

Enabling Service Innovation through Dynamic Capabilities: Insight from Telecommunication Firms

¹Ezenwakwelu, Charity A.

²Ekom Etim Akpan

³Odera I. Ogbogu-Asogwa

^{1,2,3} Department of Management, Faculty of Business Administration, University of Nigeria, Enugu Campus

ABSTRACT

Purpose

This study is driven by the craving to understand the possible effects of dynamic capabilities on service system innovation among telecommunications firms. It focuses on how service innovation could be enhanced among telecommunication firms through dynamic capabilities. The aim is to examine the relationships between the dimensions of dynamic capabilities and service innovation among telecommunication firms.

Design/methodology/approach

This study adopted both causal design and cross-sectional design. The causal research design was followed since the study was concerned with the examination of the effects and relationship between dynamic capabilities and service innovation. Also, cross-sectional design was adopted since data from the study respondents were collected at a specific point in time

Findings

The study revealed that there is a positive and significant relationship between dynamic capabilities and service innovation of the firms. It was deduced that a blend of sensing, seizing and reconfiguration capabilities is paramount for telecommunication firms to achieve a high level of service innovation.

Research limitations/implications

The study was constrained to telecommunication firms, therefore subsequent studies can focus on other sectors of the economy. Also, the study relied only on quantitative data which were generated from a structured questionnaire, thus subsequent can adopt a mixed-method by introducing interviews.

Practical implication

The study reveals that management of the telecommunications firms need to put mechanisms in place to monitor changes in its environment because this will avail the organizations the opportunity to foresee possible changes in the environment and devised ways to contain with the variations.

Originality/value

There are several studies on dynamic capabilities and service innovation. However, there seems to be scanty studies on these variables in the telecommunication sector, especially in the Nigerian context. Thus, this study filled this identified gap by investigating dynamic capabilities and service innovation among telecommunication firms.

KEYWORDS: Dynamic capabilities, sensing capability, seizing capability, reconfiguration capability, service innovation.

Date of Submission: 08-05-2021

Date of Acceptance: 22-05-2021

I. INTRODUCTION

Telecommunication firms are confronted with the herculean task of offering their subscribers frequently improved or entirely new services. Therefore, they need continuous innovations in their services to satisfy their customers and retain market leadership (Pöppelbuss, Plattfaut, Ortbach, Malsbender, Voigt, Niehaves, & Becker, 2011). Innovativeness is extensively attributed with the ability to accelerate business growth and it is a major player in the achievement of competitive edge both at the country and organizational level (Organisation for Economic and Co-operative Development (OECD), 2010). Interestingly, service innovation provides the platform for continuous service improvement, leading to exceptional performance, greater competitiveness and customer satisfaction (Janssen, Castaldi, & Alexiev, 2016).

On the other hand, dynamic capabilities (DCs) are essential for companies operating in competitive and dizzying environments (Akpan, Eluka, & Sylva, 2021). It helps in the achievement of a competitive edge and innovative performance (Teece, 2007). Dynamic capabilities ensure organizational survival (Ofoegbu &

Onuoha, 2018). More so, businesses require dynamic capabilities to be sustainable in the fast-changing settings (Barney, 1991; Eisenhardt & Martin, 2000). Although for capabilities to enhance competitiveness, they should be highly valued and readily available, be unique and irreplaceable (Barney, 1991; Eisenhardt & Martin, 2000).

Practically, the frequent technological changes experience in the telecommunications and other service sectors has globalized the operations of firms in these sectors and blurred any boundary that existed among firms and countries. Thus, consistent change is witnessed in the strategies adopted. Therefore, operations managers and other business executives require dynamic capabilities such as the ability to sense future changes in the environment, seize opportunities available and reconfigure their internal processes and structures to strategically contain with the competition from the globalized and dynamic environment (Zhou, Zhou, Feng, & Jiang, 2017).

Studies have revealed a positive relationship between dynamic capabilities and firm innovation (Zhou, Zhou, Feng, & Jiang, 2017). Specifically, Hsu and Wang (2012) found dynamic capability is a significant organizational asset that is directly correlated with firm innovative performance. Also, Blonigen and Taylor (2000) observed that dynamic capabilities ensure a competitive advantage by promoting the development of novel products and services.

However, despite these available evidences, not much has been done on the relationship between dynamic capabilities and service innovation in the Nigerian telecommunication sector. Could it be a lack of dynamic capabilities is the reason for the continuous poor level of innovation witnessed in the telecommunication sector? Or are the telecommunication firms not applying appropriate sensing, seizing or reconfiguration capabilities? These and many more questions inform the need for this study. Thus, this study is set to examine the association between dynamic capabilities and service innovation among telecommunication firms in Nigeria.

II. REVIEW OF LITERATURE

Dynamic Capabilities

The term 'dynamic' refers to the ability to renew competencies to be at par with the changing business environment. Therefore, to be dynamic, creative thinking is required, especially when considering time-to-market, the speed of delivery, fast technological modification, the difficulty in understanding the nature of the market and competition (Helfat & Winter, 2011; Akpan, Eluka, & Sylva, 2021). The term 'capabilities' emphasizes the vital role of strategic management in fittingly adapting, harmonizing, and recomposing internal and external organizational resources and useful competencies to match the necessities of a dynamical atmosphere (Teece, Pisano, & Shuen, 1997).

Teece, Pisano, and Shuen (1997) defined dynamic capabilities as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments". Similarly, it is the flexibility of an organization to utilize its resources effectively to accomplish harmoniousness with the dynamic business setting (Wall, Zimmermann, Klingebiel, & Lange, 2010; Rugami & Aosa, 2013). Furthermore, dynamic capability reflects the ability of a firm to achieve new styles of competitive advantage by invigorating competencies, structures, and resources to realize harmony with the ever-changing business setting (Helfat, & Peteraf, 2009).

Although dynamic capabilities were developed as strategic competences for modern organizations for coping with market changes (Teece et al. 1997; Zollo & Winter, 2002), it is still significant in static environments (Eisenhardt & Martin, 2000; Helfat & Winter, 2011). With the development of the dynamic capability theory, the concept was redefined. Zollo and Winter (2002) defined dynamic capability as "the learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness". Furthermore, Helfat et al. (2007) opined that "a dynamic capability is the capacity of an organization to purposefully create, extend or modify its resource base".

Dynamic capabilities theorists gave credence to the fact that overall performance of the firm is based on its capabilities to renew, restructure and reposition itself along with the changes in the environment (Akpan, Eluka, & Sylva, 2021). Thus, during changes in environment, sensing, seizing, reconfiguration and other dynamic capabilities will be relied on to give the organisation competitive edge (Ofoegbu & Onuoha, 2018). These strategic level competencies are distinct from normal routines that firms adopt to carry out everyday operations; uniqueness of the dynamic capabilities is that "they refer to the ability to alter these so-called zero-order capabilities" (Teece et al., 1997).

In this study, dynamic capabilities is seen as the dexterity to identify aspects of the firm needing change (sensing capability), formulate appropriate strategic response to the changes in the environment in order to grasp the opportunities presented by the changes (Seizing capability), and generate new capabilities to reinvigorate existing internal capabilities (reconfiguration capability).

Dimensions of Dynamic Capabilities

Extant literature on dynamic capabilities reveals that majority of scholars conceptualised it using sensing, seizing, learning, integration and reconfiguration capabilities. Sensing capability refers to “the capacity to recognize, interpret and catch the opportunities” (Teece, et al., 1997). Learning capability is defined as “the ability to review existing operational capabilities with new knowledge” (Helfat, et al., 2007). Integrating is “the ability put together knowledge into the business units and reconfiguration capability characterized as the convenience, timeliness and efficiency of operational process to fit the turbulent working environment” (Eisenhardt & Martin, 2000; Verona & Ravasi, 2003). Furthermore, sensing capability identifies opportunities and threats, learning capability entails the formation of new habits to seize opportunities, and reconfiguration capabilities involve strengthening the new system.

Thus, in this study dynamic capability is encapsulated in three facets (sensing, seizing and reconfiguration capabilities). These dimensions have been extensively used in strategic management studies (e.g. MacInerney-May, 2012). According to Ofoegbu and Onuoha (2018) these facets assist firms to “realize the necessity for change, formulate the necessary response to changes in the environment, and apply the right measures to remain competitive”.

Service Innovation

Service innovation is the frequent offering of new services designed for customer optimum satisfaction. Service innovation is a critical antecedent to service firms’ success (Zirger, 1997; Sethi et al., 2001), which in turn is highly associated to business success (Henard & Szymanski, 2001). Also, innovative services present great opportunities for businesses in terms of growth in market share and expansion into new areas. Innovativeness enables organisations to attain leadership position in the market and gives new participants a chance to pick up a decent footing in the market (Danneels & Kleinschmidt, 2001).

Service innovativeness is often referred to as perceived newness, novelty, originality, or uniqueness of services (Henard & Szymanski, 2001; Lassen, & Laugen, 2017). This perceived newness encompasses two perspectives: from the consumers’ perspective and the firm’s perspective (Atuahene-Gima, 1995; Cooper and de Brentani, 1991; Danneels & Kleinschmidt, 2001). Andrews and Smith (1996) consider innovativeness as the extent to which a new product/service is viewed as useful or beneficial to some consumers.

Management literature incorporates several perspectives of innovativeness in service innovativeness (Dewett, 2004). Danneels and Kleinschmidt (2001) merged two perspectives of service innovativeness. These are customers’ perspective, described as “innovation attributes, adoption risks, and levels of change in established behavioural patterns are regarded as forms” of service newness. Firm’s perspective, characterised as environmental familiarity and service-firm fit, and technological and marketing aspects (Dewett, 2004).

Wang and Ahmed (2004) defined service innovativeness as the novelty and meaningfulness of new services introduced to the market in a timely fashion. Therefore, service innovation is the introduction of a service that is new or significantly improved service with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components, incorporated software, user friendliness or other functional characteristics (e.g. replacing inputs with materials with improved characteristics: Breathable textiles, light but strong composites, environmentally friendly plastics, etc.).

2.1 Hypotheses Development

Sensing Capability and Service Innovation

Sensing capability is construed as the capacity to notice, translate, and go after openings in the operating environment. Sensing capability represent firms inclination to use its current capability to foresee changes in its environment (Teece, 2007). Sensing capability dimension of dynamic capabilities has been found to positively influence service innovation (Kindström, Kowalkowski, & Sandberg, 2013; Zhou, Zhou, Feng, & Jiang, 2017). Namely, Kindström, Kowalkowski and Sandberg (2013) observed that, innovation is a behaviour that propels the development of dynamic capabilities which drives the creation of novel products and services. The scholars further submitted that organisations hoping to boost service content of their business portfolios and looking to service innovation to generate opportunities for value creation should employ new sensing activities in four main areas: customer-linked service sensing, service system sensing, internal sensing, and technology exploration (Kindström, Kowalkowski, & Sandberg, 2013: 16).

Similarly, Hsu and Wang (2012) opine that, dynamic capability through the ability to sense changes in the environment is an important corporate resource that is directly correlated with firm innovative performance. Likewise, Blonigen and Taylor (2000) observed that dynamic capabilities strengthen competitive position by promoting the development of novel services.

Despite these overwhelming evidences that sensing capability supports service innovation, it appears most of the studies examining the relationship between these two variables were carried out in western and Asian countries, with exemption of Ofoegbu and Onuoha (2018) who did a closely related study in the fast food

industry. It is very relevant to empirically examine linkage between sensing capability and service innovation in the Nigerian telecommunication sector. Thus, it is hypothesized;

H₁: There is a positive and significant relationship between sensing capability and service innovation.

Seizing Capability and Service Innovation

Seizing capability is defined as the ability of the organisation to incorporate opportunities identified through sensing capability (Teece, 2007). According to Froehlich, Bitencourt, and Bossle (2017: 8), seizing capability is positively linked with the creation of “new products, processes, services and business models by means of the creation of organizational frameworks and the development of routines”.

Furthermore, to satisfied consumers needs and boost the development of innovative services, organisations needs to strengthen their seizing capability so as to effectively incorporate business openings. Thus, it can be asserted that seizing capability foster service innovation of the telecommunication firms.

Therefore, it was hypothesized that:

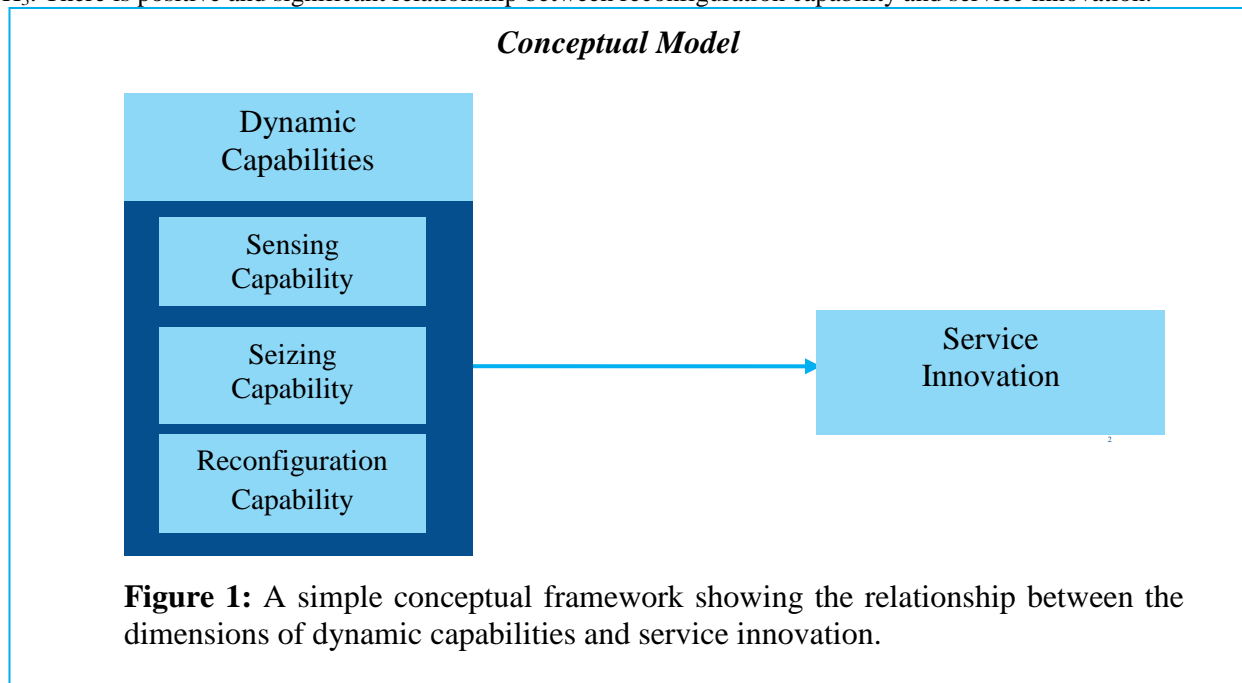
H₂: There is positive and significant association between seizing capability and service innovation.

Reconfiguration Capability and Service Innovation

This third capability, reconfiguration capability refers to the processes needed to “maintain adjustments over the life of an enterprise, as its assets and structures are realigned” (Teece, 2007). Reconfiguration capability of the firm is the ability of the firm to generate new capabilities to reinvigorate existing capabilities. Further, Wogwu and Hamilton (2018) opine that, the reconfiguration capability engrossed the transformation of obsolete knowledge into innovative and novel capabilities. Thus, reconfiguration capability is positively correlated with innovation.

Kurtmollaiev, Fjuk, Kvale and Pedersen (2018) supply empirical evidence of the pivotal role reconfiguration or transforming capability in boosting service innovation. Further, Kolko (2015: 71), conclude that, design thinking tools such as capability to transform is important for innovation and helps to forecast the future which results in the creation of new services. In this digital age characterised by innovativeness, Lavie (2006) submit that, firm innovation often rest on their reconfiguration capability. Hence, it is proposed that:

H₃: There is positive and significant relationship between reconfiguration capability and service innovation.



III. METHODOLOGY

3.1 Research Design and Participants

This study adopted both causal design and cross sectional design. The causal research design was followed since the study was concerned with the examination of the effects and relationship between dynamic capabilities and service innovation. Thus, the study empirically tested the effects of, and relationships between dynamic capabilities such as sensing, seizing and reconfiguration capabilities, and service innovation of the telecommunications. Also, cross-sectional design was adopted since data from the study respondents were

collected at a specific point in time (Onwuegbuzie & Collins, 2007; University of Southern California Libraries, 2016).

The study respondents were management staff and customer service attendants of telecommunication firms with offices in Port Harcourt. The Human Resource and Public Relations Departments of these firms were contacted to obtain permission to distribute the survey instrument. Though initially, the request was met with strong objection, with some of the branches directing us to their corporate headquarters in Lagos for approval, but after much assurance it was allowed. 125 copies of the survey instrument were administered to management staff and customer service attendants of the four major telecommunication firms in Nigeria. Convenient and snowball sampling techniques were adopted in distributing the copies of the questionnaire. Respondents were asked to provide answers on questions pertaining to their demographic characteristics as well as the study variables.

The completed and returned copies of the questionnaire amounted to 83 copies were found useable. This shows a useable rate of 66.4%. This number (83) was used for further analysis in the study.

3.2 Measures of Variables

Scales that have been tested and validated were adopted for this study. Dynamic capabilities was examined using three variables; sensing, seizing and reconfiguration capabilities. Sensing capability was measured using 6 items which included “we quickly locate new opportunities to serve our clients; we are very good at observing and anticipating technological trends”. Seizing capability was measured using 6 items such as “we invest in finding solutions for our customers; we adopt the best practices in our sector”. On the other hand, reconfiguration capability was measured using 5 items including “we can effectively recombine existing capabilities into ‘novel’ combinations; employees merged existing methods with new ways of doing things without losing their efficiency”. The items for sensing and reconfiguration capabilities were adopted from MacInerney-May (2012), and Ofoegbu and Onuoha (2018), while items measuring seizing capability was adopted from MacInerney-May (2012), Wilden, Gudergan, Nielsen and Lings (2013), Alves, Barbieux, Reichert, Tello-Gamarra and Zawislak (2017), and Akpan, Eluka, and Sylva (2021).

Service innovation was observed as a mono-dimensional construct measured with 5 statements items, including “we are fast in bringing new services into the telecommunications market”. These were adopted from Wang and Ahmed (2004), and Yang, Li and Su (2018). All the items re-worded to suit the Nigerian telecommunication environment and measured on a five-point Likert Scale.

IV. DATA ANALYSIS AND RESULTS

4.1 Descriptive Statistics

Table 1 below shows the demographic details of the respondents.

Table 1: Analysis of demographic profiles of respondents

Variable	Item	Frequency	Percentage %
Gender	Male	39	47.2
	Female	44	52.8
	Total	83	100
Marital Status	Married	46	55.1
	Single	37	44.9
	Total	83	100
Age	18-35	42	50
	36-50	34	42
	51- Above	7	8
	Total	83	100
Years of work experience	0-5	30	36.4
	6-10	42	50.6
	11-15	11	13
	16-20	-	-
	Total	83	100
Highest level of educational attainment	0 th level	-	-
	OND/NCE	4	5.1
	HND/B.Sc	69	83.6
	MBA/M.Sc	9	10.2
	DBA/Ph.D	1	1.1
Total	83	100	

Source: Field Data, 2019.

The gender characteristic revealed that, there are more female managers than male, with 39 male and 44 female respondents. This represented a 47.2 and 52.8 percent for male and female respectively. Marital status shows that 55.1 percent are married, while 44.9 percent are singles. Experience on the job, shows that, majority of the respondents have spent between 6-10 years (50.6 percent) with their firms, followed by 0-5 years (36.4

percent). Those that have worked for 11-15 years represented 13 percent. However, none of the respondents filled 16-20 years. Educational attainment indicates 5.1 percent with Ordinary Diploma or National Certificate in Education, 83.6 percent with Higher National Diploma or Bachelor’s Degree, 10.2 percent have obtained Masters Degree, and 1.1 percent have earned Doctorate Certificate. Thus, it could be concluded that, the workers in the telecommunication sectors are highly educated. This could be attributed to the high technological adoption among telecommunication firms. Therefore, only highly skilled are engaged.

4.2 Inferential statistics data analysis

The Partial Least Square - Structural Equation Modeling (PLS-SEM) was used in analysing the inferential statistics in this study. This was carried out through the SmartPLS 3.2.6 software. This technique involves two steps (Ringle et al., 2015). First, an assessment of the measurement model, secondly, assessment of the structural model (see table 2 and figure 2).

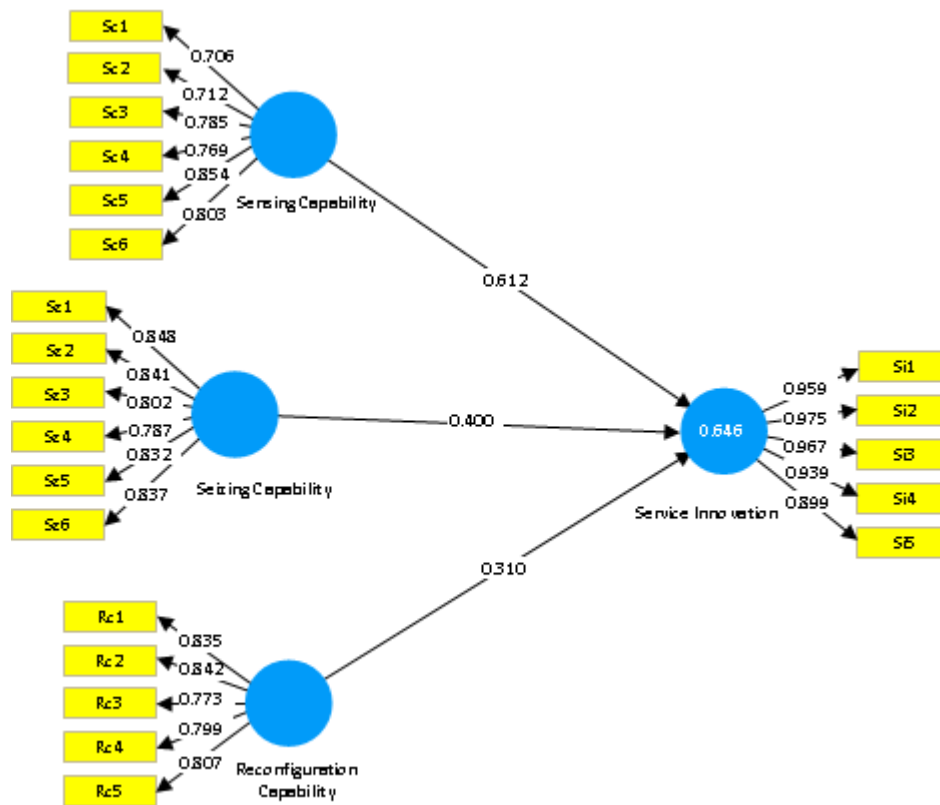


Figure 2: Assessing the Measurement Model

An assessment of the measurement model above (figure 2), revealed that all items for Sensing Capability reported acceptable levels of factor loadings of 0.70 above. Similar output was observed for individual indicators for seizing and reconfiguration capabilities. Thus, all the indicators were adopted for the final analysis (Hulland, 1999). Concerning service innovation, all its items satisfied the 0.70 threshold.

Likewise, when individual item factor loadings were squared (indicator reliability), all the items met the 0.50 threshold for indicator reliability, thus, they were suitable for the final analysis.

Further, the constructs were assessed for reliability and validity. To confirm the reliability of the constructs, composite reliability and Cronbach alpha values were used. The values as contained in table 2 below:

Table 2: Construct validity and reliability

Constructs	Cronbach Alpha	Composite Reliability	AVE	R ²	R ² Adjusted	Q ²
Sensing Capability	0.866	0.899	0.598	0.646	0.642	0.362
Seizing Capability	0.907	0.927	0.680			
Reconfiguration Capability	0.800	0.855	0.546			
Service Innovation	0.972	0.978	0.899			
Note: AVE = Average Variance Extracted. SC = Sensing Capability. SZ = Seizing Capability. RC = Reconfiguration Capability. SI = Service Innovation. Also, R ² , 0.19 = Weak, R ² , 0.33 = Moderate, R ² , 0.67 = substantial (Cohen, 1988).						

Source: SmartPLS 3.2.7 output on research data, 2019.

An examination of the Cronbach alpha and composite reliability values showed adequate level of reliability since they were at the acceptable threshold of 0.7 and above (Hair, Hult, Ringle, & Sarstedt, 2014, p. 101; Nunnally, 1978).

Additionally, the average variance extracted (AVE) criterion was used as a basis to measure the convergent validity of the constructs. An AVE value of 0.5 for each of the constructs confirmed convergent validity of the constructs based on the Fornell and Larcker (1981) and Bagozzi and Yi (1988) criterion.

To assess the structural model so as to determine the effects of the exogenous latent variables on the endogenous construct. The coefficients of determination (r²) were observed (Hair et al., 2014, p. 174). Holistically, the exogenous variables have a 0.646 effect on the endogenous variable. Revealing that, sensing, seizing and reconfiguration capabilities jointly explained 64.6% of the variance in service innovation. Thus, the model has a moderate predictive quality.

Also, the model’s predictive relevance assessed using Stone-Geisser’s Q² value and conducted by a Blindfolding procedure showed a 0.361 value. The Q² value (0.361) indicates that the model has a predictive relevance (Stone, 1974; Geisser, 1975; Hair et al., 2014).

Table 3: Discriminant validity—Heterotrait–Monotrait (HTMT) criterion

	Reconfiguration Cap.	Sensing Cap.	Seizing Cap.	Service Innovation
Reconfiguration Cap.				
Sensing Cap.	0.881			
Seizing Cap.	0.707	0.810		
Service Innovation	0.413	0.479	0.538	

Source: SmartPLS 3.2.7 output on research data, 2019.

More so, the HTMT criterion was used to assess the discriminant validity of the constructs. The outcome of the HTMT assessment is shown in table 3 above. Based on the suggestions of Henseler, Ringle and Sarstedt(2015); and Hair, Hult, Ringle and Sarstedt (2017), constructs with HTMT values less than 0.9 are considered valid. Thus, all the constructs displayed adequate level of discriminant validity since their values were below the 0.9 criteria.

Table 4: Results of Hypotheses Testing

Hypotheses	Path coefficient	Standard error	T. value	P. value	Decision
SC -> SI	0.612	0.087	7.225	0.001	Supported
SZ -> SI	0.400	0.058	7.765	0.001	Supported
RC -> SI	0.310	0.066	6.462	0.000	Supported
Note: SC = Sensing Capability, SZ = Seizing Capability, RC = Reconfiguration Capability, SI = Service Capability, T-Statistics greater than 1.92 at 0.05 level of significance.					

Source: SmartPLS 3.2.7 output on research data, 2019.

The path relationship as presented in table 4 above shows that there are positive and significant paths between sensing capability and service innovation ($\beta = 0.612$; $t = 7.225$; $p < 0.001$), seizing capability and service innovation ($\beta = 0.400$; $t = 7.765$; $p < 0.001$), and reconfiguration capability and service capability ($\beta = 0.310$; $t = 6.462$; $p < 0.000$). Therefore, stated hypotheses were all supported.

However, table 5 shows the effect sizes of each of the dimensions of dynamic capabilities (exogenous latent variables) on service innovation (endogenous constructs), f² values of (0.02, 0.15, and 0.35), respectively, represent “small, medium, and large effects” of the endogenous construct as noted by Hair et al. (2014) and Cohen (1988) guidelines.

Table 5: Effect sizes (f^2)

Paths	f^2	Effect Size
SC -> SI	0.35	Large
SZ -> SI	0.19	Medium
RC -> SI	0.16	Small
Note: SC = Sensing Capability, SZ = Seizing Capability, RC = Reconfiguration Capability, SI = Service Innovation. Effect size (f^2) of 0.02 = small; 0.15 = medium, while 0.35 = large effect.		

From table 5 above, sensing capability happens to have the most effect on service innovation with an f^2 value of 0.35. Seizing capability has moderate effect on service innovation with a value of 0.19. Also, reconfiguration capability showed a medium effect on service innovation with an f^2 value of 0.16.

V. DISCUSSIONS

As expected, the outcome of the analysis revealed that, dynamic capabilities positively influence service innovation of the telecommunication firms in the country. This is consistent with the submission of Kurtmollaiev (2016), who found that, a synthesis of sensing and seizing capability is most essential for a manager to increase service innovation in a telecommunication firm.

In a similar research conducted in Romania; Žitkienė, Kazlauskienė and Deksnys (2015), concluded that service firms need dynamic capabilities in order to identify green markets and grab the opportunities which will give them competitive edge and enhance their service innovation. This was corroborated by Kurtmollaiev (2016), who opine that, dynamic capabilities ensures improve good service.

Also, Helfat (1997) opined that firm’s capabilities allow it to develop novel products, services and processes which enable it to adopt innovative ways to respond to customers and gain market leadership. Equally, den Hertog, van der Aa, and de Jong (2009) opine that, the fashion industry needs robust dynamic capabilities which will spur service innovation. More so, Giannopoulou, Gryszkiewicz and Barlatier (2011), found that, sensing, seizing and other dynamic capabilities are variables which encourages creativity, and innovativeness.

Comparably, Kindström, Kowalkowski and Sandberg (2012), noted that “dynamic capabilities of sensing, seizing, and reconfiguring needed for service innovation”. They further submitted that, for microfoundations to achieve competitiveness, they need to realign their firm’s dynamic capabilities in order to achieve a better fit with service innovation activities. Teece and Leah (2016) posit that robust dynamic capabilities have an “orchestration effect” that allows the firms to rapidly “idealize, test and implement new innovations”. Comparatively, Tidd, Bessant and Pavitt (2001) found that, service innovation most time depends on the adopted processes in the firm. Specifically, processes such sensing, seizing, routine, transforming, reconfiguration of opportunities.

VI. CONCLUSION

This study investigated the association between dynamic capabilities and service innovation among telecommunication firms in Rivers State, Nigeria. Dynamic capabilities has sensing, seizing and reconfiguration capability as it dimensions. While service innovation was observed as uni-dimensional construct.

The analyses of data showed that sensing, seizing and reconfiguration capabilities significantly and positively correlated with service innovation of the telecommunication firms. Based on this finding, it is deduced that, a blend of sensing, seizing and reconfiguration capabilities is essential for the telecommunication firms to achieve high level of service innovativeness. Furthermore, it was found that sensing capability has the strongest effect on service innovation of the firms, followed by seizing capability and lastly reconfiguration capability.

Recommendations

- i. The management of the telecommunications firms should put mechanisms in place to monitor perceived changes from its environment. This will avail the organisation the opportunity to foresee possible changes in strategies adopted by competitors, and changes in customer preferences. Thus, causing them to proactively devise creative and innovative ways to contain with the variations.
- ii. Also, the firms should frequently acquire knowledge, cutting edge technologies and best practices from the industry. This will help the organisation seized opportunities as they arose and proffer innovative solutions to clients’ needs, while withstanding volatilities from the environment.
- iii. More so, appropriate mechanisms should be put in place to effectively integrate newly acquired knowledge, competences and practices with existing capabilities. This will ensure that, the new and existing capabilities are quickly recombined into the production of novel services to satisfy the customers.

Limitations and suggestions for Further Studies

This study was not without limitations. First, this study focused only on telecommunication firms. Hence, did not consider other sectors of the country such as manufacturing and banking. Thus, it is suggested that further studies be carried out in these sectors. Secondly, the study did not consider the moderating roles of factors such as legal environment, managerial competencies and organizational culture. Thus, it is suggested that future studies should examine the moderating effects of these variables on the relationship between service system innovation and dynamic capabilities.

REFERENCES

- [1]. Akpan, E. E., Eluka, J., & Sylva, W. (2021). Dynamic capabilities and organizational resilience of manufacturing firms in Nigeria. *Vision: Journal of Business Perspective* (Ahead print).
- [2]. Alves, A. C., Barbieux, D., Reichert, F. M., Tello-Gamarra, J., & Zawislak, P. A. (2017). Innovation and dynamic capabilities of the firm: Defining an assessment model. *RAE-Revista de Administração de Empresas*, 57(3), 232-244.
- [3]. Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99-120.
- [4]. Blonigen, B. A., & Taylor, C. T. (2000). R&D intensity and acquisitions in high-technology industries: Evidence from the US electronic and electrical equipment industries. *Journal of Industrial Economics*, 48(1), 47-70.
- [5]. Chang, S.-J., Van Witteloostuijn, A., & Eden, L. (2010). From the editors: Common method variance in international business research. *Journal of International Business Studies*, 41(2), 178-184.
- [6]. Cho, H. J., & Pucik, V. (2005). Relationship between innovativeness, quality, growth, profitability, and market value. *Strategic Management Journal*, 26(6), 555-575.
- [7]. Cohen, J. W. (1988). *Statistical power analysis for behavioural sciences* (2nd ed.), Hilldale, Lawrence Erlbaum Associates, New Jersey.
- [8]. Creswell, J. W. (1994). *Research design. Qualitative and quantitative approaches*. London: Sage.
- [9]. den Hertog, P., van der Aa, W., & de Jong, M. W. (2010). Capabilities for managing service innovation: towards a conceptual framework. *Journal of Service Management*, 21(4), 490-514.
- [10]. Dewett, T. (2004). Employee creativity and the role of risk. *European Journal of Innovation Management*, 7(4), 257-266.
- [11]. Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10/11), 1105-1121.
- [12]. Fornell, C. & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18 (1), 39-50.
- [13]. Froehlich, C., Bitencourt, C. C., & Bossle, M. B. (2017). The use of dynamic capabilities to boost innovation in a Brazilian chemical company. *Revista de Administração*, 52, 479-491.
- [14]. Giannopoulou, E., Gryszkiewicz, L. & Barlatier, P. J. (2011). A conceptual model for the development of service innovation capabilities in research and technology organisations. *International Journal of Knowledge Management Studies*, 4(4), 319-335.
- [15]. Hair, J. F., Babin, B. J. & Krey, N. (2017). Covariance-based structural equation modelling in the journal of advertising: Review and recommendations. *Journal of Advertising*, 46(1), 163-177.
- [16]. Hair, J. F., Black, W. C., Babin, B. J. & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). UK: Pearson Prentice Hall.
- [17]. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2011). *Multivariate data analysis* (8th ed.). Beijing: China Machine Press.
- [18]. Hair, J. F., Bush, R. P. & Ortinau, D. J. (2003). *Marketing research: Within a changing information environment* (2nd edn.). McGraw-Hill/ Irwin, New York.
- [19]. Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)*, (2nd Ed.). Thousand Oakes, CA: Sage.
- [20]. Helfat, C. E. & Peteraf, M. A. (2009). Understanding dynamic capabilities: progress along a developmental path. *Strategic Organization*, 7(1), 91-102.
- [21]. Helfat, C. E., & Winter, S. G. (2011). Untangling dynamic and operational capabilities: Strategy for the (n) ever - changing world. *Strategic Management Journal*, 32, 1243-1250.
- [22]. Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). a new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135.
- [23]. Hsu, L. C., & Wang, C. H. (2012). Clarifying the effect of intellectual capital on performance: The mediating role of dynamic capability. *British Journal of Management*, 23(2), 179-205.
- [24]. Janssen, M. J., Castaldi, C., & Alexiev, A. (2016). Dynamic capabilities for service innovation: Conceptualization and measurement. *R&D Management*, 46(4), 797-811.
- [25]. Kimberlin, C. L. & Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. *American Society of Health System Pharmacists*, 65, 2276-2284.
- [26]. Kindström, D., Kowalkowski, C. & Sandberg, E. (2013). Enabling service innovation: A dynamic capabilities approach. *Journal of Business Research*, (66), 8, 1063-1073.
- [27]. Kindström, D., Kowalkowski, C., & Sandberg, E. (2012). Enabling service innovation: A dynamic capabilities approach. *Journal of Business Research*, 66(8), 1063-1073.
- [28]. Kolko, J. (2015). Design thinking comes of age. *Harvard Business Review*, 93(9), 66-71.
- [29]. Krejcie, R. V. & Morgan, D.W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.
- [30]. Kurtmollaiev, S. (2016). *Service, innovation, and dynamic capabilities: from conceptualization to explanation*. Dissertation submitted to the Department of Strategy and Management at NHH – Norwegian School of Economics.
- [31]. Kurtmollaiev, S., Fjuk, A., Kvale, K., & Pedersen, P. E. (2018). Developing managerial dynamic capabilities: A quasi-experimental field study of the effects of a design thinking training program. *Academy of Management Learning & Education*, 17(2), 23-35.
- [32]. Lassen, A. H., & Laugen, B. T. (2017). Open innovation: On the influence of internal and external collaboration on degree of newness. *Business Process Management Journal*, 23(6), 1129-1143.
- [33]. Lavie, D. (2006). Capability reconfiguration: An analysis of incumbent responses to technological change. *The Academy of Management Review*, 31(1), 153-174.

[34]. Levin, K. A. (2006). Study design III: Cross-sectional studies. *Evidence-Based Dent*, 7, 24-25.

[35]. MacInerney-May, K. (2012). *The value of dynamic capabilities for strategic management*. Unpublished doctoral thesis. Universität zu Köln.

[36]. Nunnally, J. C. & Bernstein, J. H. (1994). *Psychometric theory* (3rd Ed.). New York: McGraw-Hill.

[37]. Ofoegbu, W. C. & Onuoha, B. C. (2018). Dynamic capabilities and competitive advantage of fast foods restaurants. *Journal of Management Science and Business Administration*, 4(3), 7-14.

[38]. Onwuegbuzie, A. J., & Collins, K. M. (2007). A typology of mixed methods sampling designs in social science research. *The Qualitative Report*, 12(2), 281-316.

[39]. Organisation for Economic Co-operation and Development (2010). *Oslo manual: Guidelines for collecting and interpreting innovation data* (5th Ed.). OECD Publishing, Paris, France.

[40]. Pöppelbuss, J., Plattfaut, R., Ortbach, K., Malsbender, A., Voigt, M., Niehaves, B., & Becker, J. (2011). *Service innovation capability: Proposing a new framework*. Proceedings of the Federated Conference on Computer Science and Information Systems, pp. 545–551.

[41]. Ringle, C. M., Wende, S. & Becker, J. M. (2015). *SmartPLS 3*. SmartPLS Hamburg.

[42]. Rugami, J. M. & Aosa, E. (2013). Environmental dynamic capabilities and their effect on competitive advantage and firm performance. *Prime Journal of Business Administration and Management*, 3(11), 1239-1243.

[43]. Teece, D. J. (2007). Explicating dynamic capabilities: The nature and micro-foundations of sustainable enterprise performance. *Strategic Management Journal*, 28(13), 1319-1350.

[44]. Teece, D. J., Pisano, G. & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509-535.

[45]. Tidd, J., Bessant, J., & Pavitt, K. (2001). *Managing innovation: Integrating technological market and organizational change*. Chichester: Wiley.

[46]. University of Southern California Libraries (2016). *Organizing your social sciences research paper: Types of research designs*. <http://libguides.usc.edu/content.php?pid=83009&sid=818072>

[47]. Wall, S., Zimmermann, C., Klingebiel, R., & Lange, D. (2010). *Strategic reconfigurations building dynamic capabilities in rapid innovation-based industries*. Cheltenham, UK: Edward Elgar Publishing Limited.

[48]. Wang, C. L., & Ahmed, P. K. (2004). The development and validation of the organisational innovativeness construct using confirmatory factor analysis. *European Journal of Innovation Management*, 7(4), 303-313.

[49]. Wilden, R., Gudergan, S. P., Nielsen, B. B., & Lings, I. (2013). Dynamic capabilities and performance: strategy, structure and environment. *Long Range Planning*, 46(1-2), 72-96.

[50]. Wogwu, V. E. & Hamilton, D. I. (2018). Reconfiguration capability and competitive advantage: A study of Port Harcourt public health sector. *Management*, 8(2), 47-53.

[51]. Yang, Y., Li, Z., & Su, Y. (2018). The effectiveness of service innovation practices to reduce energy consumption based on adaptive theory. *Sustainability*, 10(33170), 1-16.

[52]. Zhou, S. S., Zhou, A. J., Feng, J., & Jiang, S. (2017). Dynamic capabilities and organizational performance: The mediating role of innovation. *Journal of Management & Organization*, 20, 1-17.

[53]. Žitkienė, R., Kazlauskienė, E. & Deksnys, M. (2015). *Dynamic capabilities for service innovation*. Paper presented at Management International Conference, Portoroz, Slovenia.

[54]. Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3), 339–351.

Appendix

Questionnaire on Dynamic Capabilities and Service Innovation

This questionnaire is desired to gather information to enable me research the topic "Enabling service innovation through dynamic capabilities: Insight from telecommunication firms" kindly, indicate the extent to which you agree or disagree that the statement reflects the situation in your organization.

(1 = strongly disagree, 2 = disagree, 3 = nor disagree nor agree, 4 =agree, 5 = strongly agree)

Dynamic Capabilities						
Code	Sensing Capability	1	2	3	4	5
Sn1	Our company is fast in detecting major changes in our industry (e.g., competition, technology, regulation)					
Sn2	We often review the possible influence of changes in our operating environment (e.g., government regulation) on customers					
Sn3	We quickly understand new opportunities to serve our clients					
Sn4	We are very good at observing and anticipating technological trends					
Sn5	We regularly check the quality of our functional capabilities in comparison with companies in our sector					
Sn6	We regularly check the quality of our functional capabilities in comparison with companies in other sector					
Seizing Capability						
Sz1	We respond quickly to opportunities					
Sz2	We quickly find solutions for our customers' needs					
Sz3	We are fast in adopting best practices in our sector					
Sz4	We frequently acquire knowledge about technologies and market trends from external sources					
Sz5	We quickly proffer solutions to our users complains					
Sz6	We quickly change our practices when customers feedback gives us a reasons to					
Reconfiguration Capability						
Rc1	We effectively transformed available knowledge into new resources (e.g., new organization structure, new technical equipment)					
Rc2	Our employees bring about changes that are outside the available capabilities					
Rc3	Our workers effectively identify priced capability elements, connect, and combine them in					

Enabling Service Innovation through Dynamic Capabilities: Insight From Telecommunication Firms

	new ways					
Rc4	We can effectively recombine existing capabilities into 'novel' combinations					
Rc5	Employees merged existing methods with new ways of doing things without losing their efficiency					
	Service Innovation					
Si1	The frequently improve our services quality					
Si2	Our services are more efficient compared to our competitors					
Si3	In new service introductions, our company is often first-to market					
Si4	Our new services are often perceived very novel by customers					
Si5	We are fast in bringing new services into the telecommunications market					