



STRATEGIC FLEXIBILITY AND ORGANIZATIONAL RESILIENCE OF INDIGENOUS AIRLINES IN PORT HARCOURT INTERNATIONAL AIRPORT, RIVERS STATE, NIGERIA

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This study investigated the relationship between strategic flexibility and organizational resilience of indigenous airlines operating at Port Harcourt International Airport, with technology adoption serving as the moderating variable. The independent variable, strategic flexibility, was measured using resource flexibility, coordination flexibility, and operational flexibility, while the dependent variable, organizational resilience, was measured using adaptive capacity, absorptive capacity, and robustness. Technology adoption was operationalized through Information Technology (IT) Infrastructure Capability and Digital Innovation Adoption. A cross-sectional survey research design was adopted. The target population comprised 385 management and operational staff drawn from six indigenous airlines operating at Port Harcourt International Airport. Using the Taro Yamane formula, a sample size of 196 respondents was determined and proportionately allocated using Bowley's proportional allocation technique, while simple random sampling was employed in selecting respondents. A structured questionnaire served as the primary instrument for data collection. Out of the 196 questionnaires administered, 162 valid responses were used for analysis. Data were analyzed using IBM SPSS Statistics Version 30 and SmartPLS 4.0. Descriptive statistics were used for univariate analysis, while Spearman Rank Order Correlation and Partial Correlation Analysis were employed to test the hypotheses. The findings revealed that resource flexibility and operational flexibility had significant positive relationships with all dimensions of organizational resilience, whereas coordination flexibility significantly influenced only organizational robustness but had no significant relationship with adaptive capacity and absorptive capacity. The study further found that IT Infrastructure Capability and Digital Innovation Adoption strengthened the relationship between strategic flexibility and organizational resilience after statistical control, indicating the strategic importance of technology adoption in enhancing organizational resilience. It recommends that airline management should strengthen resource allocation flexibility, operational agility, organizational learning, digital innovation, and information technology infrastructure to enhance adaptability, absorptive capacity, robustness, and long-term organizational sustainability within Nigeria's aviation industry.

Keywords: strategic flexibility, organizational resilience, Port Harcourt International Airport, technology adoption.

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1.1 Introduction

The aviation industry has become one of the most turbulent and uncertainty-driven sectors in the contemporary global economy due to rapid technological disruption, fluctuating fuel prices, economic instability, security concerns, environmental regulations, and increasing customer expectations. These persistent disruptions have compelled airlines across the world to continuously redesign their strategies and operational systems in order to remain competitive and sustainable. In developing economies such as Nigeria, the situation is even more complex because indigenous airlines operate within a volatile business environment characterized by infrastructural deficiencies, policy inconsistency, foreign exchange scarcity, inadequate maintenance facilities, rising operational costs, and weak technological infrastructure. Within this unstable context, indigenous airlines operating through the Port Harcourt International Airport have continued to face severe operational disruptions that threaten their survival, adaptability, and long-term resilience. These challenges have increased scholarly and managerial interest in understanding how strategic flexibility can strengthen organizational resilience among indigenous airlines in Nigeria.

Strategic flexibility has emerged as a critical organizational capability that enables firms to respond effectively to environmental uncertainty, market turbulence, and unexpected disruptions. The concept gained prominence in strategic management literature as organizations sought mechanisms for surviving volatile business conditions and sustaining competitive advantage. Strategic flexibility refers to the ability of an organization to rapidly adjust its strategic actions, resource allocations, operational systems, and managerial decisions in response to environmental changes and emerging opportunities or threats. It embodies an organization's capacity to proactively and reactively modify its strategic posture without losing operational continuity or long-term competitiveness (Sanchez, 1995; Hitt, Keats & DeMarie, 1998; Grewal & Tansuhaj, 2001). Strategic flexibility has also been described as the capability of firms to redeploy and reconfigure resources, redesign processes, and coordinate organizational activities in ways that facilitate adaptation to uncertainty and environmental dynamism (Shimizu & Hitt, 2004; Zhou & Wu, 2010). Furthermore, strategic flexibility represents an organization's preparedness to cope with disruptions through managerial responsiveness, resource versatility, and operational agility (Aaker & Mascarenhas, 1984; Evans, 1991).

Within the airline industry, strategic flexibility is particularly essential because aviation operations are highly sensitive to economic shocks, technological changes,

weather disruptions, security threats, regulatory reforms, and fluctuating passenger demands. Indigenous airlines in Nigeria frequently experience route instability, aircraft maintenance challenges, flight cancellations, foreign exchange volatility, and increasing competition from both domestic and international carriers. Consequently, the ability of airlines operating through Port Harcourt International Airport to survive and remain competitive depends largely on their capacity to strategically adjust their resources, coordinate operations effectively, and sustain operational continuity during crises. This has positioned strategic flexibility as a strategic imperative for achieving organizational resilience in the Nigerian aviation sector.

Moreover, previous empirical studies have often treated strategic flexibility as a unidimensional construct without adequately distinguishing the individual and combined effects of resource flexibility, coordination flexibility, and operational flexibility on adaptive capacity, absorptive capacity, and robustness. Existing studies have also paid limited attention to the moderating role of technology adoption within the Nigerian aviation context, particularly among indigenous airlines operating through Port Harcourt International Airport. Additionally, many earlier studies were conducted in developed economies where infrastructural, technological, and regulatory conditions differ significantly from the realities confronting indigenous Nigerian airlines. Consequently, findings from such studies may not adequately explain the resilience challenges faced by domestic airlines within Nigeria's volatile aviation environment.

The present study therefore seeks to fill these conceptual and contextual gaps by examining the relationship between strategic flexibility and organizational resilience of indigenous airlines operating through Port Harcourt International Airport while specifically investigating the moderating role of technology adoption. The study intends to provide deeper understanding of how resource flexibility, coordination flexibility, and operational flexibility independently and jointly influence adaptive capacity, absorptive capacity, and robustness among indigenous airlines in Nigeria. By integrating technology adoption into the framework, the study further aims to contribute to strategic management and aviation literature by offering contemporary insights into how indigenous airlines can strengthen resilience and sustain operational continuity within an increasingly uncertain and technology-driven business environment.

1.2 Statement of the Problem

The Nigerian aviation industry has continued to experience persistent operational turbulence arising from economic instability, fluctuating foreign exchange rates, rising aviation fuel costs, infrastructural inadequacies,

technological disruptions, safety concerns, policy inconsistency, and intense market competition. These challenges have created severe pressure on indigenous airlines operating within the domestic aviation sector, particularly those utilizing the facilities of Port Harcourt International Airport. Despite the strategic importance of the airport as a major hub for business travelers, oil and gas operations, and regional connectivity within the Niger Delta region, indigenous airline operators have struggled to sustain organizational resilience in the face of recurring operational disruptions, declining customer confidence, increasing maintenance costs, and unpredictable environmental conditions. The inability of many domestic airlines to effectively withstand and recover from these disruptions has resulted in repeated cases of delayed flights, route suspensions, financial distress, operational inefficiencies, and in some cases complete business collapse. These realities suggest serious deficiencies in the adaptive capacity, absorptive capacity, and robustness of indigenous airlines in Nigeria.

Adaptive capacity has remained a major challenge among indigenous airlines because many operators have demonstrated limited ability to rapidly adjust to environmental uncertainties and industry disruptions. Airlines frequently experience difficulty responding effectively to sudden increases in operational costs, fluctuating passenger demand, adverse weather conditions, regulatory reforms, and foreign exchange volatility. Several indigenous carriers in Nigeria have repeatedly suspended operations, reduced flight frequencies, or abandoned strategic routes due to their inability to adapt swiftly to changing business realities. Scholarly findings have shown that organizations lacking adaptive capacity often experience declining competitiveness, weak crisis response mechanisms, and operational instability during periods of environmental turbulence (Lengnick-Hall & Beck, 2005; Burnard & Bhamra, 2011). Within the Nigerian aviation industry, the manifestation of poor adaptive capacity is evident in persistent flight delays, cancellation of scheduled operations, poor customer service responsiveness, inability to maintain operational schedules, and weak recovery mechanisms following operational disruptions. Airlines operating through Port Harcourt International Airport have particularly struggled with rapid operational adjustments during periods of weather disruptions, fuel scarcity, maintenance downtime, and economic shocks, thereby exposing passengers and stakeholders to continuous uncertainty and service dissatisfaction.

Absorptive capacity has also remained significantly weak among indigenous airlines because many operators have shown limited capability to acquire, assimilate, and utilize new technological knowledge, innovative operational systems, and modern managerial practices necessary for

survival within the contemporary aviation environment. Research has established that organizations with poor absorptive capacity often fail to learn effectively from environmental experiences, technological advancements, and industry best practices, thereby weakening their long-term competitiveness and resilience (Cohen & Levinthal, 1990; Zahra & George, 2002). In the Nigerian aviation sector, several indigenous airlines still rely heavily on outdated operational systems, manual processes, limited digital integration, and weak technological infrastructure despite increasing global technological transformation within the aviation industry.

Furthermore, many prior studies have failed to comprehensively examine how strategic flexibility dimensions can jointly provide sustainable solutions to the operational instability, technological deficiencies, and resilience challenges experienced by indigenous airline operators. This unresolved gap therefore necessitates the present study which seeks to examine the relationship between strategic flexibility and organizational resilience of indigenous airlines in Port Harcourt International Airport with particular attention to the moderating role of technology adoption.

1.3 Research Hypotheses

The following null hypotheses guided the study;

Ho₁: There is no significant relationship between resource flexibility and adaptive capacity of Indigenous Airlines in Port Harcourt International Airport, Rivers State, Nigeria

Ho₂: There is no significant relationship between resource flexibility and absorptive capacity of Indigenous Airlines in Port Harcourt International Airport, Rivers State, Nigeria

Ho₃: There is no significant relationship between resource flexibility and robustness of Indigenous Airlines in Port Harcourt International Airport, Rivers State, Nigeria

Ho₄: There is no significant relationship between coordination flexibility and adaptive capacity of Indigenous Airlines in Port Harcourt International Airport, Rivers State, Nigeria

Ho₅: There is no significant relationship between coordination flexibility and absorptive capacity of Indigenous Airlines in Port Harcourt International Airport, Rivers State, Nigeria

Ho₆: There is no significant relationship between coordination flexibility and robustness of Indigenous Airlines in Port Harcourt International Airport., Rivers State, Nigeria

Ho₇: There is no significant relationship between operational flexibility and adaptive capacity of Indigenous Airlines in Port Harcourt International Airport. Rivers State, Nigeria,

Ho₈: There is no significant relationship between operational flexibility and absorptive capacity of Indigenous Airlines in Port Harcourt International Airport., Rivers State, Nigeria

Ho₉: There is no significant relationship between operational flexibility and robustness of Indigenous Airlines in Port Harcourt International Airport, Rivers State, Nigeria

Ho₁₀: Information management infrastructure capability does not significantly moderate the relationship between Strategic Flexibility and Organizational Resilience of Indigenous Airlines in Port Harcourt International Airport, Rivers State, Nigeria

Ho₁₁: Digital innovation adoption does not significantly moderate the relationship between Strategic Flexibility and Organizational Resilience of Indigenous Airlines in Port Harcourt International Airport, Rivers State, Nigeria

2.0 Theoretical Standpoints

Dynamic Capability Theory

Dynamic Capability Theory was propounded by Teece, Pisano, and Shuen in 1997 to explain how organizations

develop and sustain competitive advantage within rapidly changing and highly uncertain business environments. The theory therefore explains how firms continuously adapt their strategic and operational capabilities in order to survive and remain competitive over time. The underlying principles of Dynamic Capability Theory revolve around organizational adaptability, strategic responsiveness, capability reconfiguration, innovation, and continuous learning. The theory maintains that organizations must possess the capability to sense environmental opportunities and threats, seize strategic opportunities through effective decision-making, and transform organizational systems and processes to align with changing business realities (Teece, 2007). The relevance of Dynamic Capability Theory to this study is deeply rooted in its explanation of how indigenous airlines can strategically adapt to environmental uncertainty, operational disruptions, and technological changes within the Nigerian aviation industry. Indigenous airline operators utilizing Port Harcourt International Airport operate within a highly unstable environment characterized by fluctuating fuel prices, foreign exchange volatility, infrastructural deficiencies, weather disruptions, technological challenges, regulatory uncertainty, and intense competition.

2.1 Conceptual Framework

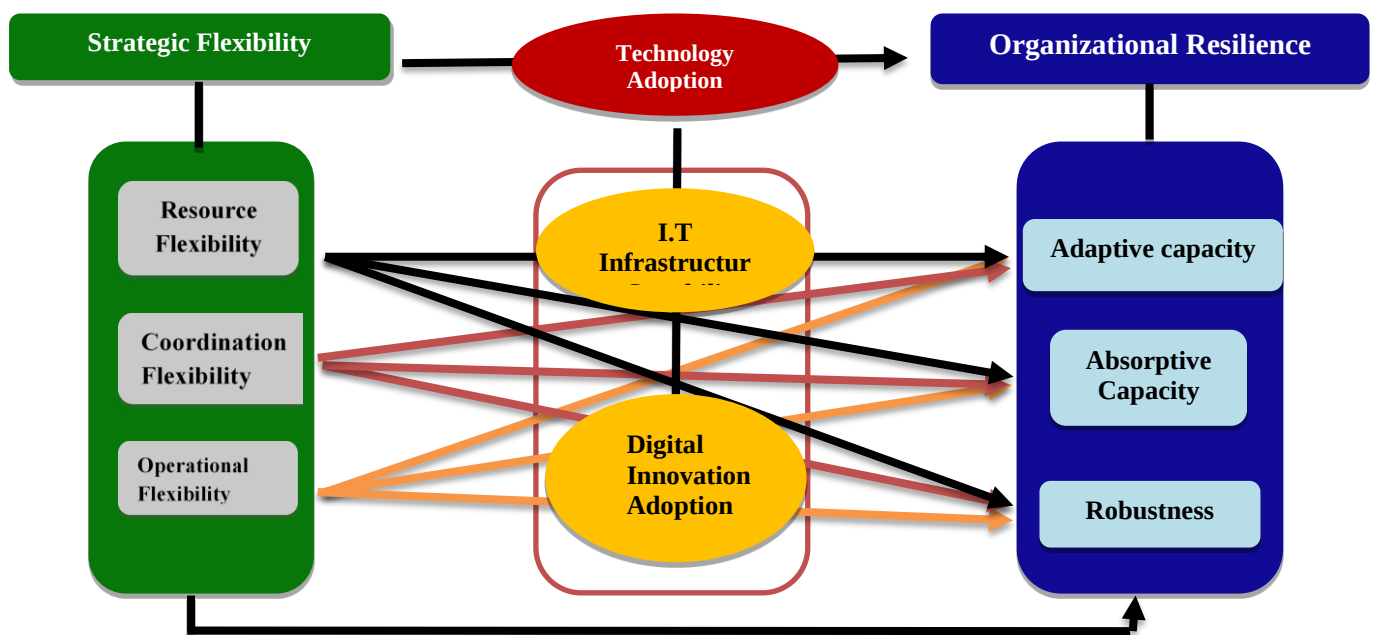


Figure 2.1: Operational - Conceptual Framework of the Study.

Operational Framework on Strategic Flexibility and Organizational Resilience of Indigenous Airlines in Port Harcourt International Airport: The Moderating Role of Technology Adoption.

Source: Figure 1: Conceptualized by Nathaniel (2026) and the dimensions of Strategic flexibility was adopted from Sanchez (1995); Johnson Lee and Saini (2003); Grewal and Tansuhaj (2001). The measures of Organizational resilience were adopted from Lengnick-Hall and Beck (2005); Teece (2007); Hamel and Valikangas (2003); Hollnagel (2011). The moderating variable – Technology adoption from Vial (2019); Nambisan (2017)

2.2.1 Strategic Flexibility

Strategic flexibility has emerged as one of the most important organizational capabilities required for survival, competitiveness, and sustainability within highly turbulent and uncertain business environments. The concept gained prominence in strategic management literature as organizations increasingly encountered environmental volatility, technological disruptions, market uncertainty, economic instability, and changing customer demands that required continuous adaptation and operational responsiveness. Strategic flexibility generally refers to the ability of organizations to rapidly adjust strategic actions, operational systems, resource allocations, and managerial decisions in response to changing environmental conditions and emerging opportunities or threats (Aaker & Mascarenhas, 1984). It also reflects the capacity of organizations to reconfigure internal competencies, redesign operational processes, and modify strategic directions in ways that enhance adaptability, responsiveness, and long-term survival within dynamic industries (Sanchez, 1995).

Several scholars have conceptualized strategic flexibility from different perspectives based on organizational adaptability and responsiveness. Evans (1991) viewed strategic flexibility as the capability of firms to respond proactively and reactively to environmental uncertainty through rapid strategic and operational adjustments. Hitt, Keats, and DeMarie (1998) further explained strategic flexibility as an organization's ability to identify major environmental changes, commit resources rapidly, and recognize when strategic decisions become ineffective within changing business conditions. Similarly, Grewal and Tansuhaj (2001) described strategic flexibility as the capability of firms to modify strategic responses and organizational systems in order to cope with economic crises and market disruptions. Shimizu and Hitt (2004) also emphasized that strategic flexibility involves organizational preparedness to reverse ineffective strategic decisions and adapt continuously to environmental turbulence. These scholarly positions collectively indicate that strategic flexibility is fundamentally associated with adaptability, responsiveness, resource deployment, operational modification, and organizational continuity within uncertain environments.

2.2.2 Resource Flexibility

Resource flexibility is a major dimension of strategic flexibility that explains the ability of organizations to redeploy, reconfigure, and utilize organizational resources efficiently for multiple strategic and operational purposes in response to environmental uncertainty and changing business conditions. The concept emerged prominently within strategic management literature through the works of Sanchez (1995) who described resource flexibility as the

extent to which organizational resources can be applied to different uses and redeployed rapidly at low cost during environmental changes and operational disruptions. Resource flexibility therefore reflects the versatility, adaptability, and usability of organizational resources in supporting organizational responsiveness, competitiveness, and survival within dynamic environments.

Several scholars have conceptualized resource flexibility from different perspectives based on organizational adaptability and strategic responsiveness. Aaker and Mascarenhas (1984) viewed resource flexibility as the ability of organizations to adjust resource commitments and operational capabilities rapidly in response to environmental turbulence and uncertainty. Evans (1991) further explained that resource flexibility enhances organizational capability to respond proactively and reactively to market disruptions and technological changes through effective redeployment of organizational assets

2.3 Empirical Review

Jacobs & Maritz (2020) conducted a study to understand dynamic strategy: investigating the ambidexterity–performance relationship. The study aimed to determine whether organisations in emerging economic contexts demonstrate ambidexterity for sustainable performance in the long term and what the effects of environmental turbulence are on the ambidexterity and sustainable performance relationship. A non-probability sampling method, more specifically, convenience sampling, was used to obtain a sample for the study. The sample consisted of profit-seeking organisations from many different industries within South Africa, including, but not limited to, manufacturing, business services, finance, hospitality and tourism, and retail and wholesale. The research was conducted during the 2017 financial year. The study used self-administered questionnaires and telephonic surveys. A total of 157 completed surveys were successfully collected, with a minimum of 150 usable answers for each question. Pearson product-moment correlation test was used to evaluate the correlations between the variables. A multiple regression model was used to examine what the moderating effect of environmental turbulence will be on the ambidexterity and sustainable performance relationship. The study revealed that moderate to strong relationships exist between the two sub-dimensions of ambidexterity and sustainable performance. The findings depict a strong relationship between exploration and exploitation as the sub-dimensional constructs of ambidexterity, reinforcing existing literature on simultaneous exploration and exploitation. There was no statistically significant information, indicating that environmental turbulence moderates the ambidexterity and sustainable performance relationship. Considering the strong positive relationship between the two sub-dimensions of ambidexterity and

sustainable organisational performance, it is advisable for management of South African organisations to focus on ambidextrous strategies for sustaining performance in turbulent environments. The study contributes to the limited body of knowledge investigating ambidexterity as a dynamic capability in an emerging economic context. The study also contributes to clarify the ambidexterity and sustainable performance relationship in terms of whether organisations can simultaneously explore and exploit and what type of relationship exists between ambidexterity and sustainable performance as previous studies delivered mixed results.

2.3.1 Coordination Flexibility

Coordination flexibility is an important dimension of strategic flexibility that explains the ability of organizations to effectively synchronize operational activities, communication systems, managerial processes, decision-making structures, and collaborative relationships in response to changing environmental conditions and operational uncertainty. The concept emerged prominently within strategic management literature through the works of Sanchez and Mahoney (1996) who explained that coordination flexibility involves the capacity of organizations to reorganize and realign operational activities, communication patterns, and managerial systems rapidly in order to respond effectively to environmental turbulence and strategic changes. Coordination flexibility therefore reflects organizational responsiveness, integration capability, communication efficiency, and collaborative adaptability within uncertain business environments.

2.3.2 Operational Flexibility

Operational flexibility is a critical dimension of strategic flexibility that explains the ability of organizations to rapidly adjust operational processes, service delivery systems, operational schedules, production activities, and internal procedures in response to environmental uncertainty, changing customer demands, and operational disruptions without significantly compromising efficiency, quality, or organizational performance. The concept gained prominence within strategic management and operations management literature through the works of Slack (1987) who described operational flexibility as the capability of organizations to adapt operational systems and processes in response to changing environmental conditions and operational requirements. Upton (1994) further explained operational flexibility as the ability of firms to modify operational activities, production systems, and service processes rapidly and efficiently in order to cope with uncertainty and market turbulence.

2.3.3 Organizational Resilience

Organizational resilience has emerged as one of the most significant concepts within strategic management and organizational studies because contemporary organizations operate in highly volatile, uncertain, and disruption-prone environments. The increasing occurrence of economic instability, technological disruptions, pandemics, security threats, operational failures, climate-related disturbances, and market turbulence has compelled organizations to develop capabilities that enable survival, continuity, recovery, and long-term sustainability despite environmental uncertainty.

2.4: Review of Empirical Literature

Grewal and Tansuhaj (2001) investigated the relationship between strategic flexibility and organizational performance during economic crises among firms operating in Thailand. The independent variable was strategic flexibility while organizational performance constituted the dependent variable. The study adopted a survey research design and utilized a population of manufacturing and service firms affected by the Asian economic crisis. A sample size of 240 firms was selected through stratified sampling techniques while regression analysis was utilized for data analysis. The findings revealed a positive and significant relationship between strategic flexibility and organizational survival during periods of economic instability with a regression coefficient of $\beta = 0.62$. The study further established that organizations possessing flexible operational systems and adaptive resource structures demonstrated stronger resilience and continuity during crises. However, the study focused on general organizational performance rather than organizational resilience dimensions such as adaptive capacity, absorptive capacity, and robustness.

Shimizu and Hitt (2004) conducted a study on strategic flexibility, organizational responsiveness, and recovery from ineffective strategic decisions. Strategic flexibility served as the independent variable while organizational responsiveness and recovery capability constituted the dependent variables. The study adopted a longitudinal research design using organizational data obtained from firms operating within technologically dynamic industries in the United States. Multiple regression analysis was utilized while the study findings indicated that strategic flexibility significantly improved organizational preparedness and operational recovery during environmental disruptions with a correlation coefficient of $r = 0.71$. The study further established that organizations possessing flexible operational and coordination systems demonstrated stronger resilience and adaptability during crises.

Lengnick-Hall and Beck (2005) examined organizational resilience and strategic adaptability among organizations operating within uncertain business environments.

Organizational resilience constituted the dependent variable while adaptive capability and strategic responsiveness served as explanatory variables. The study adopted a conceptual and empirical review approach utilizing organizational case analyses from manufacturing and service industries. The findings established that organizations possessing adaptive operational systems and flexible strategic structures demonstrated stronger resilience and continuity during crises and environmental disruptions. The study further emphasized that adaptive capacity significantly strengthened organizational continuity and learning capability during uncertainty.

Burnard and Bhamra (2011) conducted a study on organizational resilience and crisis management within dynamic operational environments. Organizational resilience served as the dependent variable while operational flexibility and adaptive systems constituted the explanatory variables. The study adopted a qualitative research design utilizing case study analysis among organizations operating within high-risk industries. The findings revealed that operational flexibility and coordination mechanisms significantly improved organizational recovery capability and continuity during crises. The study further established that resilient organizations demonstrated stronger adaptive capacity and robustness than organizations with rigid operational systems.

Methodology

3.1 Research Design

This study adopted the cross-sectional survey research design because the design provides a systematic and empirical approach for examining the relationship between strategic flexibility and organizational resilience of indigenous airlines operating through Port Harcourt International Airport with technology adoption serving as a moderating variable. The cross-sectional survey design

involves the collection of data from respondents at a single point in time for the purpose of describing existing conditions, examining relationships among variables, and generating empirical findings capable of addressing the research objectives and hypotheses (Creswell, 2014).

3.2 Population of the Study

The population for this study comprises management staff, operational personnel, administrative employees, technical officers, customer service personnel, and other relevant staff of indigenous airlines operating through Port Harcourt International Airport, Rivers State, Nigeria. These categories of employees were considered appropriate for the study because they are directly involved in strategic decision-making, operational coordination, technological implementation, crisis management, and organizational resilience activities within airline operations. The respondents are therefore expected to possess adequate knowledge regarding strategic flexibility practices, organizational resilience capability, and technology adoption within the Nigerian aviation industry.

The study focuses specifically on selected indigenous airlines operating within Port Harcourt International Airport because the airport serves as a major aviation hub within the South-South region of Nigeria and experiences significant operational activities and environmental challenges associated with airline operations. The indigenous airlines selected for the study include operational carriers with active domestic flight services within the airport environment. The estimated population distribution was obtained from operational and administrative records of the selected airline operators within the airport environment. Below is a table showing the estimated distribution:

Table 3.1: Estimated Population Distribution

S/N	Indigenous Airline Operators	Management Staff	Operational Staff	Administrative/Technical Staff	Total Population
1	Air Peace	18	52	30	100
2	Arik Air	15	40	25	80
3	Ibom Air	12	36	22	70
4	United Nigeria Airlines	10	28	17	55
5	Green Africa Airways	8	22	15	45
6	ValueJet	7	18	10	35
	Total	70	196	119	385

Source: Field Survey and Human Resource /Administrative Department ;Nigerian Civil Aviation Authority (NCAA);Federal Airport Authority of Nigeria (FAAN),Federal Ministry of Aviation and Aerospace Development.

3.3 Sample Size Determination

The sample size for this study was determined from the total population of three hundred and eighty-five (385) staff of selected indigenous airlines operating through Port Harcourt International Airport. The determination of an appropriate sample size is essential in research because it enhances representativeness, reliability, accuracy, and generalizability of research findings. Consequently, the study adopted the Taro Yamane (1967) formula for finite population in determining the sample size because the formula provides a simplified and scientifically acceptable method for selecting representative samples from a known population. Yamane's Formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = sample size

N = population size (385)

E = margin of error (e.g., 0.05 for 95% confidence level)

$$\begin{aligned} n &= \frac{385}{1 + 385(0.05)^2} \\ n &= \frac{385}{1 + 385(0.0025)} \\ n &= \frac{385}{1 + 0.9625} \\ n &= \frac{385}{1.9625} \\ n &\approx 196 \end{aligned}$$

Thus, the computed sample size for the study is therefore 196 respondents.

4.1 Results and Analysis

Upon completion of the field exercise, the retrieved questionnaires were carefully screened for completeness, consistency, and accuracy. Questionnaires that were improperly completed, contained substantial missing responses, or exhibited response inconsistencies were excluded from the final analysis. The remaining questionnaires that satisfied the screening criteria were coded and entered into the Statistical Package for the Social Sciences (SPSS) Version 30 for analysis.

Table 4.1: Response Rate for Questionnaire Administration

Response Rate

Activities	Number of Occurrences	Percent of Occurrences
Copies of Questionnaire distributed	196	100
Copies of Questionnaire retrieved	176	89.80%
Copies of Questionnaire not retrieved	20	10.20%
Copies completed but not useable	14	7.14%
Copies completed and useable	162	82.65

Source: Field Work (5th November, 2025 to 13th June 2026).

A total of 196 copies of the questionnaire were administered to respondents drawn from the six selected indigenous airline operators using Bowley's proportional allocation technique, representing 100% of the sample size. However, 176 copies of the questionnaire were successfully retrieved, representing a retrieval rate of 89.80%, while 20 copies, representing 10.20%, were not returned by the respondents. Furthermore, out of the 176 retrieved questionnaires, 14 copies, representing 7.14% of the distributed questionnaires, were found to be incomplete or improperly completed and were therefore discarded from the analysis. Consequently,

162 copies of the questionnaire, representing 82.65% of the total questionnaires distributed, were correctly completed and considered suitable for data analysis.

4.2.1 Assessment of Reliability and Validity of the Measurement Model

Table 4.15 reveals the (factor) loadings, indicator reliability, and the reliability and convergent validity (AVE) of the constructs, based on the Smart PLS 4.0., output of the measurement model.

Table 4.15: PLS-SEM Assessment Results of Measurement Model

Latent Variables	Indicators	Convergent validity	Indicator reliability	AVE	Internal consistency	Reliability	
		Loadings			Composite	Reliability Cronbach's	
		<i>f</i> _k	>0.50		Reliability	coefficient Alpha (CA)	
		>0.70		>0.50	>0.70	>0.70	70-95
SF01	SF1	0.894	0.763	0.678	0.853	0.861	0.898
	SF2	0.831	0.834				
	SF 3	0.726	0.527				
	SF 4	0.882	0.611				
	SF 5	0.746	0.657				
CF02	CF1	0.828	0.530	0.686	0.896	0.893	0.891
	CF2	0.720	0.618				
	CF3	0.898	0.737				
	CF4	0.866	0.587				
	CF5	0.712	0.659				
OF03	OF1	0.755	0.570	0.655	0.892	0.870	0.856
	OF2	0.864	0.684				
	OF3	0.727	0.529				
	OF4	0.731	0.534				
	OF5	0.878	0.560				
ADC04	ADC1	0.891	0.707	0.784	0.815	0.841	0.841
	ADC2	0.845	0.655				
	ADC3	0.725	0.781				
	ADC4	0.721	0.874				
	ADC5	0.835	0.780				
AC05	AC1	0.822	0.676	0.744	0.820	0.839	0.819
	AC2	0.741	0.707				
	AC3	0.818	0.516				
	AC4	0.715	0.664				
	AC5	0.712	0.659				
RB06	RB1	0.809	0.503	0.813	0.787	0.765	0.743
	RB2	0.892	0.627				
	RB3	0.872	0.596				
	RB4	0.788	0.789				
	RB5	0.842	0.551				
IF07	IF1	0.755	0.570	0.755	0.842	0.715	0.7426
	IF2	0.864	0.584				
	IF3	0.727	0.629				
	IF4	0.831	0.534				
	IF5	0.748	0.760				
DI08	DI1	0.855	0.570	0.755	0.762	0.740	0.876
	DI2	0.764	0.784				
	DI3	0.627	0.729				
	DI4	0.831	0.534				
	DI5	0.748	0.660				

Note: **SF** = Resource flexibility; **CF** = Coordination flexibility; **OF** = Operational flexibility; **ADC** = Adaptive capacity; **AC** = Absorptive capacity; **RB** = Robustness; **IF** = IT infrastructure capability; **DI** = digital innovation adoption.

Source: SmartPLS 4.0., output on research data, 2026.

Table 4.15 presents the results of the assessment of the measurement model using Partial Least Squares Structural Equation Modeling (PLS-SEM) generated from SmartPLS 4.0. The assessment focused on evaluating the reliability and convergent validity of the measurement items through indicator loadings, indicator reliability, Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's Alpha (CA). These measures were assessed against the recommended thresholds of factor loadings greater than 0.70, indicator reliability above 0.50, AVE above 0.50, Composite Reliability above 0.70, and Cronbach's Alpha ranging between 0.70 and 0.95 (Hair et al., 2022; Henseler et al., 2016).

The results indicate that the indicators measuring Resource Flexibility (SF01) demonstrated satisfactory convergent validity, with factor loadings ranging from 0.726 to 0.894, all exceeding the recommended minimum threshold of 0.70. Similarly, the indicator reliability values ranged between 0.527 and 0.834, indicating that each measurement item explained more than 50 percent of its variance. Furthermore, the construct recorded an Average Variance Extracted (AVE) of 0.678, which exceeded the recommended benchmark of 0.50, thereby confirming adequate convergent validity. The construct also achieved a Composite Reliability (CR) value of 0.853 and a Cronbach's Alpha (CA) value of 0.898, both of which surpassed the acceptable threshold of 0.70, indicating excellent internal consistency reliability.

The measurement model further revealed that Coordination Flexibility (CF02) exhibited strong psychometric properties. The factor loadings ranged from 0.712 to 0.898, while indicator reliability values ranged from 0.530 to 0.737, all meeting the recommended minimum values. The construct achieved an AVE of 0.686, demonstrating that more than half of the variance in the indicators was explained by the latent construct. In addition, the Composite Reliability of 0.896 and Cronbach's Alpha of 0.891 indicate a high level of internal consistency among the measurement items.

Similarly, the indicators measuring Operational Flexibility (OF03) produced satisfactory results. The factor loadings ranged from 0.727 to 0.878, while the indicator reliability values ranged between 0.529 and 0.684, all exceeding the minimum acceptable threshold. The construct recorded an AVE of 0.655, confirming adequate convergent validity.

Furthermore, the Composite Reliability (0.892) and Cronbach's Alpha (0.856) exceeded the recommended benchmark, indicating that the measurement items consistently measured the intended construct.

The assessment of Adaptive Capacity (ADC04) also demonstrated satisfactory measurement properties. The indicator loadings ranged from 0.721 to 0.891, while the indicator reliability values ranged from 0.655 to 0.874, indicating strong explanatory power of the individual indicators. The construct achieved an AVE value of 0.784, which is substantially higher than the recommended threshold of 0.50, suggesting excellent convergent validity. Likewise, the Composite Reliability (0.815) and Cronbach's Alpha (0.841) confirmed that the construct possesses adequate internal consistency reliability.

For Absorptive Capacity (AC05), all factor loadings ranged between 0.712 and 0.822, exceeding the minimum acceptable value of 0.70. Indicator reliability values ranged from 0.516 to 0.707, indicating acceptable levels of reliability for each indicator. The construct further recorded an AVE of 0.744, suggesting that the latent construct explained approximately 74.4 percent of the variance in its indicators. In addition, the Composite Reliability value of 0.820 and Cronbach's Alpha of 0.819 demonstrate that the construct possesses satisfactory internal consistency.

The results further show that the indicators measuring Robustness (RB06) exhibited satisfactory reliability and validity. The factor loadings ranged from 0.788 to 0.892, while indicator reliability values ranged between 0.503 and 0.789, all exceeding the recommended threshold of 0.50. The construct achieved an AVE of 0.813, indicating excellent convergent validity. Furthermore, the Composite Reliability (0.787) and Cronbach's Alpha (0.743) both exceeded the acceptable minimum value of 0.70, confirming that the measurement scale is internally reliable.

Similarly, IT Infrastructure Capability (IF07) demonstrated satisfactory measurement characteristics. The factor loadings ranged from 0.727 to 0.864, while indicator reliability values ranged between 0.534 and 0.760, satisfying the minimum requirements. The construct achieved an AVE value of 0.755, indicating strong convergent validity. Likewise, the Composite Reliability value of 0.842 and Cronbach's Alpha of 0.743 indicate acceptable internal consistency reliability for the measurement scale.

Table 4.16: Fornell-Larcker Criterion for Discriminant Validity

Constructs	SF	CF	OF	ADC	AC	RB	IF	DI
Resource Flexibility (SF)	0.823							
Coordination Flexibility (CF)	0.614	0.828						
Operational Flexibility (OF)	0.582	0.663	0.809					
Adaptive Capacity (ADC)	0.541	0.587	0.618	0.885				
Absorptive Capacity (AC)	0.493	0.531	0.564	0.681	0.863			
Robustness (RB)	0.575	0.621	0.676	0.704	0.689	0.902		
IT Infrastructure Capability (IF)	0.486	0.538	0.611	0.584	0.657	0.625	0.869	
Digital Innovation Adoption (DI)	0.519	0.574	0.633	0.648	0.696	0.671	0.719	0.869

Source: SmartPLS 4.0 Output, 2026.

Note: The bold diagonal values represent the square roots of the Average Variance Extracted (AVE). SF = Resource Flexibility; CF = Coordination Flexibility; OF = Operational Flexibility; ADC = Adaptive Capacity; AC = Absorptive Capacity; RB = Robustness; IF = IT Infrastructure Capability; DI = Digital Innovation Adoption.

Table 4.16 presents the assessment of discriminant validity using the Fornell-Larcker criterion proposed by Fornell and Larcker (1981). According to this criterion, discriminant validity is established when the square root of the Average Variance Extracted (AVE) for each construct is greater than its correlations with every other construct in the model. This demonstrates that each latent construct shares more variance with its own indicators than it does with other constructs, thereby confirming that the constructs are empirically distinct.

The results reveal that Resource Flexibility recorded a square root of AVE of 0.823, which is greater than its highest correlation with another construct (0.614). Similarly, Coordination Flexibility recorded a square root of AVE of 0.828, exceeding all of its inter-construct correlations, the highest being 0.663 with Operational Flexibility. Operational Flexibility also satisfied the criterion, with a

square root of AVE of 0.809, which is greater than its highest correlation (0.676) with Robustness.

The results further indicate that Adaptive Capacity recorded the highest square root of AVE of 0.885, which exceeded its strongest correlation with Robustness (0.704). Likewise, Absorptive Capacity achieved a square root of AVE of 0.863, which was greater than its highest correlation (0.696) with Digital Innovation Adoption. Robustness also demonstrated satisfactory discriminant validity, with a square root of AVE of 0.902, exceeding all its correlations with the other latent constructs.

Furthermore, IT Infrastructure Capability produced a square root of AVE of 0.869, which was higher than its strongest correlation with Digital Innovation Adoption (0.719). Similarly, Digital Innovation Adoption recorded a square root of AVE of 0.869, which exceeded all of its inter-construct correlations, the highest being 0.719 with IT Infrastructure Capability

4.3 Tests of Hypotheses

Table 4.2: Summary of the Results for the Tested Hypotheses

S/N	Hypotheses	Outcome	Extent of Relationship	Decision
H ₀₁	There is no significant relationship between resource flexibility and adaptive capacity of indigenous airlines at Port Harcourt International Airport.	$\rho = 0.447$, $N = 162$, $p < 0.001$	Moderate Positive Significant Relationship	Rejected
H ₀₂	There is no significant relationship between resource flexibility and absorptive capacity of indigenous airlines at Port Harcourt International Airport.	$\rho = 0.293$, $N = 162$, $p < 0.001$	Weak Positive Significant Relationship	Rejected
H ₀₃	There is no significant relationship between resource flexibility and robustness of indigenous	$\rho = 0.422$, $N = 162$, $p < 0.001$	Moderate Positive Significant Relationship	Rejected

	airlines at Port Harcourt International Airport.			
H ₀₄	There is no significant relationship between coordination flexibility and adaptive capacity of indigenous airlines at Port Harcourt International Airport.	$\rho = 0.067$, $N = 162$, $p = 0.394$	Very Weak Positive Insignificant Relationship	Accepted
H ₀₅	There is no significant relationship between coordination flexibility and absorptive capacity of indigenous airlines at Port Harcourt International Airport.	$\rho = 0.097$, $N = 162$, $p = 0.220$	Very Weak Positive Insignificant Relationship	Accepted
H ₀₆	There is no significant relationship between coordination flexibility and robustness of indigenous airlines at Port Harcourt International Airport.	$\rho = 0.468$, $N = 162$, $p < 0.001$	Moderate Positive Significant Relationship	Rejected
H ₀₇	There is no significant relationship between operational flexibility and adaptive capacity of indigenous airlines at Port Harcourt International Airport.	$\rho = 0.460$, $N = 162$, $p < 0.001$	Moderate Positive Significant Relationship	Rejected
H ₀₈	There is no significant relationship between operational flexibility and absorptive capacity of indigenous airlines at Port Harcourt International Airport.	$\rho = 0.278$, $N = 162$, $p < 0.001$	Weak Positive Significant Relationship	Rejected
H ₀₉	There is no significant relationship between operational flexibility and robustness of indigenous airlines at Port Harcourt International Airport.	$\rho = 0.530$, $N = 162$, $p < 0.001$	Moderate Positive Significant Relationship	Rejected
H ₀₁₀	IT Infrastructure Capability does not significantly moderate the relationship between Strategic Flexibility and Organizational Resilience of indigenous airlines at Port Harcourt International Airport.	Zero-order: $r = 0.300$, $N = 162$, $p = 0.005$; Partial: $r = 0.360$, $N = 162$, $p = 0.046$	Positive Relationship Strengthened after Controlling for IT Infrastructure Capability	Relationship strengthened after control
H ₀₁₁	Digital Innovation Adoption does not significantly moderate the relationship between Strategic Flexibility and Organizational Resilience of indigenous airlines at Port Harcourt International Airport.	Zero-order: $r = 0.301$, $N = 162$, $p = 0.005$; Partial: $r = 0.562$, $N = 162$, $p < 0.001$	Positive Relationship Strongly Strengthened after Controlling for Digital Innovation Adoption	Relationship strengthened after control

Source: Researcher's Computation from SPSS Version 30.0 Output (2026).

Hypothesis One (H₀₁) examined the relationship between resource flexibility and adaptive capacity. The findings revealed a significant moderate positive relationship between resource flexibility and adaptive capacity ($\rho = 0.447$, $N = 162$, $p < 0.001$). Consequently, the null hypothesis was rejected, indicating that improvements in resource flexibility significantly enhance the adaptive capacity of indigenous airlines.

Hypothesis Two (H₀₂) investigated the relationship between resource flexibility and absorptive capacity. The findings showed a significant weak positive relationship between the two variables ($\rho = 0.293$, $N = 162$, $p < 0.001$). Therefore, the null hypothesis was rejected, implying that resource flexibility contributes significantly to improving the absorptive capacity of indigenous airlines.

Hypothesis Three (H₀₃) assessed the relationship between resource flexibility and robustness. The results established a significant moderate positive relationship ($\rho = 0.422$, $N = 162$, $p < 0.001$). Accordingly, the null hypothesis was rejected, suggesting that resource flexibility significantly enhances organizational robustness.

Hypothesis Four (H₀₄) examined the relationship between coordination flexibility and adaptive capacity. The analysis revealed a positive but statistically insignificant relationship ($\rho = 0.067$, $N = 162$, $p = 0.394$). Consequently, the null hypothesis was accepted, indicating that coordination flexibility does not significantly influence adaptive capacity among the indigenous airlines studied.

Hypothesis Five (H_{05}) investigated the relationship between coordination flexibility and absorptive capacity. The findings indicated a positive but statistically insignificant relationship ($\rho = 0.097$, $N = 162$, $p = 0.220$). Therefore, the null hypothesis was accepted, implying that coordination flexibility does not significantly influence absorptive capacity.

Hypothesis Six (H_{06}) examined the relationship between coordination flexibility and robustness. The results revealed a significant moderate positive relationship ($\rho = 0.468$, $N = 162$, $p < 0.001$). Hence, the null hypothesis was rejected, indicating that coordination flexibility significantly improves organizational robustness.

Hypothesis Seven (H_{07}) assessed the relationship between operational flexibility and adaptive capacity. The findings established a significant moderate positive relationship ($\rho = 0.460$, $N = 162$, $p < 0.001$). Consequently, the null hypothesis was rejected, indicating that operational flexibility significantly enhances adaptive capacity.

Hypothesis Eight (H_{08}) examined the relationship between operational flexibility and absorptive capacity. The results showed a significant weak positive relationship ($\rho = 0.278$, $N = 162$, $p < 0.001$). Therefore, the null hypothesis was rejected, implying that operational flexibility contributes significantly to improving absorptive capacity.

Hypothesis Nine (H_{09}) investigated the relationship between operational flexibility and robustness. The findings revealed a significant moderate positive relationship ($\rho = 0.530$, $N = 162$, $p < 0.001$). This represented the strongest relationship among all the bivariate hypotheses tested. Consequently, the null hypothesis was rejected, indicating that operational flexibility significantly enhances organizational robustness among indigenous airlines.

Hypothesis Ten (H_{010}) examined whether IT Infrastructure Capability significantly moderates the relationship between Strategic Flexibility and Organizational Resilience. The zero-order correlation between Strategic Flexibility and Organizational Resilience was $r = 0.300$ ($N = 162$, $p = 0.005$), while the partial correlation after controlling for IT Infrastructure Capability increased to $r = 0.360$ ($N = 162$, $p = 0.046$). The findings indicate that IT Infrastructure Capability strengthened the relationship between Strategic Flexibility and Organizational Resilience after statistical control. However, because the analysis employed partial correlation rather than an interaction-effect model, the findings do not provide conclusive statistical evidence of moderation.

Hypothesis Eleven (H_{011}) examined whether Digital Innovation Adoption significantly moderates the relationship between Strategic Flexibility and Organizational Resilience. The zero-order correlation

between Strategic Flexibility and Organizational Resilience was $r = 0.301$ ($N = 162$, $p = 0.005$), whereas the partial correlation after controlling for Digital Innovation Adoption increased to $r = 0.562$ ($N = 162$, $p < 0.001$). The findings suggest that Digital Innovation Adoption considerably strengthened the relationship between Strategic Flexibility and Organizational Resilience after statistical control. Nevertheless, since the analysis was based on partial correlation rather than an interaction-effect approach, the findings cannot be interpreted as conclusive evidence of moderation but rather indicate that Digital Innovation Adoption exerts an important contextual influence on the relationship between the study variables.

5.1 Summary of Findings

The study further established that coordination flexibility exhibited mixed outcomes. While coordination flexibility demonstrated a significant positive relationship with organizational robustness, its relationships with adaptive capacity and absorptive capacity were not statistically significant. This finding suggests that although coordination mechanisms contribute to organizational stability during disruptions, they may be insufficient by themselves to enhance organizational adaptation and organizational learning without complementary organizational capabilities.

With respect to technology adoption, the findings indicated that controlling for IT Infrastructure Capability and Digital Innovation Adoption strengthened the observed relationship between strategic flexibility and organizational resilience. The results suggest that technological capabilities enhance the effectiveness of strategic flexibility by improving organizational information processing, communication, decision-making, and operational responsiveness.

5.2 Conclusions

Specifically, the study concludes that resource flexibility significantly enhances organizational resilience through its positive influence on adaptive capacity, absorptive capacity, and robustness. This indicates that indigenous airlines capable of reallocating financial, human, technological, and operational resources efficiently are more likely to adapt successfully to environmental changes, acquire and utilize new knowledge, and maintain operational continuity during periods of disruption. Consequently, resource flexibility constitutes an essential strategic capability for improving organizational resilience.

The study further concludes that coordination flexibility contributes selectively to organizational resilience. While coordination flexibility significantly strengthens organizational robustness, it does not exert a significant influence on adaptive capacity and absorptive capacity. This finding suggests that effective coordination mechanisms alone are insufficient to enhance organizational adaptation

and learning unless complemented by other organizational capabilities such as decentralized decision-making, knowledge management systems, technological support, and leadership effectiveness.

Furthermore, the study concludes that operational flexibility represents the strongest dimension of strategic flexibility influencing organizational resilience. The significant positive relationships between operational flexibility and all three dimensions of organizational resilience indicate that indigenous airlines capable of rapidly adjusting operational procedures, flight schedules, workforce deployment, and service delivery systems are more resilient and better able to withstand operational disruptions. The particularly strong relationship between operational flexibility and organizational robustness demonstrates that operational agility constitutes a critical capability for sustaining business continuity in the face of environmental uncertainty.

5.3 Recommendations

Based on the findings and conclusions of this study, the following recommendations are made:

- i. Management of indigenous airlines should develop flexible resource management systems that enable the timely reallocation of financial, human, technological, and operational resources in response to changing environmental conditions. This can be achieved through strategic resource planning, cross-functional workforce deployment, flexible budgeting, and contingency resource allocation. Such initiatives will improve the airlines' adaptive capacity and enable them to respond more effectively to market fluctuations, regulatory changes, and operational disruptions.
- ii. Indigenous airline operators should invest more in organizational learning and knowledge management systems by allocating adequate resources to employee training, professional development, technological learning, and research activities. Establishing digital knowledge repositories, continuous learning programmes, and strategic partnerships with aviation training institutions will enhance the acquisition, assimilation, and application of new knowledge, thereby strengthening absorptive capacity.
- iii. Airline management should institutionalize enterprise-wide resource contingency planning by maintaining adequate financial reserves, alternative operational resources, backup equipment, and emergency response mechanisms. Flexible resource deployment policies should be integrated into business continuity plans to ensure that airlines can sustain operations during periods of economic uncertainty, operational disruptions, or industry crises.
- iv. Although coordination flexibility did not significantly influence adaptive capacity,

indigenous airlines should improve internal coordination through decentralized decision-making, enhanced communication channels, and integrated operational planning. Management should empower departmental managers to make timely operational decisions while promoting collaboration across functional units. These measures may strengthen the effectiveness of coordination in improving organizational adaptability.

5.4 Contributions to Knowledge

One of the unique contributions of this study is the incorporation of technology adoption, measured through IT Infrastructure Capability and Digital Innovation Adoption, into the strategic flexibility–organizational resilience framework. Previous studies on strategic flexibility and organizational resilience have rarely examined technology adoption within the context of indigenous airlines in Nigeria. Although the analyses employed in this study indicate that technology adoption strengthens the relationship between strategic flexibility and organizational resilience after statistical control, the findings underscore the strategic importance of technological capabilities in enhancing organizational responsiveness, information processing, decision-making, and resilience. Consequently, the study broadens the understanding of the role of technology adoption in strengthening organizational capabilities within the aviation industry.

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