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The roles of dynamic capabilities, innovation, organizational agility and knowledge management on competitive performance in telecommunication industry

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A B S T R A C T

The turbulent and highly competitive business environment has influenced telecommunications, recently. The purpose of this study, using the survey data from 70 firms in the telecommunication industry in Nigeria, is to examine the relationships among dynamic capabilities, innovation, organizational agility and knowledge management in achieving maximum performance in the telecommunication industry. Out of 430 questionnaires distributed, 341 were returned. Partial Least Square approach of Structural Equation Model (PLS-SEM) was used to examine the research hypothesis. The research results suggest that dynamic capabilities were positively related to both organizational agility and competitive performance. Organizational agility was positively related to competitive performance. Knowledge management was also associated with dynamic capabilities, competitive performance and innovation. Innovation was insignificantly related to competitive performance. The findings from this study should assist telecommunication industries in Nigeria to cope with unwanted changes in the business environment and also help managers make better decisions to improve performance.

1. Introduction

In recent times, the service industry has become prominent in the global economy as its contribution to gross domestic product (GDP) has increased significantly. One of the most prominent sectors of the service industry is the telecom sector which plays an important role in the development of any country, especially with regard to the pace of national innovative capacity and technological advancement (Williams, 2011; Emeagwali, 2014; Emeagwali & Çalıcıoğlu, 2014). However, the telecommunications industry remains complex and irregular due to market shifts, threats and emergent innovations within the external environment (Bohlin & Erik, 2000; Yu & Lin, 2017; Emeagwali & Çalıcıoğlu, 2014). Telecommunication companies have thus emerged with new strategies geared towards the restructuring of their networks in response to these swift changes in the environment. Nigeria used to have only one telecommunication firm but as a result of liberalization in the industry, it now has more than 37 new telecommunication firms in operation in the country, constituting one of the biggest telecommunications markets in Africa (Akinyomi & Tasie, 2011; Emeagwali & Ati, 2015). Since the environment is marked by heightened levels of uncertainty and emergent threats, firms must adopt new strategies to survive in order to meet performance targets. Knowledge Management is a key factor in achieving this long-term success as it facilitates greater performance among these organizations and ensures effective response to customers' requirements and needs (Elrehail et al., 2018; Alzghoul et al., 2018; Alshanty & Emeagwali, 2019; Alshanty et al., 2019; Turgay & Emeagwali, 2012). Firms moving away from their current knowledge state and acquiring new knowledge under unpredictable market conditions are more proficient at adapting to new trends and entering new markets (Cadogan et al., 2002). For a firm to stay relevant and competitive, it will need to

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"evolve into a knowledge integrating, protecting and knowledge production firm" (Teece, 2000, 2014). Knowledge is thus an organizational strength which raises traditional questions such as "what to invest in" and "how much". Knowledge needs special attention, it is often embedded within employees and difficult to obtain within markets (Hall & Mairesse, 2006). Associations between a firm's knowledge management and its innovativeness has attracted a lot of scholarly attention within the past decade (Darroch, 2005; Elrehail et al., 2019) especially within the realm of corporate governance (Emeagwali, 2017).

A firm's capability to survive in a frequently changing market conditions by managing unpredicted and developing business opportunities is called Organizational Agility (Lu & Ramamurthy, 2011). It plays a vital part in the growth of organizations by offering high level of skills, better knowledge practices and enhanced technology usage (Sherehiy, 2008). RBV (resource based view) is a framework that defines the capabilities of an organization as a core source of increasing sustainable competitive advantage in strategic management (Schreyögg & Kliesch□Eberl, 2007). The dynamic capability of a firm "is the ability to renew itself in the face of a changing environment by changing its set of resources" (Danneels, 2010). The DC as an aspect of RBV highlights the need to adapt in the direction of changing market requirements (Teece, 2000). One major aim of this research is to test the impact dynamic capability has on a firm's competitive performance and how it can be sustained. Previous studies have mainly focused on the effects of dynamic capabilities and how to satisfy the needs of customers but have failed to examine in details the influenced dynamic capabilities have on the competitive performance and knowledge management. Dynamic capability research has never been done in the telecommunication industry. Therefore, the study intends to contribute to the previous literature and discourse the mention gaps by examining the relationship between dynamic capabilities, knowledge management, organizational agility, innovation and competitive performance in the telecommunications industry. Knowledge management not only have a significant relationship with the performance of the firm but also have a positive influence on the innovation of the firm.

The other sections of this paper are organized as follows: The following section reviews the theoretical background of the study in order to develop the hypothesis. Section three describes the methodology used in the study which includes the sample and how the data will be analyze. The analyses results related to the research hypothesis presented in section four. The concluding section discusses the findings of the research, managerial implications and recommendations for further study.

2. Theoretical background

Nath el al. (2010) define RBV (Resource base View) of a firm as a package of capabilities and resources which can be used to improve and develop competitive performance. The term dynamic capability has fascinated so many researchers recently, mostly accepting it as a key source to be competitive in the firm (Peteraf, 1993). Grant, 1991 defines capabilities as a company's general competency to organize its difficult routines, human and other resources efficiently to achieve competitive performance. For a firm to attain a high notch of performance, its resources must be valuable, rare, imperfectly imitability and are not easily changeable. Competitive performance gains gotten from organizational capabilities can be unrelenting for a long time because competitors cannot duplicate them as a result of communal complexity (Barney, 1991). Andrew and Porter (1985) developed two models which link with human resource, strategic management and competitive performance. The model included RBV and Environmental model of competitive advantage. The RBV model further explained that the firm's resources must valuable, scarce, difficult to imitate and not easily substituted for the company to own a unique competitive advantage that will improve the overall performance which includes the external analysis. So many researchers have put in efforts to develop a refine relationship for capabilities and knowledge resources, concepts that are gradually becoming apparent in the literature of strategic management (Drnevich & Kriauciunas, 2011). Teece (1999) defined dynamic capabilities as the firm's propensity to continually integrate and reallocate resources in a fluctuating business environment to gain competitive advantage. Teece further explained that *"dynamic*" is the ability to renew proficiencies that aligns with the unstable environment and *"capability*" highlights the integration, scanning and reconfiguring assets both internal and external in response to market change.

Organizational Agility stresses flexibility and speed as the main features of an agile firm (Gunas, 1999). The concept agility was grounded in the early 90's after the solution for managing a changing and dynamic environment (Yusuf et al., 1999). An agile firm should have the ability to thrive in an erratic business environment by operating efficiently to the shifting market stirred by customer choices and newer services. Organizational agility is the response to changes in a turbulent market setting. Organizational agility has been theorized as an organizational extensive competence to discourse unanticipated modifications that might occur in the business settings by swiftly reacting and developing changes and openings to be competitive (Van Oosterhout et al., 2006). Lu and Rama (2011) identified that the two major types of agility are Operational adjustment agility and Market capitalizing agility. A Latest study carried out by EIU (Economist Intelligence Unit) majority of participants were executives, they acknowledge that organizational agility is crucial to worldwide achievement and can be applied in any industry. The MCA is described as the capability to swiftly improve services offered and productions to satisfy the customers' wishes by constantly observing and exploiting changes in the business settings. The market aspect of OA is "characterized by growth orientation and an entrepreneurial mind, perceiving volatile environments as fertile opportunities to enact new strategic direction and decision making" (Sambamurthy et al,.2003). The other aspect of organizational agility is OAA which is principally alarmed with firms internal business activities and their fast adaptation process stimulated by market changes (Sambamurthy et al., 2003).

A major factor in achieving organizational success in a competitive environment is Innovation (Jiménez-Jiménez & Sanz-Valle, 2011). An innovation can be a new product or service, a new production process technology, a new structure or administrative system, a new plan or program pertaining to organizational members (Damanpour & Gopalakrishnan, 2001). Innovation is a process whereby organizations seek to improve their technological capability (Therr et al., 2011). Wang and Ahmed (2004) recognized five types of innovation which are; Strategic innovation, market innovation, behavioral innovation and process innovation. Though, there are different dimensions of innovation but this research prefers the three classification of innovation:

Innovation speed: firm's ability to speed up activities and build up competitive performance as compared to its competitors in the market within a short time (Kessler & Chakrabarti, 1996). It facilitates organizations to keep close communication with customers.

Innovation quality: With innovation quality, firms can better their production timing, features, reliability and degree of innovation with respect to products and services (Haner, 2002).

Innovation quantity: It defines the number of improved or new services and products launched in the market which are better than that of their competitors in the market (Darroch, 2005).

Knowledge management has developed to be vital because of the increase awareness and significance of knowledge for a firm to survive in a competitive environment (Grant, 1991). Gold and Malhortra (2001) examine that KM is not only an important source of a firm, but can also be major source of competitive advantage when manage effectively. "The purpose of knowledge management is to maximize the enterprise's knowledge related effectiveness and returns from its knowledge assets, and to renew them constantly*" (*Wiig, 1997). Drucker (1993) forecasted that highly competitive performance in future is determined by how well knowledge resources are manage. Knowledge is most important element in production. For a firm to remain competitive, it most recognize the significance of managing knowledge (Zack, 1999).

3. Hypothesis Development

3.1 Dynamic Capabilities and Organizational Agility

To achieve agility, it is fundamental to proactively process a large volume of distributed information, deploy flexible business processes in a swift manner, and effectively coordinate tasks between geographically dispersed units (Kalleberg, 2001). Helfat and Winter (2011) suggested that the level of performance is assessed using the evolutionary fitness. Furthermore, evolutionary fitness explains to what extent the dynamic capability (DC) enables a firm to produce success by lengthening and extending its resources. The DC which encourages high level of evolutionary fitness facilitates firms to live and grow in reaction to the alterations in the business environment, comprising the demands of customers and the strategies of the firm (Wilden et al, 2013).One key contrivances through which DC operates is by increasing the speed, the value and effectiveness in which the organization functions (Kriau & Drnevich, 2011). The swiftness, efficient and effective response to coping with the changing environment can have a positive impact on the competitive performance by allowing firms to gain advantage in market operations which leads to reduction in cost. In essence, the worth of DC can be evaluated in terms of the OA it permits. DC has become an essential proficiency in facilitating agility through synthesizing "monitoring, supporting, learning, integrating, and reconfiguring". All activities are harmonizing and are capable of enhancing agility. Hence, organizations with a solid Dynamic capability can regularly sense, scan and observe the environment and monitor activities with partners to achieve greater operational and market agility. Thus, the study hypothesizes that:

H_1. Dynamic capabilities are positively related to organizational agility.

3.2 Dynamic Capabilities and Competitive Performance

DC has positive impact the performance of the firm in many ways and counterparts the resource base with unstable business environments, initiates market modifications and also inter organization performance (Eisenhardt & Martin, 2000). Dynamic capabilities expand the swiftness, efficiency and effectiveness of organizational activities which in due course braces performance (Hitt, 2001). It allows the organization to improve it revenue by utilizing incoming opportunities and seizing operations that leads to a better competitive performance. Lawson and Samson (2001), explained DC to be crucial for growing the firm's competitive performance and firm's renewal. Accordingly, the study hypothesizes that:

H_2. Dynamic capabilities are positively related to competitive performance.

3.3 Organizational Agility and Competitive Performance

Organizational agility can be viewed as the firm's ability to work swiftly and regularly in the market environment which results to excellent and efficient performance (VALA, 2012). According to previous studies, OA is accepted to be valuable because it permits organizations to reorganize and reorder their routines in harmony with the changing market situation which eventually helps to attain better performance (Tansu, 2001).With a superior OA, positioning of firms is enhanced by identifying the opportunities for competitive performance in their aim market (Sambamurthy et al., 2003). A strong organizational

agility can offer greater reaction time, increase product customization, lowering cost and expanding the performance catalog. Firms tend to gain a competitive edge by improving Organizational agility. Thus, we hypothesize that:

H_3. Organizational agility is positively associated with competitive performance.

3.4 Knowledge Management and Dynamic Capabilities

Dynamic Capabilities and Knowledge management have been extensively studied and are commonly used to deliberate how to manage activities of a firm in an irregular environment (Prieto & Easterby-Smith, 2006). KM centers on providing solutions to executives on how to retain and transfer knowledge within the organization (Vera & Crossan, 2003). Wang and Ahmed (2004) found that with a great management of knowledge resources, DC will improve the business activities of the firm. The more KM is applied and deposited, the better the DC it can create. Thus, we hypothesize that:

H_4. There is a significant relationship between the dynamic capability and the knowledge management.

3.5 Knowledge Management and Competitive Performance

Knowledge is seen as an essential asset for firms, how to manage, exploit and apply knowledge is necessary for any organization (Kogut & Zander, 1996). Knowledge management aids in reconfiguring activities and has improved the performance better than before .Various surveys such as Hamel (1990) proposed that the organizations that create knowledge in all units can result to superior competitive performance. The competitive performance of each firm relies on the knowledge management (Zack, 1999). "Knowledge is lengthily acclaimed as a strategic source, creating and utilizing knowledge is ambiguous, but it enables organizations to develop a sustainable competitive advantage" (Grant, 1996; Teece, 1998).

Thus, we hypothesize that:

H_5. Knowledge management is positively related to competitive performance.

3.6 Knowledge Management and Innovation

Some people suggested that combining KM and innovation correctly can provide the right mix of materials for firms to make effective decisions. Thus, firms need innovation and efficient KM for a sustainable competitive performance. For an innovating firm to be successful, high level of knowledge management must be abducted which includes knowledge creation, knowledge application and distributed within the organization (Alavi & Leidner, 2001). Thus, we hypothesize that:

H_6. There is a significant relationship between knowledge management and competitive performance.

3.7 Innovation and Competitive Performance

Innovation can only happen if the company has the capacity to innovate (Laforet, 2011). Prior research suggested that innovation had a strong impact on competitive performance especially in the service sector (Miles, 2012). For a firm to enjoy high profits and large market share for long period of time, it must continue producing new products and launch new services in a radical manner. The innovative process should be quick in problem solving as compared to major competitors. Some others discussed that the vital reason why firms implement innovation is to increase the competitive performance and goals attainment. Thus, we hypothesize that

H_7. There is a significant relationship between Innovation and competitive performance.

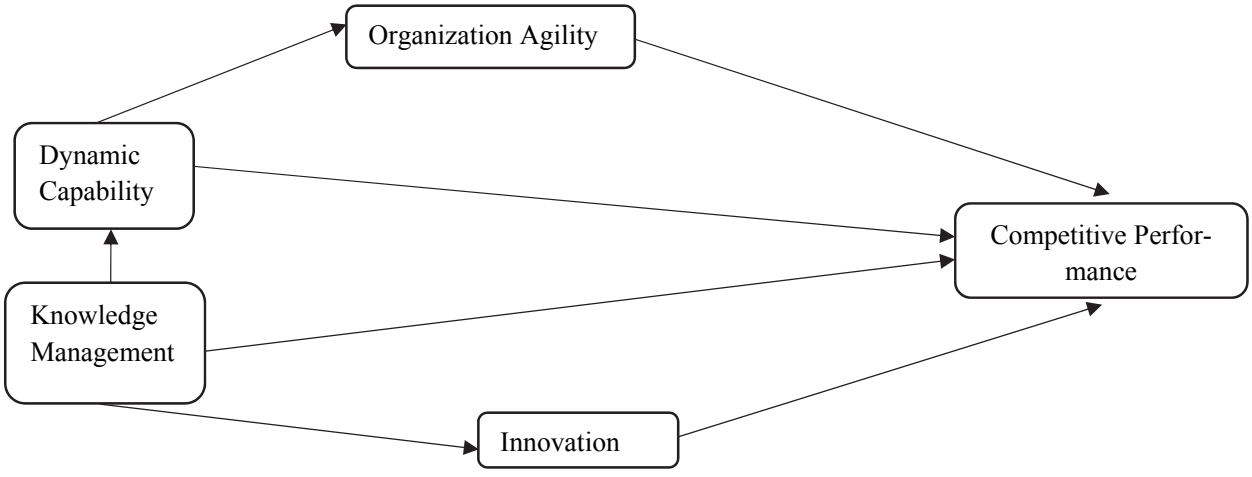


Fig. 1. Research model

4. Methodology

4.1 Sample and data collection

The sample for the study was mainly focused on the telecommunication companies in Nigeria. The survey was administered to high hierarchy executives within the firm since they are more familiar with strategic aspect of the business. A comprehensive list was compiled from the Nigerian Communication Commission, which includes 162 license working telecommunications companies, 70 firms from the list agreed to partake in this survey. Data was collected by means of a questionnaire administered in person to all respondents. 430 questionnaires were randomly distributed to executives and 341 usable questionnaires were returned in a span of 3 months. The response rate to the survey was 79.30%.

4.2 Measures

Multiple-item scales from the extant literature were used to operationalize the study construct.

Dynamic Capabilities: Dynamic capabilities were measured using a reduced version with 5items scale adapted from Mikalef and Pateli (2016) and Pavlou and El sawy (2011)**.** Respondents were asked to evaluate on a 5 point Likert scale on how effective their firms can rebuild, integrate, and reconfigure its competences in a turbulent business environment.

Competitive Performance: the items corresponding to CP from the scale was validated by Rai et al. (2010). Respondents were asked to evaluate on a 5 point Likert scale (1-Strongly Disagree to 5-Strongly Agree) by identifying the competitive advantage of the firm in relation to the market share, growth and innovation etc.

Organizational Agility: OA was measured using two dimensions from Lu and Raman (2011), Operational adjustment agility (OA) and Market capitalizing agility (MA). It comprises of three items; respondents were asked to evaluate on a 5 point Likert scale (1-Strongly Disagree to 5-Strongly Agree) the abilities of the firm to quickly respond to market changes and address customer's needs.

Innovation: The items for Innovation using multi scales tested from Mardani et al. (2018). It comprises of three items, respondents were asked to evaluate on a 5 point Likert scale (1-Strongly Disagree to 5-Strongly Agree) the abilities of the firm to quickly respond to market changes and address customer's needs.

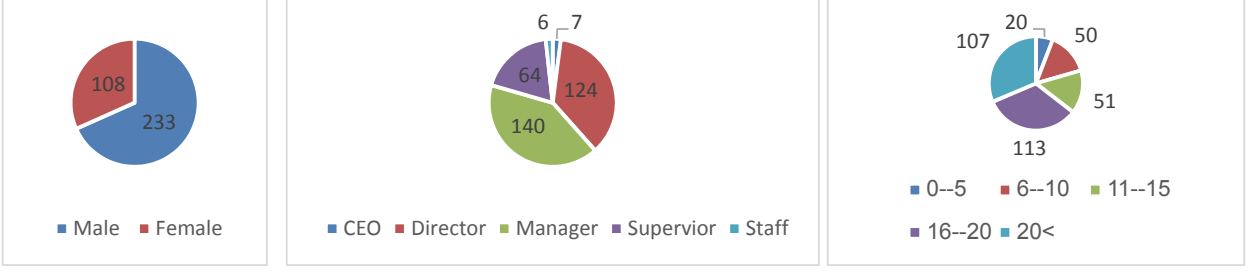
Knowledge management: KM was measured using 4 statements adopted from Mardani et al. (2018), respondents were asked to evaluate on a 5 point Likert scale (1-Strongly Disagree to 5- Strongly Agree) how knowledge is produced, managed and integrated within the firm.

5. Analysis and results

This section reports the results of the path analysis and the conceptual framework of the study. First, the assessment of the measurement model is presented; second, the structural model (including hypotheses testing) is examined. Finally, the results of IPMA for the firm performance construct are reported. The database was created using SPSS 18.0, then the Partial Least Squares approach is presented was used for analysis of data. "All the measures were subjected to confirmatory factor analysis (CFA) using the PLS-SEM approach in Smart PLS 3.2.4". (Henseler et al., 2009).

5.1 Sample Population Profile

Fig. 2 shows the demographic data of the sample (n341), such as gender, years of experience, job position and length of business operations. There was greater participation from male respondents which was 68.3 % and 31.3% females. 80% of the respondents were directors, managers and CEO's which implied that most of the respondents are knowledgeable about the strategic aspect of the business in relation to DC, OA, KM, RI and CP. Majority of the respondents had plentiful knowledge about their firms because only 17% of respondents had work for 10 years or less in regards to working experience. As regards to the length of business operations, 57.1% of companies was 21 years or less while 42.8 % was more than 21 years.



Gender Job position Years of job experience

Fig. 2. Personal characteristics of the participants

5.2 Measurement model

To ensure that the measures are valid and reliable, the reliability and validity of the constructs were evaluated. The composite reliability, Cronbach's alpha and AVE are reported in Table 1. The discriminant Validity presented by the Fornell Larcker test was also added (Henseler et al., 2009). Outer loadings minimum requirements were all met, all factor loadings were met factor, AVE and CR exceeded the cut off values recommended by Hair et al. (2013), 0.7 for CR, 0.5 for AVE and factor loading. Bagozzi and Yi (1988) explained that the Average Variance Extracted value shows the degree of variance for a covert construct. The value of AVE must exceed 0.5 to validate the use of the construct (Hair, 2010).Table 2 below shows that organization Agility had the maximum AVE value of 0.84 followed by knowledge management with an AVE value of 0.79, RI (AVE = 0.79),CP(AVE = 0.5) and DC with a value of 0.53. Therefore, all the constructs exceeded the level 0.5. The Fornell Larcker was also used to test the discriminant validity as summarize in Table 1 below.

Table 1
Cronbach's Alpha, Composite reliability (CR), AVE and correlation matrix for all the constructs

	Cronbach's Alpha	Composite Reliability	AVE	CP	DC	KM	OA	RI
CP	0.857	0.860	0.557	0.746				
DC	0.821	0.822	0.537	0.671	0.733			
KM	0.918	0.919	0.792	-0.116	-0.129	0.890		
OA	0.937	0.939	0.836	0.635	0.592	-0.036	0.914	
RI	0.892	0.894	0.739	-0.095	-0.246	0.826	-0.009	0.860

Table 2
Structural model and Hypothesis testing

	Path Coefficient		
H1: DC →OA	0.592	10.888	Significant
H2: DC → CP	0.494	6.356	Significant
H3: OA →CP	0.337	4.566	Significant
H4: KM → DC	-0.129	2.261	Significant
H5: KM →CP	-0.204	1.995	Significant
H6: KM → I	0.826	34.494	Significant
H7: I → CP	0.198	1.733	Insignificant

The structural model is evaluated to address the impact of dynamic capabilities, Organizational Agility (i.e. OA and MA), knowledge management and innovation on competitive performance using partial least square method. H1, H2, H3, H4, H5 and H6 were all supported, Table 2 summarizes the results of the model (hypothesis testing), dynamic capabilities was found to have a positive impact on Organizational Agility (b = 0.592, t-values = 10.888, p < 0.01) and competitive performance (b = 0.494, t-values = 6.356, p < 0.01). Organizational agility was also positively related to competitive performance (b = 0.337, t-values = 4.566, p < 0.01). In addition, knowledge management was positively linked to dynamic capabilities (b = -0.129, t-values = 2.261, p < 0.01), positively associated with CP (b = -0.204, t-values = 1.995, p < 0.01) and also associated with innovation (b = 0.826, t-values = 34.494, p < 0.01). Consequently, innovation was negatively linked to competitive performance (b = 0.198, t-values = 1.733, p < 0.01), thereby not supporting H7.

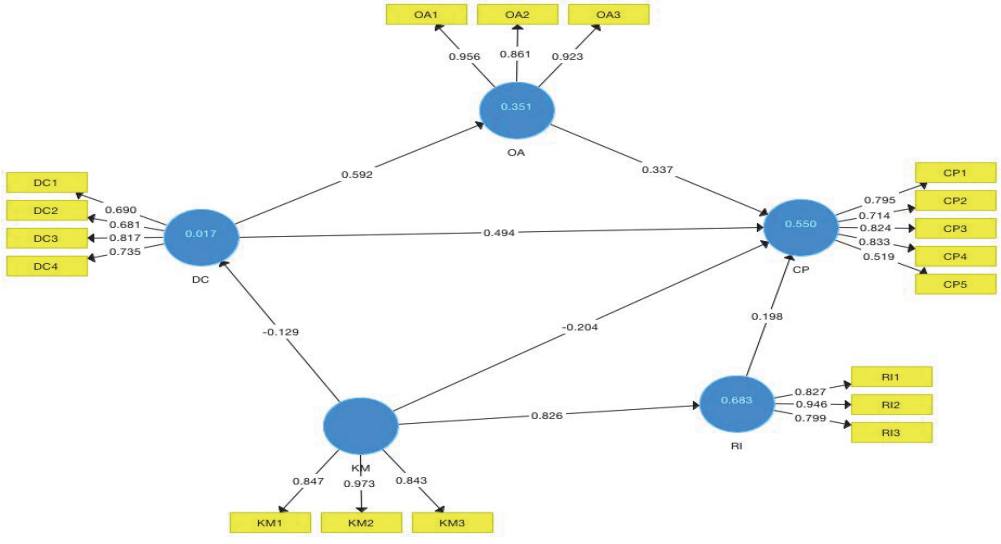


Fig. 3. Structural Model

5.3. Importance performance matrix analysis (IPMA)

The Importance performance matrix is an analysis method used to gain additional insights by showing a more detailed managerial implications, evaluations from PLS-SEM are used to add more dimension. The analysis compares the total effects and the average values of variables which helps in indicating factors that needs attention. The result shows areas with high and low performance which help managers make better decisions and strategies to adopt based on the study results. The IPMA weights mainly the comparative importance of the construct and their usage in the firm's activities to better the performance (Slack, 1994). Table 3 shows the performance matrix of the constructs. Table 3 shows the IPMA of the constructs in descending order related to the performance are DC, OA, KM and I. DC is the most essential for chasing the performance of the firm with the total effect of 0.413, the telecommunications industry in Nigeria gives greater attention to Dynamic capabilities with an actual performance of 69.6. The relative performance of OA is less than of DC (total effects: 0.355) which implies that the telecoms firms are somewhat less concerned with OA than utilizing DC, the actual performance for OA is 66.682.The Nigerian telecom firms are more concerned with addressing unexpected changes related to the business than managing its knowledge and innovating. However, innovation was found to have the least importance on the performance of the firm with respect to other constructs.

Table 3
IPMA

CONTRUCTS	TOTAL EFFECTS (Variable's performance)	Variable's Actual Performance
DC	0.413	69.682
OA	0.355	66.803
KM	-0.081	41.243
RI	0.060	37.918

*The actual performance of the variable is ranging from 0 to 100, the higher the better.

6. Discussion and conclusions.

Dynamic capability is a catalyst in improving the firm's activities and awareness to modifications in the business environment. It has been suggested that dynamic capabilities are positively related to organizational agility and competitive performance. The present study explicitly has investigated the impacts of innovation, knowledge management, organizational agility and dynamic capabilities on competitive performance in the telecommunication industry. The IPMA results have indicated that dynamic capabilities with an effect of 0.413 was the most essential element for increasing competitive performance in the Nigerian telecommunication firms and that the telecoms firms should give more consideration to dynamic capabilities .The IPMA results also have shown that organizational agility's actual performance was less than dynamic capabilities but greater than knowledge management and innovation. Consistent with previous studies, dynamic capabilities were positively related to organizational agility and competitive performance. The findings explained that DC was a key factor in reinventing better services and surviving a constantly changing business environment .Organizational Agility was found to have a positive impact on competitive performance, with a lesser performance compared to dynamic capabilities, firm's needs to prioritized market related changes, quickly balance rapid changes in demand from the market and deliver the request of customers. High levels of Operational and Market capabilities will not only result in satisfying the customers demand but will also enable increase in the performance. Telecom firms should also develop a positive relationship with suppliers to quickly make alternative changes if needed.

KM is a very important factor in achieving better performance within a firm, findings from this research indicates that KM is a substantial factor that improves competitive performance and innovation. Telecommunication firms should apply KM in all levels to enable better allocation and use of resources. Better application of KM leads to radical product development, new services as compared to their competitors and quick problem solving. Knowledge management is a major driver of DC, the assimilation of Knowledge management and dynamic capability explains how a company's knowledge assets has an impact on the capabilities. With a better amassing of knowledge, telecommunication firms will cultivate superior dynamic capability to survive in an unstable environment. The study also found that innovation was not positively related to competitive performance. The mutual ground shared by so many authors is that innovation can improve a firm's competitive performance. For that to be achieved, managers must have different capabilities to the firm's activities and innovation processes, the relationship between Innovation and performance of the firm can be revaluated for future research in different industries and environment with a larger sample.

6.1. Managerial implications

The research findings help to offer some implications for top officials in the telecommunication industry responsible for decision making and strategizing. Little knowledge was available from preceding research regarding dynamic capabilities, knowledge management, organizational agility and competitive performance on telecommunications, the study would assist firms to invest correctly and knowing the factors to strengthen. The research also validates the worth of investing more on knowledge management and dynamic capabilities to achieve sustained competitive performance. With better Organizational agility, telecom firms will exploit on opportunities in the market and an improved quickness of internal operations. In a

turbulent business environment, the findings show that dynamic capabilities facilitate organizational agility and competitive performance. The research also provides managers a parameter to discuss with stakeholders on how to manage and utilize KM within the firm. If Telecom managers understand DC, improved plans can be created to boost competitive performance by seizing the right opportunity, sense incoming openings and identify the major factors for improving growth. The telecom firms should be able satisfy customers' needs, always evaluate internal routines and effectively interact with firms the partner with. The findings also have indicated that routines and services in telecommunication industry are rapidly improved with a stable operational and market agility, this suggest that improved services to satisfy customers in the industry should be the utmost priority. Additionally, telecom firms should be flexible so that adjusting and responding to unexpected changes can be easier.

6.2. Limitations and future research direction

The research is subjected to some limitations. The sample of the study was gotten from the members of Nigerian Telecoms, findings can be deduced from other industries or regions to get a balanced view and test if the results are applicable in an international perspective. The data collection for the research was carried out at one point in time, for future research, it will be of major advantage analyzing the firms at different points in times to observe the impacts of KM, RI, and DC AND OA implementation. The respondents of the study were senior management of the firm, subsequent research sampling should consider several respondents in a firm not only the top management to improve the validity.

The research found a significant association between Dynamic capabilities, O I, KM, and innovation. Prospective studies can consider the dynamism of the environment as a moderating variable. Taking into account how the implementation of knowledge management plans, future research could consider the cost and efficiency of KM practices in solving different problems within the firm.

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