Strategic Thinking and Innovation Performance; The Mediating Role of Absorptive Capabilities

Banji Rildwan Olaleye[a], Murat Akkaya[b], Okechukwu Lawrence Emeagwali[c], Razan Ibrahim Awwad[d], Sameer Hamdan[e]

Abstract

Purpose – This paper aims to explore the relationship between strategic thinking and its dimensions on innovation performance. It also investigates whether improved innovative performance is attributable to strategic thinking competency and absorptive capabilities among IT firms in Nigeria.

Design/methodology/approach – cross-sectional data were obtained using a survey administered to 182 senior-level and mid-level managers of information technology firms in Nigeria. This paper applied the PLS-SEM to test the hypothesized relationships.

Findings – This study results show that strategic thinking components: systematic thinking, divergent thought, and reflection positively impact innovation performance while absorptive capability insignificantly mediates their relationship.

Originality/value – The study fills unattended gaps proposed in extant literature by delving into the relevance of strategic thinking as an orchestration, contributing to innovation performance among the organization's top hierarchy by providing evidence from a dynamic industry in Nigeria. The research supports prior literature investigating the relationship between innovation performance and strategic thinking. It offers new insights into similar organizational capabilities that can aid innovativeness and similar organizational outcomes, especially in a dynamic environment.

Keywords: *Absorptive capabilities, Innovation performance, Strategic thinking.*

Introduction

In today's challenging and highly dynamic business environments, innovation has increasingly become a core competence for the success of high-technology organizations (Chung & Choi, 2016; Somech & Drach-Zahavy, 2013). To eliminate old technology and technology lock-in fetter, enterprises have to forget outdated knowledge and abandon established thoughts and core rigidity. It is known to disregard inertia within firms, provide new cognitive space for innovation, generate new knowledge to be recognized and nurtured and subsequently, inspire innovation. In achieving alignment toward the inevitable changes in the technological environment in the present and the future, companies rely upon their absorptive capacity before designing their innovation strategy and eventually modernize their

business model (Veile, Kiel, Müller, & Voigt, 2019). Factually, the current highly collaborative society has made internal innovation insufficient in creating competitive advantages; thus, firms are obliged to engage in external knowledge acquisition, assimilation, and exploitation (Cohen and Levinthal, 1990).

To put this tersely, recognition of CEOs' primary roles in terms of their thought and intellectual capability is very sacrosanct, going by their job description, which encompasses corporate and strategic decisions and overall operations of the establishment. Meanwhile, studies previously conducted opined on lapses and the absence of strategic thinking by Top Management Team members being a foremost impediment to organizational performance (Bonn, 2001; Essery, 2002; Mason, 1986; Zabriskie and Huellmantel, 1991). Strategic thinking remains an inevitable capacity procedure to support managers in evolving better

[a, b, c, d] *Business Management Department, Girne American University, Cyprus.* *banji.olaar@gmail.com*
[e.] *Business Administration Department, Near East University, Cyprus.*

strategies and inspiring employees to collaborate in innovative tactics which unvaryingly aid a firm's survival.

Numerous studies recently conducted by Distel (2019); Saurabh & Derrick (2020) established the prominent role of strategic thinking among managers in developing absorptive capacity and its antecedents. In strategy and organization research, absorptive capacity developed as knowledge management is emerging as a dominant source of competitive advantage and survival due to the uncertainty of the business environment, and this has led to firms requiring new external knowledge to assimilate and apply to commercial ends (Cohen & Levinthal, 1990).

Research Problem

Irrespective of persistent suggestions by extant studies, research on the role managers play in the facilitation of absorptive capacity remains limited yet very important since managers represent the core knowledge source and mode of knowledge transfer (Cosaert et al., 2018; Distel, 2019; Yao and Chang, 2017; Argote and Ingram, 2000).

The role of absorptive capacity in innovation has been the bane of more recent extant studies (Tsai, 2001), business performance (Mukherjee et al., 2000; Lane, Salk, & Lyles, 2001; Tsai, 2001), intra-organizational and inter-organizational transfer of knowledge (Gupta & Govindarajan, 2000; Lane & Lubatkin, 1998; Lane et al., 2001). Meanwhile, scholars had theorized that strategic thinking influences decision-making, but Rezaei-Zadeh and Darwish (2016) postulated the presence of an indirect effect of strategic thinking on absorptive capacity. This proposition reflects a gap to build upon by establishing the direct and indirect nexus between strategic thinking, absorptive capacity and innovation performance.

Despite much research in each area of strategic thinking and innovation in organizations, little research has been carried out on the relationship between these two factors and their effect on each other, with none considering the moderating role of absorptive capacity as an organizational capability. Building on extant literature exploring the relationship between strategic thinking and innovation performance through absorptive capabilities, this study aims to establish whether improved innovative performance is attributable to

strategic thinking competency and absorptive capabilities among IT firms in Nigeria.

Research Questions

This paper discusses the issue of strategic thinking (ST). It specifically examines its impact on innovation performance (INP) and how absorptive capacity (AC) can mediate the relationship between ST and INP in the information technology sector. Particularly within southwest Nigeria, taking cognizance of top management teams, as well as middle-level managers by answering the following questions:

RQ1: Is there any relationship between ST and INP in IT firms?

RQ2: Is there any significant and positive relationship between ST and AC?

RQ3: Does AC have a significant and positive influence on INP?

RQ4: Does the AC have a significant positive mediation effect on the relationship between ST and INP in IT firms?

Theoretical framework, hypotheses development and research model

Meaning and conceptualization of strategic thinking

Goldman (2012) defined strategic thinking as a mental process involving synthesizing, utilizing intuition, and creativity toward problem identification and remedy control. Hence, this process intends to improve organizational performance through innovative and creative activities that enhance overall managerial effectiveness. Also, strategic thinking could be viewed as the attitude of an organization to its collective thought process responsible for driving its smart actions and for inspiring the entire firm to work towards a shared goal (Hamel and Prahalad, 1994; Bonn, 2005; Alsaaty, 2007; Dhir et al., 2018; Dhir, 2016, 2017) achieving competitive advantage over competitors and facilitating the creation of new ventures (Shaheen et al., 2012; Kazmi and Naaranoja, 2015).

Dimension of Strategic Thinking

Nuntamanop et al. (2013) characterize strategic thinking to represent capability managers are required to possess, which entails conceptual thinking, visionary thinking, creativity, analytical thinking, learning, synthesizing and objectivity. Gross (2016) presented strategic thinking as a construct comprised of three cognitive dimensions: systems

thinking, reframing and reflection. Scholars (Bonn, 2005; Jelenc & Pisapia, 2015; Moon, 2013) have confirmed that strategic thinking comprises three cognitive capabilities; systems thinking, divergent thought processing and reflection. Systems thinking represents the ability to identify interconnections within a system and between systems, recognizing the acquaintances across functions and departments. The strategic thinkers understand the relationship between the functional, business and corporate levels of strategies to the external context from a vertical perspective (Liedtka, 1998). Divergent thought processing represents the ability to identify, differentiate and use multiple perspectives to assess a problem. Reflection represents the ability to use one's perspectives and that of others to analyze past actions.

The above represents systems thinking which are noted by Bonn (2005), Pisapia et al. (2005) and Gross (2016). The second is "divergent thought process leading to outcomes which are both creative and innovative (Bonn 2005; Graetz 2002; Pisapia et al., 2005; Gross 2016 and Dhir et al., 2018). Third among them is "reflection," which mirrors bi-directional use of a manager's experiences and knowledge repositories to chart novel visions of the future for the firm as characterized by Heracleous (1998), Bonn (2005), Pisapia et al. (2005) and Dhir et al. (2018).

Strategic thinking and innovation performance
Early work by Heracleous (1998) characterized strategic thinking as individuals' competencies in creative thinking and synthesizing. Graetz (2002) extended the characterization by conceptualizing strategic thinking as individuals' ability to be intuitive, creative, and inventive. Bonn (2005) proposed a model of strategic thinking that incorporated systems thinking, creative thinking and vision orientation thinking. Meanwhile, Shaker et al. (2012) assert that strategic thinking requires creativity, foresight and insight. At the same time, foresight is the capability that allows firms predict the future.

Extant studies on the effect of strategic thinking on organizational performance reveal a body of inconclusive findings (Rajagopalan and Spreitzer,1997). While some studies, including Hambrick and Schecter (1983); Haveman (1992); Zajac and Kraatz (1993), found out that strategic thinking enhances performance, other studies associate strategic thinking with a reduction in firm performance (Jauch et al., 1980; Singh, House, and

Tucker 1986). Yet, a considerable number of studies have found strategic thinking to have no association with firm performance (Kelly and Amburgey, 1991; Zajac and Shortell, 1989) and even mixed effects (Smith and Grimm, 1987). Such contradictions in extant research findings point to the lack of a direct effect of strategic thinking on firm performance and the presence of an indirect effect. These contradictory findings imply that the relationship between strategic thinking and firm performance may not be direct, as most previous studies have assumed. (change performance to innovation)
Hypothesis 1 Strategic thinking is positively related to innovation performance.

strategic thinking and absorptive capacity
Absorptive capacity refers to a firm's ability to create and arrange the knowledge for developing operational capabilities to achieve a competitive advantage (Zahra and George, 2002; Lane et al., 2006; Sun and Anderson, 2010). It is embedded in a firm's systems, processes, and routines (Todorova and Durisin, 2007). AC consists of four unique but complementary organizational learning processes: acquisition, assimilation, transformation, and exploitation (Zahra and George, 2002). Acquisition capability refers to a firm's ability to identify and acquire external knowledge important to its business. Assimilation refers to routines and processes that the firm uses to analyze, process, interpret and understand the acquired information. Transformation refers to a firm's ability to build and purify the routines that combine existing knowledge with newly acquired expertise. Exploitation refers to a firm's ability to exploit existing and transformed knowledge into its operations. The focus of exploitation is on the conversion of knowledge into new products. The former two capabilities can be combined as a potential AC that captures the firm's ability to value and acquire external knowledge, aiming to build a firm's knowledge reservoirs. The latter two can be combined as a realized AC that leverages the acquired knowledge on its operations, aiming to develop innovation. A potential AC enables firms to explore new sources of knowledge, while a realized AC ensures that newly acquired knowledge can be used to commercial ends.

Scholars have supported these arguments by noting that managers must think strategically as they strive to efficiently develop and orchestrate the organization's absorptive capacity (Rezaei-Zadeh and

Darwish, 2016; Ocasio, 2011). Absorptive capacity represents one of such capacities which facilitates the identification, acquisition, assimilation, and application of knowledge to profitable ends (Todorova and Durisin, 2007; Cohen and Levinthal, 1990). Extant studies have established the importance of absorptive capacity in knowledge generation (Cosaert et al., 2018; Distel, 2019; Kotabe et al., 2017). Organizations understand the importance of external knowledge and invest in the development of absorptive capacity (Yao and Chang, 2017). Scholars have characterized absorptive capacity as a multidimensional construct characterized as four underlying knowledge management capabilities – knowledge acquisition, knowledge assimilation, knowledge transformation and knowledge exploitation (Ali et al., 2016; Zahra & George, 2002). Each of these underlying capabilities exhibits distinct features with different functions (Kazadi et al., 2016; Jansen et al., 2005).

Research suggests that strategic thinking is a capability that enables a holistic understanding of the organization, and it allows managers to understand the interdependencies between the organization and its environment (Fontaine, 2008; Norzailan et al., 2016). Therefore, strategic thinkers understand the value of an acquisition capability that allows organizations to collect information from the environment. Strategic thinking enables managers to understand that divergent views and multiple perspectives must comprehend the information collected from the environment and transform them into comprehensible forms (Gross, 2016; Pisapia et al., 2009). Besides, strategic thinking has been found to enable managers to use multiple perspectives to assess this interface (Pisapia et al., 2009), which allows them to create new and unconventional solutions (McKenzie et al., 2009). Since strategic thinking leads to decisions based on the "ongoing acquisition of new knowledge and strategic direction" (Gross, 2017), this study suggests that managers who are strategic thinkers support the development of absorptive capacity in their organization.

Based on these arguments, we believe that strategic thinkers will support the development of absorptive capacity. Therefore, we posit that organizations, where managers are prolific strategic thinkers, are more likely to exhibit higher levels of absorptive capacity, and we hypothesize a positive relationship between strategic thinking and the absorptive capacity of the organization:

Hypothesis 2 strategic thinking is positively related to absorptive capacity.

Absorptive capacity influence on innovation performance and its mediating role

The concept of absorptive capacity is defined as the capacity to acquire and use knowledge effectively, and this capacity critically affects firms' innovative activities and business performance (Cohen and Levinthal, 1990). Presently, the swift changing and dynamic business environs necessitate pivotal absorptive capability from firms to enable it to meet up with the growing innovative performance, as an important medium for developing and actualizing a competitive advantage (Khoo et al., 2014). Absorptive capacity refers to the process of acquisition, dissemination, organizational memory, and shared interpretation of information, whereby new insights, or knowledge, that facilitate organizational changes responsible for enhancing performance are developed (Slater and Narver, 1995). Absorption capacity is a dynamic process capability encompassing identification, assimilation, and integration of new-fangled knowledge. Darroch (2005) mentioned that knowledge acquisition is a dimension of absorptive capacity which, alongside knowledge dissemination, positively affects innovation. Similarly, even research conducted by Tsai (2001); Gebauer, Worch & Truffer (2012); Lane, Koka & Pathak (2006), and Andreeva & Kianto (2011) affirm that absorptive capacity plays a contributory role in facilitating organizational innovation.

Absorptive capacity is an important factor to help enterprises achieve organizational performance (Fosfuri and Tribó, 2008). Most of the studies have shown that absorptive capacity has a positive impact on innovation performance. Absorptive capacity promotes the enterprise's innovation performance from innovation speed, innovation frequency, and innovation level (Kostopoulos et al., 2011). Absorptive capacity at a high level can bring many benefits to an enterprise, such as first-mover advantages, rapid response to customer needs, and avoidance of the "lock-in effect" and "competence trap" (Cohen and Levinthal, 1990; Hamel, 1991). These advantages, in turn, encourage enterprises to gain higher innovation performance.

The different dimensions of absorptive capacity also play different roles in promoting innovation. Zahra and George (2002) believe that potential absorptive capacity helps companies identify and

obtain new external knowledge. Realized absorptive capacity enables enterprises to combine existing knowledge and new knowledge to develop new ideas and new inference and apply it to solve practical problems. Acquisition ability helps find more opportunities, useful in helping enterprises better understand customer needs, and thus target product improvement and new product development (Nieto and Quevedo, 2005). The ability of assimilation and transformation can help organizations avoid path dependence to enable enterprises to respond to changes (Todorova and Durisin, 2007) better. The application ability is necessary to transform knowledge into practical application and contribute to the formation of new products or new ideas (Neergaard, 2005).

Strategic thinking enables managers to establish the relationship between the environment and organizational processes (Barr et al., 1992; Capra, 2002; Gross, 2017). Once managers establish the linkage, they understand the need for new information/knowledge to adjust internal processes as per the environmental needs (Zahra and Nambisan, 2012). The recognition of new knowledge triggers an adaptive response, forcing managers to focus on developing capabilities that will help the organization in acquiring/generating new knowledge (Floyd and Lane, 2000; Huff et al., 1992). Thus, managers with sound strategic thinking capabilities are likely to promote the development of absorptive capacity. Besides, strategic thinking enables managers to integrate divergent views to analyze, interpret and comprehend the complexities of the organizational ecosystem (Zahra and Nambisan, 2012).

Thus, strategic thinking enables managers to think beyond existing conceptions and beliefs and connect

events and issues that may otherwise seem fragmented (Robinson et al., 1997; De Bono, 1996). Hence, strategic thinkers understand the need for capabilities that enable organizations to analyze and interpret new and diverse knowledge (Gentner and Stevens, 2014; Pisapia et al., 2005). Therefore, they are supportive of the developing absorptive capacity in their organization.

Andreeva and Kianto (2011) mentioned that firms aspiring to enhance the rate of innovation must master their absorptive capacity. In contrast, literature also contended that a firm that cannot absorb new external knowledge would not benefit from innovation (Kostopoulos et al., 2011). Other studies found absorptive capacity to influence innovative behavior generation positively, and the construct has also been found to improve the effectiveness of developmental product processes (Fosfuri and Tribó, 2008; Jantunen, 2005). Furthermore, in their study conducted among Malaysian manufacturing SMEs, Mamun, Fazal, Mohiuddin & Su (2018) suggested that managers ought to consider how the partial mediation effects of absorptive capacity enhance innovative capacity.

Therefore, this study identifies absorptive capacity as a significant factor to affect innovation, and thereby postulating the following hypothesis:

Hypothesis 3: absorptive capacity positively influences innovation performance.
Hypothesis 4: Absorptive Capacity mediates the relationship between strategic thinking and innovation performance.

Following the prior discussions in the literature review and the hypotheses development, the research model is represented in figure 1 as follows;
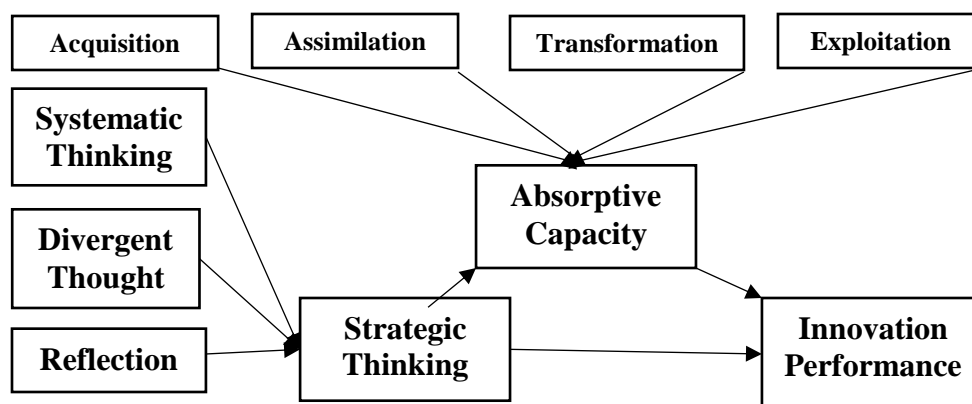

Figure 1. **Research Model**

Methodology

This study focuses mainly on registered Information Technology firms in Nigeria since innovation is always noticed in a dynamic environment, which requires an investment of time and effort in scanning the external environment regardless of their strategy and industry type. The unit of analysis is the organizational level, where CEOs and senior managers from the top to mid-level managerial positions would be representing the IT firms since they have an all-inclusive understanding of organizational processes and principally participate in planning and decision making. Meanwhile, IT firms in Lagos were selected since most of them had their head offices situated in Lagos, being the most commercialized and business-driven populated area in the country. A comprehensive list was compiled from sectoral and national bodies like Nigeria Computer Society (NCS), Information Technology Association of Nigeria (ITAN), and The National IT Development Agency (NITDA) responsible for the implementation of the National ICT policy. This was done to ascertain the number of licensed working information technology companies eligible to partake in this survey.

A quantitative cross-sectional survey research design was employed, where data were sourced using a well-structured instrument adapted from previous studies. The questionnaires were randomly and purposively distributed within three months, considering the uncontrollable effects of the pandemic on response rate from selected firms. A sample size of 183 was proposed as suitable for the given parameters, considering the population of 350 registered firms and using "G*Power" software with an error probability of 0.05 (Faul et al., 2009).

Measures

Constructs contained in this study were measured using scales adapted from previous studies. Strategic Thinking (ST) was treated as a dimensional construct with three dimensions: systematic thinking, divergent thought, and reflection. This scale is based on the ten-item scale utilized by Liedtka (1998) and Napier and Albert (1990). Absorptive Capacity (ABSORB) was viewed as a need for knowledge relevant to organizations in increasing creativity. This study recognizes that absorptive capacity can be divided into potential absorptive capacity and realized absorptive capacity, including four dimensions extracted from the two categories.

Moreover, this study used fourteen items to measure absorptive capacity (Zahra & George, 2002; Cohen & Levinthal, 1990). Similarly, managerial support (MGS) was viewed as commitment from the administrators in the organization considering some pressing and uncontrollable circumstances of their employees that require attention towards their development in achieving better performance. Considering innovation performance (INP) as the outputs or impacts of a firm's inventions, the authors measure this construct using four items based on Brettel and Cleven (2011) by examining their self-reported satisfaction with innovation outcome performance. Respondents were asked how far they agreed with statements on aspects of innovations the firm had introduced within the last three years. Hence, this study measured all constructs using multiple items on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Data Analytical Techniques

The data analysis procedure deployed in this study is the Partial Least Square Structural Equation Modelling (PLS-SEM) technique using SmartPLS version 3.0. However, in executing the analysis, the widely established two-step approach (Anderson & Gerbing, 1988; Chin, 1998) was followed, which entails evaluating the measurement model's psychometric properties and examining our hypothesized structural model. The socio-economic profile of the respondents: gender, marital status, among others, was described with the aid of frequency and percentages.

Analysis and Results
Descriptive Profile of the Respondents

The socio-economic characteristics of the respondents, including gender, marital status, working experience, academic qualifications, and job positions, are presented in Table 1.

The gender distribution shows that male respondents accounted for 69.2% of total responses obtained, while 30.8% are female. On the average, majority of the respondents are still in their active age with an average working experience of above 20 years. If linked with the marital status, an above-average proportion (59.3%) are married compared to 33.5% accounting for being single, while the remaining 6% and 1.1% are divorced and widowed, respectively. The respondents encompass 68.1% being the CEOs while 15.9% occupied Director and

closely followed positions were manager (14.8%) with the least occupying supervising position. Finally, responses concerning academic qualification

evidenced that the majority (39%) possess master's degree, closely followed by those with bachelor certificate (34.1%), and the least were those with their Doctorate (12.1%).

Table 1. **descriptive profile of the respondents**

Demographic Variables	Categories	Frequency (n=182)	Percentage
Gender	Male	126	69.2
	Female	56	30.8
Marital Status	Single	61	33.5
	Married	108	59.3
	Divorced	11	6.0
	Widowed	2	1.1
Working Experience	Below 10 years	56	30.8
	10 - 15 years	18	9.9
	16 - 20 years	10	5.5
	21 – 25 years	46	25.3
	Above 25 years	52	28.6
Academic Qualifications	Bachelors	62	34.1
	Masters	71	39.0
	Doctorate	22	12.1
	Others	27	14.8
Job Position	Chief Executive Officer (CEO)	124	68.1
	Director	29	15.9
	Supervisor	2	1.1
	Manager	27	14.8

Source: *Computations from Survey Data, 2020*

Measurement Model

The results of the measurement model are presented in Table 2, using the Partial Least Square Structural Equation Modeling (PLS-SEM) to confirm the reliability, convergent, and discriminant validity of all constructs in the study. The outer loadings, Composite reliability (CR), Cronbach's alpha (CA), and rho_A as measures of assessing construct's reliability had values above the 0.7 threshold for all the dimensions, which affirms that item-construct structure in our model is of good reliability (Dijkstra & Henseler, 2015; Chin, 1998). The average variance extracted (AVE) values for all study variables were above 0.50, except the strategic thinking construct (AVE = 0.471), which still falls within the acceptance region since its Cronbach's alpha (CA= 0.857) and Composite reliability (CR = 0.887) are higher than 0.6. These support the convergent validity (Fornell & Larcker, 1981), and hence, previous studies have also reported low AVE value of adapted scales (Iyer et al.,

2016; Olaleye *et al.,* 2021; 2021).

The discriminant validity among the variables is also recognized following the Fornell-Larcker criterion (1981). The square root of AVE (represented diagonally in bold format) for each latent variable is higher than the inter-construct correlation for each construct in the measurement model depicted in table 3. Furthermore, critiques made on the reliability of Fornell-Larcker's (1981) criterion invented the alternative proposed technique, the Heterotrait-Monotrait (HTMT) ratio of correlations, to demonstrate its superiority over the Fornell and Larcker (1981) approach (Henseler *et al.*, 2015). As observed in the table, the HTMT values shown in italics right above the square roots of AVE in diagonal for all the constructs in our measurement model are below the thresholds of 0.85, as recommended by Kline (2015), which affirms an actual discriminant validity existence among variables in our model.

Table 2. **Measurement model**

Constructs and Indicators	*Loadings (λ)*	Mean	Std. Deviation	Skewness	Kurtosis
Strategic Thinking	*Systematic Thinking*				
SYT1	0.960***	2.676	1.350	0.486	-1.012
SYT2	0.961***	2.604	1.382	0.562	-1.023
SYT3	0.954***	2.637	1.338	0.535	-0.972
SYT4	0.896***	2.522	1.386	0.441	-1.126
	Divergent Thought				
DVT1	0.973***	2.896	1.639	0.184	-1.648
DVT2	0.973***	2.890	1.647	0.207	-1.646
DVT3	0.965***	3.022	1.641	0.108	-1.656
	Reflection				
REF1	0.857***	2.192	0.921	0.672	-0.081
REF2	0.862***	2.082	0.913	0.839	0.270
REF3	0.844***	1.978	1.053	1.267	1.341
Absorptive Capacity	*Acquisition capability*				
ACQ1	0.919***	3.060	1.210	-0.173	-1.029
ACQ2	0.930***	3.011	1.297	0.025	-1.217
ACQ3	0.921***	2.978	1.271	-0.007	-1.194
	Assimilation capability				
ASS1	0.965***	3.121	1.393	0.003	-1.378
ASS2	0.964***	3.126	1.351	0.092	-1.431
ASS3	0.974***	3.154	1.402	0.025	-1.466
ASS4	0.930***	3.000	1.579	-0.042	-1.582
	Transformation capability				
TR1	0.847***	2.907	1.405	0.036	-1.346
TR2	0.654***	3.412	1.271	-0.424	-0.940
TR3	0.896***	2.808	1.442	0.097	-1.412
	Exploitation capability				
EXP1	0.931***	2.967	1.288	0.094	-1.359
EXP2	0.939***	2.951	1.348	0.023	-1.358
EXP3	0.926***	3.082	1.262	-0.107	-1.250
Innovation Performance					
INP1	0.854***	4.533	0.590	-0.858	-0.242
INP2	0.846***	4.538	0.599	-0.924	-0.135
INP3	0.800***	4.495	0.677	-0.996	-0.229

Note: *** = $p < 0.01$.

Table 3. **Inter-construct correlations, Convergent and Discriminant Validity**

Constructs	CA	Rho	CR	AVE	ABSORB	INP	STR
Absorptive Capability	0.935	0.957	0.947	0.596	**0.772**	0.215	0.120
Innovation Performance	0.782	0.791	0.872	0.695	0.183	**0.834**	0.232
Strategic Thinking	0.857	0.906	0.887	0.471	-0.084	0.172	**0.686**

Notes: **CA**=Cronbach's Alpha, **CR**=Composite reliability, **rho**= rho_A reliability indices, **AVE**= Average Variance Extracted, [a]= Diagonal values in bold are the square root of AVE, [b]= *Italicized* values above the square root of AVE are Heterotrait-Monotrait (HTMT) ratios.

To conclude, collinearity between and among the predictors is tested by calculating the Variance Inflation Factor (VIF) for each independent variable. The values presented in Table 4 depict the absence of collinearity or multicollinearity since all the VIF values met the threshold value of below 3.0 (Hair et al., 2017; Becker et al., 2015).

Table 4. **Structural Model Multicollinearity (VIF Values)**

Constructs	ABSORB	INP	STR
Absorptive Capability	-	1.007	-
Innovation Performance	1.043	1.007	-
Strategic Thinking	-	-	-

Assessing the Structural Model

In assessing the hypothesized relationship between the constructs as depicts in the structural model in Fig 2, the R^2 values, the beta (*β*) coefficients alongside related t-values obtained from

bootstrapping using 2,000 subsamples and effect sizes (f^2) are being examined as recommended by Hair *et al.,* (2019), and presented in table 5. At first, the direct effects of the predictor variable on the outcome variables are analyzed. From the result, it was evidence that strategic thinking (STR) had a positive effect on innovation performance ($β$ = 0.189, p < 0.05) and absorptive capacity ($β$ = 0.198, p < 0.05), explaining approximately 7% (R-squared = 0.069) while strategic thinking (STR) shows an insignificant and inverse relationship with absorptive capacity ($β$ = -0.006, p > 0.05).

Furthermore, considering the specific mediating (indirect) effect of strategic thinking (STR) on innovation performance (INP), hypothesis 4 revealed that absorptive capacity (ABSORB) shows insignificant indirect relationship between STR-INP path ($β$ =

0.187, t = 0.852, p > 0.05). Hence, we find support for all hypothesized direct paths in our study model except Strategic Thinking -> Absorptive Capacity. Simultaneously, the indirect effect accounted for an insignificant path Strategic Thinking -> Absorptive Capacity-> Innovation Performance.

However, in addition to observing the beta coefficients ($β$), statistical significance (*P*-value) and variance explained (R^2), Sullivan and Feinn (2012); Chin, Marcolin, and Newsted (1996) recommends that the substantive significance (f^2) also referred to as the effect size, be reported to reveal the actual magnitude of the observed effects. The direct paths' effect sizes revealed that STR-INP and ABSORB-INP paths recorded small effect sizes since the f^2 fell within the limit of 0.02 - 0.15 as suggested by Cohen (1988).

Table 5. **Results of the Path Analysis**

Hypotheses	Model Fit Indices: SRMR= 0.122					
Direct Effects	**B values**	**T statistics**	**P values**	**f²**	**R²**	**Decision**
H1: Strategic Thinking -> Innovation Performance	0.189	2.677***	0.007	0.038	0.069	S
H2: Strategic Thinking -> Absorptive Capacity	-0.006	0.217	0.828	0.000	-	NS
H3: Absorptive Capacity -> Innovation Performance	0.198	2.666***	0.008	0.042	0.069	S
Indirect Effects						
H4: Strategic Thinking -> Absorptive Capacity-> Innovation Performance	0.000	0.187	0.852	-	-	NS

*Note: ***p < 0.05 (based on two-tailed test). S- supported NS- Not supported*

Finally, we examine the predictive validity of the study model using the PLS predict functionality in SmartPLS. We do this to examine the predicting items and constructs in our study model to predict the outcome variable using an out-of-sample study (Shmueli et al., 2016). This process of establishing out-of-sample predictability (predictive validity) was conducted following Shmueli et al., (2016) recommendation. They suggested carrying out cross-validation using hold-out samples and then generating k-fold cross-validated prediction errors and error summary statistics. These error summary statistics include the root mean squared error (RMSE), the mean absolute error (MAE) as well as the mean absolute percentage error (MAPE). The PLS predict analysis yielded Q^2 values for each of the constructs as follows ABSORB (0.945), INP (-0.504), and STR (0.943); since they are all greater than zero,

it signals the sufficient predictive relevance and predictive validity of the model. However, while the obtained RMSE, MAE, and MAPE values for most of the indicators were all smaller relative to their counterparts in the linear model (LM), as shown in the table below, a substantial number of indicators had their error summaries in the PLS model greater than those of the linear model (LM), which implies a low predictive power. According to Shmueli et al. (2016), when this occurs, it is indicative that those items concerned are insensitive to model changes, or the study model is adept at explaining them rather than predicting them out-of-sample. However, since we are more concerned with the predictive relevance of the latent constructs in the model and have established its predictive validity, we conclude that the study model's predictive performance is sufficient at the latent construct level.

Table **PLS Predict Analysis**

Latent Construct Prediction Summary

Constructs	Q^2
ABSORB	0.945
INP	0.504
STR	0.943

Measurement Indicator Prediction Summary

|	PLS				LM				PLS-LM			
	RMSE	MAE	MAPE	Q^2	RMSE	MAE	MAPE	Q^2	RMSE	MAE	MAPE	Q^2
ACQ1	0.637	0.501	23.535	0.726	0.000	0.000	0.000	1.000	0.637	0.501	23.535	-0.274
ACQ2	0.614	0.513	23.774	0.778	0.000	0.000	0.000	1.000	0.614	0.513	23.774	-0.222
ACQ3	0.700	0.554	27.258	0.700	0.000	0.000	0.000	1.000	0.700	0.554	27.258	-0.300
TR1	1.271	1.031	54.707	0.190	0.000	0.000	0.000	1.000	1.271	1.031	54.707	-0.810
TR2	1.246	1.042	47.279	0.051	0.000	0.000	0.000	1.000	1.246	1.042	47.279	-0.949
TR3	1.281	1.075	57.804	0.222	0.000	0.000	0.000	1.000	1.281	1.075	57.804	-0.778
EXP1	0.731	0.536	27.798	0.681	0.000	0.000	0.000	1.000	0.731	0.536	27.798	-0.319
EXP2	0.776	0.601	30.123	0.673	0.000	0.000	0.000	1.000	0.776	0.601	30.123	-0.327
EXP3	0.746	0.537	24.245	0.654	0.000	0.000	0.000	1.000	0.746	0.537	24.245	-0.346
AS1	0.672	0.540	23.096	0.770	0.000	0.000	0.000	1.000	0.672	0.540	23.096	-0.230
AS2	0.672	0.507	20.576	0.756	0.000	0.000	0.000	1.000	0.672	0.507	20.576	-0.244
AS3	0.670	0.511	21.834	0.775	0.000	0.000	0.000	1.000	0.670	0.511	21.834	-0.225
AS4	0.837	0.665	32.113	0.722	0.000	0.000	0.000	1.000	0.837	0.665	32.113	-0.278
INP1	0.585	0.525	12.431	0.027	0.614	0.502	11.879	-0.073	-0.029	0.023	0.552	0.099
INP2	0.597	0.528	12.581	0.017	0.654	0.545	12.982	-0.181	-0.057	-0.017	-0.401	0.198
INP3	0.668	0.570	14.114	0.038	0.665	0.524	12.906	0.047	0.003	0.045	1.208	-0.009
SYT1	0.673	0.512	26.480	0.754	0.000	0.000	0.000	1.000	0.673	0.512	26.480	-0.246
SYT2	0.694	0.549	30.247	0.750	0.000	0.000	0.000	1.000	0.694	0.549	30.247	-0.250
SYT3	0.722	0.557	28.648	0.712	0.000	0.000	0.000	1.000	0.722	0.557	28.648	-0.288
SYT4	0.839	0.700	39.322	0.638	0.000	0.000	0.000	1.000	0.839	0.700	39.322	-0.362
DVT1	1.079	0.803	41.861	0.571	0.000	0.000	0.000	1.000	1.079	0.803	41.861	-0.429
DVT2	1.155	0.849	44.703	0.513	0.000	0.000	0.000	1.000	1.155	0.849	44.703	-0.487
DVT3	1.169	0.869	43.186	0.498	0.000	0.000	0.000	1.000	1.169	0.869	43.186	-0.502
REF1	0.897	0.677	39.507	0.061	0.000	0.000	0.000	1.000	0.897	0.677	39.507	-0.939
REF2	0.882	0.681	40.501	0.079	0.000	0.000	0.000	1.000	0.882	0.681	40.501	-0.921
REF3	1.023	0.788	48.725	0.066	0.000	0.000	0.000	1.000	1.023	0.788	48.725	-0.934
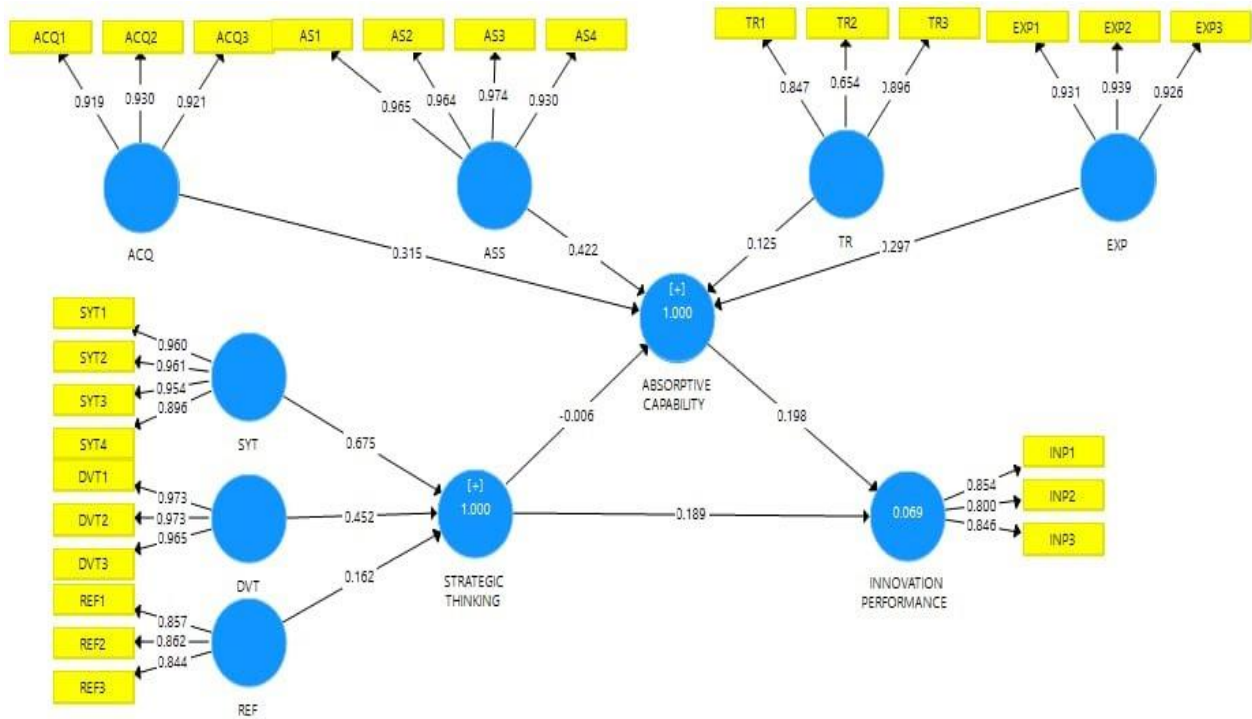
Figure 1. **Structural Model**
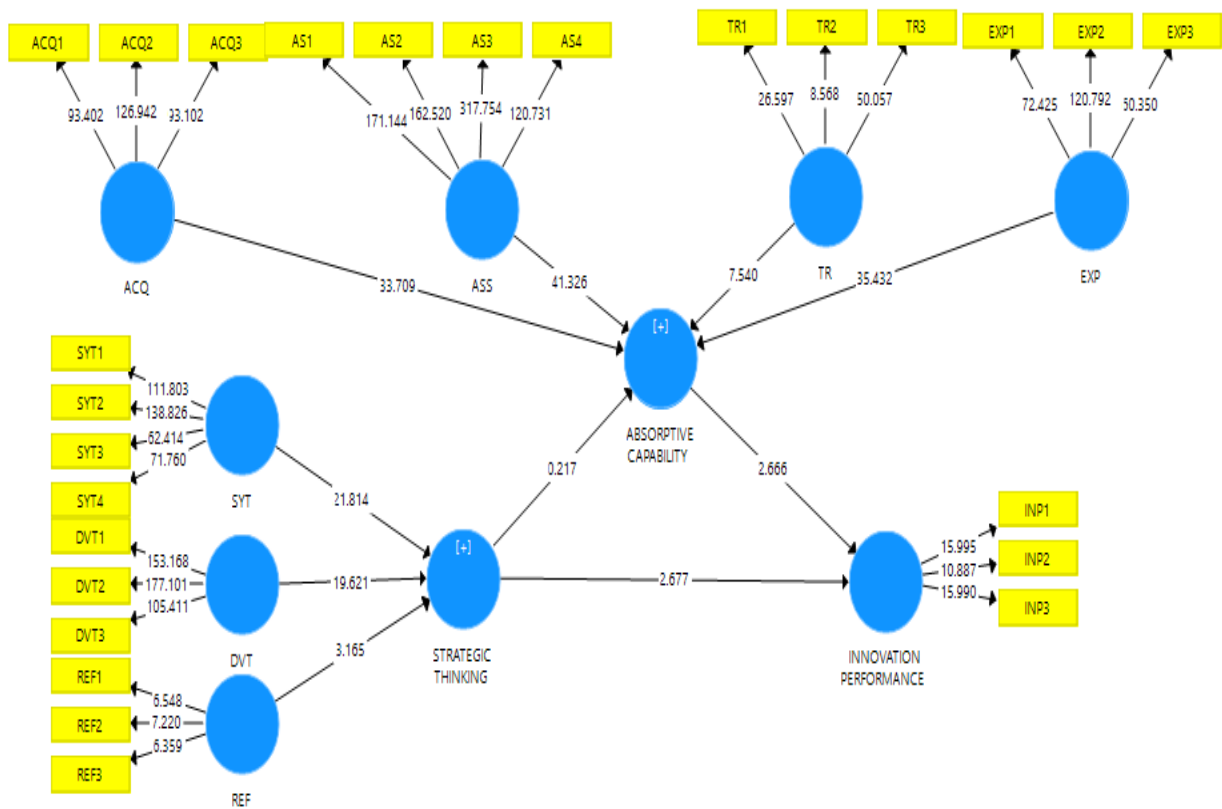
Figure 3. **t-test statistic**

Discussion and Conclusion

This study explores an imperative organizational capability; strategic thinking (a metaphysical capability) and absorptive capacity (a dynamic capability) – transversely organizations. This study takes a pioneering step to theoretically position strategic thinking as a pivotal of the organizational antecedent of innovation, considering absorptive capacity as a mediating role and confirming hypothesized relationships between the constructs. As innovation becomes vital for the well-being of a country and the survival of business enterprises, prior research has identified several individuals and institutional factors affecting innovations among firms operating in a dynamic environment (Hoidn and Kärkkäinen, 2014; Zhu, 2015).

This study introduces variations in the propositions to be established and shows changes to the future research avenues suggested by Saurabh & Derrick (2020) and Rezaei-Zadeh & Darwish (2016). In their recommendations, they advocated investigating the relationship between strategic thinking and other organizational capabilities and the effects of strategic thinking on organizational outcomes that innovation is encompassed. Hence, providing pragmatic evidence that strategic thinking has a positive influence on innovative performance. The result of hypothesis 1 revealed that top-level managers in the IT industry in Nigeria are familiar and do implement strategic thinking, and this enables them to understand the dynamic nature of firms, most especially in this ever-changing business era. The significance of the path between the dimension of strategic thinking (systematic thinking, divergent thoughts, and reflection) and innovation envisages the need for being positive-minded and innovation-driven at all levels of management within Nigeria firms.

The concept of strategic thinking being a managerial forerunner of absorptive capacity is in response to continuing demands for an empirical study on the micro-foundations of absorptive capacity (Distel, 2019; Rezaei-Zadeh and Darwish, 2016; Yao and Chang, 2017). This study affirms the influence of strategic thinking on the development of an organization's absorptive capacity. This study discovered that strategic thinking is negatively related to absorptive capacity as a construct. Thus, it implies that strategic thinkers at the top management level reluctantly acquire, assimilate, transform and exploit external information and opportunities in the business operations. Meanwhile, competition is a vital force that may hinder managers in transforming external information into opportunities.

Results substantiate the need for a positive and significant nexus between absorptive capacity and innovation performance. The development and focus on the acquisition of important information about the current market, customers, and competitors provide an avenue in organizational capability to align with innovation, even as several firms, including information technology companies, progressively source for external knowledge to enhance innovation with the determination of attracting competitive gains (Zollo et al., 2002; Nonaka and Von Krogh, 2009) and survival (Bruni and Verona, 2009; Trantopoulos et al., 2017).

This study established that absorptive capacity does not indirectly influence strategic thinking and innovation, as recommended by Saurabh and Derrick (2020). Although, results supported absorptive capacity contributing to organizational innovativeness. Meanwhile, an argument was made regarding constantly searching for new opportunities supporting innovation. The focus of strategic thinkers is to develop an absorptive capacity that tends to support innovativeness, whereas the reverse is the case in the Nigerian context. The insignificance of the mediating role of absorptive capacity on strategic thinking and innovation performance evidence that, though strategic thinkers are willing to align with innovation, fear of the unknown from external forces in forms of information, competition, opportunities remain a notable reconsideration in operating in dynamic environment

Theoretical and Managerial Implications

This study adds to the mounting frame of research by examining the nexus between strategic thinking and innovation and creates an exclusive contribution to extant literature. Findings show the impact of absorptive capacity on innovation- since a firm's ability to absorb new external knowledge remains beneficial to the organization. However, organizational processes such as strategic thinking may affect absorptive capacity and subsequently lead to positive innovation performance outcomes (**Zollo and Winter, 2002).**

Also, it is held by scholars that there is a need to develop a better theoretical understanding of the mechanisms explaining the interplay between strategic thinking and absorptive capacity (Cockburn

et al., 2000; Martinkenaite and Breunig, 2016; Zollo and Winter, 2002); hence, this work fills this gap and provides a mechanism for understanding how the pattern of relationships within an organization affects organizational outcomes by supporting the direct and indirect effect of absorptive capability. Meanwhile, our findings suggest that organizations must be conscious and eager to develop managers in divergent thoughts and systematic thinking to find solutions to strategic issues awaiting adequate acquisition and assimilation of knowledge from internal and external sources.

In the milieu of organizational operations, our study adds new insights into the alignment between strategic thinking and absorptive capacity being a constituent of organizational capabilities, helps managers to focus on maintaining and improving on organization's competitive position in the marketplace and a dynamic business environment (Todrova and Duirisin, 2007). Hence, organizations operating in a dynamic environment must understand and manage changes to keep their survival amidst competition.

Limitations and Area of Future Studies

Despite the contributions obtainable from this current study, few confines persist. At first, the current study's dominant input ties to a well-expended study that explored strategic thinking indirectly influencing organizational outcomes through absorptive capacity. Underlying assumptions made from extant literature is that strategic thinking may enable creativity, which leads to innovation, opportunity recognition, and organizational innovativeness (Graetz, 2002; Hanford, 1995). In this paper, insights are offered on how absorptive capacity significantly contributes to organizational innovativeness. It will be thought-provoking in further studies seeing how strategic thinking and absorptive capacity jointly influence innovation instead of a mediating role, and exploring the research in the related industry apart from IT, likewise countries with different national cultures (Flatten et al., 2015).

Evidence embodied here submits that absorptive capacity makes no significant effect in terms of mediating role between the relationship between strategic thinking and innovation; hence, it will be prolific for future studies to test whether other elements of organizational capabilities, such as leadership, learning, talent and resources management, have dissimilar mediating effect in this

particular relationship. Again, in providing theoretical explanations on the underlying mechanism of the relationship between strategic thinking and innovation within different organizations, this research would help in opening further studies since the meditation effect of absorptive capacity is insignificant, and this could be explained by the existence of numeral predictors and control variables that might account for the variation like; organizational culture, industry type, organizational strategy, and structure.

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