, reduce error/defect rates, eliminate and reduce massive wastage (2) anticipate, respond to, adapt, and stay-out in front of change, and (3) frequently create and deliver high-quality, timely, accessible, and dependable public services to citizens and users. These findings are in line with those of other studies that demonstrate that innovativeness significantly improves the performance of public sector organizations (Arnold, 2019; Alosani et al. 2020; Bernier & Hafsi, 2007; Borins, 2014; Damanpour et al, 2009; Gieske et al. 2016; Kim, 2010a, 2010b; Rastoka et al. 2022; Sirola et al. 2022; Walker et al, 2010).

Second, the findings revealed that proactiveness will significantly and positively influence the performance (i.e., improved internal process, successful change-management, and service quality delivery) of Federal Ministries in South-South region of Nigeria. These findings suggest that with a proactive culture and behavior (including been forward-thinking and forward-looking, envisioning and learning about the future, been pioneering and creative, planning and acting in advance, embracing change, and adapting properly, *etc*), Nigerian Federal Ministries will improve their performance. More specifically, with a culture and behavior pattern of proactivity, Nigerian Federal Ministries will be more likely to: (1) identify areas of possible mistakes in internal work-routines and avoid them before they occur, preempt and prevent disruptions in operating and administrative processes, anticipate future needs and plan ahead to reduce error-rate and massive wastage, update and adapt internal processes to survive the future (2) quickly respond to, plan for, and adapt to fast shifting environments, and (3) anticipate public needs effectively, gain public expectations insights, launch better products successfully, and be rightly positioned to deliver high-quality, timely and reliable services. These results are consistent with previous research showing that proactiveness significantly enhances the performance of public sector organizations (Alosani et al. 2020; Kim, 2010b; Min & Oh, 2020; Rastoka et al. 2022; Rauch et al. 2009; Sirola et al. 2022).

Third, the findings revealed that autonomy will significantly and positively affect the performance (i.e. improved internal process, successful change-management, and service quality delivery) of Federal Ministries in South-South region of Nigeria. Such findings deserve closer

attention because of the potentially important general implications for understanding how granting civil servants operational autonomy/discretion (to show initiative, suggest ideas freely, exchange and debate ideas, participate in certain decisions and manage certain tasks, etc.) will improve Nigerian Federal Ministries' performance. In Particular, with a culture of operational autonomy/discretion for civil servants, Nigerian Federal Ministries will be more likely to: (1) cut-down cost and massive wastage, reduce error-rate in operating and administrative processes, reduce the time it takes to process and deliver services, develop new internal operating methods and strategies, improve design productivity and new service introduction, (2) successfully manage change, and overcome resistance to change, and (3) enhance service quality delivery. These findings are further corroborated by previous works (Gore, 1993; Han & Hong, 2019; Rasul et al., 2017; Thompson, 2000) which suggests that civil servants' operational autonomy and discretion will contribute to enhance public sector organizations' performance.

This study has yielded two vitally-important implications for theory and practice in public entrepreneurship. First, the findings, concepts and framework of this study have made distinct and novel contributions to the body of research on public entrepreneurship and organizational performance in the public service (in a developing country like Nigeria). Second, the central concepts and framework of this study is more likely to provide policy-makers and public managers (more specifically in Nigeria) with new insights to stimulate thinking on how to effectively introduce reforms associated with public entrepreneurship (and thus impressively turnaround and revitalize their public organizations for enhanced performance). Admittedly, like every other study in social science fields, this study does not have a flawless, unblemished track-record. Thus, it most likely suffered from inherent flaws and limitations. Specifically, first, data was gathered and analyzed at a 'single-point in time' (i.e., one-off cross-sectional data). Consequently, we were unable to make series of observations (across time points) to get definite information regarding "cause-and-effect" relationships between public entrepreneurship and organizational performance of Federal Ministries in South-South region of Nigeria. As a result, while we can claim that, empirically, there is a correlation, we cannot, however, declare to have definitively found cause-effect relationships. Second, this study was carried out wholly in South-South region of Nigeria. The implication of this fact is that the specific peculiarities of South-Southern environment may perhaps constitute limitation for the broad generalizability of the study findings. In addition to these limitations, this study was unable to develop a framework and application model on how to successfully integrate entrepreneurial practices with the administrative operations and systems of Nigerian Federal Ministries. Finally, we hope that these areas of limitations will offer interesting paths for future research.

5. Conclusions

The most evident issue facing Nigeria is Federal Ministries' ongoing underperformance and catastrophic failures. As a result, the quality of public services has left Nigerians feeling let down for far too long. Of course, it is evident that during the past three decades, a number of governmental reform initiatives have attempted to turnaround the Federal Ministries in order to improve their performance. Nevertheless, in spite of the seeming failures of the various reform initiatives, governmental officials including policy-makers and public managers have not aggressively pushed for reforms associated with public-sector entrepreneurship. This study sought to determine whether encouraging entrepreneurial practices within Federal Ministries in South-South region of Nigeria would result in the much-needed transformation that would improve their performance. Based on the results of this study, we draw the conclusion that Federal Ministries in

South-South geographic region of Nigeria will perform better if they engage in real and active entrepreneurial practices.

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JOB CONTROL AND EMPLOYEE PRODUCTIVITY OF OIL SERVICES FIRMS IN RIVERS STATE

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Abstract
Probing the impact of job control and employee productivity of oil services firms in Rivers State. The study is necessitated by identified safety issues, work place ethics, conflict management, workplace accident, involuntary work schedule, pollution caused by terrorist attacks, sabotage and illegal refineries. This study utilised a quasi-experimental research approach to achieve its goal. Out of 1,200 people, a sample size of 300 partakers was chosen utilizing the Taro Yemen formula with 30 partakers drawn from ten firms. Out of 300 questionnaires, 285 were finally retrieved as sample size. Data was analysed utilising and the Spearman Rank's Order Correlation Coefficient statistical tool aided by SPSS (25.0). Results showed remarkable number of employees in the target companies likewise noteworthy correlations between job control and employee productivity, as indicated by rho values upshot. These correlations are reinforced by the organisational culture's moderating effects. Given the organisation goals and objectives, managers are advised to identify aspects of job control that would improve employee productivity in their organisations. They should also develop a culture that facilitates efficient resource management and job design for seamless operations. Further research on environmental control and decision-making strategies for oil servicing companies was recommended.

The Key Words:
Job control, Employee Productivity, Organization Culture

INTRODUCTION

Job Control which is a means of controlling work load is gaining so much attention in the field of research in recent years due to so many reasons. Mainly, there is the search for a unique way of reducing work pressure on employees and for organizations to direct and manage work, man, machine, materials and equipment due to the complex nature of oil servicing firms in order to achieve optimum success in the work place. Formal work organizations are created to produce goods and services and to pursue dominant goals that individuals acting alone cannot achieve, Ogunyemi et al, (2015). The means of effectively achieving this forms the basis for this study.

Secondly, as a result of a seeming desire of employees to influence what happens in the work place such as control over work task, work pace, physical movement, social and technical environment and freedom from tight supervision, particularly to manage matters that are relevant to personal goals (Wikipedia, 2019) job control is imperative at the work place.

Thirdly, the importance of a manager's ability to control work and also freedom of the subordinate to manipulate his job circumstances to his favour in dealing with unfavourable circumstances at work has also given rise to research of Job Control.

Sequel to the huge sums invested and the great wealth generated for the State, there is need to inspect job control and employee productivity in oil services firms. Oil services firms like Halliburton (HAL) and Baker Hughes (BKR) are involved in the provision of services throughout all the stages of production. Consistent with Investopedia, (2024) these firms are into services like engineering, fluid hauling, maintenance, geological surveying, non-destructive testing, etc. The foundation of this subject is how to do this in an efficient manner. Without a doubt, the goal of oil services firms is to create or provide high-quality products and services via synergy, maintain growth, reduce risk and profitability. In order to accomplish this as successfully as possible, job control is necessary. One of the special ways that oil servicing companies manage and guide labor, man, machine, materials, and equipment to achieve maximum achievement is via job control, which is a way to lessen work pressure on employees.

Congruent with Flynn & James, (2009); Searle, Bright & Bochner, (1999), work expectations and job control are two elements that are crucial for employee success. In congruent with Parker et al. (2009), job demands may be understood as a numeric workload or as time pressure, and they refer to the quantity and complexity of an employee's task. Karasek (1979) defined work control as an employee's level of autonomy, decision-making flexibility, and active engagement inside an organization. Researchers have operationalized this as the ability to manage one's upshots and manipulate job demands.

Subsequently, R. Anthony Inman in a publication titled 'productivity concepts and measures' stated that doing unnecessary work efficiently is not exactly being productive. They said it would be more correct to interpret productivity as a measure of effectiveness (doing the right thing efficiently).

Additionally, Inman proposed that a productivity measure characterizes the degree to which an organization uses its resources to generate output in a paper titled productivity ideas and metrics, which Plenert revised. They contend that efficiency and production are often conflated. Efficiency is often defined as the ratio of work completion time to a predefined benchmark time. However, it is not precisely constructive to work effectively on unneeded tasks. They argued that it would be more accurate to see productivity as an upshot-oriented metric, rather than an output-oriented one, that measures effectiveness (doing the right thing efficiently). As an upshot, they utilized the phrases partial, multifactor, and total productivity to describe productivity.

Problem Statement:

The study became necessary as a result of perceived identified issues and challenges in terms of organizational failures, poor performances and poor level of productivity, growth and inconsistency in organizational operations; occurring as a result of staff dissatisfaction, involuntary work schedule, poor retirement benefits, lack of promotion and staff welfare.

The concept of Job Control has been of great interest to the researcher who has seen or experienced different behavioural patterns of workers where most times, they seem to be fed up with work yet

refuse to quit and some who are always unavailable in the office, because of other personal interests and goals.

Smeed and Heyter, (2010) defined presenteeism as turning up to work while ill. In a Public health publication, it is said that presenteeism and productivity are unavoidably connected and the following were listed as factors responsible for presenteeism: working while ill, work-life imbalance, unhealthy lifestyle, stress, personal financial difficulties due to poor remuneration, casualization.

In another vein Hatinen, Kinnunen, Pekkonen, and Kalimo, (2007) cited cynicism and exhaustion as two symptoms of occupational burnout, and suggested that increasing job control as an intervention can help counteract such traits in the workplace.

Aim and Objectives of the Study:

The aim of this study is to examine the Relationship between Job Control and Employee Productivity of Oil Services Firms in Rivers State and the Moderating Role of Organization Culture.

Research Question:

To accomplish the goals of this study, the researcher sought to address the ensuing key question: What is the correlation between Job Control (measured by Task Control Indicator as derived from McLaney and Hurrell's, (1988) factor analysis of Greenberger et al's, (1989) questionnaire) and Employee Productivity indices proposed by William A. Ruch, (1994), i.e. Effectiveness and Quality viz-a-viz Organization Culture as the moderating variable.

Hypotheses:

H 1: There is no significant relationship between Task Control and Effectiveness.
H 2: There is no significant relationship between Task Control and Quality.
H 3: The organization's culture does not moderate the relationship between Job Control and Employee Productivity.

LITERATURE REVIEW

Conceptual Frame Work

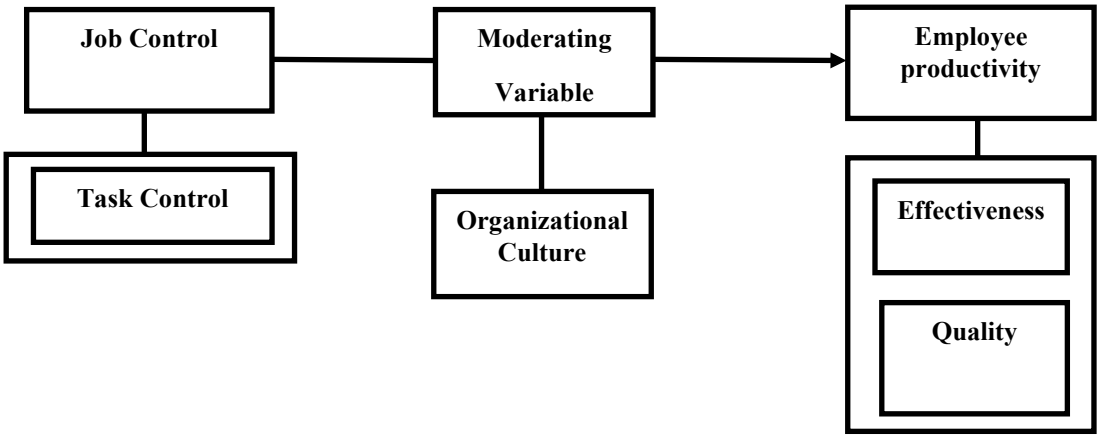

Figure 1: *Conceptual Framework showing the correlation between job control, employee productivity and organizational culture. The predictor variable job control is operationalized utilising three dimensions (task control, decision control, and input control) which were adopted*

from Pascale and Zijlstra (1999). The criterion variable employee productivity measures are operationalized to utilising (effectiveness and quality), adopted from Ruch (1994). Organizational culture was established to moderate the correlation between job control and employee effectiveness.

Source: Dimensions adopted from Pascale and Zijlstra (1999). Measures adopted from Ruch (1994). Moderating Variable Schein (1996).

Predictor Variable – Job Control	**Moderating Variable –**	**Criterion Variable – Employee Productivity**
Task Control	**Organizational Culture**	**Effectiveness**
- *Safety measures*		- *Timeliness*
- *Workstation design*		- *Utilizing available resources,*
- *Noise control*		- *Expertise and*
		- *Ethical standards*
		Quality
		- *Operational effectiveness*
		- *Customer satisfaction and*
		- *Continuous improvement*

This chapter is specifically centred on the following:

- ❖ Conceptual Frame Work
  - − Job Control (Task Control),
  - − Employee Productivity (Effectiveness, and Quality),
  - − Organizational Culture,
- ❖ Theoretical Framework

Theoretical Review is on the following:

- − Job Characteristics Theory,
- − Herzberg's Two-Factor Theory,
- − Self-Determination Theory,
- − Job Demand-Control-Support Theory

- ❖ Empirical Review
- ❖ Gap in Literature

Job control

Job control is defined as the belief in one's ability to shape one's work environment for the better, mitigating negative features and maximising good ones (Ganster, 1989). The efficient execution of tasks, the effective utilisation of resources, and the achievement of organisational objectives are all dependent on this idea. Workers' emotional health, job happiness, and productivity may all benefit from giving them more say over their working conditions. Various well-established frameworks lend credence to this idea. i.e., Hackman and Lawler's, (1971) job characteristics model, Emery and Trist's (1960) sociotechnical systems approach, Frese and Zapf's, (1994) action theory, which incorporates work by Hacker, Skell, and Straub, (1968), and Karasek's, (1979) demands-control model. Taken as a whole, these theoretical frameworks highlight how crucial agency and choice are in creating a positive and fulfilling workplace.

Congruent with Terry and Jimmieson, (1999), there is a clear correlation between increased workplace autonomy and control and a reduced occurrence of stress-related consequences. These comprise a range of negative consequences, comprising worry, mental anguish, exhaustion, impatience, physical symptoms, and even less alcohol intake. Further supporting the importance of job control, a study by Bosma, et al., (1997) showed a strong longitudinal correlation: among London public servants, lower levels of job control over time were associated with an increased risk of developing coronary heart disease. This highlights how one's level of control over their work environment substantially affects their psychological and physical health in the long run.

Task control

Ensuring efficiency, productivity, and the attainment of strategic goals is the goal of task control, which is the systematic coordination and monitoring of activities inside an organisation. Assigning tasks, keeping tabs on progress, providing feedback, and being flexible are all parts of this idea, and they are all essential for good management in fast-paced corporate settings. The fundamental principle of task control is the systematic distribution of organisational tasks and responsibilities to specific persons or groups. In order to make sure that activities are a good fit for workers' abilities, this method takes their expertise, competences, and skills into account (Hackman and Oldham, 1976). In addition to improving individual performance, efficient work assignment also adds to team chemistry.

Crucial is the strategic alignment of duties with the objectives of the organisation. To make sure that everything is working towards the same goal, tasks should be structured to directly contribute to the accomplishment of those goals. With everyone pulling in the same direction, morale soars and productivity soars (Senge 1990). In order to keep tabs on how far along certain tasks and projects are, task control involves setting up monitoring tools. It is usual practise to evaluate team and individual progress utilising performance metrics and key performance indicators (KPIs) (Carroll, 2004). If managers do performance evaluations on a regular basis, they may assess upshots, pinpoint problem areas, and reward outstanding work. In ever-changing corporate settings, continuous monitoring is of the utmost importance. The capacity to adjust tasks and reallocate resources in congruent with new information is a characteristic of good task management. Because of this flexibility, the company can easily respond to changes in the market (Bryson, 1988).

Employee Productivity

The idea of employee productivity is fundamental to organisational management; it measures how well and efficiently workers accomplish the organization's overall objectives. It incorporates aspects like managerial practises, work atmosphere, employee motivation, and individual abilities beyond just measuring output in congruent with Kanfer et al., (2008). There is a strong correlation between leadership and management styles and worker output. Leadership that is both effective and supportive creates an atmosphere where employees are more invested in their job and more likely to go above and beyond in their efforts (Riggio and Bass, 2006). Motivational work, chances to learn new skills, and a clear sense of purpose all contribute to an engaged workforce, which in turn boosts output. Saks, (2006) says there is a strong correlation between the physical and mental aspects of the job that influence productivity. Factors that contribute to the well-being and productivity of employees comprise ergonomics, organisational culture, and access to resources

(Hackman and Oldham, 1976). Improving productivity in the workplace is impossible without training and development programmes. By facilitating the acquisition of relevant skills, these programmes help workers better meet the demands of their employers (Noe, et al., 2017). A high-performance culture may flourish when workers are financially and otherwise rewarded for their efforts (Luthans, 2011). A well-rounded strategy that takes into account both quantitative and qualitative indicators is necessary for measuring employee productivity. Time management, production volume, and job quality are common measures congruent with Macan, et al., (2014).

Effectiveness

Effectiveness refers to the degree of proficiency in doing tasks efficiently within a certain timeframe, utilising the available resources i.e. personnel, finances, equipment, and materials. In order to effectively manage high-value contributions, the organisation may plan corrective and enhanced operations to guarantee they stay on track with meeting the current demand, while maintaining impartiality. Rice, (2003) noted that effectively addressing factors that impact a strong level of dedication can create an optimal environment for both the business and the primary earner. These factors may encompass various aspects i.e. working conditions, expertise, labour force structure, energy, control, ethical standards, training protocols, strategies, organisational structure, and opportunities for professional growth. Effective management of these factors fosters employee motivation and encourages them to do their responsibilities with utmost dedication. By efficiently managing their tasks and promoting physical activity, representatives who fulfil their obligations effectively mitigate the challenges encountered by the workforce, ensuing in increased productivity.

Quality

Quality is a crucial principle that supports the achievement of organisational success by prioritising the provision of goods and services that continuously meet or surpass consumer expectations. It adopts a comprehensive approach, taking into account not just the end upshot but also the procedures, structures, and values inside an organisation. Striving for excellence is crucial in establishing consumer confidence, improving competitiveness, and attaining long-term expansion. Quality management fundamentally entails a dedication to fulfilling client demands and consistently enhancing procedures. The dedication is shown via the concepts of Total Quality Management (TQM), a philosophy that highlights the participation of all workers in the pursuit of excellence (Deming, 1986). Total Quality Management (TQM) places substantial emphasis on prioritising customer satisfaction, continuously improving processes, and making decisions owing to factual analysis.

An essential element of effective management is understanding that quality is not just the duty of a particular department, but rather a collective dedication that spans the whole organisation. This entails establishing a culture that prioritises quality, where each person is committed to providing exceptional upshots. In congruent with Philip Crosby, Quality comes at no cost. Although it is not a present, it is provided without charge. The things that lack quality are what incur expenses (Crosby, 1979). This viewpoint emphasises the possibility for cost reduction by investing in practises that provide high quality management. ISO 9001 and similar quality management systems provide organisations a systematic framework to establish and enhance their operations in an organised manner. ISO 9001 prioritises customer happiness, operational effectiveness, and the significance of making decisions owing to factual data (ISO, 2015). Implementing such

systems enables organisations to establish excellent practises and showcase their dedication to adhering to international standards.

To achieve effective quality management, it is necessary to have a proactive stance in recognising and resolving possible problems before they have a negative influence on the final product or service. The notion of prevention over inspection embodies a proactive approach to quality assurance, emphasising the need of integrating quality into processes rather than just depending on inspections conducted after production (Juran, 1995). Service quality has become more imperative in the service industry. The SERVQUAL model, established by Parasuraman, Zeithaml, and Berry, delineates five distinct aspects of service quality: dependability, assurance, tangibles, empathy, and responsiveness (Parasuraman, et al., 1988). This paradigm facilitates the evaluation and enhancement of service quality inside organisations, acknowledging the distinctive obstacles and prospects encountered in the service industry.

The organization's commitment to quality goes beyond its own bounds to comprise suppliers and other external partners. Establishing collaborative partnerships with suppliers is essential for guaranteeing the quality of inputs in the organization's operations. The notion of supply chain quality management highlights the need of a synchronised strategy to ensure quality throughout the whole supply chain (Handfield, et al., 2019).

Organizational Culture

The organisational ethos encompasses an organization's prospects, capabilities, ideas, and the rules that govern participant behaviour. It is reflected in the self-image of members, internal operations, interactions with the external environment, and aspirations for the future. Culture is owing to shared attitudes, ideas, practises, and explicit and implicit rules that have been developed over time and are considered legitimate.

Organisational culture influences how people interact, the context in which their understanding is shaped, the challenges they may face with uncertainties, and ultimately the way they communicate (or fail to communicate) information. Organisational culture encompasses the shared values, beliefs, and philosophies of individuals inside an organisation. It may also be influenced by factors i.e. historical context, product type, market conditions, expertise, strategy, workforce composition, managerial approach, and national culture.

Culture encompasses an organization's vision, values, norms, strategies, symbols, language, assumptions, beliefs, and practises (Needle, 2004).

Chester Bernard, (1983, 1960:88) first formulated the notion of organisational culture, emphasising the distinctions between the personality of an organisation and that of an individual. There is a prevailing opinion that the irrational conduct of employees, as shown by a collection of conclusive research, is the primary cause perpetuating the issue of cultural dynamics. The most substantial contribution was made by Taylor's scientific management, which aimed to prevent workers from deviating from reason by utilising skills that eliminated ambiguity from work processes (Kanigel, 1997). The word culture was first utilised in the field of organisational literature by Elliot Jaques, (1951) in his work titled The Changing Culture of Factory.

Theoretical Review

1) Job Characteristics Theory

Job characteristics theory is a framework developed by Hackman & Oldham in 1975 and further refined in 1980 in their book 'Work Redesign'. The authors of the book presented a series of concepts that should be utilised in order to enhance work satisfaction inside organisations. Initially, this theory proposed a framework consisting of five fundamental job attributes, comprising skill diversity, task identity, task importance, autonomy, and feedback, which led to five upshots connected to work. The upshots of interest in this context comprise motivation, satisfaction, performance, absenteeism, and turnover. These upshots are influenced by three psychological states: experienced meaningfulness, experienced responsibility, and knowledge of upshots. Essentially, the idea elucidated the connection between job features and individual work reactions.

The concept of work redesign originated in the 1960s with the aim of simplifying occupations in order to optimise output. Upon completion of these activities, workers experienced increased dissatisfaction owing to the excessively monotonous and repetitive nature of the work. This led to the emergence of the concept of job enrichment, aimed at enhancing motivation. Consequently, the notion of simplifying jobs via routine and repetition was superseded (Oldham, G. R. and Hackman, J. R., 2010). The idea elucidates the conditions under which people are inclined to thrive in their employment. The theory also comprises individual variance factors as mediators in the correlation between the characteristics and the upshot variables.

2) Herzberg's Two-Factor Theory

When we talk about what causes individuals to select one course of action over another, we are referring to a wide range of emotions and factors (Maicibi, 2003). Both internal and external factors might motivate an individual to choose a certain course of action. Herzberg polled 203 engineers and accountants in 1959 on their views towards their jobs. We wanted people to remember times when they were happy or sad at work and explain why. The upshots showed that the job traits were associated with the tasks and type of the work that people performed. Motivating variables did seem to be able to boost confidence, competence, self-development, self-actualization, and status. But it does not seem that de-motivation or discontent ensues when such satisfying employment qualities are absent. To the contrary, discontent stems from negative evaluations of aspects of one's employment i.e. business policies, interpersonal relations at work, pay, supervision, technical issues, and general working conditions. They do not exist on a continuous scale, contrary to the conventional wisdom. They are two separate continua that do not rely on one another.

Factors that inspire people to put forth effort are known as motivators, in congruent with Herzberg, (1966). Workplace happiness is the end consequence of these drivers. Individuals' needs for personal improvement are the foundation of motivational forces. When present, motivation elements may play an active role in generating contentment in one's work life. They have the potential to inspire people to go above and beyond, leading to better upshots if they work. Some of the things that may motivate people to work hard comprise tasks that are both tough and exciting, opportunities for recognition and development, a feeling of personal accomplishment, a high social position, and a sense of personal progress within the profession.

Motivating variables contribute to elevating an employee's level of work satisfaction. Their productivity rises as an upshot, and the organisation as a whole benefits. In congruent with Zimmerman, (1988), these are prizes or incentives that increase the motivation to meet an employee's needs.

3) Self-Determination Theory

A person's autonomous incorporation of the activity into their identity is the source of this kind of passion, in congruent with the self-determination theory (Vallerand et al., 2003). The psychological conditions in which an individual's sense of psychological connection to their job and the autonomy with which they approach their employment are defined by self-determination theory (SDT) (Deci & Ryan, 1985). In congruent with Deci and Vansteenkiste, (2004), meeting these needs may boost human motivation in many situations. In congruent with Ryan and Deci (2022), organismic integration is the underlying psychological process that allows individuals to become more differentiated and coherent in their functioning. It is a reflection of people's proactive, synthetic tendency.

Humans, in congruent with self-determination theory Ryan & Deci, (2000), have an innate need to satisfy one of three psychological needs: competence, autonomy, and relatedness. The amount of agency an action has is defined by how much it is part of the actor's self-concept, in congruent with self-determination theory (SDT) (Caudroit, Boiché, Stephan, Le Scanff & Trouilloud, 2011). The core principle of self-determination theory is the satisfaction of basic psychological needs, comprising the need for relatedness (the desire for relatedness with others), competence (the desire to feel effective and able to overcome challenges), and autonomy (the desire to feel capable of managing one's own actions and behaviours) (Deci & Ryan, 2000). An essential difference between doing something and having an experience is the basis of the idea. Specifically, people who seem to have the same driving forces behind an action could really have rather distinct experiences with that action (Gurland & Glowacky, 2011). Field, Martin, Miller, Ward and Wehmeyer, (1998) state that goal-pursuing, self-directed, and autonomous behaviours are the upshot of a combination of knowledge, abilities, and beliefs that are part of self-determination theory.

4) Job Demand-Control-Support Theory

An imperative and widely-known theoretical framework, the Job Demand-Control (JDC) hypothesis elucidates the intricate correlation between elements in the workplace and the stress that employees feel. With its comprehensive framework for understanding how job demands and the degree of employee control over their work influence stress standards and overall well-being, Robert Karasek's JDC theory—first suggested in the 1970s—has had a tremendous effect on the study of occupational stress. Concerns about occupational stress and its effects on health and performance led to the development of Karasek's ground breaking Demand-Control-Support (JDC) theory, which aims to address the complex connection between job aspects and stress. An influential work by Karasek, (1979) titled Job Demands, Job Decision Latitude, and Mental Strain: Implications for Job Redesign was officially utilised as its introduction. This idea recognised the need of considering the interplay between individual traits and work-related factors in defining stress levels, rather than relying only on simplistic definitions.

Congruent with the Job Demand-Control theory, job demands are the aspects of work that need workers to exert effort, whether they be physical, psychological, social, or organisational. These pressures may take many forms, comprising but not limited to heavy workloads, limited time, emotional demands, and conflicting expectations from inside one's workplace. To the contrary, job control is a measure of an employee's degree of independence and agency in making decisions related to their job. It comprises features like choice authority, diverse skill sets, and task discretion.

Consistent with the premise, a stressful work environment increases stress and has negative impacts on one's health when job demands are high but control is low. When managers have high expectations for their employees but fail to provide them with sufficient support, workers may begin to feel overwhelmed by the workload (Karasek, 1979). On the other side, employees may have less negative effects of stress when they have great job control, which allows them to make decisions about their work and their autonomy, even when faced with high expectations (Van der Doef & Maes, 1999).

Empirical Review

According to Ogunyemi et al, (2015) formal work organizations are created to produce goods and services and to pursue dominant goals that individuals acting alone cannot achieve. They carried out an empirical review on Organizational variables & effective performance of employees in oil and gas section to examine the contribution of work environment, organizational culture, to employees' job performance. Their findings encourage employers to provide suitable work environment to boost employees' performance; and make the organizational culture favourable enough to improve productivity in the work place.

In another vein Flora Chiang, Ho Kwong Kwan and Thomas A. Birtch, (2010) carried out a study on the moderating roles of job control and work-life balance practices on employee stress in the hotel and catering industry. They examined the relationships among job stressors, coping resources, and job stress. They thus discovered that high job demands coupled with low job control and the availability of work-life balance practices resulted in a higher level of stress.

Similarly, Sholokwu, B. M. and Olori, W. O. (2016) investigated the relationship between Management Practices and Industrial Harmony in the Oil and Gas Firms in Rivers State. The outcomes showed a significant relationship between Management practice and Industrial harmony and also that organizational culture significantly moderates the relationship between managerial practices and industrial harmony in Oil and Gas Companies in Rivers State. The study thus proved that Management practice affects Industrial harmony in Oil and Gas Companies in Rivers State.

RESEARCH METHODOLOGY

Research Design:

The quasi-experimental research design was used for this study since it is the appropriate method for administrative or social sciences research where the variables cannot be manipulated.

Population of the Study:

The population for this study was originally a sample of 300 respondents from ten selected oil services firms in Rivers State. However, the actual population was 285 based on the number of questionnaires retrieved.

Sampling Procedure/Sample Size Determination:

The Taro Yemen's formula was employed based on the sample size because there is 95 percent (i.e. .05) chance that the sample is distributed the same way as the population giving equal opportunity to every member of the population of being selected.

Data Collection Method:

The basic instrument or primary source here was the questionnaire. Secondary data was gotten from journals, text books, personal interview and publications.

Operational Measures of the Variables:
Data was gathered by operationalizing the variables with the statement items in appendix B of the main research work.

Test of Validity and Reliability:
Content and face validity were employed in this section. For face validity the instrument was given to the project supervisor and three other authorities of management sciences, while for reliability test the Cronbach's Alpha was used to check the measuring instrument. See table below:

Table 1: Test of Reliability on Questionnaire Items

Variables	No. of Items	Cronbach's Alpha Levels
Task Control	8	.875
Effectiveness	6	.854
Quality	6	.768
Organization culture	6	.728

Sources: SPSS Output (2021)

The table above shows the reliability of the questionnaire items using Cronbach's Alpha. The results show a strong reliability of the test conducted.

Data Analytical Technique(s)
The Spearman's Rank-Order Correlation Coefficient was used to analyze the data above where data were presented and analysed. The formula is as follows:
The formula to use when there are tied ranks is:

$$p = \frac{\Sigma_i(x_i - x)(y_i - y)}{\sqrt{\Sigma_i(x_i - x)^2(y_i - y)^2}}$$

where i = paired score.

Analysis also comprised of both descriptive and inferential statistical techniques given the nature of generated primary data which was both discrete and continuous.

RESULTS AND DISCUSSION

Administered and Returned Questionnaire with Responses on Demography

Table 2: Questionnaire Distributed and Retrieved

Questionnaire	Frequency	Percentage (%)
Distributed	300	100
Retrieved	285	95

Not Retrieved	15	5

Source: Field Survey Data, 2021.

The table above shows that 300 questionnaires were distributed, 285 were retrieved, while 15 was not retrieved.

Administered and Returned Questionnaire with Responses on Demography

Table 3: Gender of Respondents

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	Male	212	74.3	74.3	74.3
	Female	73	25.7	25.7	100
	Total	285	100	100	

Source: Field Survey Data, 2021.

The table above shows that 212 males' responses were gotten from field survey data, while 73 females only responded to the questionnaire administered.

Administered and Returned Questionnaire with Responses on Demography

Table 4: Educational background of Respondents

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	O level	5	1.7	1.7	1.7
	B.Sc	57	20.0	20.0	21.7
	M.Sc	10	3.4	3.4	25.1
	Others	213	74.9	74.9	51.5
	Total	285	100	100	100

Source: Field Survey Data, 2021.

The table above shows the educational level of the respondents. 5 of them read up to O'level, 57 of them have B.Sc. degree, 10 of them are Masters degree holders, while the 213 respondents, are skilled in various ways.

Table 5: Test of Hypotheses, Outcome and Decision

S/N	HYPOTHESES	OUTCOME	EXTENT OF RELATIONSHIP	DECISION

1.	H_{01}: There is no significant relationship between Task Control and Effectiveness.	Rho – 0.931	Very strong relationship	Reject the Null Hypotheses
2.	H_{02}: There is no significant relationship between Task Control and Quality.	Rho – 0.874	Strong relationship	Reject the Null Hypotheses
3.	H_{03}: The organization's culture does not moderate the relationship between Job Control and Employee Productivity.	Rho - .793, .799, .614, .761	Positive significant relationship	Reject the Null Hypotheses

Summary, Conclusion and Recommendation

Summary of Findings:

- All three hypotheses were rejected using the spearman's rank-order correlation coefficient.
- The study outcome shows significant relationship between task control with effectiveness and quality. This is evident in the rho values of $.931^{**}$and $.874^{**}$ from H_1 and H_2. This simply explains that the concept of task control relates significantly with effectiveness and quality.
- The correlation rho values of .793, .799, .614 and .761 show positive significant relationship between organizational culture with Job Control and Employee Productivity. This result also reveals that the organizational culture is a significant moderator of the relationship between job control and employee productivity as obtained from evidence of relationship within target organizations.

Limitation of the Study:

The study finally highlights the correlation between Job Control and Employee Productivity in ten (10) Oil Services Firms in Rivers State given organization culture as the regulating variable. This is however, due to the large population of Oil Services firms in the State and the uncertainty of retrieving sensitive information from partakers along with the need to present verifiable upshots. Though from online source it is discovered that there are about 325 oil services firms in Rivers State that could produce over 1,200 partakers, meanwhile, some of the firms may no longer be in operation. Subsequently the population was narrowed down to ten (10).

Conclusion:

The findings of the study reveal that good task control mechanisms, can produce effectiveness and quality. Also, the organizational culture is a significant moderator of the relationship between job control and employee productivity as obtained from evidence of relationship between target organizations. The importance of employers providing suitable work environment to enhance job performance in oil and gas companies in Rivers State is a priority. The need to properly control tasks for organizations to run effectively and produce quality outcomes are paramount due to the huge capital investment.

Finally, the Organizational culture fosters employee productivity by creating ethical and positive organizational culture, where work place spirituality is applied underscoring employee's inner life that is nourished by meaningful work in the context of community.

Recommendation:

1) It is recommended that managers be equipped to determine the dimensions of job control that would be appropriate for their organization to foster employee productivity since every organization has different aims and objectives.
2) Regulating measures such as resource control should be encouraged to allow for proper disbursement of resources to enhance effectiveness and promote employee productivity at large.
3) Specifically, oil servicing firms should intensify efforts to professionally develop methods and tactics for appropriate job control which will help make roles of employee clearer and eliminate all forms of job ambiguity.
4) They should also encourage a culture that promotes effective resource management and job design for smooth and hitch-free operations.

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THE ROLE OF ARTIFICIAL INTELLIGENCE IN BUSINESS DECISION MAKING :EVIDENCE FROM STRATEGIC BUSINESS DECISIONS

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Abstract

Artificial Intelligence (AI) is becoming a strategic business-decision cornerstone and therefore a critical transformative shift in terms of planning, adaptation, and competition of firms. In the study, the researcher examines how the power of AI can be used in five thematic dimensions, predictive analytics, and automation of strategic processes, organizational agility, risk resilience, and leadership culture. Based on a qualitative theme-based analysis of peer-reviewed literatures and industry reports, the study shows that the use of AI allows companies to make strategic choices in a more agile, data-driven, and prediction-accurate way based on the real-time information and predictions capabilities. Automation minimizes delay in the strategic cycles and the foresight and scenario planning capabilities are boosted by high-fidelity modeling. Nevertheless, the work also suggests that in addition to long-lasting barriers like algorithmic opacity, warning of ethical issues, and a lack of AI-literate executives, there are other barriers that occur on a long-term basis. The strategic alignment also gets better when the AI is integrated in the fundamental planning systems that connect the tactics implementation and the corporate ambitions. The paper gets to the conclusion that the entire capacity of AI in strategic administration is in that focal point of technical infrastructure, ethical governance, and cultural adaptability. The trend on strategic excellence should be in those organizations that come up with the balanced model of technology, talent, and trust as AI develops.

Keywords: Artificial Intelligence, Strategic Decision-Making, Predictive Analytics.

Introduction

In the past, most strategic decisions were made on a gut feel, experience, and slight analysis of data. The sharp increase in big data has, however, exhausted the conventional decision-making models (Majdzadeh, 2024). To respond to this challenge, AI technologies came to the scene to provide powerful data mining, pattern recognition, and predictive modeling capacities (Zong and Guan, 2024). Using machine learning algorithms has become a way of helping the executives detect trends on how the market is going to change long before other businesspeople can realize it. They are able to process large datasets on the fly and provide insights that were not available

before or that it used to take too long to produce. Subsequently, strategic planning has been made faster, nimble, and based on evidence hence less on guesswork. Whether in financial forecasting or risk analysis, to mention but two, the impact of AI cuts across all levels of business operations. Through AI integration, therefore, not only the technological transformation is under discussion, but the overall radical shift in the manner of strategic decision conception and implementation (How and Cheah, 2024).

Among the most influential effects of AI, its capability of increasing organizational agility should be referred to (Ononiwu*et al.,*2024). The business world is fast paced in that, the most successful business must be able to change according to the changes. Intelligent AI-powered tools make this process easier by automating the decision cycle in addition to updating the strategic model in real-time with live data. As an example, AI-driven simulations can be used to predict impending failures in the supply chain and suggest alternatives to overcome the problem. The dynamic nature of marketing strategies can be changed with real-time analysis of the behavior of customers with the help of AI (Awais, 2024). Further, AI allows distributing decision-making processes across teams of all levels and allows providing them with solutions. The idea of democratization of data creates a more adaptive, reactionary corporate culture. After all, AI enables entrepreneurs to adapt swiftly to any kind of internal and external pressure and remain resilient and relevant (Rane *et al.,* 2024).

The power of the AI can distinguish between the winners and losers in a crowded market. Early and successful adopters of AI tend to get strategic advantage by being more productive, focus better on customer targeting, and have shorter cycle of innovation (Aldoseri*et al.,* 2024). AI systems can learn continuously based on both internal and external sources of data and can perfect business strategies in a way in which not even a human being is able to perform. This continual optimization helps maintain long-term competitive position against the opponents who use conventional approaches. Moreover, AI is another part of intellectual capital, which creates own proprietary algorithms and data insights (Lim, 2025). These can form central elements of a long-term value proposition of a firm. Yet, to make this promise a reality, they must have adequate governments of the AI, ethical usage, and employee retraining. In the absence of all this, it is possible that even the strongest AI tools can potentially fail to provide sustainable advantage (Kaakandikar, 2025).

Although the potential of AI in aiding strategic decision-making is extensive, there are several problems that can be encountered when incorporating the former into its latter. Ethical and operational risk can be seen through the threat to data privacy, algorithmic bias and explain ability. Other problems of many organizations are legacy systems and reluctance of the workforce to automation (Almatrodi and Alojail, 2023). To overcome these barriers, companies should invest in, develop a culture of innovation, and focus on transparent AI practices. The further development of AI, including general intelligence and the sophisticated neural network, can transform the strategic planning as well (Rane *et al.,* 2024). Nevertheless, there will still be a need to have human oversight to put the AI results into perspective with organizational principles. AI is still developing, and businesses should not be caught unawares and should be agile in coping and balancing between automation and ownership. The way forward is to synergize human judgment

and the machine intelligence to pave the way to smarter and more sustainable strategic impact (Raman *et al.,* 2025).

II. Literature Review

The academic response highlights the decisive role of AI in the improvement of strategic decisions. Tiwari *et al.,* (2025) argues that the capability of AI to extract substantial amounts of data reveals tacit patterns that allow executives to predict a trend and act in advance. Further elaborating on this point, Ahmad (2022) explain that predictive analytics of machine learning (ML) models can enhance decision-making precision and minimise uncertainty variations at the long-range planning. In addition, according to the European Economic Letters (2023), the role of AI in the reengineering of the strategic planning processes of innovation pipelines, investment strategies, as well as the overall organization design, makes AI not only a tool but a strategic asset (Willcocks, 2024). Taken together, this literature presents AI as a facilitator as well as a guiding light to overcome tricky strategic environments. It is common knowledge among scholars that AI has stopped being utilized only in operations, but it has entered the realm of executive planning. This transformation is especially apparent in such areas that are highly volatile, like finance, healthcare, and logistics. Accordingly, the academic debate focuses more and more on the strategic necessity of AI in the industries (Bareis and Katzenbach, 2022).

The fact that AI and decision-making cultures in organizations interact dynamically is also discussed by several studies (Rajagopal *et al.,* 2022; Trunk *et al.,* 2022). Balakrishnan & Dwivedi, (2021) describe the effect of the trust in AI systems on the strategic component of the adoption process. By making executives feel that the AI suggestions are accurate and interpretable, the former will feel more compelled to use them during the planning process. On the contrary, the problem of non-interpretability often results in underutilization of effective AI tools. Technology Acceptance Model developed by Davis (1989) is commonly referred to as the explanation of the impact of perceived usefulness and ease of use on the adoption of the AI in the strategic places (Na *et al.,* 2022). This framework is used more recently in the literature in a bid to comprehend hindrances in executive buy-in and implementation. As an example, Igwe et al. (2021) believe that the absence of infrastructure and trust is a major barrier in the case of emerging economies. This literature supports the statement that technical ability is not the only thing needed in effective AI integration but a cultural fit and ready organization (Uren and Edwards, 2023).

The literature has also cited the role of AI in the creation of competitive advantage by strategic differentiation. The researchers Bhardwaj *et al.,* (2024) stress personalization engines enabled with AI enhance customer segmentation and targeting so firms could respond more precisely than ever before. This is strategic personalization that has demonstrated quantifiable consequences in customer loyalty and increase in revenue. In a similar manner, Kumar, (2025) observe that AI allows quicker iterations of products, reduced time to market and developments of inventiveness. Such capabilities have a direct impact on strategic performance measures like profitability and market shares. According to Es, (2024), those companies that incorporate AI strategically can outperform their peers in major business functions by great margins. Interestingly, companies that

have already established an established AI plan have more flexible and robust business plans. With that, AI is not a technological add-on but a backbone facilitator of strategic leadership (Kalishina, 2023).

Nonetheless, there is also warning by literature of a blind love of AI to introduce the risk of ethics, process, and strategy. Trust, (Yu *et al.,* 2025) emphasize, forms a prerequisite to strategic dependency on AI-generated insight. Unrestrained bias in AI algorithms will distort the results of the decisions, which will cause reputational and financial losses. In (Murikah*et al.,* 2024), cultural dimensions also influence the adoption of AI, and some people are either more comfortable with automation or dependence on data than others. Besides, Salimi, (2024) states infrastructural differences in Sub-Saharan Africa, which impede the implementation of AI in strategy at scale. This implies that although the strategic... According to the scholars, a model of governance should develop with the capabilities of AI to provide responsible and effective use. Open model design, data stewardship, and moral governance appear in recent literature regularly. Finally, the literature poses AI as an extremely powerful and, at the same time, something that ought to be managed deliberately and on a regular basis (Singla *et al.,* 2024).

III. Methodology

Research Design

In this paper, a qualitative thematic approach will be used to identify AI effects in enabling strategic corporate decisions (Christou, 2024). It is based on the constructivist paradigm of research, which shows compliance with the contextual interpretation of managerial phenomenon as driven by fast changing technology. Considering the subjective connotations cases and executives give to the integration of AI, the study gives their insights precedence over the statistical representation (Madan and Ashok, 2024). The qualitative method can enhance a detail-oriented discussion of the perceptions and implementations of AI in the context of strategic approaches. It is particularly ideal to use this design when it comes to the complex and contextual nature of a phenomenon that one would need to see and capture which in this case is technological transformation in the decision-making. It equally facilitates the channeling of various opinions within industries and functional levels of organizations.

Data Collection

Secondary information was carefully obtained in high impact rated journal papers, white paper publications in the industry and prestigious case-based registers. An academic credibility and

relevance in line with the research objective was considered by following a rigorous selection process. The systematic searches were conducted in academic databases such as the Scopus, Web of Science, and ResearchGate (Biranvand *et al.,* 2025). The thematic saturation of domains was possible by using the defined search term, which was comprised of terms such as AI in strategic planning, AI business decision-making, and AI-driven corporate strategy. To the selection criteria, recent works (2019 2024), empirical orientation and value to managerial strategy, were prioritized. This extensive, yet thematically consistent, data set was obtained after the long period of the process, which involved both theoretical modeled and real-life business-application-based materials.

Data Analysis

Thematic analysis in accordance with Braun and Clarke (2006), a five-stage thematic analysis was followed to present and compile regular patterns in the literature as observed in the study by Hamadi *et al.,* (2024). The early steps taken were getting familiar with each of the chosen texts through their in-depth readings and then the open coding (identifying those parts of the data that constituted extracts of a meaningful data). The codes were then systematized into possible themes depending on conceptual similarities and strategic pertinence. These were tested back and forth to provide the thematic structure that emerged. The theme of analysis resulted in five themes in general, which will have reflection of the academic theory as well as the trend in the industry. The process was methodologically rigorous as it allowed flexibility to adapt to the versatility of sources and outlooks. This direction will advantageously facilitate a rich, interpretive synthesis of the effects that AI has on strategic decision-making in diverse organizational contexts (Kaggwa *et al.,* 2024).

IV. Thematic Findings

1. Strategic Forecasting and Predictive Analytics

Incorporation of AI provides power to organizations with predictive analytics that forecast potential future business situations according to various sets of data information (Ramya *et al.,* 2024). Such models apply methods like neural networks and time-series forecasting that enable processing of structured and unstructured data of large volumes. AI provides course of action regarding possible market changes and customer behavior based on historical review of trends and current signal analysis and processing (Okeleke*et al.,* 2024). This foreknowledge is advantageous to strategic planning on resource mobilization, expansion, and product innovation. It also enables the firms to model uncertain results based on different assumptions, increasing their preparedness to uncertainty. AI augments the situational awareness by involving external factors such as economic benchmarks, competitor shifts, and external events. Forecasts are no longer a negation of historical data, but they are increasingly live projections based on current intelligence. This would enable the firms to conduct stress testing and scenario planning at levels that used not to be

possible. Finally, with AI-based forecasting, firms become not merely reactive in terms of their decision making but proactive in anticipating a strategy (lo Conte, 2025).

In addition to ameliorating the planning, predictive analytics makes planning and interdepartmental coordination on common foresight (Rahaman and Bari, 2024). Strategic forecasts provided in all those functions enable marketing, finance and operation to tie the initiatives with each other. Dashboards that use AI make sure that the insights stay current, taking in the live information feeds about the customers on their platforms, sales pipelines as well as economic newsfeeds (Kumar, 2024). This real time updating makes it capable of rendering the forecasts to be competent and able to adjust real time to rapidly changing settings. Organizations may therefore adjust early enough to new trends, and there would be little time lag between a realized trend and implementing an action (Kirtley and OMahony, 2023). In addition, predictive systems eliminate human judgments common in strategic planning as the decisions are based on empirical trends. Decision-makers will have access to macro-level trend forecasts as well as micro-level predictions (Brunner *et al.,* 2024). This two-layered forecasting gives a wholesome picture of where the opportunities and threats are prone to take place (Wali *et al.,* 2025). The outcome is stronger and opportunity-focused strategies that conform to future realities.

2. Strategic Processes Automation

Automation with the use of AI is shaping the way strategy is formulated and executed in companies (Kokala, 2024). One of them is partially automated intelligent algorithms that are used to conduct a market scan and assess risks that in the past were performed by the manager with thoughtful consideration. In the case of competitor intelligence, Natural Language Processing (NLP) can confidently mine financial reports, analyst briefs, and worldwide news to retrieve competitor intelligence at scale (Khalil and Pipa, 2022). Such insights are then summarized by AI systems into dashboards and visual summaries, saving extremely vast amounts of time involved in situational awareness. In addition, internal financial trends could be studied with the help of machine learning models to automate budget planning and forecasting. The AI will not simply accelerate the work of collecting information but will also increase the depth of analytical analysis of strategic reports, revealing the existing hidden correlations and anomalies (Paramesha *et al.,* 2024). Pre-analyzed intelligence is delivered to executives and frees their time to make high-impact strategic thinking instead of doing hands-on data. Consequently, organizations are finding it easier to plan their strategies and become responsive to changes in the environment. This is automation, not leadership. Indeed, it increases the effectiveness of leadership when navigating a highly noisy strategic environment at the expense of reducing the signal-noise ratio (Sharada *et al.,* 2024).

At the same time, AI tools enable dynamic implementation of strategies as it is constantly tracking KPIs and correlates them to greater set objectives (Dua, 2025). The dashboards create automatic performance dashboards where real time deviations are shown against the benchmarks and corrective action can be taken without involvement of the executive. The systems particularly prove useful in big, decentralized structure where manual reporting would be ineffective. The cycles of decision making are accelerated, evidenced-based, and ensures that decisions are

congruent with the business units. In addition, automation contributes to strategic adherence monitoring, and thus firms become sure that the rules of behaviour are followed (Thanasas*et al.,* 2025). AI tools can signal deviation or anomalies in real time minimizing strategic blind spots. This automation does not only help efficiency but governance as well, which is the central point of a sustainable strategy. In the long term, companies with AI automation incorporated as part of their strategy procedures develop institutional memory-systems record and learn about the previous pattern of decisions. Since such legacy of intelligence is a strategic advantage, future versions of the planning will be informed by what has already been learnt in the past and the situational understanding (Jarrahi*et al.,* 2023).

3. Enhanced Strategic Agility

Strategic agility can be defined as the ability of an organization to change its course of action fast, as a reaction to the altering external environment (Kumkale, 2022). AI can make this even more nimble by allowing constant data-driven changes to business drivers with important implications: prices, portfolios, and logistics. Companies use adaptive algorithms, which track such signals as customer sentiment, competitor pricing, and disruptions in the supply chain in real-time (Aljohani, 2023). Synthesis of these inputs is done in dashboards that warn the decision makers of inflection points that need to be addressed. As an example, an increase in the customer churn can initiate a real-time reconfiguration of the product or its promotion. Through automation of the analysis to action pipeline, AI enables near-real time performance of strategic shifts. Such agility is particularly essential when it comes to industries that have a high level of innovativeness and low error margin like e-commerce, aviation, and digital services. Instead of depending on quarterly reviews, the firms work under constant strategic surveillance. Because of this, AI is turning agility into something feasible and practical (Guruprasad *et al.,* 2024).

AI-driven strategic agility influences the organization design and culture as well. Companies can decentralize their decision-making process, but teams can base their actions on data gleaned with AI prior to the hierarchical decision-making process (Baumann and Wu, 2023). This minimizes bureaucratic affectation and stimulates experimentation with set strategic limits. Agile companies also enjoy shorter feedback cycles; performance of any strategic implementing is high, and the results are used to improve subsequent versions (Chukwunweike and Aro, 2024). Machine learning models can determine which strategic responses were useful, and they increase the accuracy of recommendations on a continuous basis. Moreover, AI can simulate different scenarios in which companies can pre-test the consequences of possible strategic actions. This virtual trial-and-error ability minimizes the possibility of failing at the risky expense of explosive conditions. The other benefit of AI is that it can help to coordinate cross-functionally to incorporate knowledge in marketing, finance, and operations (Ahmad *et al.,* 2023). After all, AI-powered agility helps adopt a culture of strategic responsiveness, as companies learn, adapt, and evolve, real time. This kind of flexibility is already somewhat of a competitive condition in the modern unstable markets (Chukwunweike and Aro, 2024).

4. Strategic Resilience and Risk Management

The key task of AI is to increase the quality of strategic risk management through issuing early warnings with the use of diversified data streams (Reichstein *et al.,* 2025). In contrast to conventional frameworks, where financial signals are of paramount importance, AI uses features such as sentiment analysis, geopolitical events as well as environmental signals. This multi-dimensional risk awareness enables companies to observe weak signals without developing them into the crises. As an example, NLP can search the news in the world and on social media to find signs of political instability or even the threat to reputation (Vyas, 2025). When used alongside operational measures, these insights allow companies to adjust the strategies in advance. Risk scenarios simulation is also achieved with the help of AI systems, which allow leaders to comprehend possible cascading effects within functions and geographies (Undheim and Ahmad, 2024). This assists in the development of healthy contingency plans and response procedures. Organizations with resilience go on to be strategic in anticipating rather than reacting to a crisis and continue with stability and image. AI thereby displaces the purpose of strategy, which is to insure, with pro-active adaptation to the uncertainty (Irianiet *al.,* 2024).

In addition, AI-driven resilience implies constant stress testing of business models. Organizations are also able to simulate the impact of different risk events on operations and margins such as impact of currency shocks, pandemics, or regulatory developments (Malynovska*et al.,* 2025). The quantification of vulnerabilities enables the companies to prioritize them in a way that mitigation is given the much-deserved attention and reinforcements on weak areas are established. The simulations can be predictive; however, AI can make suggestions about diversity plans, including the new markets or suppliers (Francis *et al.,* 2022). Besides, AI-based risk evaluation is also useful in compliance-intensive sectors, such as finance and healthcare, where business miscalculations come at severe financial costs (Saminathan, 2024). They do not only facilitate internal auditing but also external reporting and make it easier to enhance transparency and stakeholder trust. This gradually accumulates strategic capital in the form of AI-enabled resilience, which renders the firms more desirable to partners and investors (Carayannis*et al.,* 2025). It also plays a part in creating value over a long term by ensuring that expansion gets conducted in a set risk environment that is sustainable and controllable. Altogether, AI imbues resilience into its strategy, which is proactive as opposed to a reactive add-on (Rane *et al.,* 2024).

5. Developing Data Driven Leadership Culture

Ethos of AI and the introduction of AI in the sphere of strategy is changing the leadership landscape of intuitive-driven leadership to empirical-based leadership (Hallo and Nguyen, 2023). In the real-time decision environment, executives are pressed to read multiple dashboards and insights created by artificial intelligence. This transition requires new skills, such as data literacy, critical thinking, and model querying assumptions (Dobrin, 2024). Today strategic leadership is about interacting with erratic, probabilistic outcomes, multiple scenarios, and not linear cause-effect regarding thinking (Lee and Bettis, 2023). Trust in algorithmic suggestions becomes a prerequisite as AI gets at the heart of decision support. Leaders should also be concerned about the results of transparency in the operation of AI models when strategies are ethically or socially relevant (Akinrinola*et al.,* 2024). This cultural change to the use of data in the decision process needs to be facilitated by constant training and change management programs. Notably, there

needs to be an ethical stewardship, which does not allow AI to replace human judgment but complements it. The obligatory traceability, evidence-based decisions, constitutes strategic accountability in such a culture (Nag, 2025).

The task of establishing the culture of data is also the reorganization of organizational norms and the flow of communication (Ghafoori *et al.,* 2024). Dashboards and data stories are being discussed more and more while anecdotal evidence and soloed knowledge are being talked about less and less during strategic discussions. Democratized insight creation is one of the key benefits of AI, as an ideology that enables the participation of non-executive employees in strategic discussions that are supported with evidence. This sideways transfer of knowledge makes a difference to strategy development and helps keep up buy-in on all levels. Organizations are therefore required to create psychological safety and the willingness to disagree, which allows multiple interpretations of AI outputs (Brown, 2023). Moreover, AI application generates novel problems of governance in the form of privacy, model discrimination, and responsibility (Kubanek and Szymoniak, 2024). The leaders are required to develop policies ensuring balance between innovation, compliance, and societal confidence. Data-centricity is attributed to cultural transformation, which is a transformative shift in the long term rather than a once-changing factor. To be succeeding, it does not only take technological investment but also involves leadership, foresight in ethics, and alignment in the organization (George, 2024).

V. Results and Discussion

The results highlight a paradigm transition in the Artificial Intelligence (AI) transformation of defining strategic decision-making in the industries (Kaggwa *et al.,* 2024). Among the most obvious consequences, we can count the high efficiency levels that AI introduces to the strategic processes that are traditionally understood as time-consuming. Activities like market intelligence, scenario simulation and competitor analysis which before depended on the time-consuming efforts of manpower and took weeks of processing are now automated using AI. Machine learning algorithms and Natural Language Processing (NLP) permit organizations to mine, interpret, and visualize huge sets of data in conditions approximately as close to real time as is possible (Uddin, 2024). This acceleration of the strategic time enriches not only the pace of actions, but also their scalability, providing the possibility to make a sharper turn with the nuances of true markets. The output is a more trim and dynamic strategic process that intensifies competitiveness. Notably, this transition frees the top management system of operational bottlenecks, and it therefore results in an increased orientation towards innovation and a long-term outlook. Such efficiency is even more apparent when it comes to industries that have a lot of data at their disposal, particularly in retail, tele-communications and manufacturing industries. With the process of automating analytical groundwork, companies are best-equipped to turn towards the implementation of human intelligence in high-impact strategic innovation (Yu *et al.,* 2024)

The other important one is increased accuracy and objectivity in strategic decisions that AI enables. Heuristics, previous experience, or even imperfect information are commonly used in the

formation of traditional strategies that could expose them to cognitive bias and mistakes (Hunt *et al.,* 2024). A conflict is that AI breaks this paradigm by merging a variety of data sets, including aspects of financial performance and management activity alongside external signals including customer sentiment and policy developments (Marian, 2024). Making strategic planning systematic and statistically rigorous will involve utilization of algorithmic method of analysis. In addition, predictive models can detect non-obvious patterns and weak signals, therefore, enriching foresight (Sytnik and Proskuryakova, 2024). Human judgment is still at the core, but AI enables more evidence-based and rather granular approach to evaluate the options and outcomes. The outcome of such is more educated and flexible strategies. And yet, data integrity and transparency of AI models are long-standing issues of accuracy maintenance. Under competent management, AI is a significant input to faster decisions, which are, in fact, better illustrated (Kaggwa *et al.,* 2024).

It is also found in the findings that the transformational role of innovation and business models done by AI is strong (Black *et al.,* 2024). Companies in e.g. fintech, biotechnology, logistics and digital media are not only using AI to become more efficient, also, AI is being used as a pillar of new strategic operations. You can take artificial intelligence (AI) powered computer-based simulations of biotech companies to take shorter cycle to research and development, and Fin-tech start-ups to dynamically disrupt the traditional banking with highly differentiated financial services enabled by AI (George, 2024). Such abilities enable organizations to try new value propositions, digital ecosystems as well as market access practices that were limited due to uncertainty and cost. The innovation is also enhanced by the fact that AI can be used with agile techniques, which enable fast learning and iteration (Tupsakhare, 2022). AI further decreases the cost of strategic experimentation due to the low resource commitment resources to conduct testing of hypotheses (Kar *et al.,* 2021). Notably, this is not all innovation as an end unto itself; this is data driven, precise and comes up close to the strategic objectives. Therefore, AI can be treated as a process accelerator and a risk detector in the innovation processes. The net outcome is increasing strategic horizons as well as quicker path to commercialize an idea (Divan and Sharma, 2024).

Nevertheless, there are still some obstacles to AI adoption in strategy that continue to exist and cannot be referred to as minor (Jrgensen et al. 2025). Data quality concerns and algorithmic transparency top the list, especially the operations in black-box models whose working logic is incomprehensible by the decision-makers. Such uninterpretability may undermine trust and restrict the role of AI in strategic decision-making (De Bruijn *et al.,* 2022). Furthermore, several companies suffer the lack of executives who perfectly understand AI and who can close the gap between technical capacities and strategic use. In absence of such leadership, AI efforts tend to bog down or not be aligned to the overall organizational goals. Ethical concerns—ranging from data privacy to algorithmic bias and fairness—further complicate implementation. These issues raise questions about accountability and governance that must be addressed before AI can be scaled sustainably in strategic contexts. Overcoming these barriers requires investments not just in technology but in human capital, ethical frameworks, and organizational culture. Until such efforts are normalized, AI's strategic integration will remain uneven and context dependent.

Finally, the literature supports that AI alignment increases strategic alignment among business layers when well executed (Knol, 2025; Saxena *et al.,* 2024). Organizations that embed AI in their strategic operating model realize more alignment between corporate vision, departmental KPIs, and day-to-day execution. AI supports tighter feedback loops, mapping tactical activity to strategic intent through real-time performance monitoring and predictive alerts (Ekundayo, 2024). This enables a more responsive and aligned organization, in which mid-level managers can act with decisiveness on AI-supported directives. Strategic misalignments—such as unmatched priorities or soloed initiatives—are reduced since AI highlights disagreements and inefficiencies early (Vayyavur, 2024). AI also facilitates transparency so stakeholders can follow how decisions are formulated and monitored over time. Such traceability allows strategic accountability and empowers adaptive governance. As AI becomes more pervasive, it not only functions as a tool but also as a connective tissue that binds strategic vision and operational reality together. By doing this, AI facilitates more holistic, agile, and outcome-focused strategy execution.

VI. Conclusion

Artificial Intelligence has escalated from being a mere help to operations to being a core support to strategic management, transforming the means in which organizations forecast, select, and act. Through its capacity to enhance foresight, minimize decision loops, and enable real-time responsiveness, AI has emerged as a force promoting strategic agility and innovation. Beyond providing efficiency, AI refashions organizational culture—enabling data-driven stewardship and imparting evidence-based decision-making at all levels. With escalating complexity and volatility in industries, strategic embedding of AI will be a key differentiator in resilience and market leadership over the long run. However, the journey to AI maturity is not purely technological and requires simultaneous investment in ethical governance, human-oriented design, and executive AI literacy. Strategic misstep in data stewardship, algorithmic transparency, or stakeholder trust can undo strategic achievement. Thus, sustainable value from AI is in the intersection of technical expertise and moral utilization. Businesses that seize both these demands will not only outmaneuver their peers but also redefine strategy excellence in the era of AI. In effect, AI is no longer optional—it is the foundation of future strategic genius.

RECOMMENDATIONS

Businesses looking to leverage AI in their decision making processes should

(i) Identify specific use cases by not implementing AI for the sake of the business. They should begin by identifying specific business problems or decision-making processes where AI can provide a tangible benefit.

(ii) Develop a phased adoption plan by creating a roadmap that outlines how AI will be adopted and scaled across the organization.

(iii) Address data bias by ensuring that data used to train AI can contain biases that can lead to flawed or discriminatory outcomes. It is crucial to proactively identify and mitigate these biases to ensure fair and ethical decision-making.

(iv) Build trust with stakeholders by providing clear insights into AI systems function and measures taken to ensure fairness helps built trust with employees, customers, and other stakeholders.

(v) Establish an ethical framework by developing clear guidelines for the ethical use of AI in addressing issues such as data privacy,fairness,accountability,and potential societal impact of AI-driven decisions.

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Top Management Commitment and Leadership and Project Performance of Construction Firms in South-South

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Abstract

The study top management commitment and leadership and project performance of Construction Firms in South-South. The population comprises 695 managers and supervisors of the construction firms. Sample size of 248 was established using Krejcie and Morgan's (1970) table. The Simple random sampling approach, was applied and Bowley's (1964) formula was utilised in the assignment of copies of questionnaire to each firm. The primary data for this study were collected through the use of a structured questionnaire. The bivariate analysis was analysed using Structural Equation Modelling (SEM) with the aid of Smart PLS 3.3.3. The findings reveal a significant relationship between top management commitment and leadership and project performance. The study conclude that top management commitment and leadership relates with project performance of construction firms in South, South. The study recommends enhancing top management commitment and leadership for a successful project performance.

Keywords: Top Management Commitment and Leadership, Project Performance, Project Timeliness, Project Quality, Project Efficiency.

1. Introduction

Success in the effective completion of a project is mostly what determines the performance of construction firms. According to Ali (2011), there are six variables that can be used to gauge the performance success of a project which include price, time, quality, health and safety, client satisfaction and functionality. According to project management theory, a project is successful when it is finished as quickly and within budgeted cost. The performance of construction firms helps in driving their competitiveness and overall performance in the industry. The success of any construction firm that must survive the turbulent and stiff competitive world is based on the level of the performance (Issa & Akhigbe, 2022).

Chan and Kumaraswamy (2002) stated that construction time is increasingly important because it often serves as a crucial benchmarking for assessing the performance of a project and the efficiency of the project organization. It is generally accepted that time, cost, and quality are the major factors in the project performance. Both time and cost are measured and managed, while quality often does not have any form of a formal measurement process in place, except by virtue of the final delivered results. Time, money, and quality are typically regarded as the three main concerns when evaluating a project's performance (Barkley & Saylor, 1994). Furthermore, a researcher (Atkinson,

1999) referred to these three important elements as a "iron triangle." A well implemented top management commitment and leadership gives all the stakeholders the confidence that the organization will improve over time. Although several attempts have been made by scholars towards enhancing project performance (Ali, 2011; Githae & Stephen; 2014; Issa & Akhigbe, 2022), there are lack of empirical work that has looked into the relationship between top management commitment and leadership and project performance of construction firms in South-South. This study is informed in an attempt to bridge this observed lacuna.

Statement of the Problem

Construction projects frequently have subpar performance, including low quality, scheduling issues and cost overruns (Lo et al., 2006). According to Frimpong et al. (2003), payment issues, poor contractor management, issues with the procurement of materials, lack of technical expertise and an increase in material prices are the main causes of schedule delays and cost overruns which has affected the project performance of many of the firms in the industry. A construction project's performance may give insight into its success.

Some factors that affect the performance of a project include project complexity, contractual agreements, interpersonal interactions among participants, the project manager's expertise, and the skills of the project's key players. The construction firms have suffered from specific limitations that have caused lasting problems to individual firms especially growing construction companies in south south region of Nigeria. The problem of project performance was also observed in Akhigbe and Ozor (2021), where they asserted that organizational are faced with high level of low project success. They remarked that the incapability of firms in the construction industry to successfully complete their project within a given timeframe and cost, will reduce their competitiveness and overall fortune. Many construction firms have suffered liquidation owing to their inability to stay resilience as a result of poor project success. Maintaining high quality and ensuring continuous improvement as a result of top management commitment and leadership may help address the issue of project performance. Hence, this study examined the relationship between top management commitment and leadership and project performance of construction firms in South-South.

Objectives of the Study

The specific objectives are to;

i. Examine the relationship between top management commitment and leadership and project timeliness of construction firms in South-South.

ii. Investigate the relationship between top management commitment and leadership and project quality of construction firms in South-South.

iii. Determine the relationship between top management commitment and leadership and project efficiency of construction firms in South-South.

Research Questions

The following research questions were proffered in this study;

i. What is the relationship between top management commitment and leadership and project timeliness of construction firms in South-South?

ii. How does top management commitment and leadership relate with project quality of construction firms in South-South?

iii. What is the relationship top management commitment and leadership and project efficiency of construction firms in South-South?

Research Hypotheses

The following null hypotheses serve as a tentative answer to the research questions;

Ho_1: There is no significant relationship between top management commitment and leadership and project timeliness of construction firms in South-South.

Ho_2: There is no significant relationship between top management commitment and leadership and project quality of construction firms in South-South.

Ho_3: There is no significant relationship between top management commitment and leadership and project efficiency of construction firms in South-South.

2. Review of Related Literature

This work rely on the goal setting theory. Locke and Latham (2002) have offered a well-developed goal-setting theory of motivation. The theory places a strong emphasis on the critical connection between performance and goals. According to research, performance seems to be most effective when goals are clear and difficult, when they are used to measure performance and provide feedback on results, and when they foster commitment and acceptance. Goals 'effectiveness to motivate people may be moderated by factors like self-efficacy and ability and having deadlines. Setting goals for learning rather than performance improves performance and setting goals for groups is equally important to setting goals for individuals. Setting goals may be a powerful strategy for inspiring employees in an organization when done correctly.

Top Management Commitment and Leadership

Top Management in organizations maintains the leadership responsibility for the quality management systems, with involvement of all organizational staffs. This responsibility includes;

ensuring the availability of resources to all staff to ensure improved service delivery is achieved for the realization of the organization's vision and mission. Establishing and reviewing the quality policy and quality objectives quarterly to ensure compliance to the quality standards (Cane, Sheila 1996, Soltani, 2005, Ali and Abedalfattah 2012). Leaders should provide a clear vision of the organization's future and set challenging goals and targets. It is only through unity of purpose and direction of employees that achieves organization's objectives.

Choudhary, Akhtar and Zaheer (2013) argued that leadership is a very vital element of management as well as development source of human resource; furthermore it helps in gaining sustained competitive advantage in order to improve institutional performance. Kakavogianni (2009) contends that leadership helps the employees to get maximum performance and also to get the current objectives of the institution. Leadership has great importance since it influences the condition of the organization. Any type of organization needs good leaders who can encourage their follower by increasing employee engagement in order to boost the performance of business. There are various potential variables which are associated with leadership behavior and they play a significant role. Kiue (2010) stated that the behaviors of top-level leadership play a vital role in the organization. Leaders are very important elements in the success of any type of organization.

Highly competent leaders are the key to the development of an environment that helps to achieve organizational goals. As effective leaders have been shown to be predicative of attitudes and performance in organizations, the question was raised regarding whether other leadership behaviors would also be predictive the same way. It has been suggest in the studies about management literature that top management commitment may have a great impact on organizational practices (Dubey, Gunasekaran, Childe, Papadopoulos, Hazen & Roubaud, 2018). According to Meyer and Herscovitch (2001) there are various forms of commitment in the workplace and they have the potential to influence organizational practices. Great leaders are need by all the organizations since they positively influence their co-workers and help to achieve organizational goals. Commitment of leadership is a key to the outcome of organizations. Thus, those leaders who have proved to be committed play a vital role in order to develop a suitable environment that renders organizational effectiveness (Keller, 2006).

Top management should demonstrate empowerment by allowing its project managers to take full responsibility and make decisions (Pheng and Jasmine, 2004). TQM initiative programs, always emphasizes on the importance of top management as the main driver of TQM activities. Lawler (1994) further perceived TQM as a culture. He pointed out that priorities should be set by top managers by ensuring that commitment to the principle of TQM exists throughout all departments in their organization. Other advocates of TQM such as Deming (1982) pointed out that most quality problems are caused by management and the system they create and operate (Minjoon *et al*. 2006). Pearson *et al*. (1995) also pointed out that managerial leaderships require management at all level should shift their role from authoritarian decision maker to coaching facilitator.

Project Performance

Project performance is perceived as being execution-oriented, with a focus on controlling risk and uncertainty (Winch and Maytorena 2010) while delivering projects on schedule and under budget (Flyvbjerg, 2010). However, a number of key contributions emphasize how projects are heavily institutionalized, and as a result, project method and output vary little from project to project (Kadefors, 1995). There are many different methods and criteria to evaluate the progress and success of projects; the oldest is based on the so-called "iron triangle," which consists of the principles of cost, time, and quality (Meredith & Mantel, 2000).

Therefore, a project would be deemed successful if it stayed within the primary budget, adhered to the timeframe, and met the standards set forth by stakeholders. Project success, according to Lianying (2013), is an ill-defined concept that is difficult to define. In order to determine the relationship between project success and project managers' leadership style, he quoted Nagarajan (2012) who developed a composite project success measure consisting of ten factors. The performance of engineering projects, information projects, and organizational initiatives was primarily assessed using these ten criteria. Also mentioned in Chan and Chan (2002), project success criteria varied by field. Then, the indicators of time, cost, health and safety, profitability and quality, technical performance, functionality, productivity, satisfaction, and environmental sustainability were categorized into "objective measures" and "subject measures" and were stressed particularly for design/build projects in the construction industry. Setting a criterion or criteria for measuring project deliverables can be thought of as the simplest definition of project success. For a long time, time, scope, and money constraints were used to gauge a project's success. This has since been broadened throughout time to take into account additional criteria, such as achieving the enterprises' financial and strategic objectives, and is now generally surrounded by stakeholder satisfaction.

Project Timeliness

Every construction project needs to have a schedule. The whole range of a project's required planning, acquisition, design, and construction operations is characterised as a timelines in the discipline of construction management. A typical project schedule for transportation projects includes the following elements: project initiation, preliminary engineering, environmental assessment, right of way mapping and acquisition, utility engineering and adjustment, final design, letting (advertising and bidding), contract execution, construction, and project close-out. The projected dates for when specific tasks will occur are calculated using the unique durations for each project activity and the logistical connections between distinct tasks.

Project Quality

There is no single, widely-accepted set of standards for determining if a project is successful, which makes the concept of "project success" very nebulous. Due to this, project performance is still typically assessed using the "iron triangle" of time, cost, and quality performance (Atkinson, 1999). Even though quality is a crucial component of project management, (Kloppenborg & Opfer, 2002) reported that there was a decline in the number of articles in project management journals that addressed quality management from 1994 to 1998, and that decline continued from 1999 to 2003. Crawford (2006) also noted a decline in the number of articles in project management journals that addressed quality management. The extent to which a project satisfies requirements determines its quality. In order to make sure that a project satisfies the identified needs it was designed to address, it entails developing and adhering to policies and procedures.

Project Efficiency

Project efficiency cannot be over emphasize as it is described as the improvement of project management method by using less cost to achieve the goals of the organization. Olsson (2008) claimed that efficiency is related to producing direct outputs, and effectiveness is related to added value for owners and users. Eikland (2000) related efficiency in a construction process to cost and time used. High efficiency, then, means that the construction process uses a minimum of resources, time and cost to produce the specified result. Furthermore, Eikland (2000) sees efficiency as a measurement of friction in the value chain, related to the level of cooperation between the involved actors. In this interpretation, efficiency is related to doing things in the right way and is an internally focused measurement. According to Olsson (2008), effectiveness can be related to doing the right things. It is an external type of measurement. The effectiveness of a construction process can be seen as the ability of the process to satisfy the requirements, objectives and priorities related to customers in the construction industry, primarily the project owners. Effectiveness is focused on how the construction process contributes to increased value for the owners and users.

Empirical Review

Ann, Mary, Joyce and Kepha (2018) study sought to determine the moderating effect of top management commitment on the relationship between human resource information system and organizational performance in commercial state corporations in Kenya This study adopted a census method, and used both qualitative and quantitative methods of data collection. The target population of the study was 165 chief executive officers (policy makers), directors of human resources and deputy directors of human resources of both pure and strategic commercial state corporations in Kenya. Fifty-five interviews were carried out and forty eight of the respondents were interviewed. The study found that there is a moderating effect of top management on the relationship between human resource information system and organizational performance of commercial state cooperation. It is therefore, recommended that a continuous assessment on the influence of HRIS on organizational performance is necessary if commercial state corporations

are to maintain the competitive advantage resulting from usage human resource information systems.

Muhammad (2017) study aims to determine the effect of top management commitment, organizational culture on the implementation of management accounting information system. The research method used is survey method. Sources of data are primary and secondary data, data collection techniques with questionnaires and Library Research. Testing Data with validity and reliability test. Data analysis using Multiple Linear Regression with the help of SPSS program. The result of research shows that 1) Top Management commitment and Organizational Culture have significant influence simultaneously on Implementation of Management Accounting Information System; 2) Top Management commitment significant partially influence on Management Accounting Information System Implementation; 3) Organizational Culture has significant influence partially on Implementation of Management Accounting Information System; and 4) Top Management commitment has the most dominant influence when compared with Organizational Culture.

Praxidis, Meshack and Francis (2019) examine the effect of top management commitment and support on operational performance of commercial banks in the County of Nandi, Kenya.. The target population consisted of 177 commercial bank employees in Nandi County. A simple random sampling technique was used to select a sample of 123 employees. The study used questionnaire as instrument for data collection. The study found out that top management support was a regular QMS practice evidenced in Nandi County commercial banks. Through top-down approach, regular top down communication thrived well and the top management regularly reviewed organizations' QMS at planned intervals to ensure effectiveness and continuity.

3. Methodology

The population comprises 695 managers and supervisors of the construction firms. This study's sample size was established using Krejcie and Morgan's (1970) sample size determination method. The table yielded a total sample size of 248 respondents. As a result, the sample size for this study is 248 managers of Construction firms in South-South. Simple random sampling approach, was applied and Bowley's (1964) formula was utilised in the assignment of copies of questionnaire to each firm. The primary data for this study were collected through the use of a structured questionnaire. The bivariate analysis that is geared towards examining the relationship between quality management system and project performance was analysed using Structural Equation Modelling (SEM) with the aid of Smart PLS 3.3.3.

4. Result

In order to test the bivariate hypotheses via the SEM, the bootstrap method was applied. Path coefficients (β values) of .10 to 0.29, .30 to .49 and .50 to 1.0 are weak, moderate and strong correlations, respectively. Also, for a two tailed test, t values greater than 1.96 are significant,

while t values less than 1.96 are non-significant (Hair et al., 2014). Furthermore, hypotheses with p-values less than 0.05 level of significance were accepted, while those above 0.05 were rejected. The coefficients of determination (R2 or predictive accuracy) were identified. R2 values for endogenous variable are assessed as: 0.00 to 0.25 (weak), 0.26 to 0.50 (moderate), ≥ 0.75 (substantial). The effect size (f2) of each path in the model by means of Cohen's (Cohen, 1988).

Top management commitment and leadership and Measures of Project performance

Ho^1: There is no significant relationship between Top management commitment and leadership and Project timeliness of construction firms in South-South.

Ho_2: There is no significant relationship between Top management commitment and leadership and Project quality of construction firms in South-South.

Ho_3: There is no significant relationship between Top management commitment and leadership and Project efficiency of construction firms in South-South.

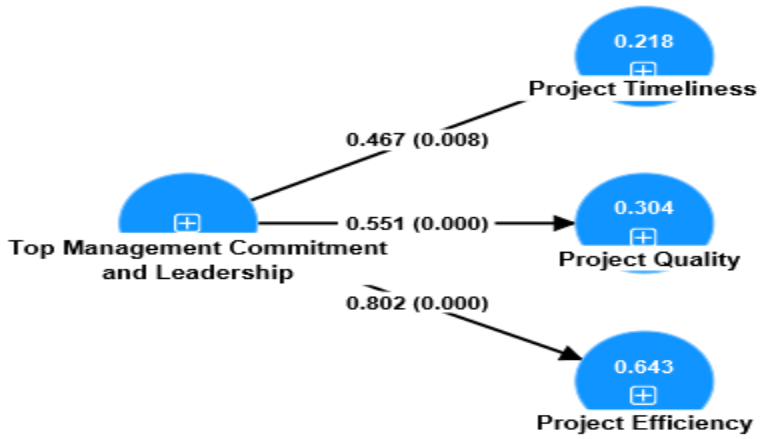

Figure 1: Top management commitment and leadership and Measures of Project performance

Source: SmartPLS 4.0 output on Research Data, 2023

Figure 1 shows the result of the Path relationship between Top management commitment and leadership and Project timeliness. This shows a β = 0.467. An increase in Top management commitment and leadership will lead to a corresponding increase in Project timeliness and reduced Top management commitment and leadership will bring about a decrease in Project timeliness. This implies that there is moderate positive relationship between Top management commitment and leadership and Project timeliness. This answers the first research question which seeks to find out the relationship between Top management commitment and leadership and Project timeliness.

The analysis shows a significant level of 0.008 which is less than 0.05. This implies that there is a significant relationship between Top management commitment and leadership and Project timeliness. Considering this, the study therefore rejects the null hypothesis and accept the alternate hypothesis that that *there is a significant relationship between Top management commitment and leadership and Project timeliness of construction firms in South-South.*

Figure 1 shows the result of the Path relationship between Top management commitment and leadership and Project quality. This shows a $\beta = 0.551$. An increase in Top management commitment and leadership will lead to a corresponding increase in Project quality and reduced Top management commitment and leadership will bring about a decrease in Project quality. This implies that there is strong positive relationship between Top management commitment and leadership and Project quality. This answers the second research question which sought to find out the relationship that exists between Top management commitment and leadership and Project quality. The analysis shows a significant level of 0.000 which is less than 0.05. This implies that there is a significant relationship between Top management commitment and leadership and Project quality. The study therefore rejects the null hypothesis and accept the alternate hypothesis that that *there is a significant relationship between Top management commitment and leadership and Project quality of construction firms in South-South.*

Figure 1 shows the result of the Path relationship between Top management commitment and leadership and Project efficiency. This shows a $\beta = 0.802$. An increase in Top management commitment and leadership will lead to a corresponding increase in Project efficiency and reduced Top management commitment and leadership will bring about a decrease in Project efficiency. This implies that there is strong positive relationship between Top management commitment and leadership and Project efficiency. This answers the third research question, "What is the relationship between Top management commitment and leadership and Project efficiency?" The analysis shows a significant level of 0.000 which is less than 0.05. This implies that there is a significant relationship between Top management commitment and leadership and Project efficiency. Considering this, the study therefore rejects the null hypothesis and accepts the alternate hypothesis that that *there is a significant relationship between Top management commitment and leadership and Project efficiency of construction firms in South-South.*

Table 1 Summary of the Results and Decision Making

Null Hypothesis	Path Coefficient (β)	P Values (p)	T Statistics (t)	Predictive Accuracy R^2	Decision on Null Hypothesis
H_{O1}	0.467 (Moderate)	0.008 (Accepted)	2.665 (Significant)	0.218 (Weak)	Reject
H_{O2}	0.551 (Strong)	0.000 (Accepted)	7.539 (Significant)	0.307 (Moderate)	Reject
H_{O3}	0.802 (Strong)	0.000 (Accepted)	18.578 (Significant)	0.643 (Substantial)	Reject

Source: Output on Research Data, 2023

5. Discussion of Findings

Top management commitment and leadership and Project timeliness

The outcome of the analysis on how Top management commitment and leadership relates with Project timeliness revealed that there is a noteworthy relationship between Top management commitment and leadership and Project timeliness, given the p-value of 0.008 which is less than the level of significance of 0.05 (p=0.008< 0.05). The hypothesis which was given in null form was thus rejected and the alternate hypothesis was accepted. The path coefficient (β) was 0.467. This indicates a positive relationship between Top management commitment and leadership and Project timeliness in construction firms in South-South. The positive relationship implies that the Project timeliness increases when there is Top management commitment and leadership in place. Furthermore, the coefficient of determination (R^2) was 0.218. This denotes that a unit change in Top management commitment and leadership in the construction firms will account for up to 21.8% total variation in Project timeliness. Hence, Top management commitment and leadership improves Project timeliness. This finding concurred with that of Noble et al. (2002) who pointed that Leadership commitment is all about the managerial preparedness to assign resources and take behaviours that lead to the advance of capabilities in-line with the anticipated results.

Top management commitment and leadership and Project quality

Based on the bivariate analysis on the connection between Top management commitment and leadership and Project quality, it was observed that Top management commitment and leadership relates significantly with Project quality with P-value of 0.000 which was less than 0.05 level of significant (p-value = 0.000< 0.05). Thus, the null hypothesis was rejected owing that Top management commitment and leadership relates with Project quality significantly. However, the outcome revealed a positive correlation between Top management commitment and leadership and Project quality (β =0.551). This indicates that when Top management commitment and leadership of construction firms increase, the Project quality increases. The path coefficient of

0.551 shows that Top management commitment and leadership, to a high extent, influences Project quality. The coefficient of determination (R^2) of 0.304 shows that a unit change in the Top management commitment and leadership will account for up to 30.4% variation in Project quality. Thus, Top management commitment and leadership in the construction firms is very vital in obtaining Project quality. This finding agrees with that of Low and Teo (2004) who commented that top management commitment is one of the elements that would reflect TQM performance in construction firms.

Top management commitment and leadership and Project efficiency

The bivariate analysis on the association between Top management commitment and leadership and Project efficiency shows that Top management commitment and leadership relates significantly with Project efficiency with P-value of 0.000 which was less than 0.05 level of significant (p-value = 0.000 < 0.05). Thus, the null hypothesis was rejected owing that Top management commitment and leadership relates with Project efficiency significantly. However, the outcome revealed a positive correlation between Top management commitment and leadership and Project efficiency (β =0.802). This indicates that when Top management commitment and leadership in the construction firms increase, the Project efficiency increases. The path coefficient of 0.802 shows that top management commitment and leadership to a high extent influences Project efficiency. The coefficient of determination (R^2) of 0.643 shows that a unit change in the Top management commitment and leadership will account for up to 64.3% variation in Project efficiency. Thus, Top management commitment and leadership in the construction firms is important in achieving Project efficiency. This supports the notion of Chin, Chu and Yuen (2003) who found that top management commitment is the most critical factor for successful ISO9000 implementation that would boost project quality.

6. Conclusion.

This study examines the relationship between top management commitment and leadership and project performance of construction firms in South-South. The success of construction projects is intricately tied to the dedication and active involvement of top-level executives in fostering a culture of excellence and accountability. Through a comprehensive examination of project timeliness, project quality, and project efficiency, it becomes evident that effective leadership at the highest echelons of the organization is a linchpin for achieving favourable project outcomes.

Firstly, project timeliness stands as a critical yardstick for success. Leadership that prioritizes time management fosters a sense of urgency, ensuring that all project stakeholders are aligned in their efforts to meet deadlines. Secondly, project quality is a key determinant of construction project success. Leadership that prioritizes quality not only meets client expectations but also contributes to long-term reputational gains for the construction firm. Lastly, project efficiency, encompassing factors such as resource utilization and cost-effectiveness, is a metric that resonates with the financial sustainability of construction firms. Effective leadership is pivotal for maintaining a

competitive edge and achieving financial objectives. The commitment to excellence demonstrated by leadership not only enhances the likelihood of project success but also contributes to the overall growth and sustainability of construction firms in a dynamic and challenging industry.

The study recommended that;

1. The construction firms should implement a communication protocol that ensures clear and transparent information flow between top management, project managers, and team members.
2. The construction firms should invest in advanced project management and monitoring tools that allow real-time tracking of project milestones and timelines.
3. The construction firms should foster a culture of quality assurance at all levels of the organization. and actively promote and support the implementation of quality management systems, emphasizing adherence to industry standards and best practices.
4. The construction firms should define and monitor key performance indicators specifically related to project quality.

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ECONOMIC GROWTH AND ENVIRONMENTAL SUSTAINABILITY IN SELECTED AFRICAN COUNTRIES

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Abstract

This study examined the effect of economic growth on environmental sustainability among selected African countries. To achieve the objectives of this study economic growth was analysed alongside some control variables - foreign direct investment, credit to the private sector, population growth rate and trade openness to determine their impact on the environmental performance index a proxy for environmental sustainability) in the six selected African countries namely: Angola, Algeria, Egypt Ghana, Libya, and Nigeria over the period 1990-2022 using panel analysis. Based on the analysis of the data trend analysis and econometric analysis of the panel fixed effect regression econometric technique, some key empirical findings were made. Egypt had the highest environmental performance index (EPI), Direct relationship between the real GDP and environmental performance index (EPI) was visualised in Algeria, Egypt and Libya. Economic growth had a positive and significant impact on the environmental performance index. FDI and trade openness had positive but marginal effects on environmental performance index while credit to the private sector and population growth rate had a negative impact on environmental performance index in the selected countries. Based on the findings, the study recommended an increase in investment in the real sector and an increase in emission tax in order to sustain the environment in in the selected African countries.

Keywords: Economic growth, Environmental Performance Index, Foreign direct investment and Population growth

i. Introduction

Energy consumption is a crucial catalyst for economic growth and development, fueling industries, transportation, and households globally. Nevertheless, the dependence on fossil fuels and non-renewable energy sources has resulted in substantial environmental repercussions, intensifying problems such as air and water contamination, deforestation, and climate change (environmental degradation).

As the world's populace expands and becomes more industrialized, the need for energy increases, leading to a greater sway on the environment (Haliru, 2023). Wajid, et al (2022) define energy consumption as the utilisation of energy in various activities i.e. power generation, transportation, heating, and industrial processes. Fossil fuels, comprising coal, oil, and natural gas, have

traditionally been the primary sources of energy worldwide and most especially in less developed countries because of their abundant supply, cost-effectiveness, and high energy concentration. Nevertheless, the process of burning fossil fuels emits greenhouse gases (GHGs) and air pollutants, hence contributing to climate change, air pollution, and public health issues.

The transport industry has a major role in both energy consumption and degradation of the environment, being accountable for a substantial share of worldwide emissions of carbon dioxide (). The prevalence of petrol and diesel-powered internal combustion engine cars worsens air pollution and urban congestion, leading to adverse impacts on air quality and public health (Kehinde & Devi, 2022). Industrial processes i.e. manufacturing, mining, and construction are substantial energy consumers. They frequently depend on fossil fuels and non-renewable resources to fulfil their energy requirements. The extraction, processing, and utilisation of natural resources result in environmental consequences, comprising habitat destruction, soil erosion, and water contamination. Furthermore, the utilisation of energy in residential and commercial areas, mainly for the purpose of heating, cooling, lighting, and operating appliances, leads to the degradation of the environment due to the discharge of greenhouse gases (GHGs) and air pollutants. Buildings and appliances that are not efficient worsen the use of energy and have adverse effects on the environment, highlighting the need of energy efficiency measures in decreasing emissions and the depletion of resources.
Abdulkarim (2023) found that the connection between energy consumption and degradation of the environment is influenced by both direct and indirect mechanisms, which operate at different spatial and temporal dimensions. The extraction, production, and combustion of fossil fuels and non-renewable sources of energy have direct consequences, as they release pollutants and greenhouse gases (GHGs) into the environment. Emissions from power plants, industrial facilities, and cars have a substantial sway on the environment at the local, regional, and global levels, leading to issues i.e. air and water pollution, likewise climatic instability. Indirect repercussions arise from the wider socio-economic and technological systems that support energy consumption, comprising alterations in land use, urbanisation, populace expansion, and consumption habits.

Less developed countries depend mainly on fossil fuels for energy their energy needs (industrial production, transportation, household activities among others) due to their availability, cost and the low level of investment in other energy sources like hydro, solar and natural gas despite their

availability. This lack of energy diversification has effects both on the economy and environment of a country. It is in light of this development that this study seeks to examine the effect of fossil fuel consumption on environmental sustainability in selected African countries.

The study covers a period of thirty-three (33) years that is, 1990 – 2022. This time scope is informed by the availability of the data that are required and necessary to conduct a robust analysis in this study. Geographically, the study mainly concentrates on six African countries. These African countries includes: Nigeria, Angola, Egypt, Algeria, Libya and Ghana. The selection criteria are based on the energy production capacity, population size, energy consumption as well as the level of economic activities in these countries. We shall continue our investigation by reviewing related works on the topic, followed by the methodology employed to achieve the purpose of the study, results of data analysis, discussion of findings and concluding remarks and recommendations.

ii. Literature review

The Environmental Kuznets Curve (EKC) hypothesis proposes a curvilinear nexus, curved like an inverted U, between the level of degradation of the environment and the level of economic activities. The EKC hypothesis, named after Economist Simon Kuznets, suggests that environmental degradation initially worsens during the industrialization process and as incomes increase. However, it eventually improves once a certain level of economic growth is achieved. The Environmental Kuznets Curve (EKC) hypothesis posits that there exists a curvilinear link between carbon emissions and income per capita, characterised by an initial increase in pollution during the early stages of economic growth, ensued by a subsequent decline in the later stages.

The fundamental concept behind the Environmental Kuznets Curve (EKC) is that as a nation's industrialization progresses, there exists a corresponding rise in resource extraction and pollution levels due to rising income levels. As individuals experience an increase in their wealth, they become more aware of the importance of environmental quality and are now able and willing to buy greener sources of energy. Consequently, compelling the reduction of pollution emissions after a certain timeframe. This is the method by which the inverted U-shape is achieved. The first proposal of the Environmental Kuznets Curve theory, which suggests an inverted-U form, was put out by Grossman and Krueger in 1991. Beckerman (1992) argues that the most effective approach to decreasing environmental pollution is for the nation to achieve economic prosperity.

The concept has established itself as one of the widely accepted observations in the field of environmental and resource economics, as shown by the work of Cole and Neumayer (2005). However, there has been substantial criticism in assent with both theoretical and empirical reasons (Stern, 2003; Cole and Neumayer, 2005). Many scholars interpret the EKC as suggesting that developing nations should not implement environmental policies until they become wealthy. In assent with this interpretation, the environmental issues in these nations will be addressed through policy changes in the future when they have achieved higher levels of economic growth. Consequently, it may be inferred that there is less effort being made to carry out environmental remediation in emerging nations. Recent data (Dasgupta, 2002) challenges these ideas by demonstrating that pollution concerns are really being handled and resolved in emerging nations.

Furthermore, it is probable that the income elasticity of emissions in affluent nations is less than 1, but it is not adverse, as proposed by the Environmental Kuznets Curve (EKC) theory. In nations with slower growth rates, the use of technology that reduces emissions may counterbalance the impact of increasing income per person on emissions. In recent decades, several Organizations for Economic Cooperation and development (OECD) nations have seen substantial declines in emissions per capita. In rapidly developing middle-income nations, the impact of increasing affluence surpasses the influence of technology in mitigating emissions. In general, there exists a robust correlation between economic expansion and pollution. Nevertheless, the interconnections between these two phenomena may be alleviated by several aspects, i.e. transitioning to eco-friendly technology and implementing technical advancements that ensure overall economic advancement and, more particularly, the reduction of pollution. Nevertheless, due to the doubt around the possibility of boundless replacement or technical advancement, there could be constraints on the degree to which these connections can be further relaxed in the future. Previous empirical research has demonstrated the connections between the degradation of the environment and economic activities. For instance, Hung and Shaw (2016) found evidence of a simultaneous link between economic growth and environmental quality. In assent with Stem (2014), the Environmental Kuznets Curve (EKC) suggests that degradation of the environment and pollution initially occur during the early stages of economic activities. However, as economic expansion continues, there exist a tendency for environmental resources to improve at a later era.

In a study conducted by Ajudua (2023), it was discovered that an increase in GDP has a substantial relationship with various environmental degradation factors, comprising forest loss, gas flaring, and oil spills. Similarly, Yusuf, et al (2022) found that economic advancement and energy consumption in Nigeria are favourably associated with environmental degradation. In addition, Igbru and Ifurueze (2021) discovered that per capita GDP, utilised as a proxy, had a substantial sway on environmental degradation in Nigeria. Furthermore, the upshots of Ajayi and Ogunrinola (2020) demonstrate that real income per capita, when utilised as a metric for growth, has a noteworthy and affirmative sway on the degradation of the environment, both in the short-term and long-term. In assent with Dizaji, Badri, and Shafaei (2016), economic advancement in D8 member nations is favourably correlated with carbon dioxide emissions.

Osuntuyi and Lean (2022) examined whether education matters in economic performance, energy consumption and environmental degradation nexus in diverse countries. The study employs FMOLS, DOLS, ARDL-PMG, CCEMG and heterogeneous panel causality test techniques to investigate the direct and moderating effects of education in the growth-energy-environment linkages in heterogeneous income groups of 92 countries from 1985 to 2018. The findings of this study indicated that economic growth is a long-term solution to environmental deterioration in high and upper-middle-income countries, while the opposite holds for lower-middle-income and low-income countries. In addition, energy consumption is linked with environmental degradation across all income groups. Also, the study found that learning aggravates environmental degradation across all income groups. Moreover, its moderating role ameliorates the adverse effects of energy consumption on environmental degradation in high and upper-middle-income groups but worsens it in the lower-middle-income and low-income groups. The study concluded that education is important for environmental sustainability as it encourages pro-environmental behaviors and attitudes and supports energy-efficient products and investments in green technologies. However, education may also aid energy-intensive activities and dirty technology by supporting lifestyles that are not friendly to the environment. The study therefore suggested that it is important to provide education that promotes better environmental quality.

Rodolfo and Drilona (2022) examined the impact of climate change on states characterized by structural weaknesses, government failure, and lack of institutional basic functions in sub-Saharan Africa (SSA) over the period 1980-2019 using a panel analysis. The fixed effect model revealed

that the effect of a 1^0C rise in temperature decreases income per capita growth in fragile states in SSA by 1.8 percentage points. Panel quantile regression models that account for unobserved individual heterogeneity and distributional heterogeneity, corroborate that the effects of higher temperature on income per capita growth were negative while the effect of income distribution growth on carbon emissions growth differs across the countries, indicating that higher income distribution growth could help reduce environmental degradation for high-emitter countries.

In another study, Abubakar and Cudjoe (2022) employed the Vector Error Correction Model (VECM) to study the environmental effect of energy used in Nigeria using annual time series data from 1990-2018. Our study found a long run positive effect of GDP on CO_2 emissions in Nigeria. This result seems to disprove the Environmental Kuznet Curve hypothesis that a clean environment exists with an increase in income level. The study also found that the utilization of charcoal has a long run potential of mitigating CO2 emission while the use of fuel wood has a long run tendency to increasing CO_2 emission. The usage of gas oil was found to have a negative effect on CO2 emissions while natural gas utilisation and fuel oil consumption had adverse effects on CO2 emission. Consumption of Hydroelectricity was found to have a negative impact on CO2 emission in the long run in Nigeria. Notwithstanding, the study recommended that investment in hydroelectricity and wood biomass energy consumption could reduce environmental damage in Nigeria.

Okon (2021) examined the relationship between per capita GDP and per capita emissions of greenhouse gas carbon dioxide (CO2) to observe the possible implication of an increase in economic activities on environmental degradation in Nigeria by applying the Environmental Kuznets Curve (EKC) analysis approach. To achieve the purpose of the study, time series data spanning the period 2000-2019 was used and the Auto Regressive Distributed Lags (ARDL) approach to co-integration was adopted for the purpose of analysis. Concerning CO2 emission, the anticipated EKCs is not found to exist in this study. The study found a mixed effect of economic growth on the environment. This implies that a 'U' shape instead of an inverted 'U' shape curve for Nigeria. Furthermore, a 1% change in environment policy in the lag period leads to a decrease in environmental degradation in the short run. Based on this finding, the study advocated the need for a clean revolution in industrial production in Nigeria. In addition, more local and national

sustainability efforts are needed on several fronts, especially vis-a-vis water and sanitation, as well as in terms of air quality.

Ondaye, Ondze and Imongui (2021) analyzed the influence of economic growth on CO2 emissions in the Republic of the Congo over the period 1980-2015 using annual time series and the ARDL methodology. The results show the existence of an inverted U-shaped curve between economic growth and carbon dioxide emissions in the Republic of the Congo in the long run. However, the Gross Domestic Product exerted no effect on carbon dioxide emissions in the short term. With respect to the environmental protection policy instruments deployed, Republic of the Congo represents a good example of governance. Thus, the study recommended that the government strengthen environmental protection and renewable energy policies so that economic growth is always achieved without carbon dioxide emissions exceeding environmentally acceptable limits.

Igbru and Ifurueze (2021) investigated the nexus between environmental degradation and economic growth in Nigeria using samples from 2011 to 2020. The objectives were established to examine the effect of foreign direct investment, per capita GDP and population density on CO_2 emission. After testing the stationarity of the variables and the possibility of long run nexus using the Johansen Co-integration procedure, the result showed that per capita GDP and population density have a significant effect on environmental degradation but foreign direct investment shows no significant effect on environmental depletion as was measured by carbon dioxide.

Kahn, et al; (2021) investigated the long-term impact of climate change on economic performance. The result indicated that per-capita real output is negatively affected by constant changes in the temperature, but they do not obtain statistically significant effects for changes in precipitation. The counterfactual analysis implies that a consistent rise in average global temperature by 0.04°C per year, where there is a lack of mitigation policies, reduces world real GDP per capita by more than 7% by 2100. However, when the Paris Agreement is followed, limiting the temperature increase to 0.01°C per annum reduces the loss significantly to about 1 percent. These effects appear to change substantially across countries depending on the level of temperature increases and vagaries of climate conditions.

Adejumo (2021) also studies the potential effect of climate change on Nigerian economic growth using time series data (1980-2017). Using the OLS methods, the research work found that annual

average rainfall has a significant effect on economic growth both short-run and long-run. Also, there is a high degree of positive and significant relationship between carbon emission, foreign direct investment, gross fixed capital formation and economic growth under investigation. The result also revealed that this relationship between climatic factors and economic growth is more noticeable in the long run. In addition, an inverse relationship was found between forest depletion, population growth and economic growth in the long run. Finally, there is unidirectional causality between annual average rainfall and economic growth in Nigeria. It is therefore recommended that the stakeholders and the general public should build a green economy that enables sinking carbon and promotes the carbon market in the long-run.

Ogbonna, Ojeaburu and Ehilegbu (2021) investigated the relationship between carbon emission and economic growth in Nigeria for a period ranging from 1981-2018 using carbon dioxide CO_2 as a proxy for carbon emission and real GDP growth rate as and the proxy for economic growth. Both inferential and dynamic ordinary least Square and bivariate granger causality test were employed to analyze the data. The results showed evidence of autoregressive effect of previous records of gross domestic product on its future value; there is an inverse relationship between carbon emission and gross domestic product. The bivariate granger causality confirms no existence of causality running between the variables. On the basis of the findings, the study concluded that there is an insignificant and negative relationship between carbon emission and Gross domestic product. It also concluded that CO_2 and GDP are causally neutral to each other. It therefore recommends that earnest effort should be made by the government to reduce greenhouse gas (GHG) in Nigeria by adhering to all relevant protocols and standards. Emissions not connected to the production of industrial and consumer goods should be taxed and avoided completely except the inevitable domestic emissions by practically applying the necessary laws both national and international. Precisely, the focus should be shifted to going green in terms of energy generation, ensuring positive multiplier effect of constant power supply and the economics of clean air on human health and productivity.

Ajayi and Ogunrinola (2020) provided empirical insight into the relationship between growth, trade openness, and environmental degradation in Nigeria. The ARDL bounds test approach was applied on time series data from 1960-2017 to determine if a long run nexus exists among the variables. Employing the Pollution Haven and Environmental Kuznets Curve hypotheses,

empirical findings validate the EKC hypothesis in Nigeria in the long-run. All estimated parameters were found to have the expected signs in the short- and long-run, except population, with the expected sign only in the long-run. The analysis proves that trade openness and population aid environmental degradation in the short-run. It reveals that financial development counters environmental degradation in both the short- and long-run, and real income per capita has a positive and significant effect on environmental degradation in both the short- and long-run. The coefficient of the error correction term suggests that 62.5% of the divergence between actual and equilibrium CO2 emissions is corrected annually. Post-estimation tests employed prove the robustness of the result. The RESET test affirmed the specification of the model and the CUSUM and CUSUM of squares tests confirm the stability of the parameters. Consequently, Nigeria should foster policies that encourage the development and utilization of renewable energy to boost economic development.

Ogundipe, Obi and Ogundipe (2020) investigated the effects of environmental degradation on food security in Nigeria using annual data for the period 1970-2017. The theoretical framework was based on the Mathusian theory and the environmental Kuznets curve (EKC) hypothesis. The empirical model developed was estimated using the Johansen and vector error correction analysis. The empirical evidence suggested an inverse relationship between food production and environmental degradation implying that food security is threatened by the rising degradation of the environment. In the same manner, food production responded inversely to gross domestic product per capita, hence justifying the EKC hypothesis. Since pollution is a rising function of income at the initial development stages, the rising pollution associated with income growth tends to hamper food security. On the other hand, the evidence revealed a positive influence of agricultural land and population growth on food production. However, the effect of the latter (population growth) is negligible suggesting that an increase in population results in a lesser proportionate increase in food production, hence confirming the Mathusian theory.

Egbetokun, et al (2019) examined the EKC considering the impact of institutional quality on six variables of environmental pollution [carbon dioxide (CO_2), Nitrous Oxide (N_2O), Suspended Particulate Maters (SPM), Rainfall, Temperature and Total Green House Emission (TGH)] using the case of Nigeria. The EKC model includes population density, education expenditure, foreign direct investment, and gross domestic investment as control variables, and it was analyzed using

the Auto Regressive Distribution Lag (ARDL) econometric technique, which has not been applied in the literature on Nigeria. The results, inter alia, indicate that there is EKC for CO_2 and SPM. This implies that the green growth objective can be pursued in Nigeria with concerted efforts. Other environmental pollution indicators did not exert a significant influence on economic growth. Therefore, it is recommended that Nigeria's institutional quality be strengthened to limit environmental pollution in light of economic growth.

In a similar vein, Derickand and Elisha (2019) examined the Environmental Kuznets Curve (EKC) theory by investigating how economic growth relates to environmental pollution, specifically carbon dioxide emissions (CO2) and combustible renewable waste (CoWaste). The study utilized a panel dataset spanning from 1970 to 2013, focusing on selected West African nations with similar income levels, with the objective to determine whether economic growth leads to a reduction in environmental pollution, and at what income threshold this might occur. The findings of the study showed that in the short term, economic growth significantly contributes to increased CO_2 emissions and CO_2 Waste. However, in the long run, it does not lead to a significant decrease in CO_2 emissions or CO_2 Waste. These results appear to suggest that the EKC does not exist in West Africa, as there is no significant correlation between economic growth and environmental pollution. Additionally, the study identified a very low point at which CO_2 emissions and CO_2 Waste begin to decrease. Nonetheless, the absence of the EKC implies that the relationship between economic growth and environmental deterioration in West African countries cannot be explained by an inverted U-shaped curve. In spite of the key outcomes of the report, the analysis is restricted to a panel dataset spanning from 1970 to 2013. This relatively short timeframe may not capture longer-term trends and fluctuations in the relationship between economic growth and environmental pollution, potentially leading to incomplete or inconclusive findings. Additionally, the study concentrated exclusively on selected West African countries with similar income levels. This sub-regional focus might limit the generalizability of the results to other regions or countries with different economic and environmental dynamics, making it challenging to draw broader conclusions therefrom.

Nwokoro and Chima (2017) carried out a study to examine the impact of environmental degradation on agricultural production and poverty in rural Nigeria. They examined that minimizing the use of natural resources is essential to ensure sustainable environmental

conservation. They explained that the continuous pressure placed on the environment exceeding the capacities to which the ecosystem can carry is the major cause of the problem. Their study aimed at addressing the issues of rural poverty and unsustainable agricultural practices, which have a negative impact on the environment and also, highlighted policy implications on sustainable agricultural production in Nigeria.

Dizaji, Badri and Shafaei (2016) investigated the relationship between economic growth and environmental quality in D8 member countries. The study examined the relationship between economic growth and environmental quality in Bangladesh, Egypt, Indonesia, Iran, Malaysia, Nigeria, Pakistan, and Turkey using a panel data model in the period 1975 –2012. The results showed that economic growth has a positive effect on carbon dioxide emissions. However, the square GDP per capita has a significant negative effect on carbon dioxide emissions. The study concludes that the Environmental Kuznets Curve hypothesis is confirmed by the group of countries.

Omotor (2016) examined the relationship between per capita income and environmental degradation in the ECOWAS countries using two indicators of environmental quality of CO2 and SO2 emission. The results from both, the fixed and random effect models, support the existence of the Environmental Kuznets Curve in the ECOWAS region for both CO2 and SO2.

Azam, et al (2016) inspected the influences of CO2 emissions, energy use, trade, and human capital on economy growth from 1971 and 2013 for China, the USA, India, and Japan by utilizing panel fully modified ordinary least squares (FMOLS) for checking the association among the study variables. The examined results pointed out that CO2 emissions and energy consumption negatively and significantly influence economic growth while trade and human capital positively and significantly influence economic growth.

Babatunde and Ayodele (2015) examined the empirical linkage between economic growth and climate change in Africa. Using annual data for 34 countries from 1961 to 2009, we find the negative impact of climate change on economic growth. Our results show that a 1°C increase in temperature reduces gross domestic product (GDP) growth by 0.67 percentage points. Evidence from sensitivity analysis shows the two largest economies in Sub-Saharan Africa (Nigeria and South Africa) play a significant role in ameliorating the negative economic impact of climate change in the region. In addition to the impact on Africa, this article provides estimates of the

impact of climate change on GDP growth of these 34 countries, which can be valuable in appraising national adaptation plans. We do not find evidence that average long-run temperature changes affect long-run economic growth as measured by 5 year averages.

Leitao (2014) examined the interplay between economic growth, carbon emissions, renewable energy, and globalization within the context of Portugal. To achieve this, the author utilized a range of econometric tests, including ordinary least squares, the generalized method of moments, and Granger causality tests. The study revealed that carbon emissions, renewable energy usage, and globalization all had a positive impact on economic growth. Furthermore, the study provided confirmation for the growth hypothesis.

Alege and Ogundipe (2013) investigated the relationship between environmental quality and economic growth in Nigeria using a fractional cointegration analysis over the period 1970-2011. It seeks to examine the effect of growth on environmental performance by controlling for the role of institutional quality, trade openness and population density. The paper found that the early stages of development in Nigeria accentuate the level of environmental degradation. It also finds that weak institutions and unrestricted trade openness increase the extent of environmental degradation due to environmental dumping. Finally, the paper shows that a larger population density enhances the promptness of environmental abatement measures and consciousness for a cleaner environment. The study, however, failed to attain a reasonable turning point and hence a non-existence of EKC in Nigeria. The study recommended the need to restrict the importation of emission intensive products, check the activities of multinationals that invest in producing high CO_2 emitting goods in LDCs and exports to home countries. Finally, there is to need to strengthen institutional quality to ensure the adoption of clean technologies as income rises.

Usenobong and Chuku (2011) carried out a study on "economic growth and environmental degradation in Nigeria: Beyond the Environmental Kuznets Curve". The study contributes to the debate on the existence and policy relevance of the EKC for Nigeria by applying autoregressive distributed lag (ARDL) framework to annual time series data from 1960 to 2008. The traditional EKC model is extended by including (in addition to the level, square and cubed values of the income variable), trade openness as well as the shares of manufacturing, agriculture and service sectors in Nigeria's GDP. Using Co2 emissions per capita to proxy environmental degradation, our findings do not support the existence of the EKC hypothesis. Rather our results show that

Nigeria's situation when confronted with data is exemplified by an N-shaped relationship with a turning point at $77.27 that lies below the data set used for the study. Based on these findings, the paper posits that the hypothesized EKC serves as a dangerous policy guide to solving environmental problems in Nigeria. The conclusion is that to ensure sustainability, there exists an urgent need to look beyond the EKC by adopting courageous policy measures of environmental preservation in Nigeria irrespective of the country's level of income.

The review of the literature revealed that a lot of studies have been done on the nexus between increased productive activity and the environment. However, there appears to be a paucity of literature on cross country studies especially in developing countries. African countries, in their drive to enhance development and reduce poverty have deployed both conventional and unconventional methods in the production of goods and services. These have diverse degrees of impact on the environment. It is therefore pertinent to examine how the environment has been affected in course of increasing productive activities in the African.

iii. Methodology

In estimating the effect of economic growth on the environment, the work followed the Kuznet inverted U shape argument that there is the increase in environment destruction during the early stage of productive activity and a cleaner environment when economic growth has stabilized. Analytically, the work of Omotor (2016) was useful in the modelling of the environmental sustainability equation but with little modifications. In this study Omotor studied the relationship between per capita income and environmental degradation in the ECOWAS countries using two indicators of environmental quality of CO_2 and SO_2 emission. However, in this study our emphasis is on the effect of real GDP, FDI, credit to the private sector, trade openness and population on the Environmental performance index. Given this background, the study specifies an environmental performance index model thus:

$$EPI = f(RGDP, FDI, CRED, TROPEN, POPL) \quad (1)$$

Equation 1 is transformed into econometric models as follows:

$$EPI_t = \beta_0 + \beta_1 RGDP_t + \beta_2 FDI_t + \beta_3 CRED_t + \beta_4 TROPEN_t + \beta_5 POPL_t + \mu_t \quad (2)$$

Equation 2 is transformed into pool effect model as follows:

$$EPI_{it} = \beta_0 + \beta_1 RGDP_{it} + \beta_2 FDI_{it} + \beta_3 CRED_{it} + \beta_4 TROPEN_{it} + \beta_5 POPL_{it} + \mu_{it} \quad (3)$$

Equation 3 is transformed into fixed effect models as follows:

$$EPI_{it} = \beta_0 + \beta_1 RGDP_{it} + \beta_2 FDI_{it} + \beta_3 CRED_{it} + \beta_4 TROPEN_{it} + \beta_5 POPL_{it} + \sum_{i}^{9} = 1\alpha_i idum\varepsilon 1_{it} \quad (4)$$

Equation 4 is transformed into Random Effect model as follows:

$$EPI_{it} = \beta_0 + \beta_1 RGDP_{it} + \beta_2 FDI_{it} + \beta_3 CRED_{it} + \beta_4 TROPEN_{it} + \beta_5 POPLC_{it} + \mu t + \varepsilon 1_{it} \quad (5)$$

Where:

RGDP = Real Gross Domestic Product, FDI = Foreign Direct Investment, CRED = Credit to the private sector, TROPEN = Trade openness, POPL = Population, GDPPC = GDP per capita, β_0= Regression intercept, β_1 – β_6 = Parameter estimates of the explanatory variables (including the main and control) in each model, $_t$ = time subscript, μ_t = cross-section or firm-specific error component

$\varepsilon 1_{it}$ = combined time series and cross-section error component.

It should be noted that foreign direct investment, credit to the private sector, trade openness and population growth rate are control variables. These variables have a serious effect on productive activities and the environment in the long run. The data were sourced from the World Bank Development Indicator, Africa Energy Portal and the International Energy Agency. The data set covers the period 1990 – 2022.

iv. Results

Figure 1 represents the plotted line graph showing the trend in Environmental Performance Index and Economic Growth among the selected countries namely Algeria, Angola, Egypt, Ghana, Libya, and Nigeria. The line graph depicts the environmental performance index in each country from 1990 to 2022. During the bulk of the sample period, Egypt had the highest environmental performance index (EPI), except for a few years when Algeria had a higher EPI than Egypt. Furthermore, Libya consistently had the lowest environmental performance index for most of the study period.

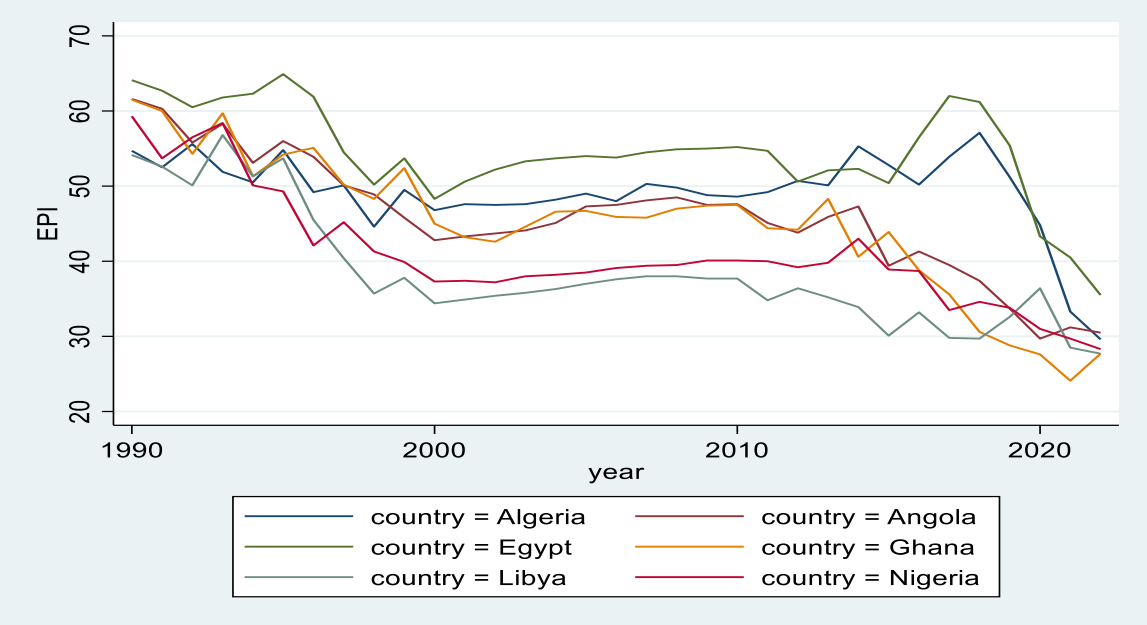

Figure 1: Line graph showing the trend in Environmental Performance Index (EPI) among the Selected African Countries
Source: Author's Plot, 2024.

Based on line graph presented as Figure 2, Nigeria has the greatest economy in terms of real GDP among the nations included in the analysis. Furthermore, the gross domestic product (GDP) of Algeria, Egypt, and Nigeria consistently exceeded that of Angola, Ghana, and Libya from 1990 to 2022. Finally, the line graphs illustrate that Libya saw greater volatility in economic growth over the specified timeframe.

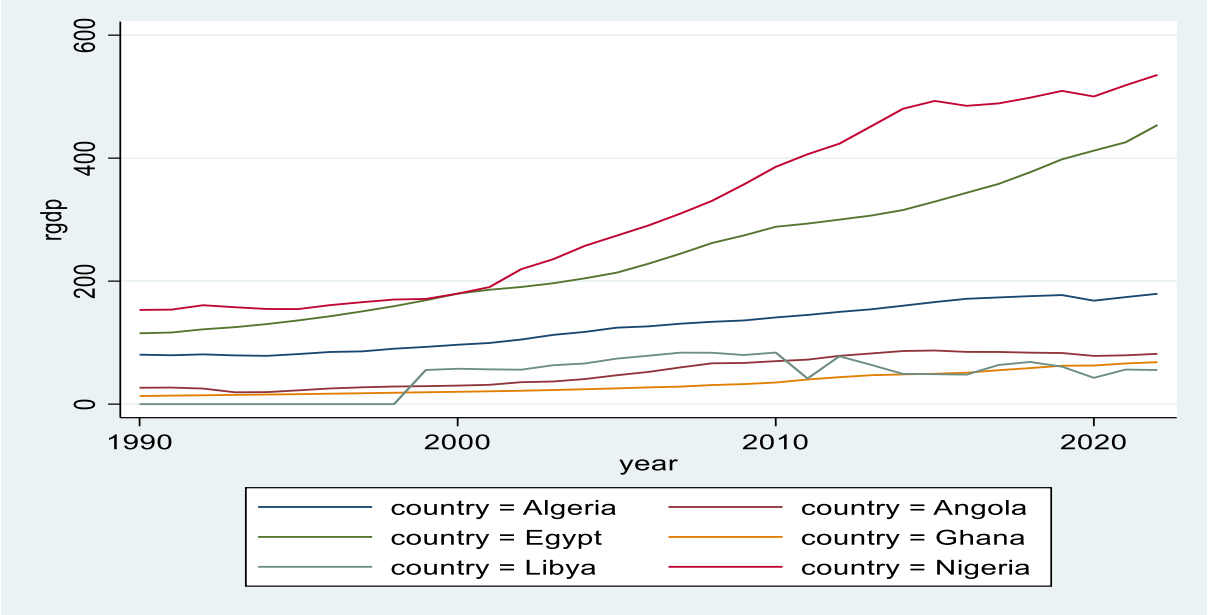

Figure 2: Line graph showing trend in Real Gross Domestic Product (RGDP) among the selected African countries.
Source: Author's Plot, 2024.

Figure 3 shows a direct relationship between the real GDP and environmental performance index (EPI) in Algeria, Egypt and Libya from 1990 to 2022. While a high real GDP was accompanied by a high EPI in Algeria and Egypt, a low real GDP was accompanied by a low EPI in Libya. However, this relationship does not hold true for Angola, Ghana, and Nigeria. While EPI was high despite the low real GDP in Angola and Ghana, EPI was low despite the high real GDP in Nigeria. Therefore, one can infer a positive or negative relationship between real GDP and EPI. We will undertake a quantitative analysis utilising the panel data regression econometric technique to examine the nature relationship between real GDP and the EPI.

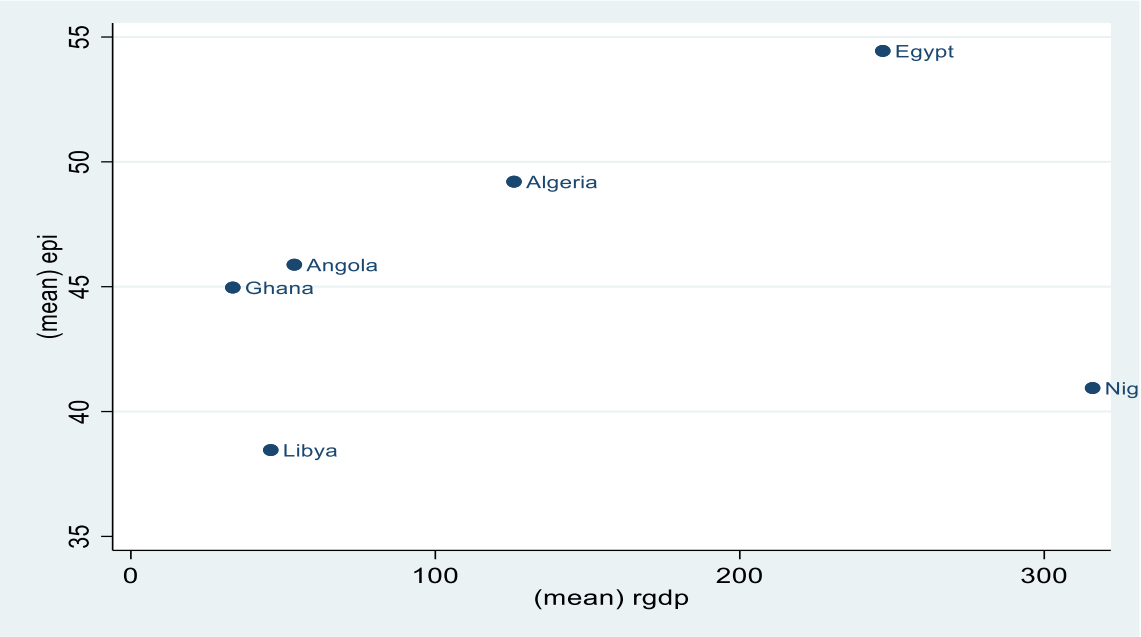

Figure 3: Scatter plot showing the relationship between Real GDP (RGDP) and Environmental Performance index (EPI) in the Selected African Countries

Source: Author's Plot, 2024.

Table 1 presents a concise overview of the dataset, based on the number of observations (N = 198), the number of cross sections (i.e., countries) (n = 6), and the time period covered (T = 33). This table displays the summary statistics including the means, standard deviations (overall, between nations, and within countries), minimum and maximum values, skewness, and kurtosis. Statistical characterization of the variables is essential for examining the distribution and variability of the variables under study. This is done to avoid the potential issues that may arise when working with time series and cross-section data. All the variables display considerable variation both between and within countries. This suggests that the use of panel estimation techniques, which allows the identification of the various parameters of interest, is reasonable. For example, while the mean statistic is computed to be 45.65, the overall, between and within standard deviation statistics for the environmental performance index are 9.14, 5.73, and 7.48 respectively.

This implies that, on average, the selected countries performed below average with respect to environmental performance, and that although there is variation in their performance index, it cannot be said to be a huge one. Moreover, the skewness and kurtosis statistics are -0.14 and 2.25. This implies a left-skewed (since the skewness statistic is negative) and platykurtic (fewer and less extreme outliers) (since the kurtosis statistic is less than 3) distribution. The skewness and kurtosis (with the exception of hydro energy consumption) statistics of all the variables are all positive and greater than 3.

Table 1. The results of summary statistics for selected variables (N =198; *n* = 6 countries; *T* = 33)

Variables	Mean	Overall Std. Dev	Between Std. Dev.	Within Std. Dev.	Min	Max	Skewness	Kurtosis
EPI	45.65	9.14	5.73	7.48	24.1	64.9	-0.14	2.25
RGDP	143.49	130.57	116.00	75.06	13.17	535.336	1.39	4.08
TROPEN	61.24	24.70	20.19	17.38	16.35	152.55	0.99	3.97
CRED	18.41	12.27	9.21	8.37	3.66	56.14	1.38	4.47
FDI	2.17	4.72	1.35	4.55	-10.72	40.17	3.60	26.94
POPL	52.74	52.22	53.90	17.13	4.24	218.54	1.39	4.11

Table 2. The results of summary statistics for selected variables (N = 6 countries; T = 33)

	Levels				
	Constant		**Constant and Trend**		
Variables	Test Statistic	5% Critical value	Test Statistic	5% Critical value	**Decision**
lnepi	-2.35*	-2.07	-2.40	-2.68	Non-Stationary
tropen	-2.39*	-2.07	-2.46	-2.68	Non-Stationary
cred	-2.38*	-2.07	-3.13*	-2.68	Stationary
fdi	-2.73*	-2.07	-3.25*	-2.68	Stationary
lnpopl	0.50	-2.07	1.50	-2.68	Non-Stationary
	First Difference				
	Constant		**Constant and Trend**		
Variables	Test Statistic	5% Critical value	Test Statistic	5% Critical value	**Decision**
D.lnepi	-6.12*	-2.07	-6.14*	-2.68	Stationary
D.lnrgdp	-6.17*	-2.07	-6.09*	-2.68	Stationary
D.tropen	-5.56*	-2.07	-5.61*	-2.68	Stationary
D.lnpopl	2.91*	-2.07	-2.97*	-2.68	Stationary

The results of the Im, Pesaran and Shin (IPS) panel unit root test conducted on each of the variables are presented in Table 2. The test was conducted under the constant and constant and trend random walk conditions. The decision rule is based on the comparison of the test statistic with the 5% critical value under each of the random walk assumptions. The null hypothesis is rejected when the test statistic is greater than the 5% critical value under both of the random walk assumptions.

The results presented showed that while *cred*, and *fdi* were all stationary at level; *lnepi*, *lnrgdp*, *tropen*, and *lnpopl* only became stationary after first differencing. The stationarity of the panel data variables validates their incorporation into the model for the purpose of estimating the relationship between the dependent and independent variables.

Panel Cointegration Test

The panel regression model specified to examine the impact of economic growth on environmental degradation- with environmental performance index as the dependent variable. The panel cointegration test result presented in Table 3 shows that we cannot fail to reject the null hypothesis of no cointegration between the variables in each of the models tested. The results show that at no point did all the test statistics for the respective models prove to be statistically significant. Though some of the test statistics proved significant for the environmental performance index model, it was not sufficient to decide that a cointegrating relationship exists between the variables in each of the models. Hence, the econometric technique adopted for estimating the models ignores the estimation of an error correction term.

Table 3: The results of Pedroni (2004) test of cointegration for Environmental Performance index model ad estimated

Modified Phillips-Perron t Stat. [p-value]	**Phillips-Perron t** Stat. [p-value]	**Augmented Dickey Fuller t** Stat. [p-value]	**Comment**
-0.30[0.38]	-5.60*[0.00]	-2.36[0.01]	No Cointegration

Note 1: * signifies significance at 5% levels of significant errors respectively. Note 2:
Source: Authors' computation, 2024

Table 4: The results of models estimated to examine the impact of economic growth on environmental degradation.

Independent variables	Dependent variable = Environmental performance Index				
	Fixed Effect		**Random Effect**		**Hausman Test**
	Coefficient	P-value	Coefficient	P-value	chi2 (p-value)
Lnrgdp	0.1953**	0.019	-0.1164***	0.000	103.18***
Fdi	0.0051	0.217	0.0030	0.607	(0.000)
Cred	-0.0018	0.110	0.0058***	0.000	
Tropen	0.0004	0.542	0.0003	0.789	
Lnpopl	-0.9100***	0.000	0.1157***	0.000	
const.	6.2240***	0.000	3.7927***	0.000	
R^2_W	0.5152	-	0.0073	-	
R^2_B	0.2682	-	0.5142	-	
R^2_O	0.0691	-	0.2307	-	
F-stat.	31.03***	0.000	-	-	
Wald	-	-	45.29***	0.000	

Note 1: *, **, and *** signifies significance at 10%, 5%, and 1% levels respectively. **Note 2:** R^2_W = R-squared within; R^2_B = R-squared between; and R^2_O = R-squared overall.
Source: Author's computation, 2024.

Table 4 presents the results of the panel regression study examining the impact of economic growth on environmental degradation. The dependent variable used in this research is the environmental performance index. The Hausman test indicates that fixed effect models are the best suitable for interpretation due to the statistically significant test statistics (103.18 and 113.79) at the 1% significance level (p-value < 0.01). Hence, going forward, the interpretation of the result will be solely based on the fixed effect models. Firstly, the result of the fixed effect model estimated to examine the impact of economic growth on the environmental performance index shows that the coefficient (i.e., 0.1953) of the natural log of real GDP (*lnrgdp*) appeared with a positive sign. This implies that economic growth had a positive impact on the environmental performance index in all the selected countries. The p-value (i.e., 0.019) shows that the coefficient of economic growth is statistically significant at the 5% level of significant error. Moreover, the coefficients (i.e., 0.0051, -0.0018, 0.0004, -0.9100) of the control variables appeared with both positive and negative signs. This implies that while foreign direct investment and trade openness have a positive impact on the environmental performance index, credit to the private sector and population have a negative impact on the EPI. However, only population proved to be statistically significant at 1% level of significant error. While the within R-squared and between R-squared statistics were computed as 0.5152 and 0.2682, respectively, the overall R-squared is computed as 0.0691. This suggests that the model, on average, explains 51.52% of the variation within the panel variables, 26.82% of the variation between the panel variables, and 6.91% of the variation in the entire panel data. The computed F-statistic (i.e., 31.03) and its p-value (i.e., 0.000) imply that the dependent variable is significantly explained by the independent variables in the model. Thus, the entire model is statistically significant.

Lastly, the post-estimation diagnostic test results for the two models estimated to examine the impact of economic growth on environmental degradation are presented in Table 5. From the results presented in Table 5, we observe that we failed to reject the null hypotheses in all the tests conducted. This is so because while the p-values of the test statistics for heteroscedasticity, autocorrelation, Ramsey RESET omitted variables, and normality test were all greater than 0.05, the stability test statistics (i.e., 0.7162 and 0.5301) were less than the 5% critical value (i.e., 0.9479). Moreover, the recursive CUSUM plot presented in figure 4 shows that the plot fell within

the 5% critical area. Hence, we conclude that the models passed all the post-estimation tests.

Table 5: The results of post-estimation diagnostic tests for the models estimated to examine the impact of economic growth on environmental degradation.

Dependent variable = Environmental performance Index				
Tests	**Test Statistic**	**Test of significance**		**Comment**
		P-value	5% critical value	
Heteroscedasticity	0.24	0.6242	-	Fail to reject null hypothesis
Autocorrelation	3.221	0.0727	-	Fail to reject null hypothesis
Stability (Recursive)	0.7162	-	0.9479	Fail to reject null hypothesis
Omitted variables	1.92	0.1287	-	Fail to reject null hypothesis
Normality	0.1862	0.3941	-	Fail to reject null hypothesis

Note 1: * signifies significance at 5% levels of significant errors respectively.
Source: Authors' computation, 2024.

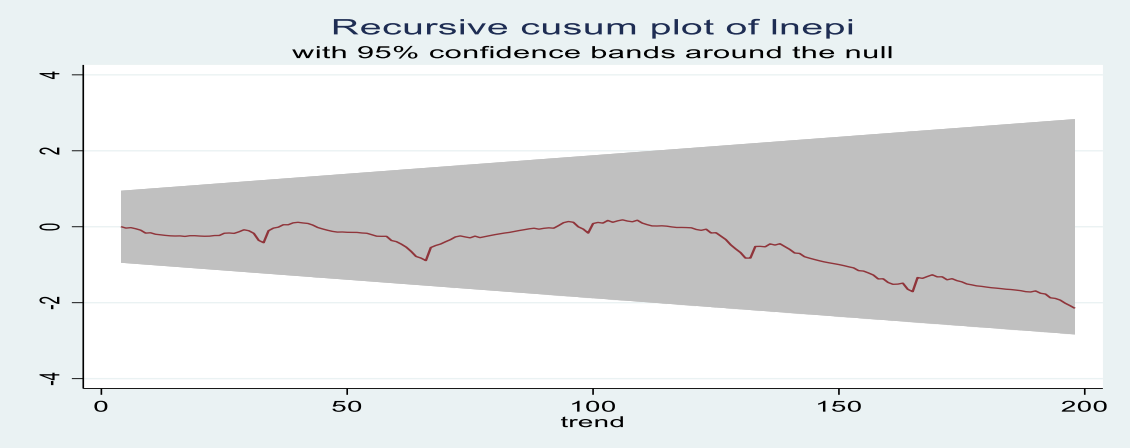

Figure 4: Recursive cumulative plot of EPI model estimated to examine the impact of RGDP
Source: Author's computation, 2024.

v. Discussion of findings

Significant findings have emerged from the data analysis to examine the effect of economic growth on environmental degradation among selected countries in Africa. The result shows that economic growth has the expected positive and significant impact on the environmental performance index. This implies that increase in economic growth improves environmental performance in Nigeria. The population growth rate was found to have significant negative implications on the environmental performance index which implies that increase in population retarded environmental performance.

Nigeria has witnessed stunted economic growth and a very high population growth rate over the years. These might have contributed to the low environmental performance index. As of 2022, Nigeria's economic growth grew at about 3.10% while the national population growth rate was 2.4%. The rising population growth rate and the fluctuating GDP growth have further worsened poverty and environmental performance in the country.

EPI combines 58 parameters that cut across 11 categories such as climate change mitigation, air pollution, waste management, sustainability of fisheries and agriculture, deforestation and biodiversity protection. The 2024 report ranks Nigeria 141 with 37.5 score. This implies that Nigeria has very low environmental performance index hence low environmental sustainability. The findings of the study on the impact of economic growth on environmental sustainability do not conform with findings from studies by numerous authors like Ajudua (2023), Igbru and Ifuruze (2021) and Derickand and Elisha (2019). These studies show that growth in several developing countries is not sustainable with the environment. Increase in production output is usually accompanied by environmental degradation in most developing economies and even some developed or emerging economies. The positive effect of trade openness on environmental performance deviated from an earlier study by Ajayi and Ogunrinola (2020) while the negative effect of population growth conforms with the study by Ajayi and Ogunrinola (2020). This implies that population growth has serious implications for environmental performance in Africa.

vi. Concluding Remarks

This study examined the effect of economic growth on environmental sustainability among selected African countries. To achieve the objectives of this study economic growth was analysed along with foreign direct investment, credit to the private sector, population growth rate and trade openness to determine their impact on environmental performance index (a proxy for environmental sustainability) on the six selected African countries namely: Angola, Algeria, Egypt Ghana, Libya, and Nigeria over the period 1990-2022 using panel analysis. Based on the analysis of the data trend analysis and econometric analysis of the panel fixed effect regression econometric technique, some key empirical findings were made. Egypt had the highest environmental performance index (EPI), Direct relationship between the real GDP and environmental performance index (EPI) was visualised in Algeria, Egypt and Libya. Economic growth had a positive and significant impact on the environmental performance index. FDI and trade openness had positive but marginal effect on the environmental performance index while credit to the private sector and population growth rate had a negative impact on the environmental performance index in the selected countries. Based

on the findings, the study recommended an increased investment in the real sector and an increase in emission tax in order to sustain the environment in Africa.

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Impact of just-in-time, standard and activity-based costing strategies on the Return of Assets of Nigerian manufacturing Firms.

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Abstract

The study concentration is on evaluating the potency of just-in-time (JIT), standard costing and activity-based costing as proxies for cost management techniques, with a particular emphasis on their influence on return on assets. The sample comprises 26 quoted manufacturing companies and the data on the study variables run from 2013 through 2022. Statistical analysis was conducted using the pooled regression method in a panel form to account for both cross-sectional and time dimensions within the data set. The findings indicated that while JIT did not yield significant impact on return on assets though, it did exhibit a noteworthy influence on ROA of selected Nigerian manufacturing companies. On the contrary, standard costing and activity-based costing demonstrated substantial effects on return on assets. Thus, the conclusion is that there is evidence that standard costing and activity-based costing has a positive and highly significant influence on return on assets of the manufacturing firms in Nigeria, but just in time is positive and insignificant. This means that the application these techniques of cost reduction has helped in operating a-cost-effective policy that significantly increase shareholders earnings. This study recommended that management should employ all the cost techniques such just-in-time, standard costing, and activity-based costing at a flexible situation, this means that they must not be rigid with any technique so as to sustain shareholder earnings.

Keywords: Just-in-time, standard and activity-based costing strategies, return on asset, Pooled panel,

Introduction

A key component of any organization is cost management, which entails controlling expenses across the board. This process comprises planning, managing, and cutting costs in addition to raising profitability, competitiveness, and productivity in order to improve financial performance. Cost management strategies are employed by organizations as instruments to control and minimize expenses. Businesses can choose from a variety of cost control strategies, each with pros and cons. This section will go over several cost management strategies and how to use them.

Furthermore, if a company has an effective cost management strategy in place and access to both current and predicted cost information, it can forecast future expenses and know how to control them. Managers are therefore in a better position to make decisions that would enhance the manufacturing companies' financial success.

Global corporations, and manufacturing enterprises in particular, have shifted their focus from being the most profitable and competitive in the world market to prioritizing sustainability. Consumer behavior is changing with time, and sustainability is becoming the

new standard. The workforce has seen changes in terms of required skills, working conditions, and benefits (Ganesh et al. (2023). In order to create common, environmentally friendly products, mention the goals of sustainable manufacturing as creating production methods, materials, strategies for recycling and reuse, waste management methods, software tools, pollution prevention methods, efficient industry practices, and business development.

With 13% of people employed directly by the industry, the manufacturing sector generates jobs, stimulates demand in other economic sectors, and is vital to global trade. With 17% of the world's GDP coming from it, it also helps the economy flourish. Economic and geopolitical concerns can have significant short- and long-term effects on manufacturing businesses and their operations. To increase competitiveness and ensure the ability to meet the needs of the public and customers, governments and businesses must comprehend the effects of shifting global trends on current and future generations.

Current issues facing the business include escalating inflation, rising oil prices, the conflict between Russia and Ukraine, shifting global economic policies, and an increase in the frequency of catastrophic weather occurrences and their consequences. It is imperative for governments and businesses to comprehend the ways in which contemporary geopolitical shocks are impacting the economy both in the short and long term, as this will determine their capacity to effectively respond to the changing requirements and desires of the populace (World Manufacturing Report, 2022).

Tapping and Shuker (2018) claimed that people like to invest in companies that have achieved great success. In the end, survival in the corporate environment is ultimately guaranteed and maximized by profit. An organization must have efficient cost control in order to make a profit that is sufficient.

Robert (2017) indicated that a company's chances of achieving its profit target are higher when it has an appropriate cost structure. Innes, John, Mitchell, and Sinclair (2000) assert that controlling a company's costs, performance, and quality of goods and services are essential to its survival in the modern world. While stockholders anticipate a strong return on their investment, customers are looking for high-quality items with greater performance at cheaper rates.

Literature Review

Concept of Just-in-Time

Ensuring that the proper quantity of raw materials is available when needed to support effective manufacturing is the main objective of this inventory management method. A specific alteration to the production procedure has an effect on both the quantity and the duration. Demand determines the quantity of goods needed in a demand-pull system such as just-in- time, or JIT manufacturing. Inventory should be kept as low as practical, according to the business, since it is a resource waster. Benefits of just-in-Time (JIT) manufacturing include reduced costs, shorter lead times, and less inventory. Just-in-Time (JIT) adopters have experienced higher employee turnover and lower inventory maintenance expenses. Proponents of the just-in-Time approach view building up inventory as an expensive inefficiency. The JIT approach aims to minimize this hidden cost by focusing on the exact time, location, and amount of material required (Odumusor, 2024).

As a lean manufacturing strategy, Just-In-Time (JIT) inventory management stresses the significance of creating or acquiring things solely when they are required, as opposed to hoarding inventory. Businesses can cut down on waste, boost efficiency, and adapt faster to shifts in demand by using this method. When it comes to supply chain optimisation and bottom line improvement, JIT has become a vital tool for enterprises. A company's bottom line, inventory expenses, and customer happiness can all benefit from JIT (Kumar & Suresh, 2018).

Businesses can lessen their negative effects on the environment by implementing JIT, which helps with waste minimization and surplus inventory storage reduction (Sarkis, 2012). Many scholars have offered descriptions of JIT, but each has done so from their own unique perspective. As an example, JIT was acknowledged (Bartezzaghi & Turco, 1989) from two angles: first, as a worldwide idea; and second, as a set of instruments meant to steadily raise production. The goal of just-in-time (JIT) production, as stated, is to reduce inventory while simultaneously increasing product quality and customer satisfaction (Clarke & Mia, 1993) Bandyopadhyay (1995) argues that the most effective approach to implementing JIT is for top management to fully grasp the necessary methodologies and make employee participation their top priority. Yasin and Wafa state that the Japanese implemented the Just-in-Time (JIT) paradigm for production and management in the 1960s (1998). Canel et al. (2000), JIT is a concept that is utilised in both manufacturing and services to ensure efficient and high-quality product manufacturing and service. Chan et al. (2010), JIT is a production philosophy aimed at achieving the lowest possible inventory level. Kootanaee et al. (2013), JIT is a manufacturing concept that works to decrease inventory by creating a pull system where one part of the system pushes the other to deliver the best possible quality. The concept evolved from Toyota's mastery of making cars that, in some way, satisfy the immediate needs of customers while living up to their high standards of quality. Green et al. (2014) states that in order to adopt JIT, the supply chain must be fully integrated. Crucial components for completing performance were also specified by them: JIT purchasing, JIT running, and JIT selling.

Standard Costing

In standard costing, an anticipated cost is used in place of a real cost in the books of accounts. Following this, discrepancies between actual and anticipated expenses are documented as variances. Cost layering techniques, like FIFO and LIFO, necessitate extensive records of past costs for each item in stock; this method offers a more straightforward substitute (Maskell et al., 2017). Nweze (2010) defined standard costing as an accounting method that uses predefined costs for materials, overhead, and cost layout for each line of manufactured goods or rendered service.

Adeniji (2009) emphasizes the pivotal role of standard costing within the framework of management accounting control. This method, coupled with budgeting system and responsibility accounting statement, serves as a cornerstone in ensuring effective financial management and performance evaluation within organizations. Egbunike (2019) suggests that the evaluation of stand costing can be approached through two distinct lenses: absorption coting and marginal costing techniques. Each approach offers unique insights into the allocation and analysis of costs, allowing managers to make informed decisions regarding

resource allocation and pricing strategies. Moreover, the implementation of standard costing often necessitates variance analyses. These analyses enable organizations to compare planned or standard costs with the actual costs incurred during the manufacturing process. By identifying discrepancies between expected and actual costs, managers can pinpoint areas of inefficiency or areas where performance exceeds expectations, facilitating continuous improvement and strategic decision-making. Adeniji (2004) further clarifies the concept of variances, defining them as the differences between actual and budgeted revenues, or between the total production cost and actual costs incurred in production. Understanding these variances is essential for organisations to maintain financial control and make adjustments to operations in alignment with their strategic objectives.

Rotch and Allen, (1982) declared that divergence is the difference between the real and the predicted. The discrepancies between standard costs and real costs can be attributed to multiple variables. These elements are related to material costs, material consumption, labor costs, labor productivity, and overhead. Relying on the goal and quality of the standard, management can focus on areas of ariances—whether favorable or unfavorable—by practicing management by exception when standard costing is implemented.

The process of standard costing entails estimating the costs of a company's operations and establishing a baseline for comparison. The main justification for utilising standard costs is that they provide a reasonable approximation to actual costs in many contexts when collecting them would be too laborious. Cost accountants routinely compute variances that disentangle variations in standard costs from actual costs, taking into consideration variables like changes in labour rates and material costs. To make the standard costs more in line with the real expenses, the cost accountant may make adjustments to them from time to time (Boardman, Greenberg, Vining, & Weimer, 2017).

Activity Based Costing (ABC)

Activity-based costing (ABC) is a method of cost control wherein overhead expenses are assigned to certain tasks. It is a technique for determining and allocating expenses to resource-consuming tasks. When a company's operations are complex and conventional costing techniques are insufficient; ABC can be helpful because it is focused on those activities customers can readily pay for and thereby avoids waste of resources on irrelevant items. A company can figure out the cost of each operation and each good or service by using ABC since it concentrates on critical and relevant costs presently required. Because overhead expenses can be high in manufacturing, ABC is very useful in these types of businesses. Businesses may cut costs and boost efficiency by figuring out how much each task costs.

When ABC was first presented, the community expected that most businesses would replace their existing costing methods with it. The identification of the ABC dilemma was critical in changing the ABC study from presentation to empirical study of why ABC is not more actively applied (Bescos & Charaf, 2013; Vetchagool et al., 2019; Kitsantas et al., 2020). Ultimately, Activity-Based Costing implementation aims to achieve advantages that either directly or indirectly affect performance (Brierley, 2015). Organizations that use ABC can increase efficiency by identifying, minimizing, or eliminating tasks that do not provide value for their customers and reevaluating their offerings. Consequently, ABC may reduce product costs, improve the quality of the information, and accelerate the production process (Askarany and Yazdifar, 2012; Kissa et al., 2019).

By essentially converting general indirect costs into direct production costs, the ABC method provides more accurate product costing. It allocates the expenses of various indirect costs to the various activities that use them after computing their costs. The ABC method provides management with valuable data that can be used to increase process effectiveness and boost product profit margins. This accounting system seems to be suitable for the pharmaceutical business, which is a highly competitive sector with many indirect expenditures, a wide range of goods, and complex production procedures (Chen et al., 2019).

However, because state-owned pharmaceutical companies were formerly supported by the Vietnamese government, these pharmaceutical firms did not need to adopt a cost accounting strategy like ABC to increase their cost effectiveness and competitiveness (Al-Omiri and Drury, 2007). ABC is based on allocating costs that can't be directly allocated to the product to the activities that cause them, which then results in costs being allocated to the product for each activity in accordance with the expected benefit from that activity. It is described as a particular strategy for enhancing costing that places an emphasis on activities as primary cost goals before allocating costs to final goals. By taking into account the connection between cost components and their causes, this method analyzes the cost of activities, their performance, and the resources that support them. This method came into being as a result of the limitations of traditional accounting techniques in addressing problems brought on by the recent advancement of production techniques and modern accounting techniques (Maiga, 2014).

As a result, it is regarded as one of the most significant entrances to strategic costs because it helps decision makers by giving them more precise and useful information and by helping them achieve their goals (Faiza &Thair, 2022). Hilton, (2011) described it as a system in which indirect costs are allocated in two stages: first, they are gathered in cost pools, and second, they are assigned to the final products as cost drivers.

The activity-based costing system is used in the company as a supplement to the traditional costing system and not as an alternative, according to Garrison, (2012), who also believes that this approach is a method for calculating the cost in order to give managers information about the cost to make strategic decisions and decisions that can affect the production capacity of the company. (Al-Sayed, 2019), it is a system based on categorizing work into activities and connecting the costs of each activity to the final product based on appropriate cost causes. This leads to accuracy in calculating the cost of the service or product through activity analysis, as well as providing the administration with financial and non-financial data that supports the planning, control, and performance improvement processes (Kissa et al., 2019).

Return on Assets (ROA)

“Financial performance is predicted to be related to cost management measures in the following way: A positive or negative association between cost management strategies and financial performance is anticipated by the researcher. According to one school of thinking, manufacturing organisations' bottom lines are directly correlated with their use of effective cost management measures” (Kumar & Shafabi, 2011).

“Furthermore, there is a positive correlation between the use of cost containment strategies such standard costing, sourcing, and budget systems and an increase in profitability. These approaches limit the maximum cost that may be incurred, allowing expenses to be lower for the same level of income.

fixed and variable expenses of an essential activity is what we mean when we talk about cost reduction" (Groth & Kinnery, 1994). "Reducing the present Because of this, the overall asset output is low in relation to the income that is generated. Profitability rises as a result of an increase in the return on assets ratio. Lowering the negative impact on income, cost avoidance (i.e., the elimination of activities that generate expenses of non-added values) improves profitability by lowering expenditure on things that do not generate income in the future. As a measure of financial success, this study finds that an increase in income leads to an increase in return on assets (ROA) and profitability. A different perspective suggests that cost management does not correlate well with financial performance metrics. This perspective suggests that traditional cost accounting metrics should be supplemented with a variety of non-costing metrics in order to capture important aspects of strategic performance that are under-represented in short-term accounting metrics". Brancato (1995) and Fisher (1995a) "show that many businesses think cost accounting measures are "backward-looking" and focused on the past rather than the present. They also think that they don't adequately account for "intangible" assets like intellectual capital, which are hard to quantify, and that they reward wrong or short-term behaviour. To get a more complete picture of their financial health, many companies are adding a variety of non-cost performance measurements to their cost accounting metrics".

Empirical Review

In Patel et al. al. (2016) "The objectives of the JIT System were examined by in the Implementation of Just-In-Time in an Enterprise. These objectives include producing high-quality goods in a timely manner while reducing material waste. When these goals are achieved, the customer will be satisfied with the speed of service, the quality of the goods, and the fair price. A method based on analysis was employed. The findings showed that JIT successfully produced the necessary components in the specified amount and quality within the given time frame. In addition to reducing waiting times and damaged items, JIT production helps with appropriate trash disposal".

Barkhordari and Denavi (2017), "JIT manufacturing in Yazd Province's tile and ceramic industry affects supply chain competency and organisational performance. The method employed was a descriptive one. Included in the study's sample were 219 managers with varying levels of technical and non-technical expertise in the tile and ceramic business. Supply chain competencies and strategies are essential for a successful supply chain, according to the study's results. In addition, it was proven that entire JIT is an appropriate technique for managing supply chains".

"Regarding JIT in Jordanian Industrial Companies, an empirical study was conducted. The method employed was descriptive-analytical. The study's sample included 55 individuals from 76 representative industrial companies. An analysis of Jordanian public industrial businesses found that their JIT manufacturing systems are ineffective. In addition, many businesses are unable to implement the JIT production system due to a lack of knowledge and awareness on the part of upper management.

Ogbonna (2021) "looked at the relationship between cost management strategies and the success of Nigerian manufacturing firms. This research aims to provide light on the relationship between

conventional costing and activity based costing as it pertains to twelve Nigerian manufacturing enterprises' NPBT, EPS, and ROA. The independent variables, standard costing (STC) and activity based costing (ABC), were measured using binary numbers zero and one, and the data was derived from audited financial statements of companies from 2014 to 2018. Standard costing and activity based costing were found to affect net profit before tax and earnings per share, but had no influence on return on asset, according to pooled regression statistical analysis in panel form. Standard costing and activity based cost significantly affect Nigerian manufacturing enterprises' net profit before tax and income per share, but have little effect on return on asset, according to the research's key result".

Qureshi et al. (2013) "empirically examined elements involved in incorporating and adopting Just in Time management in cement industry of Pakistan using primary data sourced from four hundred operations managers of cement industry to elicit information about benefits cement industry have derived through adoption of Just in Time. Factor analysis was employed in investigating the relationship between the parameters linear functions and findings reveal that incorporating elements of Just in Time into their production process improves the competitiveness of cement industry considerately in Pakistan. Though the research realized the fact that incorporating Just in Time elements into the production processes faced some problems, findings suggested that product quality design, quality control, and management of stock effectively, planning of production processes and chain of product supply can help to solve those problems identified".

Oyedeji et al. (2023) "looked at the influence of cost management practice techniques on the performance of fast-moving consumer goods in Nigeria. They were interested in how these strategies affected the FMCG industry in Nigeria. This study made use of an ex post facto research strategy using 35 listed FMCG businesses in Nigeria as the population. Quantitative information was obtained from the twelve (12) years of publicly available audited financial reports for the chosen organizations between 2009 and 2020. The Nigeria Stock Exchange (NSE) top five (5) traded FMCG firms were identified through the application of stratified and purposive sampling approaches.

The statistical method used was descriptive, Generalized Linear Model (GLM) regression statistics and correlational analysis to test the research hypotheses. The statistical tool employed was econometrics view (E-view) software to analyse the data. The findings of the study revealed the coefficient estimates that budgetary control ($r = 675680.4$; $p = 0.0029 < 0.05$), activity-based costing ($r = 4.166310$; $p = 0.0000 < 0.05$) and life-cycle costing ($r = 806197.9$; $p = 0.0000 < 0.05$) are statistically significant at 0.05 levels while the standard costing ($r = 25890.39$; $p = 0.7433 > 0.05$) variable is positively related but statistically insignificant with the performance of FMCG in Nigeria. Thus, the correlational result depicts that budgetary control and standard costing techniques are negatively correlated, while activity-based costing and life-cycle costing are positively correlated. Though only the standard costing hypothesis was accepted, the other hypotheses were rejected. The study concluded that good costing techniques could be seen in identifying, measuring, and quantifying effective cost management practices on FMCG firm performance".

Rundor et al., (2013) "investigated Activity-Based Costing in Small Manufacturing Firms in South African by means of a survey of the experiences and perceptions of activity-based costing (ABC), as an alternative to traditional costing, in small manufacturing firms in the Southern Gauteng region of South Africa. The objectives of the study were to determine the: Extent to which ABC is adopted; Perceptions of the benefits and the barriers of ABC; Experiences regarding the practice of ABC; and Reasons why firms do not adopt ABC. An analysis of 48 questionnaires indicated that 16 firms implemented ABC whilst 32 did not adopt this approach. The study firstly found that the ABC users have been in business significantly longer than the non-users, ABC users' firms are significantly larger than the non-users firms', there are some significant differences in the perceptions between the users and non-users regarding the benefits and the barriers of implementing ABC, that the ABC users are to a great extent neutral in respect of the practical issues of ABC and finally, that the non-users of ABC are of the opinion that ABC is too expensive to implement".

Theoretical Review

Efficiency Structure Theory (ES)

The efficiency-superiority hypothesis holds that businesses make more money because they are more efficient than other businesses. The X-efficiency and scale-efficiency hypotheses are two distinct approaches in the study of economics. In line with the X-efficiency approach, profitable businesses are more streamlined since their expenses seems lower. These businesses frequently get larger market shares, which raises the degree of market concentration; however, there is no connection between profitability and concentration (Athanasoglou et al., 2006).

Using the scale approach prioritizes obtaining cost advantages through higher production volume over changes in production methods or management. By taking advantage of economies of scale, large businesses can lower unit costs and boost profitability. Gaining a larger share of the market can help large businesses become more profitable by increasing market concentration.

Methodology

Within its longitudinal subset, the research used a causal research design. Data in longitudinal research are structured to be replicated for different companies over time (Pettigrew, 1990). The Population of this study consists of eighty-two manufacturing companies, which are further categorized as Natural Resources, Real Estate and Construction, Consumer Goods, Industrial Goods, and Conglomerates that are listed on the Nigerian Stock Exchange as at 31st December, 2022 for 11 years as from 2012 – 2022. A pooled Panel technique was applied to investigate the effect of just-in-time, standard and activity-based costing strategies on earnings per share of manufacturing firms in Nigeria.

Model Specification

Based on previous models developed by Zhang et al. (2017), the paper lays forth its functional form here: Firm Performance = *f*(Costing Technique)

$ROA_{it} = f(JIT, STC_{it}, ABC_{it})$ 1

The subsequent equations are given by converting the previous equation to an econometric/mathematical format;

$ROA_{it} = ß_{0it} + ß_1 JIT_{it} + ß_2 STC_{it} + b_3 ABC_{it} + ₡_{it}$ 2

Where:

ROA=Return on Asset

JIT=Just in Time

STC=Standard Costing

ABC=Activity Based Costing

Results and Discussion

Descriptive Statistics

Table 1

Summary of Descriptive Statistic

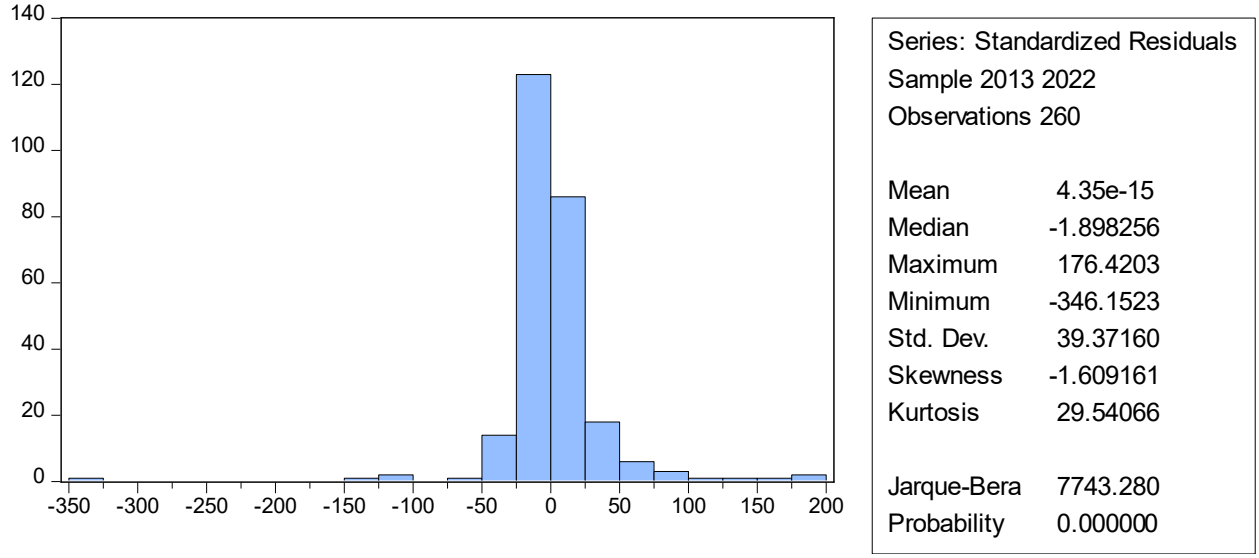
Variable	Obs	Mean	Std. Dev.	Min	Max
roa	260	18.20043	40.80918	-343	200
jit	260	.3307692	.4713975	0	1
stc	260	.3307692	.4713975	0	1
abc	260	.3384615	.474099	0	1

Return on Asset, just-in-time, standard costing, and activity-based costing are among the variables whose descriptive statistics are shown in Table 1. The companies had an average Return on Asset of 18.20. The study revealed that the mean values for just-in-time, standard cost, and activity-based cost are 0.3307692, 0.3307692, and 0.3384615, respectively, while the standard deviation values are 40.809, 0.4713975, 0.4713975 and 0.474099. The standard deviations are relatively greater than their corresponding mean values. This suggests that the statistical mean represents data that is spread out or varied (Field, 2009).

Table 2: Correlation Matrix

	roa	jit	stc	abc
roa	1.0000			
jit	-0.2597	1.0000		
stc	0.1647	-0.4943	1.0000	
abc	0.0945	-0.5029	-0.5029	1.0000

Return on Asset, just-in-time, Standard Costing, and Activity Based Costing matrix correlation data are shown in Table 2. Just-in-time has a -25.97% negative correlation with ROA. STC has correlation values of 16.47% with ROA and the correlation values of 9.45% is found for ABC and ROA.



Source: E views 10.0 output

Figure 1: Normality Tests

The results of the normality tests are shown in Figure 1. At the 0.05 level, the Jarque-Bera test revealed that the p-value of 0.00000 is statistically significant. For the dependent variable (ROA), the Jarque-Bera test yielded a p-value of 0.0000, meaning that at the significance level of 0.05, the data is not regularly distributed.

Table 3: Results of Pooled Regression Estimates

	Pooled regression	
	Coeff	**P-value**
JIT_{it}	3.152326	(0.4602)
STC_{it}	27.74419	(0.0000)**
ABC_{it}	23.57968	(0.00000)**
R^2	0.2241	
N	260	
F*	30.16	(0.00000)

Dependent variable: $(EPS)_{it}$

Note: *, **, *** show significance at 1%, 5% and 10% respectively

Table 3 displays the summary of results for the pooled regression, with an R^2 value of 0.2241. 22.41% of the variation in the dependent variable return on Asset (ROA) is attributed to the

changes or effects of the independent variables Just-in-Time (JIT), Standard costing (STC), and Activity Based Costing (ABC).

The coefficient for Just-in-Time (JIT) is 3.1523 with a p-value of 0.4602. The study period from 2013 to 2022 showed a beneficial impact of Just-in-Time (JIT) on Return on Asset (ROA). Just-in-Time (JIT) shown a minimal rise in the return on assets of manufacturing companies. The results of this investigation also align with the work of Patel et al. (2016) about the integration of Just-In-Time within an enterprise. The outcome showed that JIT caused the necessary elements to be produced in the necessary quantity and quality in a constrained amount of time. JIT production also lessens waiting times for damaged products and helps with efficient waste management.

The results corresponded with the research conducted by Barkhordari and Denavi (2017) regarding the impact of Just-in-time (JIT) manufacturing on supply chain competency and organizational performance in the tile and ceramic sector of Yazd Province. A descriptive methodology was used. 219 managers in the tile and ceramic industry with varied degrees of technical and non-technical experience were included in the study's sample. The study's findings indicate that supply chain strategies and competences are critical to its success. Furthermore, it has been demonstrated that supply chain management is a suitable application for whole JIT.

Moreover, the results align with the research conducted by Qureshi et al. (2013), which investigated the factors involved in implementing and embracing Just in Time management in Pakistan's cement sector. The study used primary data collected from 400 operations managers in the cement industry to gather insights about the advantages the sector has experienced since implementing Just in Time.

The coefficient for Standard Costing (STC) is 27.744 with a p-value of 0.0000. There is a favourable impact of Standard Costing (STC) on Return on Assets (ROA). Standard costing (STC) significantly enhances the return on assets (ROA) of manufacturing enterprises in Nigeria. This result is in consonance with Ogbonna (2021) who empirically examined cost management techniques and manufacturing firm performance in Nigeria. Finding out how activity-based costing and standard costing relate to net profit before taxes, earnings per share, and return on asset for twelve Nigerian manufacturing companies is the goal of this research.

Standard costing has an impact on return on asset, according to the results. The outcome also concurs with a study conducted in 2023 by Oyedeji et al., which looked at how fast-moving consumer goods in Nigeria performed in relation to cost management practices. This study employed an ex post facto research strategy using 35 listed FMCG businesses in Nigeria as the population.

Quantitative information was obtained from the twelve (12) years of publicly available audited financial reports for the chosen organizations between 2009 and 2020. The Nigeria Stock Exchange (NSE) top five (5) traded FMCG firms were identified through the application of stratified and purposive sampling approaches.

The Activity Based Costing (ABC) model has a coefficient of 23.57 and a p-value of 0.0000. The study period from 2013 to 2022 showed a beneficial impact of Activity Based Costing (ABC) on Return on Asset (ROA). Activity Based Costing (ABC) significantly affects the return on assets of manufacturing enterprises. This results is in line with that of Ogbonna (2021),

who conducted an empirical investigation into the relationship between Nigerian manufacturing firm performance and cost management strategies. The study's objective is to determine how activity-based costing affects the return on assets of twelve Nigerian manufacturing companies. The outcome showed that return on asset is significantly impacted by activity-based costing.

Once more, the results were consistent with those of Rundor et al. (2013), who used a survey to learn about the experiences and opinions of small manufacturing firms in the Southern Gauteng region of South Africa regarding the use of activity-based costing (ABC) as a substitute for traditional costing.

The study aimed to ascertain the following: The degree of adoption of ABC; Perceptions of the advantages and obstacles associated with ABC; experiences pertaining to ABC practice; as well as the reasons businesses don't use ABC. 48 surveys were analyzed, and the results showed that 16 businesses used ABC and 32 did not. First, the study discovered that the firms of ABC users have been in business for a significantly longer period of time than those of non-users; second, there are notable differences in the perceptions of users and non-users regarding the advantages and obstacles of implementing ABC; third, the users of ABC are largely unbiased when it comes to the practical issues of ABC; and, last, the non-users of ABC believe that ABC is too costly to implement.

Conclusion

The main aim of this study is to examine empirically the relationship between cost management techniques and manufacturing firm's performance in Nigeria. The study also considers the influence of firm-specific characteristics such as organizational culture, management policy and procedure on financial performance and their interactions with cost management techniques. The sample comprises 26 quoted manufacturing companies and the data on the study variables run from 2013 through 2022. Thus, the conclusion is that there is evidence that standard costing and activity-based costing has a positive and highly significant influence on return on assets of the manufacturing firms in Nigeria, but just in time is positive and insignificant. This means that the application these techniques of cost reduction has helped in operating a-cost-effective policy that significantly increase shareholders earnings. This study recommended that management should employ all the cost techniques such just-in-time, standard costing, and activity-based costing at a flexible situation, this means that they must not be rigid with any technique so as to sustain shareholder earnings.

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VALUE FOR MONEY AUDIT AND GOVERNMENT EXPENDITURE IN NIGERIA

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ABSTRACT

It is constitutional and statutory for public sector organisations at federal, state, and Local government levels to embrace the concepts of value for money audit and integrate it in their organisations; also required is to prepare budget of activities and programmes to be executed. To determine how efficient these programmes are in meeting their objectives is a major concern. This study investigates the relationship between Value for Money Audit and Government Expenditure in Nigeria. The study sample size consisted one hundred and five (105) staff of selected tertiary institutions and an agency in Rivers State. Using the desktop analytical approach and questionnaire method; primary data were collected with Cronbach Alpha of 0.7 coefficients. Data were analysed using Pearson Correlation Coefficient Statistical tools with the aid of Statistical Package for Social Sciences version 23.0. Findings at 0.05 significance level reveal that Economy and Efficiency Audit has strong positive relationship with capital expenditure (r = 0.678**) and (r = 0.638**), and re–current expenditure (r = 0.620**) and (r = 0.683**) respectively. Therefore, the study concludes that value for money audit have positive and significant correlation with government expenditure. It was recommended that government should establish clear legal mandate for VFM audits, outlining their scope, powers, and reporting requirements. This would strengthen their independence and effectiveness of due process and best practices, and will encourage collaboration between Audit Institutions, anti-corruption agencies, and others to share their expert knowledge. This would enhance overall effectiveness of financial oversight. Finally, it will focus VFM audits on areas identified as high-risk for waste, inefficiencies, and corruption. Which include sectors like public procurement, infrastructural projects, and social welfare programs.

INTRODUCTION

1.1 Background to the Study

Value for money audit according to Okwoli (2004) is "a systematic evaluation of the methodologies employed in the execution of programmes, projects, and activities with the objectives of confirming whether the stated objectives of the programmes, projects, and activities were actually achieved and at what cost". According to him, this method of audit has evolved over time and been found to be the best approach to confirming whether managers of resources are applying best practices in the use and application of fund and resources. He maintains that the best practices in this respect will be the extent to which the authorities as well as managers apply economically and efficiently in the resources made available and how the expected results are being achieved. According to the Institute of Chartered Accountants of Nigeria (ICAN) Study Park, Advance Auditing Assurance (2009), Value for Money is the concept that seeks the maximization of the scarce resources for the welfare of the public, ensuring that activities and programmes are carried out at low cost and to a high standard. In order to achieve this phenomenon, there are three basic elements usually covered; and these are economy, efficiency and effectiveness. These were the key elements of Value for Money with the view expressed by both United States Comptroller – General and the United Kingdom Controller – General and Auditor about three decades ago. It further maintained that The Value for Money Audit suggests those procedures which are designed to assist managers of resources and management establish necessary controls to ensure that the desired objectives are met at the desired level of efficiency and effectiveness. Though this emphasises cost savings but that may not be the overriding objectives. Value for money may be applied to both private and public enterprises, but it is particularly relevant in the public sector as in this case. It's application in the public sector is designed to provide to the oversight bodies an assessment basis for the performance of the operating arm of the government with information available, observations and recommendations designed to promote answerable, fair government expenditure, honest and productive government. Value for Money encourages accountability and best practices, and also increase ethical behaviour with better understanding in relation to government expenditure be it capital , current or recurrent in nature.

Therefore, the procedure for Value – for - Money is to assess the economy, efficiency and effectiveness with which government acquires and applies available resources to benefit the well-being of the citizens. Economy does not necessarily imply the cheapest price while measures of effectiveness is subjective, often involving the perception of the recipients of Government services. The value for money audit may be sensitive to certain political realities as in the present day situation, such as labour agitation. For instance, where value for money review clearly reveals overstaffing and over-spending in public service. Some

other non-financial considerations may shape Government reaction to a recommendation to staff reduction and some other associated cost decrease. However, a Value for Money review will certainly focus on the following areas which include but not limited to; Corporate structure, Information system, Management style, Authorisation procedures, Segregation of duties, Resource allocation and utilisation, Investment decision, Decision criterion, and Effective supervision.

It is necessary to note that value for money audit addresses the critical issue of the extent to which government expenditure satisfices the requirements of the concept of value for money audit which are economy, efficiency and effectiveness. Essentially, Oshisami (1992), states that is of the view that value for money audit determines whether the entity is acquiring managing or utilizing its resources (staff, buildings, spaces, material etc) in an economic and efficient management and the causes of any inefficiencies or uneconomical practices (google.com/search/vfm). It is a constitutional requirement that it is the responsibility of public sector organizations at local, state and federal governments levels to embrace and ensure the concepts of value for money audit and integrate it in their organizational financial activities. Value for money audit as a useful accountability tool aims at preventing any unnecessary government expenditure.

In order to achieve the phenomenon of value for money in relation to public expenditure, three (3) element are usually covered; Normally referred to as the Three E's which includes:

1. Economy, 2. Efficiency and 3. Effectiveness.
   (1) Economy Audit: This is aimed at whether an organisation has acquired the resources required for its activities at the lowest cost thereby highlighting wasteful expenditure areas. Economy is seeing that minimum quality of resources is used to achieve the desired output or not as earlier stated.
   (2) Efficiency Audit: This is aimed at confirming that there is a positive relationship between the level of service provided and the resources used to achieve that level; thus, highlighting expenditure. Efficiency is concerned with minimum input or spending minimum input to achieve stated or targeted budget.
   (3) Effectiveness Audit: This is concern whether organisation is achieving its objectives and progarammes. Thus, effectiveness audit is aimed at examining the extent to which a programme or project undertaken for the purpose of meeting established policies or goals has met the desired result.

The application of value for money concept to auditing leads to the concept of Value-for-Money Audit. It is applicable to both public and private sector but more emphasis has been place for its application to the public sector organisations of the economy and its resultant effect on government expenditure in Nigeria with respect to this research work. Value for Money Audit is carried out with a view to ascertain whether the establishment pursues

optimal value with adequate consideration for Economy, Efficiency and Effectiveness in its quest for resource management. It is an investigation into an event whether proper arrangement has been carried out for securing Economy, Efficiency and Effectiveness in the use of resources. It is also referred to as comprehensive audit.

Oshisami (1992) states that Value for Money Audit determines whether the entity is generating acquiring, managing or utilizing its resources (staff, fund, buildings, spaces, equipments, materials, etc) in an economic and efficient manner and the causes of any inefficiencies or uneconomical practices. He went further to state that it involves an inquiry into whether in carrying out its responsibilities, the organisation gives adequate consideration to optimal acquisition, procedures and practices, safe keeping of its assets, money and minimum expenditure of effort. Value for money audit has been found to be particularly useful in public sector where measurement of results achieved by public sector organisations is more subjective than in the private sector. In the private sector, measurement of the success of an enterprise is a function of the profit of such an enterprise. The managers in the civil service are usually provided with resources in the form of men, materials, fund (money) for the purpose of achieving stated objectives to the interest of the public. However, the extent or how far to which these objectives are achieved depends on how these resources are being economically managed and utilized. Public service is seen as a trust. It is therefore highly obligatory for any one, entrusted with such responsibility to exercise accuracy, due diligence and utmost prudence in the utilization of given resources and to ensure that the expected results are achieved for the benefit of the public. Therefore, it is highly recognised that Value for money audit will contribute greatly in government expenditure in order to achieve budgetary implementation in the Nigerian public sector organisations; if all things being equal.

1.2 Statement of Problem

In recent time, some wilful behaviours as well as intentional acts of some person(s) have given rise to challenges in some, if not all the public sectors and they are faced with one challenge or the other just to gain some unjustified personal benefits despite the existence of qualified professionals and internal control system, and other protective measures put in place that is to serve as the watch-dog in the system. Series of irregularities, fraud and corrupt practices have been committed in the public sector of the economy thereby given rise to adverse effect of Value-for money audit and government expenditures in the economy, more especially in government owned organisations. These, in no doubt are perpetrated under the supervision of accounts officers, direct supervisors, departmental heads and managers, and the internal auditors of the organisations. It suffices to say that the independence of the internal auditor who is an employee of the same organisation is not even guaranteed because he works as an ordinary employee of the government or

organisation thereby having some limitations in exercising its functions and duties as expected. Then come the idea of external auditors who is expected to express its opinion on certain financial matters, yet fraud and financial, misappropriation, crime and other irregularities are still being committed on a daily basis which has grossly reduce the confidence and benefits of Value-for-money audit and government expenditure in government budget implementation for the welfare of the entire public. Value for Money Audit is appreciated to the extent to which best practices in this respect will be achieved by the authorities as well managers of resources in applying economically and efficiently in the resources made available. In effect, therefore, while the need to achieve stated results is of primary importance, the curtailment of waste and extravagance makes the results more realistic. In spite the need that value for money audit constitutes the policies and procedures established to provide reasonable assurance that specific public-sector objective will be achieved; the system still cannot by itself guarantee efficient administration, completeness and accuracy of the records because of fears of suspected lapses in the system. Those in position of trust most time are involved in fraudulent collusion. Policies and procedures that require segregation of duties are circumvented by collusion amongst person(s) both within and outside the sector. Often time management overrides certain controls and systems which they establish thereby reducing economy, efficiency and effectiveness of the available resources and the organisation as whole given rise to unnecessary excessive as well ambiguous government spending, thereby giving rise to poor budget implementation. Errors in the application of policies, standards and procedures, principles and by-laws also arises to misunderstanding of instruction, mistake in poor judgment and personal carelessness, distraction or fatigue, dishonesty etc.; still exist in the control system of government owned organisations. Hermanson and Rittenberg (2003) assert that the existence of an effective public-sector auditing function is associated with superior organisational performance. Although prior research (for example, Mak, 1989 & Simons, 1987) suggest a link between accounting control practices and financial performance, majority of prior studies had concentrated mostly on the budgeting aspect of accounting controls. This aside, the available studies so far had dealt exclusively with large privately - owned companies especially in the advanced countries. Little is known, at present, about the influences of value for money audit and government expenditure of government owned enterprises. It is in the light of the above problems, that this studies is carried out with the aim of examining Value for Money Audit and Government Expenditure in selected government – owned organisations in Rivers State of Nigeria to fill in the exiting gap in knowledge and proffer lasting solutions to the said problems for the social welfare of the public and economic growth. Also, impact study is being done in order to determine the real change in the economic, socio-cultural, financial, educational and health as a result value for money audit on government expenditure

1.3 Aim and Objectives of the Study

The main aim of this study is to examine the impact of Value for Money Audit on Government Expenditure in Nigeria with respect to some selected public sector organisations in Rivers State. The specific objectives of this study (Impact of Value for Money Audit on Government Expenditure) is designed to:

I. Determine the impact of Economy Audit on Government Capital Expenditure in the public sector.
II. Determine the impact of Economy Audit on Government Recurrent Expenditure in the public sector.
III. Determine the impact of Efficiency Audit on Government Capital Expenditure in the public sector.

4 Theoretical Framework

Agency Theory

The most relevant theory upon which this study is based is the agency theory. It is an acknowledged fact that the principal-agent theory is generally considered the starting point for any debate on the issue of corporate governance emanating from the classical thesis on The Modem Corporation and Private Property by (Heracleous, 2001). According to this thesis, the fundamental agency problem in modem firms is primarily due to the separation between shareholders (owners) and management (managers). Modem firms are seen to suffer from separation of ownership and control and therefore are run by professional managers (agents) who cannot be held accountable by dispersed shareholders. In this regard, the fundamental question is how to ensure that managers follow the interests of shareholders in order to reduce costs associated with principal-agency theory? The principals are confronted with two main problems. Apart from facing an adverse selection problem in that they are faced with selecting the most capable managers, they are also confronted with a moral hazard problem; they must give agents (managers) the right incentives to make decisions aligned with shareholder's interests. Jensen and Meckling (1976) describe agency relationship as a contract under which "one or more persons (principal) engage another person (agent) to perform some services on their behalf, which involves delegating some decision-making authority to the agent". In this scenario, there exists a conflict of interests between managers or controlling shareholders, and outside or minority shareholders leading to the tendency that the former may extract "perquisites" (or perks) out of a firm's resources and be less interested to pursue new profitable ventures. Agency costs include monitoring expenditures by the principal such as auditing, budgeting, control and compensation systems, bonding expenditures by the agent and residual loss due to divergence of interests between the principal and the agent. The share price that

shareholders (principal) pay reflects such agency costs. To increase firm value, one must therefore reduce agency costs. The following are the key issues towards addressing opportunistic behaviour from managers within the agency theory: Composition of board of directors; the board of directors is expected to be made up of more Non-Executive Directors (NEDs) for effective control. It is argued that this reduces conflict of interest and ensures a board's independence in monitoring and passing fair and unbiased judgment on management. CEO duality meaning that it is also expected that different individuals occupy the positions of CEO and board chairperson as this reduces the concentration of power in one individual and thus greatly reduces undue influence of particular management and board members.

Resource Dependency Theory

This theory introduces accessibility to resources, in addition to the separation of ownership and control, as a critical dimension to the debate on corporate governance. Again, the theory points out that organisation usually tend to reduce the uncertainty of external influences by ensuring that resources are available for their survival and development. By implication, this theory seems to suggest that the issue of dichotomy between executive and non-executive directors is actually irrelevant. How then does a firm operate efficiently? To resolve this problem, the theory indicates that what is relevant is the firm's presence on the boards of directors of other organisations to establish relationships in order to have access to resources in the form of information which could then be utilized to the firm's advantage. Hence, this theory shows that the strength of a corporate organisation lies in the amount of relevant information and power it has at its disposal. Corporate boards are responsible for major decisions like changing corporation's Memorandum and Articles of Association, issuing of shares, declaration of dividends, etc. This explains to some extent, the reason why discussions on corporate governance usually focus on boards. The board of directors is the "apex" of the controlling system in an organisation and is there to monitor the activities of top management to ensure that the interests of shareholders are protected (Jensen, 1993). It acts as the fulcrum between the owners and controllers of the corporation (Jones, 1994) and regarded as the single most important corporate governance mechanism (Lanoo, 1995). The board of directors is the institution to which managers of a company are accountable before the law for the company's activities (Oxford Analytical Ltd, 1992)

Stakeholder Theory

It has previously been suggested by scholars that stakeholder's theory holds the potential for understanding the financial performance-autonomy relationship stakeholder theorists argue that the organisation's financial performance (fp) is determined by their stakeholders' provision of resources in response to the organisation's actions (Fooman,

1999). A stakeholder's decision to either provide or cease to provide resources to the organisation is the culmination of complex considerations that coalesce within an overall evaluation of the organisation's reputation. Stakeholders are uniquely positioned to affect the FP of the organisation whether through withholding or providing efforts (e.g. employees), infrastructure (e.g. government or cash flow (e.g. customers), among other things Rowley and Berman, 2000). Jones & Wicks, (1999) critique the Stakeholders theory for assuming a single-valued objective (gains that accrue to a firm's constituencies). The argument of (Valdes, 1997) suggests that the performance of an organisation is not and should not be measured only by gains to its stakeholders. Other key issues such as flow of information from senior management to lower ranks, inter-personal relations, working environment, etc. are all critical issues that should be considered. Some of these other issues provided a platform for other arguments as discussed later. An extension of the theory called an enlightened stakeholder theory was proposed. However, problems relating to empirical testing of the extension have limited its relevance (Jones & Wicks, 1999).

5. Methodology

Methodology in research refers to the methods, procedures or modalities by which the researcher intends to accomplish the objectives of his research project. According to Agbonifoh and Yomere (1999), a vital aspect of every research proposal is the research methodology. And it is very important because it determines whether the research results will fall or stand. If objectionable or faulty methods are employed in conducting a study, then one cannot be sure of the accuracy of the result. So, once the research objectives have been determined, the hypotheses formulated, and all the variables to be used are well specified, the next is that the researcher is confronted with how the data are to be gathered and collected; which is the research design. Data for the study were collected through primary sources as this enabled the researcher to elicit the relevant data needed for this study. Questionnaires were designed and distributed to staff and officers of various selected public organisations. This is done by serving it personally to the respondent. This is a very important method in data collection; unlike the interview, it demands for less face to face response. This method gave the respondent the relative advantage of taking his or her time and react to the question more conveniently as this to an extent justified the reality about the current situation obtainable in that organisation chosen for this study. This is a method where the researcher deals face to face with interviewers. The method serves as a ground clearing Device; that is a supplementing instrument to the total research assignment as needed for the study. In this method, the researcher has in mind to:

(1) Gain information not available in the desk research.
(2) To supplement the information that the researcher obtains by desk research.
(3) Substantiate the hypothesis in the research which the writer has instituted.

(4) Get to the rudiment of some doubting issues which may not be available on the desk research.
(5) Obtain other practical knowledge in operation in some of the organisations that will contribute positively to the body of existing knowledge.
(6) Clear other issues raised through documentary method which the researcher had some doubt or could not understand the intricacies that had led to such stated hypothesis.

The documentary method is the systematic examination of variable, relevant documents, literatures, academic journals publish annual statement of accounts of public organisations and relevant text books, trade association, or office of statistics as stated by Agbonifoh and Yomere (1999) in their book stated that; Data collection through this method referred to as secondary data because it is the data taken from other people work; otherwise known as fact and figure. Documentary sources are very important in the planning stage of data collection and has an advantage over other methods and that 99% of data obtained here are correct and reliable; because it has been tested, confirmed and proven over time. Statistical Package for Social Sciences (SPSS) were used for the hypotheses in this work. The major research instrument used is this study is the use of questionnaire. The researcher used the questionnaire in eliciting the relevant information from respondents in the selected public sector organisations for the study. Having used questionnaires in collecting the needed data for the hypotheses thus. It becomes inevitably necessary to measure the statistical tools used. The administered questionnaires will be analysed using Pearson Correlation Coefficient with the aid of Statistical Package for Social Sciences (SPSS) version 23.0 for the hypotheses in this work.

6. **Results and Discussion**

The test of hypotheses was done using primary data obtained from the respondents and the extent and direction of the relationship between the predictor variables (economy audit, efficiency audit and effectiveness audit) and the measures of government expenditure (capital expenditure and re- current expenditure) and also the effect of the value for money audit and its predictor variables on government expenditure and its measures were determined. Thus, it is imperative to discuss the findings and relate them to the literature reviewed in chapter 2 as follows.

Table 4.12 was concerned with the analysis on the extent and direction of the relationship between value for money audit and government expenditure. It found that: there is a positive, strong relationship between value for money audit and government expenditure, and also value for money audit statistically affect government expenditure. The analysis in table 4.12 showed the correlation coefficient of r = 0.847** significant at pv = 0.000 < 0.05. Also table 4.19 showed the Pearson's correlation coefficient of r = 0.847 and coefficient of determination R 2 =0.599 which indicate that a 59.39% variation of

government expenditure is explained by the changes in value for money audit. Also, value for money audit had a calculated t-value of

|11.534| >t-tab (0.05, 79) = 1.66 and a corresponding significant/probability of 0.00 < 0.05 level of significance, hence the conclusion that there is a significant relationship between value for money audit and government expenditure. This finding is in line with that of Elkana, (2018) who examined effect of value for money auditing in public accountability. The study found that the economy value, efficiency value and effectiveness value have positive impact on public sector accountability.

On the test of hypotheses one (H0 1), it was found that there is a significant positive relationship between economy audit and capital expenditure, also economy audit statistically affects capital expenditure. The analysis in table 4.13 showed the correlation coefficient of r = 0.678** significant at pv = 0.000 < 0.05. Also table 4.20 showed that economy audit had a calculated t- value of |9.347| >t-tab (0.05,79) = 1.66 and a corresponding significant probability value (PV) of 0.00 < 0.05 level of significance. Hence, the conclusions that there is a significant relationship between economy audit and capital expenditure and also that economy audit statistically affect capital expenditure. The implication of this finding is that an increase in capital expenditure is associated with an increase in economy audit. This finding is in line with the study of Yasin (2020) who examined the effect of government spending on economic growth. He opined that by nurturing productive activities, reducing unproductive ones and implementing appropriate policies, this enhances good spending and maintain economic growth.

Test on the second hypothesis (H0 2) show that there is a significant positive relationship between economy audit and re - current expenditure, also economy audit statistically affect re – current expenditure. The analysis in table 4.14 showed the correlation coefficient of r = 0.620** significant at pv = 0.000 < 0.05. Also, table 4.21 showed that economy audit had a calculated t- value of |4.874| >t-tab (0.05,79) = 1.66 and a corresponding significant probability value (PV) of 0.00 < 0.05 level of significance. Hence the conclusions that there is a significant relationship between economy audit and re - current expenditure and also that economy audit statistically affect re - current expenditure. The finding implies that a decrease in re - current expenditure is associated with an increase or improvement in the economy audit. This result is in consonant with findings of Olugbenga and Owoye (2017) who examined the connection between government expenditure and economic growth for a group of 30 countries during the period of 1970-2005. The finding was that a long-run relationship exists between government expenditure and economic growth. Also, the causality on 10 of the countries, confirmed the Wagner's law.

Test on the third hypothesis (H0 3), show that there is a significant positive relationship between efficiency audit and capital expenditure, also efficiency audit statistically affect capital expenditure. The analysis in table 4.15 showed the correlation coefficient of r =

0.638** significant at pv = 0.000 < 0.05. Also table 4.20 showed that efficiency audit had a calculated t- value of |3.049| > t-tab (0.05,79) = 1.66 and a corresponding significant probability value (PV) of 0.003 < 0.05 level of significance. Hence the conclusions that there is a significant relationship between efficiency audit and capital expenditure and also that efficiency audit statistically affect capital expenditure. This finding implies that a decrease in capital expenditure is associated with an increase in efficiency audit. This finding is in line with the study of Olugbenga and Owoye (2017) examine the connection between government expenditure and economic growth for a group of 30 countries during the period of 1970-2005. The finding was that a long-run relationship exists between government expenditure and economic growth. Also, the causality on 10 of the countries, confirmed the Wagner's law

7. Conclusion

This study investigated the relationship between value for money audit and government expenditure in Nigeria. Results from the study indicate that economy, efficiency and effectiveness audit significantly have relationships with capital expenditure and re – current expenditure in Nigeria. The findings of the study have significant implications for regulators and researchers in Nigeria. First, the results of the study signify the importance of value for money audit in minimizing government expenditure. Hence, it was concluded that there is significant relationship between value for money audit and government expenditure and also that value for money audit significantly affects government expenditure in Nigeria. Therefore, VFM audits can become a powerful tool for improving the quality and effectiveness of government spending in Nigeria. Ultimately, ensuring value for money translates to better public services, improved livelihoods, and a more prosperous nation for all Nigerians.

8. Recommendations

In the light of this research work, the following recommendations were made:

1. The government should establish a clear legal mandate for VFM audits, outlining their scope, powers, and reporting requirements. This would strengthen their independence and effectiveness.
2. Encourage collaboration between Audit Institutions, anti-corruption agencies, and other relevant bodies to share expertise, information, and best practices. This would enhance the overall effectiveness of financial oversight.
3. Focus VFM audits on areas identified as high-risk for waste, inefficiencies, and corruption. This could include sectors like public procurement, infrastructure projects, and social welfare programs.
4. Evaluate potential projects based on their economic, social, and environmental impact, ensuring clear justification for each investment.

5. Training of government officials in financial management, project planning, and anti- corruption practices is required.
6. The citizens should be educated on government budgeting, public spending, and their rights to hold officials accountable.

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DIGITAL SERVICE DELIVERY AND MARKETING PERFORMANCE OF HOTELS IN PORT HARCOURT

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ABSTRACT

This study conducted an empirical investigation into the correlation between the supply of digital services and the performance of hotels in Rivers State. The research philosophy utilised was the nomothetic and quantitative methodological approach. The study strategy employed was a quasi-experimental approach using cross-sectional data. The research population consists of personnel working in four-star hotels in Rivers State. The sample size for the study includes a total of 120 designated employees selected from 12 hotels. In addition, a total of 10 hypotheses were formulated and subjected to statistical testing using the Spearman's Rank Correlation Coefficient tool. The findings revealed a robust correlation between digital service delivery and organisational performance, indicating a strong positive relationship. Based on the information provided, we determined that digital service delivery is a strategic management instrument that enhances the performance of hotels. Therefore, this study suggests that hotel management should use computerised services in the front-office to generate invoices and bills, facilitate guest check-in and check-out, track guest expenses, and facilitate information sharing within and between different areas of the hotel. Through the utilisation of computerised front-office systems, clients may engage in real-time communication with front-office workers, resulting in quick attention to their demands. This research has proved that these offerings enhance the quality of hotel service and increase worker productivity.

Keywords: Digital Service Delivery, Organizational Performance, Reservation Systems.

1. INTRODUCTION

The hospitality business has emerged as a significant sector on a worldwide level and is anticipated to have further expansion. The hotel business has played a significant role in various economies by providing a substantial number of jobs and generating substantial money (Nwakanma, Ubani, Asiegbu, & Nwokonkwo, 2020). According to the United Nations Conference on Trade and Development (UNCTAD, 2020), the worldwide hospitality industry generated more than $2 trillion in revenue for enterprises in the United States, or 11.3% of global consumption in 2010. There is no doubt that the hotel sector in Nigeria has seen significant development. In 2016, the

industry made up more than 48.8% of Nigeria's Gross Domestic Product (GDP) and employed 1.6% of the country's population, according to Kinetic Consulting (2020). Remarkably, these efforts have had favourable outcomes in the nation's economy, consequently assisting in redefining and enhancing the value of the hotel business.

The hotel industry has emerged as a significant economic endeavour, with increasing demands for the use of leisure time (Williams, 2018). As stated by the Hospitality Guild (2020), the hospitality sector encompasses several types of institutions such as hotels, restaurants, fast food chains, food service management, and coffee shops. It is regarded as a subsidiary sector within the tourist supply chain. As to the Hospitality Guild (2020), a hotel can be described as an institution that provides temporary accommodation in exchange for payment. A standard hotel offers essential lodging amenities, such as a room furnished with a bed, along with supplementary amenities like a telephone, Wi-Fi access, a television, or a mini-bar. Additionally, it may offer luxurious amenities such as bathrobes and slippers. In addition, larger hotels may provide additional amenities for guests, including a fitness facility, childcare services, a swimming pool, a business centre, conference facilities, and social function services. The hotel's quality and services are often assessed using a star-rating system, with ratings ranging from one to five stars being the most prevalent (Bilgihan, Okumus, & Kwun, 2021).

The implementation of Information and Communication Technology (ICT) plays a crucial role in the success of hotels, since it enables digital service delivery. It is well recognised that ICT has a significant influence on many cultures and enterprises. Hotels allocate a significant amount of money into developing digital service delivery solutions, with a focus on designing services and products, as well as enhancing hotel performance (Richard 2021). Presidential Hotels in Port Harcourt have implemented a guest satisfaction system in order to enhance the quality of client accommodation and boost marketing efficiency. The utilisation of digital service delivery in hotels is becoming increasingly significant in the present era of hospitality (Nwakanma et al., 2020). In the current day, the provision of digital services has emerged as a primary means of gaining a lasting competitive edge and a strategic tool that hotels depend on due to intense competition in the market. Indeed, several scholars argue that the implementation of digital service delivery may enhance customer happiness, improve the quality of service delivery, increase staff productivity, boost profitability, and enhance return-on-investment (Aziz, Bakhtiar, Syaquif, Kamaruddin, & Ahmad, 2016).

Prior research has been conducted on the subject of digital service delivery and its impact on organisational performance in several sectors of the economy (Williams 2018; Aziz et al., 2016; Kim and Brymer, 2020; Sirirak, Islam and Khang, 2018). However, the majority of these studies have primarily concentrated on analysing the impact of digital service delivery on various aspects of hotel performance, such as competitive advantage and customer purchasing behaviour. To the best of the researcher's knowledge, there is a scarcity of research on the correlation between digital service delivery and the overall organisational performance of hotels in advanced countries like the US, UK, Germany, China, and others. The existing literature on the organisational performance of hotels primarily concentrates on specific research areas such as marketing strategy, guest satisfaction, and loyalty. However, there is a limited number of studies that assess organisational performance in terms of service quality, productivity, and marketing effectiveness in the hospitality industry (Lin et al., 2010; Sirirak, Islam, and Khang, 2018). This research differed from previous studies by using front-office systems and reservation systems as components of digital service delivery and service quality, and marketing effectiveness as indicators of marketing success, specifically in relation to hotels in Rivers State.

1.1 Statement of the Problem

Many hotels strive to implement tactics aimed at enhancing marketing performance as a primary objective. Nevertheless, the problem of sustained productivity and performance in the majority of hotels in Rivers State, particularly during the initial three years of operation, has emerged as a significant factor contributing to hotel failures (Small and Medium Enterprises & Development Agency in Nigeria, SMEDAN, 2020).

SMEDAN (2020) reports that the majority of hotels in Rivers State face challenges in consistently enhancing their performance, particularly after three years of operation. Once again, the problem of maintaining consistent quality in service delivery has resulted in a reduction in performance, namely in the ability to continuously provide exceptional value over a period of time. The challenges encompass deficient inter-personal communication, inadequate security infrastructure, diminished efficiency rates, insufficient quality control and customer service, absence of standardisation in operations, sluggish intelligence sharing, elevated operation costs, and a general deterioration in quality service delivery. (SMEDAN, 2020). The aforementioned difficulties have adversely affected hotels' capacity to enhance service quality, productivity, marketing efficacy, and performance. Despite implementing various methods such as lowering hotel rates and

beverage pricing, as well as hiring new workers, particularly at the administrative and supervisory level, the issue continues to exist.

Given the issues and conclusions mentioned above, this study aims to examine whether the propositions and findings of previous research on digital service delivery are applicable in the hotels industry in Rivers State. The essential question of whether the successful implementation of digital service delivery will result in enhanced marketing performance demands a response. Can digital service delivery potentially address the aforementioned issues? By using this technique, it is possible that problems such as subpar service quality, decreasing performance, low productivity, inadequate communication with stakeholders, and overall service failures can be eliminated. The resolution to these inquiries constitutes the theoretical and empirical expedition of this investigation.

2. LITERATURE REVIEW

2.1 Conceptual Framework

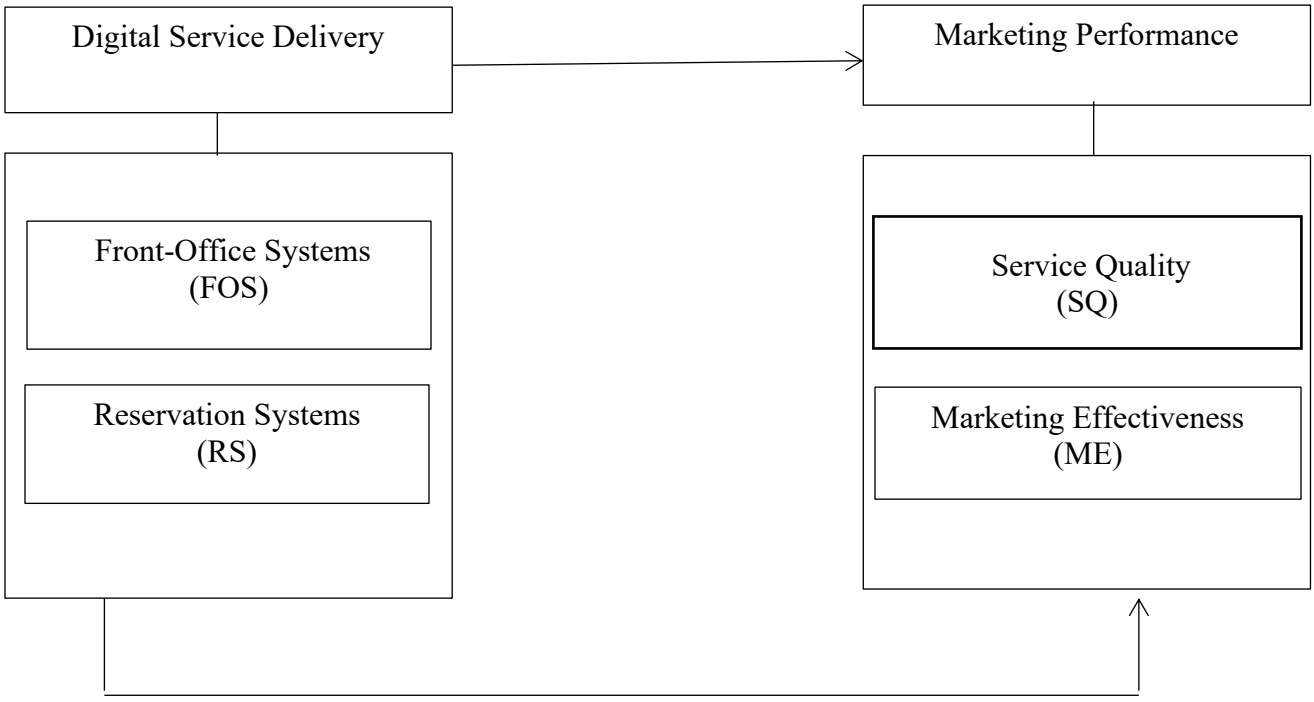

Fig 1.1: Conceptual Framework on Digital Service Delivery and Organisational Performance

Sources: Adoted from Williams 2018; Aziz et al., 2016; Kim and Brymer, 2020; Sirirak, Islam and Khang, 2018

2.1.1 Concept of Digital Service Delivery

The concept of digital service serves as a first stage in comprehending technology as an active participant with the ability to take action, rather than viewing technology just as a tool (Salminen, 2011). The digital service is intended to function as a reliable intermediary between the perspectives of the tool and the user in relation to technology. The suggested notion of digital service can serve as a representation and encapsulation of technological systems with agency in service science, regardless of the implementation technology used. A digital service is a service that is fully implemented by a technological system. It is invoked by a user through a digital Information, Computing, Communication, and Automation Technology (ICCAT) based system, which collaboratively generates the intended output.

Rust & Kannan (2002) define digital services as offers that possess a combination of features often associated with both products and services. The authors posited that digital services revolve on four fundamental qualities, namely intangibility, high technology, invariance, and scalability (referred to as the "IHIS model"). These features suggest that marketing digital services allows for the advantageous combination of the best aspects from two different worlds. The digital services idea is based on four distinct features, which are outlined below. The list is exploratory in nature and is not intended to be comprehensive. However, its goal is to encompass the most fundamental features.

2.1.1.1 Front-Office Systems

The front-office department at the hotel is very visible and focuses on facilitating and assisting with guest services and transactions from the moment guests arrive until they depart. The use of digital service delivery in the front-office is rapidly increasing, resulting in streamlined work processes (Ansah et al., 2012). Presently, front-office functions are conducted via a computerised system. Front-office systems are the primary systems that operate continuously, every day of the year. According to Kim et al. (2008), hotel staff should use front-office systems while interacting with customers. Front-office systems offer a range of information to staff who directly interact with customers. These systems aim to expedite and secure transactions, with the goal of minimising the time spent on the system and maximising the time devoted to client care. Front-office systems are often developed utilising a user-friendly language and technology (Kim et al., 2008). Digital service delivery is employed in the front-office operations of hotels for tasks such

as generating invoices and bills, facilitating guest check-in and check-out, managing bookings and reservations, tracking visitor expenses, and facilitating information sharing within and across hotel departments (Choi and Kimes 2002).

2.1.1.2 Reservation Systems

As stated by Scaglione and Schegg (2015), a reservation system is a tool that provides precise information to the right people at the right time and place, allowing them to make a purchasing decision and reserve and pay for the desired products. The effective allocation of perishable inventory is vital for hotels, making the progress in these systems the subject of substantial study on digital service delivery in the hospitality industry. The introduction of Computer Reservation Systems (CRS) in the 1970s, Global Distribution Systems (GDS) in the 1980s, and the rise of the Internet in the 1990s drastically transformed the sales processes in the hotel industry (Buhalis and Law 2008). Utilising the Internet as a means of making bookings may be advantageous for both hospitality establishments and customers. It facilitates instantaneous exchange of information and contributes to cost reduction for both parties (Kim and Kim 2004). In small boutique hotels, the room inventory can be managed and accessed using a basic reservation module offered by a Property Management System (PMS) software. The reservation module possesses the capacity to exhibit the rooms that are now accessible in the hotel, as well as manage the input, storage, and retrieval of bookings. This specific module is located at the property level.

2.1.2 Marketing Performance

Several writers have conducted extensive debates on marketing performance, including Hessellman (2001) and Dhillon & Vachhrajani (2012). Marketing performance is an often used dependent variable in marketing research literature. However, it is also a notion that is often ambiguous and weakly defined. Nevertheless, it is crucial to differentiate between overall performance and marketing performance. Performance refers to a collection of financial and non-financial indicators that provide information about the level of success in achieving results (Dhillon & Vachhrajani, 2012). Marketing performance refers to a company's capacity to achieve its goals by efficiently and effectively utilising its available resources. Lambe (2014) defines organisational performance as the capacity of a company to attain preset objectives, such as generating high profits, delivering excellent products, capturing a significant market share, achieving favourable financial outcomes, and ensuring survival, via the implementation of appropriate strategies and activities. Harkkart & Kemp (2006) defined marketing performance as

the actions and evaluation of how well management uses available resources in the market to achieve marketing objectives.

2.1.3 Digital Service Delivery and Marketing Performance

The impact of digital service delivery on the performance of hospitality businesses The initial implementation of digital service delivery in the tourist industry can be traced back to the 1950s when airlines began utilising the CRS (Ma et al. 2003). Nevertheless, the adoption of digital service delivery in the hotel industry did not commence until the late 1970s. In the 1980s, hotels began using GDS, PMS, and hotel CRS systems to improve interoperability and connectivity (Ma et al., 2003). Following that, the analysis of the impact of digital service delivery on the hotel industry has advanced. In his literature analysis on information technology in tourism, Frew (2000b) noted that there were no mentions of the Internet or the Web's impact on tourism before to 1994. According to Ip et al. (2011), the introduction of digital service delivery has led to an unprecedented progress in the hotel industry. Mihalič et al. (2015) have identified three unique correlations between digital service delivery and performance in their research. Multiple studies (e.g Ham et al. 2005; Lam et al. 2007; Piccoli 2008; Karadag and Dumanoglu 2009) have recognised different digital service delivery systems as important assets that can offer a significant competitive edge. Specialists in this domain contend that digital service delivery systems can exert a direct or indirect influence on competitiveness. Additionally, they recognise that allocating resources to digital service delivery may effectively decrease expenses and enhance efficiency. **2.2 Theoretical Framework**

2.2.2 Diffusion of Innovation Theory

Everett Rogers introduced the diffusion of innovations hypothesis in 1995, which elucidates the mechanisms, reasons, and pace at which novel ideas and technologies disseminate. This theory, which has been effectively used in the social sciences, is considered one of the oldest theories in communication. The idea elucidates the process by which humans become cognizant of a message via repeated exposure, and then behave in a manner consistent with that message. Rodgers (1995) defines innovation as an idea, activity, or thing that is considered novel by a person or another adopting entity (Rogers, 1995). The diffusion of innovation theory elucidates the process by which new business ideas, goods, and services are effectively conveyed to members of a social system through certain channels in a consistent manner. Diffusion, as defined by Boden & Miles (2000), is the transmission of an invention through certain channels over a period of time among

individuals within a social system. The theory of Diffusion of Innovations studies and elucidates the process of how a new innovation is adopted. The diffusion of innovation theory relies on four key elements: the social system, invention, communication channels, and time (Rogers, 2003). According to Calvo & Rahrig (1997), the spread of innovation first progresses at a sluggish pace and gradually gains momentum, leading to more positive communication. After implementing an online marketing plan, business leaders establish a social infrastructure that facilitates ongoing engagement with workers, stakeholders, and consumers.

3. METHODOLOGY

This study has adopted a philosophical position that is in line with a realist view of existence and an objectivist view of knowledge. This study primarily concentrated on quasi-experimental research, utilising ideas derived from the social and behavioural sciences. Thus, the study utilised a cross-sectional survey strategy to evaluate the various research elements.

Primarily, this study will focus just on four-star hotels in Rivers State. This limitation is due to their close proximity and convenience. Additionally, it is worth noting that there are no five-star hotels in the state at the time of this study. As per the Hotel Association of Nigeria (HAN, 2023), there are precisely twelve (12) four-star hotels in Rivers State. They include; Presidential Hotel, Echelen Heights Hotel, Golden Tulip Hotel, Novotel Hotel, Le Meridien Hotels, Beverly Hills Hotels, Habitat Hotel, Swiss International Mabisel, Limewood Hotels, Swiss Spirit, Genesis Raventon, and Best Western Hotels.

This research will specifically focus on specific positions within each of the hotels. The positions encompassed in this include general managers, assistant managers, head of IT, human resource managers, marketing manager, operations manager, procurement manager, food & beverage manager, accountant/auditor, and store officers. The research target population consists of the top ten positions across the twelve hotels. According to the analysis provided, the research includes a total of 120 senior staff members. Given the reasonable target population size of 120, there was no necessity to conduct sample drawing. Therefore, the researcher will directly approach or contact individuals who hold the positions of interest at the hotels mentioned, providing them with copies of the questionnaire.

The instrument consisted of parts A to C. Section A gathered information on the demographics of the respondents, section B gathered information regarding the independent factors, and section C focused specifically on the dependent variables. Section A consists of 4 questions, whereas section

B, which includes two variables, contains a total of 8 statement items. Section C has two variables and yields eight statement items. A total of 16 statement items were included in the questionnaire. The variables were measured using a 5-point Likert Scale style, with 5 representing "strongly agree," 4 representing "agreed," 3 representing "not sure," 2 representing "disagree," and 1 representing "strongly disagree." The scale was adjusted to align with the specific aims of this study. The Likert-type scale was selected as a measurement tool due to its ease of construction, time efficiency, and perceived reliability. This scale allows respondents to answer each statement in the questionnaire, even if the statements do not directly relate to the attitude being studied (Kothari, 2010).

Furthermore, this study largely concentrated on evaluating the accuracy and relevance of the data collection tool. The tool underwent a comprehensive evaluation by experts in the disciplines of management and ICT. With respect to face validity, the instrument contains statement items that clearly and accurately describe the elements in each situation and are easily understood and readable by respondents.

Factor Analysis

This sub-part presents factor loading values of all studied instruments and loadings were above the value of 0.60. The standardized factor loadings ranged from 0.70 to 0.99 as they appeared in tables below. Additionally, composite reliability (CR) and average variance extracted (AVE) will be calculated. All these values were above the threshold value of 0.70. The AVE values were above 0.50, which was acceptable (Hair et. al, 2010). It is also expected that CR is higher than AVE.

Table 3.2: Discriminant Validity

Construct	FOS	RS	SQ	ME
FOS	**0.95**	0.353	0.381	0.401
RS	0.353	**0.94**	0.268	0.444
SQ	0.381	0.268	**0.96**	0.343
ME	0.401	0.444	0.343	**0.94**

Source: Computed from Pilot Study CFA results

Table 3.2 shows that the average variance retrieved above the criterion of 0.5 in all situations. Specifically, the front office system has a variance of 0.95, the reservation system has a variation of 0.94, the service quality has a variance of 0.96, and the marketing effectiveness has a variance of 0.94. The table clearly demonstrates that the square root of average variance retrieved (shown in bold) for each construct is much greater than the off-diagonal components of the correlation

matrix, which indicate the correlation between the constructs. Consequently, the achievement of discriminant validity has been confirmed.

The reliability of the instruments was assessed using the Cronbach Alpha test. Existing research indicates that a coefficient alpha of 0.7 (70%) or above is seen to be credible, as stated by Kumar (2005). Nunnally (1978) advocated for a widely acknowledged standard of 0.70 (70%) for assessing the reliability of measurement devices using Cronbach Alpha. Sekaran (2003) states that reliabilities within the range of 0.7 are generally regarded acceptable, while reliabilities beyond 0.8 are considered good. The findings of this examination were presented in the subsequent section of this investigation.

In addition, this study utilised Spearman's Rank Correlation Coefficient to examine the four hypotheses that were suggested. This tool was utilised to determine the existence of a correlation between the independent and dependent variables, as well as to discover the magnitude and direction (positive or negative) of the connection. All analyses will be conducted using Statistical Package for the Social Sciences (SPSS) version 25.

4. RESULTS AND ANALYSES

4.1 Response Rate

One hundred and twenty (120) copies of questionnaires were administered to respondents as explained in the methodology. The results of the questionnaire distribution and retrieval are shown in table 4.1.

Table 4.1: Questionnaire Response Rate

Questionnaire	Frequency	Percent
Distributed	120	100%
Retrieved and Usable	98	82%
Not retrieved	10	8%
Discarded	12	10%

Source: Survey Data 2024

Table 4.1 above shows a total of One hundred and twenty (120) copies of questionnaires distributed. Ninety-eight (98) of 82% copies of questionnaires were retrieved. Twelve (12) copies

of questionnaires of 16.2% were discarded. Ninety-eight (98) representing 82% of the total copies of questionnaires distributed was useful in the study.

4.2 Test of Hypotheses using Spearman Rank Order Correlation

Test of Hypothesis One

H_{01}: There is no significant relationship between front-office systems and service quality of hotels in Rivers State.

Table 4.2: Correlation Analysis showing the relationship between of front-office systems and service quality.

Correlations

			Front-Office Systems	Service Quality
Spearman's rho	Front-Office Systems	Correlation Coefficient	1.000	.912**
		Sig. (2-tailed)	.	.000
		N	98	98
	Service Quality	Correlation Coefficient	.912**	1.000
		Sig. (2-tailed)	.000	.
		N	98	98

**. Correlation is significant at the 0.05 level (2-tailed).

Source: Field Survey Data, 2024, SPSS 22.0 Output

Decision: The result above indicates a Spearman Rank Correlation Coefficient of 0.912 and a probability value of 0.000. This finding suggests a robust and positive correlation between front-office systems and the level of service provided by hotels in Rivers State. Thus, we reject the null hypothesis and accept the alternative hypothesis based on the probability value (0.000) being less than the significance threshold of 0.05. Front-office systems have a substantial impact on the service quality of hotels in Rivers State.

Test of Hypothesis Two

H_{02}: There is no significant relationship between front-office systems and marketing effectiveness of hotels in Rivers State.

Table 4.3: Correlation Analysis showing the relationship between of front-office systems and marketing effectiveness

Correlations

			Front-Office Systems	Marketing Effectiveness
Spearman's rho	Front-Office Systems	Correlation Coefficient	1.000	.908**
		Sig. (2-tailed)	.	.000
		N	98	98
	Marketing Effectiveness	Correlation Coefficient	.908**	1.000
		Sig. (2-tailed)	.000	.
		N	98	98

**. Correlation is significant at the 0.05 level (2-tailed).

Source: Field Survey Data, 2024, SPSS 22.0 Output

Decision: The result above indicates a Spearman Rank Correlation Coefficient of 0.908 and a probability value of 0.000. This finding suggests a robust and favourable correlation between front-office systems and the marketing success of hotels in Rivers State. Thus, we reject the null hypothesis and accept the alternative hypothesis, as the probability value (0.000) is less than the significance threshold of 0.05. Front-office systems have a substantial impact on the marketing success of hotels in Rivers State.

Test of Hypothesis Three

H_{03}: There is no significant relationship between reservation systems and service quality of hotels in Rivers State.

Table 4.4: Correlation Analysis showing the relationship between of reservation systems and service quality

Correlations

			Reservation Systems	Service Quality
Spearman's rho	Reservation Systems	Correlation Coefficient	1.000	.958**
		Sig. (2-tailed)	.	.000
		N	98	98
	Service Quality	Correlation Coefficient	.958**	1.000
		Sig. (2-tailed)	.000	.
		N	98	98

**. Correlation is significant at the 0.05 level (2-tailed).

Source: Field Survey Data, 2024, SPSS 22.0 Output

Decision: The result above indicates a Spearman Rank Correlation Coefficient of 0.958 and a probability value of 0.000. This finding demonstrates a robust and positive correlation between reservation systems and the quality of service provided by hotels in Rivers State. Thus, we reject the null hypothesis and accept the alternative hypothesis, as the probability value (0.000) is less than the significance threshold of 0.05. There is a strong correlation between reservation systems and the level of service provided by hotels in Rivers State.

Test of Hypothesis Four

H_{04}: There is no significant relationship between reservation systems and marketing effectiveness of hotels in Rivers State.

Table 4.5: Correlation Analysis showing the relationship between of reservation systems and marketing effectiveness

Correlations

	Reservation Systems	Marketing Effectiveness

Spearman's rho	Reservation Systems	Correlation Coefficient	1.000	.829**
		Sig. (2-tailed)	.	.000
		N	98	98
	Marketing Effectiveness	Correlation Coefficient	.829**	1.000
		Sig. (2-tailed)	.000	.
		N	98	98

**. Correlation is significant at the 0.05 level (2-tailed).

Source: Field Survey Data, 2024, SPSS 22.0 Output

Decision: The result above shows a Spearman Rank Correlation Coefficient of 0.829 and a probability value of 0.000. This finding suggests that there is a robust and favourable correlation between reservation systems and the marketing performance of hotels in Rivers State. Thus, we reject the null hypothesis and accept the alternative hypothesis based on the probability value (0.000) being less than the significance threshold of 0.05. There is a strong correlation between reservation systems and the marketing performance of hotels in Rivers State.

4.3 Discussion of the Findings

This section of the chapter discusses the stated findings of the study on the relationship between supply chain agility and performance.

i. **Front office systems significantly and positively correlates with marketing performance and as such enhances indices such as service quality and marketing effectiveness.**

Overall, the results of hypothesis one, two, and three suggest that front office systems have a favourable and substantial correlation with marketing success, including factors such as service quality and marketing effectiveness. Contrary to this, existing investigations have shown comparable results when compared to these findings. Piccoli (2008) and Karadag and Dumanoglu (2009) discovered that digital service delivery systems can have a direct or indirect effect on competitiveness. They also acknowledge that investing in digital service delivery can cut costs and improve productivity, making it a valuable capacity. According to studies conducted by Karadag and Dumanoglu (2009) and Kettinger et al. (1994), it has been argued that investments in front office systems do not have a significant impact on a company's value, performance, or competitive advantage. These findings generally support the theory of the digital service delivery paradox. The authors said that implementing digital front office systems has a favourable impact on company performance. They suggest that during the period of implementing digital service

delivery, businesses often face decreases in market share or profit, which may be attributed to competition.

ii. **Reservation systems has a significant and positive relationship with marketing performance and as such enhances indices such as service quality and marketing effectiveness.**

The results from hypotheses seven, eight, and nine indicate that there is a strong and statistically significant correlation between the reservation system and marketing performance. Grey et al. (2000) supported the previous findings by stating that effective innovation strategies and early adoption of new reservation systems for business communication have a beneficial impact on corporate performance in the hotel sector. The primary purpose of utilising reservation systems in the hotel business is to enhance performance (Ham et al., 2005). Research on the correlation between reservation systems and company success in hospitality organisations is growing (Grey et al., 2000). Existing literature has shown a clear and positive correlation between reservation systems and both organisational production and efficiency. For example, Byrd and Turner (2001) and Sahadev and Islam (2005) have demonstrated this association.

5. CONCLUSIONS AND RECOMMENDATIONS

The findings indicate that the dimensions of digital service delivery, including front-office systems and reservation systems, have a major role in enhancing the marketing effectiveness of hotels. The results on the dimensions of digital service delivery, including front-office systems and reservation systems, have a substantial favourable impact on the attainment of marketing performance in hotels, particularly in terms of service quality and marketing effectiveness.

i. The findings on the correlation between front-office systems and marketing performance (namely service quality and marketing effectiveness) demonstrated a significant and favourable influence.

ii. Based on the third and fourth hypotheses, the study indicates that there is a large and favourable influence between reservation systems and the performance of hotels in terms of service quality, productivity, and marketing effectiveness.

Based on the aforementioned findings and conclusions, the following recommendations were proposed:

i. Hotel management should implement computerised systems in the front-office to generate invoices and bills, facilitate guest check-in and check-out, track guest

expenses, and facilitate information sharing within and across hotel departments. Through the utilisation of computerised front-office systems, clients are able to engage in real-time communication with front-office workers, resulting in quick attention to their demands. This research has verified that these offerings enhance the quality of hotel service and increase worker productivity.

ii. Hotel strategists should implement comprehensive guest service systems, including electronic door locks, electronic notifications for do-not-disturb/make-up-room requests, in-room telephones, in-room entertainment options, electronic minibars, internet access, in-room printing capabilities, energy management systems, and energy switches. These gadgets are particularly intended to offer extra services and features within hotel rooms. They have been proven to enhance visitors' perception of service quality and act as an effective marketing method to promote the hotel through good word-of-mouth and referral marketing. These factors contribute to the enhancement of marketing effectiveness and overall performance of the hotel.

iii. Hotel management have to establish and utilise Computer Reservation Systems (CRS) for managing their online sales and marketing. Additionally, it enables hotel management to promote their prices and room availability to be accessed by sales channels that are employing the CRS, such as travel agents. The CRS serves as a primary tool for disseminating information, namely on the availability of rooms and corresponding pricing, among hotels within a specific geographical area. Using the internet as a reservation method may be advantageous for both hospitality businesses and clients. It allows for real-time information transmission, reduces expenses, and improves service quality for both sides. Networking the CRS enhances hotel efficiency, marketing effectiveness, speedier communications, and efficient administration of data and effective flow of information.

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