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Operations Improvement Function and Organisational Adaptability of Petroleum Tank Farms in South-South, Nigeria

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Abstract

The study examined the nexus between operations improvement function (dimensioned by contingency planning, benchmarking and continuous improvement processes) and organisational adaptability of Petroleum tank farms in South-South, Nigeria. The contingency theory and the theory of routine dynamics underpinned the study, and positivism was the underlying philosophy. The study adopted the cross-sectional survey through the use of questionnaire. 820 middle and top-level managers constituted the elements of the population, and the Krejcie & Morgan's formula was used to determine the sample size of 262 respondents. Structural Equation Modeling was deployed to test the hypotheses at a 0.05 significance level. The results showed that contingency planning; benchmarking and continuous improvement processes all have a significant positive relationship with organisational adaptability of Petroleum tank farms in South-South, Nigeria. The study concludes that Petroleum tank farms' operations should focus on the adoption of contingency planning, benchmarking and continuous improvement processes to enhance organisational adaptability. Therefore, it is recommended that the management of Petroleum tank farms should put in place mechanisms to advance continuous improvement processes by allocating the necessary amount of resources, such as energy, time and money, in order to promote the continuous development of the continuous improvement systems. Furthermore, managers of Petroleum tank farms should make better the adoption of contingency planning, ensuring that there is as much necessary training and information for employees on how to act during a crises situation, in order to evaluate safety and prepare in advance for recovery from disasters.

Keywords

Adaptability, Benchmarking, Contingency Planning, Continuous Improvement Processes, Operations Improvement Function and Petroleum Tank Farms

1. Introduction

The oil and gas sub-sector in Nigeria are the upstream, midstream and downstream. While the upstream companies are established to explore and produce crude oil and gas, the midstream companies essentially provide logistic services to the upstream companies. Specifically, the downstream companies are involved in storage, marketing and distribution of refined petroleum products and Petroleum tank farms are key assets for bulk storage of the products such as automotive gas oil (AGO), prime motor spirit (PMS), aviation kerosene (popularly called Jet A1) and dual purpose kerosene (DPK). The industry is however faced with challenges related due to Government policy inconsistencies, corruption, rigid bureaucratic structures, unstable market conditions, increasing intensity and diversity of markets, inadequate contingency planning and general infrastructural inadequacies [1] [2] [3] [4] [5]. These challenges have reduced the ability of Petroleum tank farms to move quickly towards new opportunities, adjust to volatile markets and avoid complacency, which are all facets of organisational adaptability. Adaptability is an increasingly important skill in organizational success and reflects a functional change in response to actual or correctly anticipated alterations in environmental contingencies [6]. According to Schwarzer and Warner [7], organizations that are not adaptive may not be able to demonstrate great persistence and function well under stress. From the perspective of Klein and Pierce [8], adaptive organizations have more latitude due to fewer internal restrictions, as a higher degree of freedom, combined with the other adaptive characteristics can result in more flexibility for the organization. Besides, Lwangi *et al.*, [9] studied the contribution to the improvement of the petroleum products delivery policy by the implementation of a computer system based on the Dijkstra method. Rodriguez [10] assessed the practices of continuous quality improvement among teacher education institutions in Basilan. Furthermore, a review of extant literature showed that previously suggested predictors of organisational adaptability include: scenario planning [11]; complexity leadership [12]; organisational intelligence and efficiency [13]; locus of control, organisational structure and communication [14]; and career management [15].

Despite the avalanche of studies on organisational adaptability, it has been observed that only a few studies have considered the context of operations improvement function [11] [12] [13] [15]. Therefore, the motivation for this study is to fill the existing contextual gap in extant literature by assessing the nexus between operations improvement function (contingency planning, benchmark-

ing and continuous improvement processes) and organisational adaptability, as a means of attenuating the effects of the concomitant challenges of the Petroleum tank farms in South-South, Nigeria.

Hypotheses

The following null hypotheses were formulated:

$\mathbf{H_{01}}$: There is no significant relationship between contingency planning and organisational adaptability.

$\mathbf{H_{02}}$: There is no significant relationship between benchmarking and organisational adaptability.

$\mathbf{H_{03}}$: There is no significant relationship between continuous improvement processes and organisational adaptability.

2. Literature Review

2.1. Theoretical Framework

The theories that underpin the study are the contingency theory [16] and the theory of routine dynamics [17]. The contingency theory suggest that organizations whose internal features best match their situation-specific demands will achieve the best adaptation [16]. The underlying motivation for the contingency theory is that there is no such thing as the "one best way" for doing things, rather an organisation should continue to adapt to environmental changes using the most feasible approaches in the circumstance. This implies that for a petroleum tank farm to remain adaptive and competitive, it can no longer rely on only internal resources but must consider the contingencies of the external environment. Similar to the contingency theory, is the theory of routine dynamics [17] which suggests that organisational routines are best conceptualized as generative systems that can produce a wide variety of performances depending on the circumstances. As such, organisational routines should not be seen as static, but must be adaptive and flexible enough to accommodate prevailing circumstances. Therefore, the contingency theory and theory of routine dynamics, complements each other as situational theories for organisational adaptability.

2.2. Conceptual Framework

The predictor variable-operations improvement function and dimensions (contingency planning, benchmarking and continuous improvement processes) were adopted [18] [19] [20] and [21]; while the criterion variable-organizational adaptability was adopted from [22].

2.2.1. Operations Improvement Function

Operations improvement is the ability to do the right things better and make it a part of continuous process. Operation function is not only limited to conversion of input to output but also deals with transportation, storage, preservation and quality assurance for the consumers in the market [23]. Thus, operations im-

provement function (techniques) can be applied effectively in enterprises of any size, to enhance organizational well-being. In all, the operations improvement function creates value in the system and no organisation can afford to lose its most prized strategies for competing in the global-dynamic business environment [18].

2.2.2. Contingency Planning

Contingency Planning is defined as "First aid kit for future planning [24]. This indicates that an essential aspect of contingency planning is to incorporate the planning effort and the resulting plans into the formal business strategy [25]. As such, it is argued that the organisation is like an onion, where layers of the organisation form together to prepare for any eventuality of a crisis [26]. Essentially, contingency planning is composed of three stages: preparedness, response, and restoration.

2.2.3. Benchmarking

Benchmarking is a way of measuring an organization's strategies and performance against best-in-class companies, both inside and outside the industry [27]. According to Lee [28], benchmarking is an activity which organizations use for discovering best practices and to establish a leadership position. Long [27] further argued that benchmarking involves learning about one's own practices, learning about the best practices of others, and then making change for improvement that will enable one to meet or beat the best. Likewise, Carpinetti and Melo [29] emphasized that benchmarking is a means of promoting continuous improvement in organizational performance and providing a basis for learning what a company's weakness and strengths are.

2.2.4. Continuous Improvement Processes

The primary purpose of continuous improvement is to improve the efficiency and effectiveness of work-processes in a sustained way [30]. Thus, continuous improvement involves generating ideas for improvement, testing these ideas, and implementing solutions [31]. These continuous improvement processes include Kaizen, Lean and Six Sigma, among others [32].

2.2.5. Organizational Adaptability

Organisational adaptability—a derivative of organizational change is the ability of an organisation to recognise the need to change and seize opportunities in dynamic environments. According to Kotter [33], organizational adaptability can be a planned or unplanned change; however, to foster planned organizational change, a planned method or framework is required to modify the functioning of the organization. Similarly, Heifetz, Grashow and Linsky [34] argued that organizational adaptability is an attitude that must pervade the organization and it is about setting expectations for the individual and the organization to adjust to the ever-changing environment, as well as mobilizing followers to overcome challenges and improve the organization.

2.3. Empirical Review

In a related study, Bayo and Harcourt [35] examined the relationship between continuous improvement and performance of Deposit Money Banks in Rivers State, Nigeria. The study adopted a cross-sectional survey research design with distribution of a structured questionnaire. The population for the study was 750 staff of deposit money banks operating in Rivers State, Nigeria. A sample size of 260 was determined using the Taro Yamen sample size formula. The study found out that there is a significant relationship between continuous improvement and performance of Deposit Money Banks in Rivers State, Nigeria. Furthermore, Alshamsi and Pathirage [36] examined the role of effective contingency planning in managing extreme disasters in United Arab Emirate (UAE). The findings show that inadequate preparation for disasters can have significant impacts on the environment and people. Again, Simatupang and Widjaja [37] studied benchmarking of innovation capability in the digital industry. This paper applied dynamic capability theory as an approach to understand innovation strategies in the Indonesian creative digital content industry. Face to face interviews were conducted with five Indonesian digital content companies to show that their innovation capability consists of abilities to gather and develop ideas into marketable products before they are launched to the market. The study found that innovation capability is determined primarily by the quality of human resources who are capable to learn continuously and to follow the changing trend in technology. Furthermore, Lwangi *et al.*, [9] studied the contribution to the improvement of the petroleum products delivery policy by the implementation of a computer system based on the Dijkstra method. The survey method adopted in the study, consists of identifying the delivery points of the products (gas stations), then using the graph theory applied to the distribution of petroleum products to implement our algorithm. The Dijkstra algorithm was deployed to find the tree of the shortest path of the graph that constitutes the mapping of gas station through the commune of Lemba, following, the management of roads that corresponds to a graph G = (X, E, v) corresponding to the road network, where the vertices are the hot spots of the commune. The results are interesting because this project is going to help most of the services working in the distribution of petroleum products as well as to the researchers for the advancement of the sciences in this field. Moreso, Rodriguez [10] assessed the practices on continuous quality improvement among teacher education institutions in Basilan. The study employed a mixed methods design, all quantitative data were collected purposively from sixty (60) faculty members using an adapted questionnaire formulated by Thalner [38] of Western Michigan University, the instrument consists of a framework that measures CQI in higher education, and descriptive statistics were used to analyze the weighted means, standard deviations, and ranges for the various variables. While the qualitative data were collected from ten (10) college deans, and program chairpersons and the vice president for academic affairs from the four HEIs, utilizing FGD and KII. Results showed that awareness on the continuous quality improvement is

present but the need to strengthen the training on the process and methods should not only among department heads to strengthen the commitment as a shared culture in the pursuit of quality assurance, commitment towards continuous quality improvement regardless of departments and among stakeholders is evident to be a powerful tool given the training and other resources available, and support mechanism for a continuous quality improvement must be guided by a framework best fit for academic institutions.

3. Research Methods

The study adopted positivism as the underpinning research philosophy, with a cross-sectional survey as the research design. Data retrieved from the Nigerian Midstream and Downstream Petroleum Regulatory Authority (https://www.nmdpra.gov.ng), showed that there are 124 Petroleum tank farms in Nigeria, out of which 37 Petroleum tank farms are located in South-South, Nigeria. Elements of the accessible population are 820 middle and top level managers of Petroleum tank farms owned by members of the Independent Petroleum Products Importers, in South South, Nigeria. The sample size of 262 respondents was determined using Krejcie & Morgan's formula. To ensure proportionate representation of the tank farms, the Bowley's proportional sample allocation formula was used and the simple random sampling was adopted. The questionnaire was the source of data collection, and hypotheses were tested using the Structural Equation Modeling at 0.05 level of significance.

As indicated in Table 1, a total of 262 copies of the questionnaire were administered, out of which a total of 241 copies were retrieved, representing 92% of actual distribution rate. However, 21 copies representing 8% were not retrieved. Of the 241 copies of the instrument retrieved, 11 copies, representing 3.82% were not usable due to missing responses. In all, 230 copies of the instrument, representing 87.87% of the distributed copies of questionnaire were found useful for the interpretation analysis and analysis of data.

4. Data Presentation and Analysis of Data

The mean distribution (Table 2) of the study variables are shown as: Continuous Improvement Processes = 21.36; Contingency Planning = 26.11; Benchmarking = 18.49; and Organisational Adaptability = 23.42. The evidence from the analysis reveals that all four constructs are substantial and significant, suggesting that the petroleum tank farm operators are positively inclined to these factors.

4.1. Assessment of Normality

The normal range for skewness-kurtosis value should be ±2.58 [39]. All the items in the dataset were found to be normally distributed with the skewness in each case in the range of ±1.0, with standard error of 0.160, and kurtosis values in the range of ±1.0, with standard error of 0.320, as reflected in Table 3. This confirms that the dataset is normally distributed.

Table 1. Questionnaire distribution.

Number of Questionnaire Distributed	262	100%
Number of Questionnaire Retrieved	241	91.98%
Number of Usable Questionnaire	230	87.78%

Table 2. Descriptive statistics for production improvement function.

	N	Minimum	Maximum	Mean	Std. Deviation
Continuous Improvement Processes	230	9	35	21.36	7.039
Contingency Planning	230	7	25	26.11	4.995
Benchmarking	230	8	30	18.49	6.135
Organisational Adaptability	230	7	30	23.42	6.627
Valid N (listwise)	230				

Table 3. Normality statistics.

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Continuous Improvement Processes	230	6	35	15.57	3.898	0.012	0.160	−0.211	0.320
Contingency Planning	230	7	35	21.42	6.627	−0.007	0.160	−0.485	0.320
Benchmarking	230	6	30	19.73	5.267	−0.249	0.160	−0.410	0.320
Organisational Adaptability	230	6	30	18.49	6.135	−0.014	0.160	−0.515	0.320
Valid N (listwise)	230								

Source: Researcher's Desk, SPSS 25.0 Outputs 2023.

4.2. Assessment of Homogeneity of Variance

The Levene's test in SPSS 25.0 was used to determine the presence of homogeneity of variance in the dataset (see **Table 4**) using Age of Respondents as a non-metric variable on the one-way ANOVA. The results of the ANOVA and Levene's tests revealed that all of the latent variables were non-significant (*i.e.* $p > 0.05$), the assumption of homogeneity of variance not violated.

4.3. Measurement Model

The measurement model is in two stages: 1) the examination of the goodness of fit indices after the indicators have been loaded into the latent variable; and 2) the interpretation of the parameter estimates. The suggested goodness of fit indices provided in [40], states that acceptable model fit is defined by the following criteria: RMSEA (≤0.6), SRMR (≤0.8), CFI (≥0.95), TLI (≥0.95), GFI (≥0.90), NFI (≥0.95) PCLOSE (≥0.5) and AGFI (≥0.90) [41]. Where: RMSEA = Root Mean Squared Error of Approximation, CFI = Comparative Fit Index, TLI = Turker-Lewis index, GFI = Goodness-of-Fit-Index, AGFI = Adjusted Goodness-

Table 4. Test of homogeneity of variances.

		Levene Statistic	df1	df2	Sig.
Continuous Improvement Processes	Based on Mean	0.244	4	225	0.913
	Based on Median	0.257	4	225	0.905
	Based on Median and with adjusted df	0.257	4	219.21	0.905
	Based on trimmed mean	0.260	4	225	0.903
Contingency Planning	Based on Mean	0.447	4	225	0.775
	Based on Median	0.500	4	225	0.736
	Based on Median and with adjusted df	0.500	4	208.92	0.736
	Based on trimmed mean	0.462	4	225	0.764
Benchmarking	Based on Mean	1.100	4	225	0.358
	Based on Median	1.099	4	225	0.358
	Based on Median and with adjusted df	1.099	4	171.14	0.359
	Based on trimmed mean	1.032	4	225	0.392
Organisational Adaptability	Based on Mean	0.537	4	225	0.709
	Based on Median	0.502	4	225	0.735
	Based on Median and with adjusted df	0.502	4	221.74	0.735
	Based on trimmed mean	0.544	4	225	0.704

Source: Researcher's Desk, SPSS 25.0 Outputs 2023.

of-Fit-Index, SRMR = Standardized Root Mean Residual, NFI = Normed Fit Index. Parameter estimates should be greater than 0.5 and preferably above 0.7 [41].

The results of the goodness of fit indices indicated acceptable fit to the data for one-factor model (chi-square (14df) = 53.515, χ^2/df = 3.822, RMSEA = 0.211, CFI = 0.968, NFI = 0.966 and TLI = 0.962). Table 5 summarized the goodness of fit indices, the factor loading estimates and the error variances. Factor loading estimates revealed that six indicators were strongly related to latent factor (continuous improvement processes) and were statistically significant. Figure 1 showed that the indicators CIP1-CIP6 had factor loadings of 0.83, 0.79, 0.86, 0.84, 0.76, and 0.78 respectively and error variances of 0.25, 0.31, 0.28, 0.22, 0.37, and 0.30 respectively. These parameters are consistent with the position that these are reliable indicators of the construct of continuous improvement processes.

The results of the goodness of fit indices indicated acceptable fit to the data for one-factor model (chi-square (14df) = 42.164, χ^2/df = 3.012, p = 0.000, RMSEA = 0.094, CFI = 0.976, NFI = 0.965 and TLI = 0.964). Table 6 summarized the goodness of fit indices, the factor loading estimates and the error variances. Factor loading estimates revealed that seven indicators were related to latent factor (contingency planning) and were statistically significant. Figure 2 showed that indicators CP1-CP7 had factor loadings of 0.847, 0.870, 0.860, 0.921, 0.819, 0.771, and 0.301 respectively and error variances of 0.72, 0.76, 0.74,

Table 5. Measurement model analysis of continuous improvement processes.

Model	Chi-Square (df)	χ^2/df	NFI	TLI	CFI	RMSEA	Variable	Factor Loading Estimates	Error VAR
Continuous Improvement Processes	(14df) = 53.515,	3.822	0.966	0.962	0.968	0.211	CIP1	0.83	0.25
							CIP2	0.79	0.31
							CIP3	0.86	0.28
							CIP4	0.84	0.22
							CIP5	0.76	0.37
							CIP6	0.78	0.30

Source: Amos 24.0 output on research data, 2023.

Table 6. Modified measurement model analysis of contingency planning.

Model	Chi-Sq (df)	χ^2/df	NFI	TLI	CFI	RMSEA	Variable	Estimates	Err.VAR
Contingency Planning	(14df) = 42,164,	3.012	0.965	0.964	0.976	0.094	CP1	0.847	0.72
							CP2	0.870	0.76
							CP3	0.860	0.74
							CP4	0.921	0.85
							CP5	0.819	0.67
							CP6	0.771	0.59
							CP7	0.301	0.09

Source: Amos 24.0 output on research data, 2023.

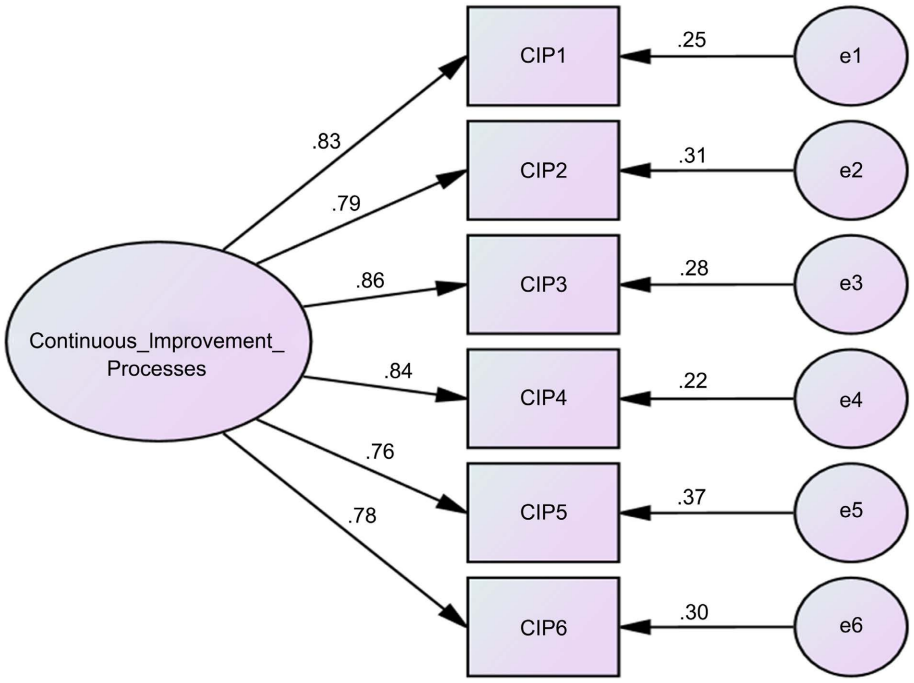

Figure 1. Measurement model of continuous improvement processes.

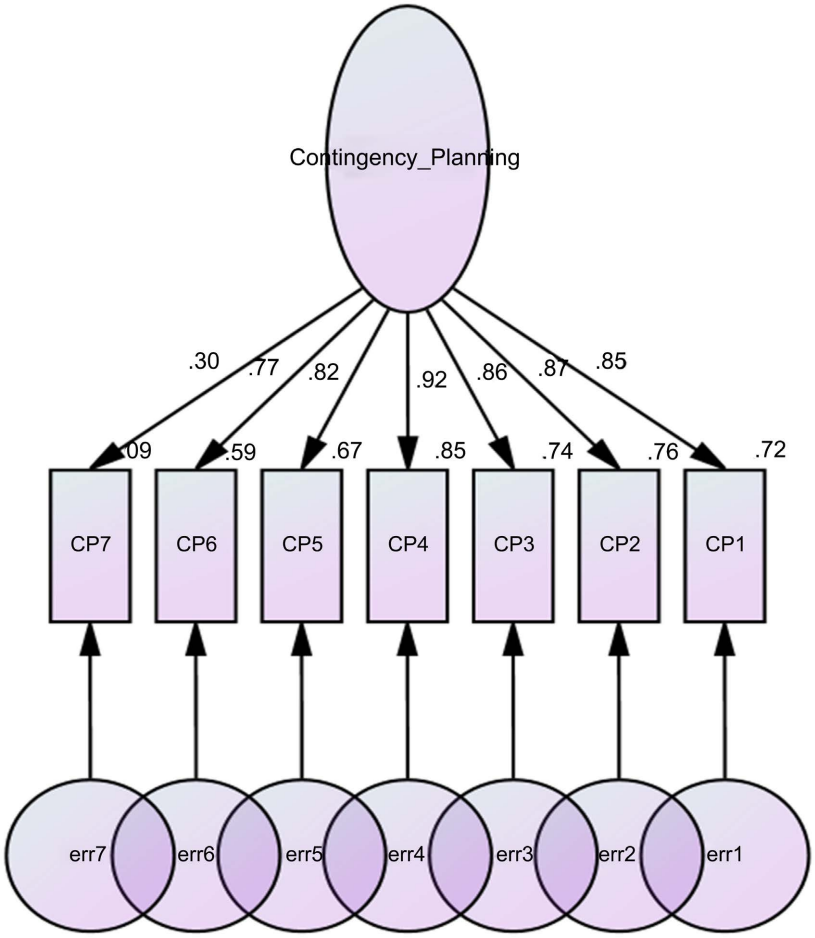

Figure 2. Modified measurement model of contingency planning.

0.85, 0.67, 0.59 and 0.09 respectively. The weak indicator CP7 was deleted. Apart from the indicator CP7, all the other freely estimated standardized parameters were statistically significant. These parameters are consistent with the position that these are reliable indicators of the construct of contingency planning.

Table 7 summarized the results of the goodness of fit indices indicated mediocre fit to the data for one-factor model (chi-square (9df) = 66.751, χ^2/df = 7.417, p = 0.000, RMSEA = 0.167, CFI = 924, NFI = 0.914 and TLI = 874). Table 7 summarized the goodness of fit indices, the factor loading estimates and the error variances. Factor loading estimates revealed that five indicators were strongly related to latent factor (benchmarking) and were statistically significant. Figure 3 showed that the indicators BM1, BM2, BM3, BM4 and BM6 had factor loadings of 0.780, 0.820, 0.863, 0.837, and 0.68 respectively and error variances of 0.48, 0.56, 0.81, 0.81, and 0.60 respectively. However, indicator BM 5 had factor loading of 0.61 and error variance of 0.00. To improve the model, indicator BM5 was deleted and covariances were added between the error terms err1 and err2, err3 and err4, and err5 and err6. After the model modification, the results of the goodness of fit indices indicated acceptable fit to the data for one-factor model (chi-square (6df) = 10.447, χ^2/df = 1.741, p = 0.107, RMSEA = 0.057, CFI = 994,

Table 7. Measurement model analysis of benchmarking.

Model	Chi-Square (df) Significance	χ^2/df	NFI	TLI	CFI	RMSEA	Variable	Factor Loading Estimate	Error VAR
Bench marking	(9df) = 66.751	7.417	0.914	0.874	0.924	0.167	BM1	0.780	0.61
							BM2	0.820	0.67
							BM3	0.863	0.75
							BM4	0.837	0.70
							BM5	0.061	0.00
							BM6	0.768	0.59

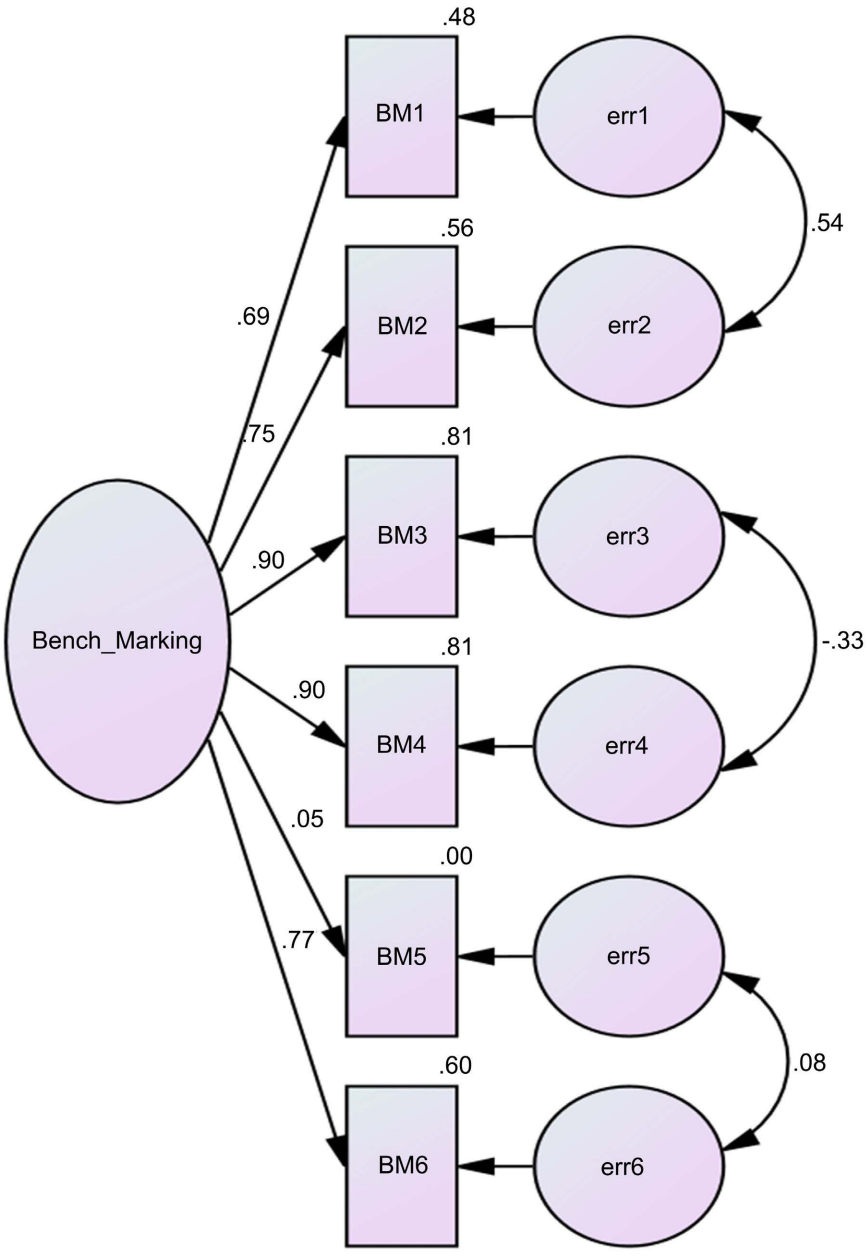

Figure 3. Measurement model of benchmarking.

NFI = 0.987 and TLI = 985). Apart from BM5, all the other freely estimated standardized parameters were statistically significant. These parameters are consistent with the position that these are reliable indicators of the construct of benchmarking.

Table 8 summarized the goodness of fit indices, the factor loading estimates and the error variances. The results of the goodness of fit indices indicated acceptable fit to the data for one-factor model (chi-square (9df) = 73.940, χ^2/df = 8.216, RMSEA = 0.178, CFI = 0.987, NFI = 0.975 and TLI = 0.962). Factor loading estimates revealed that the six indicators were related to latent factor—Organisational adaptability. Figure 4 showed that the indicators OA1-OA6 had factor loadings of 0.82, 0.73, 0.74, 0.80, 0.77 and 0.81 respectively and error variances of 0.26, 0.31, 0.18, 0.26, 0.33 and 0.29 respectively.

Table 8. Measurement model analysis of organisational adaptability.

Model	Chi-Square(df)	NFI	TLI	CFI	RMSEA	Variable	Estimates	Err. Var
Org. Adaptability	(9df) = 73.940	0.975	0.962	0.987	0.178	SI1	0.82	0.26
						SI2	0.73	0.31
						SI3	0.74	0.18
						SI4	0.80	0.26
						SI5	0.77	0.33
						SI6	0.81	0.29

Source: Amos 24.0 output on research data, 2023.

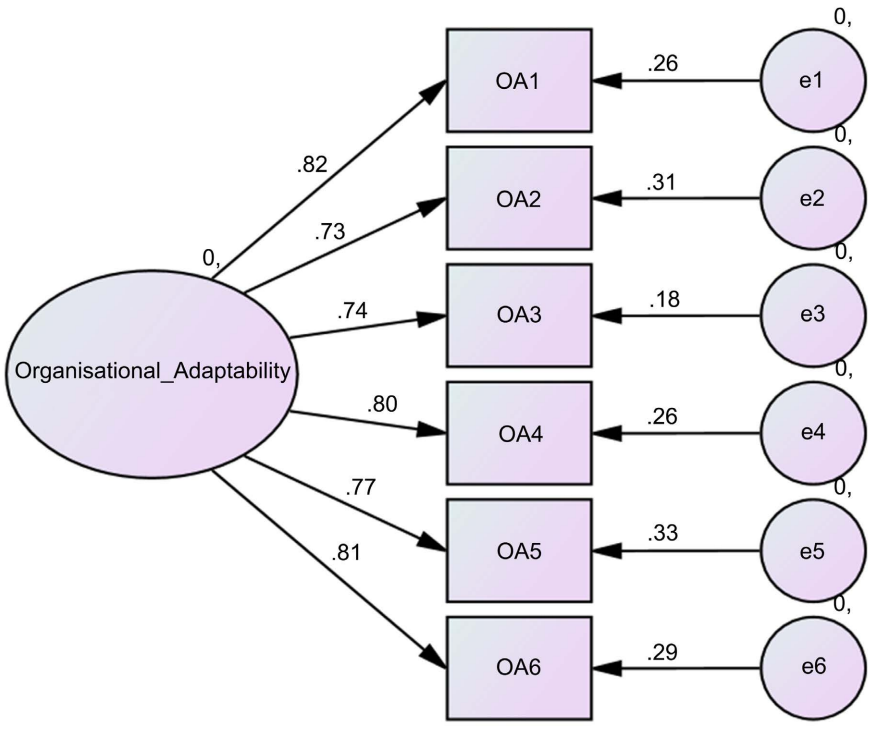

Figure 4. Measurement model of organisational adaptability.

4.4. Structural Equation Model

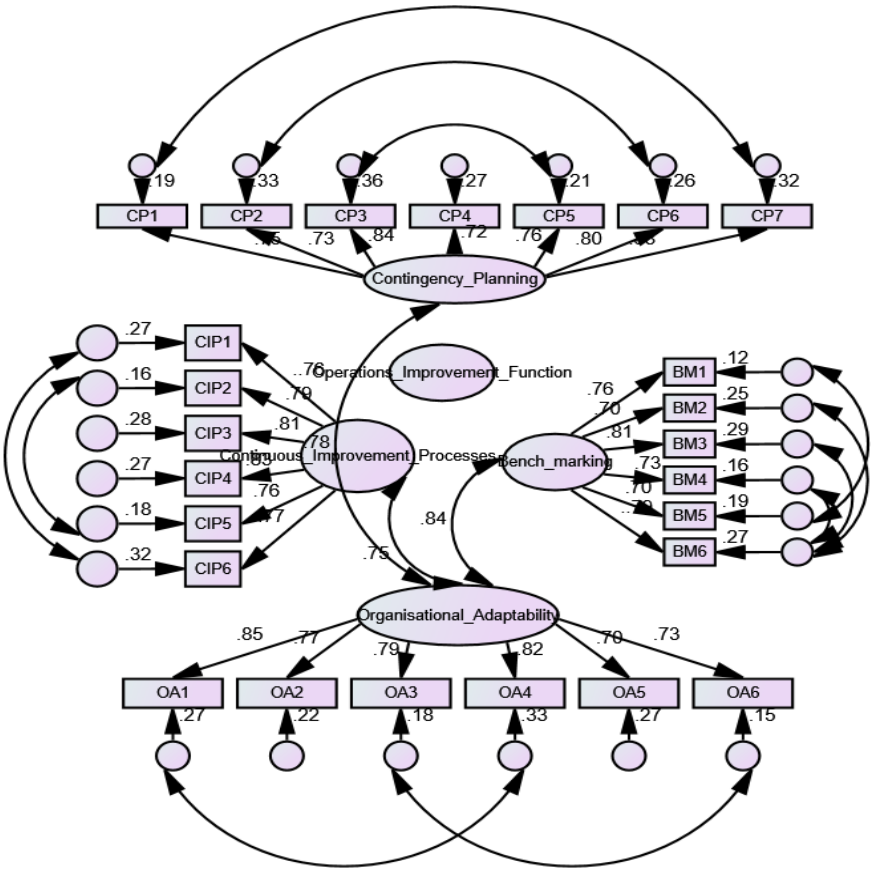

Figure 5. Structural equation model (linking the hypotheses). Source: Amos 24.0 output on research data, 2023.

Table 9. Test of hypotheses.

S/n	Mediation Stage	Hypotheses	Standard Beta value > 0.5; or ≥0.7	Critical Ratio (CR) the t-value ≥ 1.96	p-value < 0.05	Remark	Decision
1	CP → OA (Hypothesis 1)	There is no significant relationship between contingency planning and organisational adaptability.	0.78	3.14	0.000	Positive Significant	Not supported
2	BM → OA (Hypothesis 2)	There is no significant relationship between benchmarking and organisational adaptability.	0.84	3.35	0.001	Positive Significant	Not supported
3	CIP → OA (Hypothesis 3)	There is no significant relationship between continuous improvement processes and organisational adaptability.	0.75	2.75	0.000	Positive Significant	Not supported

4.5. Discussion of Findings

The first hypothesis (H_{01}), states that there is no significant relationship between contingency planning and organisational adaptability. However, Figure 5 and

Table 9 indicate the relationship between contingency planning and organisational adaptability (β = 0.78, CR = 3.14, p = 0.000). Therefore, from H_{01}, since $\beta > 0.7$; $t \geq 1.96$; $p < 0.05$, the null hypothesis was not supported and the alternate hypothesis is hereby accepted; indicating that contingency planning has a positive significant relationship with organisational adaptability of Petroleum tank farms in South-South Nigeria. The evidence presents contingency planning as a strong predictor of organisational adaptability of Petroleum tank farms in South-South Nigeria. Statistically, it shows that a unit increase in contingency planning will lead to 78% increase in organisational adaptability. This implies that increase in contingency planning is associated with increase in organisational adaptability. This finding agrees with Alshamsi and Pathirage [36] who examined the role of effective contingency planning in managing extreme disasters in UAE and found that inadequate preparation for disasters can have significant impacts on the environment and people. Besides, this finding further validates the theoretical assertion of the contingency theory which states that there is no such thing as the "one best way" for doing things, rather an organisation should continue to adapt to environmental changes using the most feasible approaches.

The second hypothesis (H_{02}), states that there is no significant relationship between benchmarking and organisational adaptability. However, Figure 5 and Table 9 reveal the relationship between benchmarking processes and organisational adaptability (β = 0.84, C.R = 3.35, p = 0.000). Therefore, from H_{02}, since $\beta > 0.7$; $t \geq 1.96$; $p < 0.05$, the null hypothesis was not supported and the alternate hypothesis is hereby accepted; indicating that benchmarking processes has a positive significant relationship with organisational adaptability of Petroleum tank farms in South-South Nigeria.

Statistically, it shows that a unit increase in benchmarking will account for 84% increase in organisational adaptability. This implies that increase in benchmarking is associated with increase in organisational adaptability. This finding agrees with Simatupang and Widjaja [37] who studied benchmarking of innovation capability in the digital industry and found that innovation capability is determined primarily by the quality of human resources who are capable to learn continuously and to follow the changing trend in technology. This finding further validates the Theory of Routine Dynamics which suggests that organizational routines are generative systems that produce repetitive, recognizable patterns of interdependent action carried out by multiple participants [17].

The third hypothesis (H_{03}) states that there is no significant relationship between continuous improvement processes and organisational adaptability. However, Figure 5 and Table 9 indicate the relationship between continuous improvement processes and organisational adaptability (β = 0.75, C.R = 2.75, p = 0.000). Therefore, from H_{03}, since $\beta > 0.7$; $t \geq 1.96$; $p < 0.05$, the null hypothesis was not supported and the alternate hypothesis is hereby accepted; indicating that continuous improvement processes has a positive significant relationship with organisational adaptability of Petroleum tank farms in South-South Nigeria. Statistically, it shows that a unit increase in continuous improvement processes will

account for 75% increase in organisational adaptability. This implies that increase in continuous improvement processes is associated with increase in organisational adaptability. This finding agrees with Bayo and Harcourt [35] who found that there is a significant relationship between continuous improvement and performance of Deposit Money Banks in Port Harcourt. Yet, this finding further validates the Theory of Routine Dynamics which suggest that routines are generative systems that produce repetitive, recognizable patterns of interdependent action carried out by multiple participants, but are rather misunderstood as rigid, mundane, mindless, and explicitly stored somewhere [17].

5. Conclusion and Recommendations

The study concludes that when managers of Petroleum tank farms increase their adoption of contingency planning, benchmarking and continuous improvement processes, the tendency for organisational adaptability will be enhanced. Therefore, it is recommended that:

1) Management of Petroleum tank farms should put in place mechanisms to enhance continuous improvement processes by allocating the necessary amount of resources, such as energy, time, people and money, in order to promote the continuous development of the continuous improvement systems.

2) Furthermore, managers of Petroleum tank farms should boost the adoption of contingency planning by identifying common emergencies that could occur at our facility and outlining specific tasks that the facility staff will undertake in an emergency situation, and ensuring that there is enough training and information about how to act during a crises situation, in order to evaluate safety and preparing in advance for recovery from disasters.

3) Moreso, management of Petroleum tank farms should enhance the implementation of benchmarking by actively encouraging employees to learn from the experience and expertise of other colleagues and organizations through comparing practices and processes, following a structured process for comparing performance levels, learning why better performers have higher levels of performance and adapt/implement those better practices.

Contributions to Knowledge

1) The findings of this study reinforce the theoretical assertions of the Contingency Theory and the Theory of Routine Dynamics by validating a model which underscores the structural affinity between operations improvement function and organisational adaptability of Petroleum tank farms in South-South Nigeria.

2) Finally, this study contributes to practice by providing further understanding to managers of Petroleum tank farms on how to improve organisational adaptability through the lens of contingency planning, benchmarking and continuous improvement processes.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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