Mediating factors influencing the capacities of enterprise network performance

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A B S T R A C T

Objective: The study examined the mediating factors influencing the capacities and performance of enterprise network using some food and beverages enterprises in Lagos, Nigeria.

Research Design & Methods: Primary source of data was employed in the study. The data collected from five hundred and thirty nine (539) respondents was analysed with the use of factor analysis which brings out the beauty and reality of the study. Six hundred and fifty seven (657) middle and top level management staff of six food enterprises and beverage enterprises particularly the manufacturing ones through a purposive sampling technique.

Findings: When the original ten variables were analyzed, four variables were extracted from the analysis with eigenvalues greater or equal to 1, which explained 36.414 percent of the entire variance. Hence, the mediating factor influencing the capacities of enterprise network performance is Strategic Decision-Making Capacity (SDMC), Technological Capacity (TC), Efficiency Enterprise Capacity (EEC), and Complexity in Technology or Technological Turbulence (TT).

Contribution & Value Added: Finally, factors influencing the capacities of network performance are Strategic Decision Making Capacity (SDMC), Technological Capacity (TC), Efficiency Enterprise Capacity (EEC), and Complexity in Technology or Technological Turbulence (TT). The result of the study is essential because of its significant contribution to the body of knowledge and literature regarding strategic management.

INTRODUCTION

The situation of business enterprises in the past years has been exceptional, transformative, highly competitive, and in a highly technological environment which is tumultuous. These changes spring up because of technology dynamics, market dynamics, management dynamic, business operational dynamics (demand and supply ends), and others which have direct and indirect connotation on the performance of enterprises. Ahmad *et al.* (2014) noted that enterprises are facing these and more challenges because of the term "dynamics" which affects the overall business performance.

Food enterprises and beverage enterprises are not exempted from the sweeping transformation as they have experienced increasing levels of competition during the last one decade, which create significant issues to maintaining economic balance. It was revealed in the study that there are more challenges posed which seems to be higher than enterprise survival. This challenge is experienced with the tendency at which enterprises thrive during the situation of increased competition. In fact, in the high level of competition that is predominant among all enterprises and challenging situation of the Nigerian economy are crucial factors that rooted enterprise networks to be of essence in realizing enterprise revitalization (Zahra *et al.,* 2006).

Ahmad and Pirzada (2014) also discovered that enterprise networks have significant roles in bringing a level of buoyancy to a nation's economic situations, which is laudable in fulfilling economic development. Because of this importance, there is a need for enterprises to form a formidable network (Hashim *et al.*, 2018), which will fortify them to stand against all economic odds (Zhu *et al.*, 2013). The study was purposed to examine the mediating factors influencing the capacities of enterprise network performance in some selected food and beverages industry in Lagos, Nigeria using factor analysis.

LITERATURE REVIEW

The position of enterprises in the world development cannot be far-fetched from or beyond the major purpose of realizing economic development. Realizing the performance of enterprises, there is need for the enterprise owners themselves to form a formidable network. Obasi (2013) noted that enterprise networks are essential to achieve development and industrialization. For an enterprise to be transformed and rooted into the unforeseeable future, its capability to expand and broaden horizons for significant outputs must be on the key objectives if not as the organization aim.

FMCGs and CMGs are sectors in Nigeria that have experienced and still experiencing various issues, such as reduced quality of products, less customer satisfaction on products, and many more which are caused as a result of economic imbalances, increasing competition, importation of similar products, increasing petroleum prices, naira devaluation (Industrial Report, 2016). This has created a form of tumultuous environment for most enterprises. Significant numbers of value creation and dynamic capabilities have be identified in strategic management, among are strategic decision-making, product and knowledge creation, technological capability, product innovation capability, top managers alliance, and strategic flexibility (Ibidunni *et al*., 2014; Oghojafor *et al*., 2014; Zhang, 2007; Ibidunni & Inelo, 2004).

The enterprise networks must continuously develop dynamics to new resources that will enhance their sustenance in the unendingly environment (Eisenhardt & Martins, 2000; Oladele *et al.*, 2010; Rindova & Kotha, 2001; Teece *et al.*, 1997). The creation of value and competitive advantage becomes realistic when enterprises are able to form networks for making best use of resources, opportunities, and capabilities (Teece, 2009). This will enhance highly competitive advantage among the group of enterprises that are able to team up for network. This is highly needed in the modern era (Chirico &Salvato, 2008).

In the views of Rehman and Saeed (2015) and (Wong, 2013), dynamic capability is a form of facility for any organization to flourish in the present dynamic environment. Competitive advantages are secured when intensifying business sustainable options (Seung, 2014), and creating value (Hedvall *et al.*, 2019; Hashim *et al.*, 2018; Guo *et al.*, 2018; Rodrigo-Alarcón *et al.*, 2018; Oghojafor *et al.*, 2014; Sherazi *et al.*, 2013; Machirori & Fatoki, 2013)

Ibidunni and Inelo (2004) noted that sooner, the managers and owners of enterprises will engage in strategic and innovative thinking to sustain the increasing business dynamics and to enhance success of enterprise networks. In the perspective of Eisenhardt *et al.* (2010), for enterprise to sustain in the ferocious competitive environment, there is a need to develop strategies that will enhance more customer demand, changing the legal frameworks and implementing more technology solutions (Shimizu & Hitt 2004). Studies of Stock & Wennberg (2009); Oluwale *et al.* (2013) have shown that product innovation is a value-addition activity for enterprises, and Kemper *et al.* (2013) noted that it has been an approach for realizing competitive advantage.

Though some in some studies, it was theoretically revealed that product innovation is a factor that determines enterprise survival (Damanpour & Wischnevsky, 2006; Daniel & Wilson, 2003; Damanpour & Gopalakrishnan, 1999; Stock& Wennberg, 2009). Rosenbusch*et al.* (2011) noted that empirical results of many studies are contradictory, especially those that treated small and medium-sized enterprises (SMEs). Some empirical researches reveal a positive and significant nexus between product innovation and enterprise survival (Alegre &Chiva, 2013, while other researches reveals negative nexus (Grewal & Tansuhaj (2001). From the result obtained in various studies, there were suggestions that other factors may be affecting the dynamic relationship that existed between innovation on products and the survival of enterprises. In view of this, there is thus a need to embark on the study based on selected foods and beverages enterprises. Based on this background, the study is set to examine the factors mediating between the influencing the capacities of enterprise network performance employing some selected foods and beverages enterprises in Lagos, Nigeria.

The research covers 6 foods and beverage enterprises that are quoted in the Nigeria Stock Exchange (NSE) of the manufacturing sector. This study was carried out because of the alarming report of the Manufacturing Association of Nigeria (MAN) that about 60 percent of the manufacturing company in Nigeria is not functioning well, while 30 percent have gone on comatose, and only 10 percent are operating at a sustainable level (Olamade *et al.*, 2013). Food and beverage sector was among the large-scale quoted food and beverages enterprises, from which this study select six (Honeywell Flour Mills Nigeria, 7-Up Bottling Company, Nestle Nigeria, Flour Mills Nigeria, Dangote Flour Mill Nigeria, and Unilever Nigeria) in Lagos State, Nigeria. All are listed in the Nigeria Stock Exchange (NSE). The study will cover Lagos state because the state is currently the industrial, commercial and financial hub of Nigeria.

MATERIAL AND METHODS

This section critically elucidates the approaches that were adopted in realizing the aim of this research. This study will employ quantitative approach that entails a form of survey research as research design for the purpose of exploring the observable fact, and presents a well robust explanation to the identified problems that the study seeks to address.

Research Design

This study adopts a survey research design which will assist in pointing out challenges and managerial dynamics and issues relating to operations in Food and Beverages sector particularly in Nigerian in addition to considering the dimensions of enterprise networks in the form of enterprise supplier interactions, enterprise customer connections and enterprise competitors' interactions, and to moderate the consequence of environmental dynamics in the connection between Dynamic Capacities and Enterprise Networks on Company's Performance.

Sampling

The sample for this study was achieved based on the 14 companies that were listed in the Nigerian Stock Exchange (NSE) bulletin of 2014 as indigenous and multinational enterprises. Among the 14 companies, 6 companies were tagged as foods and beverages enterprises, but 6 enterprises will be selected for this study because of the ease of getting information as earlier explained by (Udemba, 2015; Akpan *et al.*, 2016).

According to Zikmund (2003), the various error allowances was determined and the suitable one was chosen based on the discretion of the researcher. The chosen error allowance of 0.04 was employed to establish the sample size as shown in the equation: $n = Z^2/4E^2$; n is denoted as the Sample size; Z is denoted as the Z score (confidence interval which is 2.05; E is denoted as the Error allowance which is 0.04.

Based on the sample size formula, the number of sample size was 656.6406, which is approximately 657. On this note, 657 questionnaires will be distributed to respondents whom are middle and top managers in the listed foods and beverage companies.

Regarding the recommendations of the sample size for factor analysis, the recommendations are more often than not stated with respect to either the least sample size (N) or the least ratio of N to the number of variables, i.e., the number of survey items that is being subjected to factor analysis (Adeniran, Stephens & Akinsehinwa, 2020). Gorsuch (1983) recommended a minimum of 100 sample size for factor analysis, Guilford (1954) argued that sample size should be at least 200, while Cattell *et al.* (1970) made recommendation with a minimum of 250 number of sample size. Also, the following guidance was provided with respect to the determination of sample size adequacy Comrey and Lee (1992), such that the sample size of hundred is poor; sample size of two hundred is fair; sample size of three hundred is good; sample size of five hundred is very good; and sample size of one thousand or more is excellent. In this study, the sample size of six hundred and fifty seven (657) is adequate for factor analysis and reporting as rooted in earlier studies.

Primary data was extracted through a structured questionnaire that was distributed to top and middle management officers responsible for the strategic decision and direction of the companies. This study employed close-ended questions of Likert type five points scale which was modified

Model Specification for Factor Analysis

Adeniran *et al*. (2020) posits that in the situation where by the observed variables are X_1, X_2.... X_n, the dominant factors are F_1, F_2...F_m and the exclusive factors are U_1, U_2...U_n, the variables may be expressed as linear functions of the factors:

$$X_1 = a_{11}F_1 + a_{12}F_2 + a_{13}F_3 + \dots + a_{1m}F_m + a_1U_1$$

$$X_2 = a_{21}F_1 + a_{22}F_2 + a_{23}F_3 + \dots + a_{2m}F_m + a_2U_2$$

…

$$X_n = a_{n1}F_1 + a_{n2}F_2 + a_{n3}F_3 + \dots + a_{nm}F_m + a_nU_n$$

Every equation that is represented is known to be a regression equation; the coefficients a_{11}, a_{12}...a_{nm} were identified with factor analysis which suitably replicated the observed variables from the factors.

RESULTS

The targeted participants in the investigation were approved to voluntarily take part in the exercise. In furtherance to that, the aim of the study was made comprehensible to them. Intensive and joint effort was ensured to realize confidentiality, secrecy and anonymity of information given by the respondents; also, they were assured that all information elicited from them was used solely for the rationale of this work. Research assistants were educated regarding the etiquettes in research for the purpose of ensuring absolute compliance to research ethics during the process of conducting the study.

The following were limitations encountered by the researcher on the acceptance of the methodology: difficulty in data gathering from some of the enterprises however, it was achievable with the help of some staff; generally, the core assumptions of multiple regressions are quite limited because of the presence of normality in the stochastic disturbance terms (error terms), the presence of multicollinearity and homoscedasticity between any pair of independent variables and the error terms could result to unauthentic result which is the reason for making provision for stochastic disturbance term or error term or residual in the model; and hierarchical regression analysis is employed to determine the effect of enterprise networks on the performance of the company through a reconciling task of dynamic capacities, which is made doable because of the inadequate quantification of variables; it may not be apposite if the study seeks to examine more complex relationship.

From the sample size calculated to about six hundred and fifty-seven (657) which equals to the total copies of questionnaires administered by the researcher targeted at the middle managerial staff and the top managerial staff of particular beverages and food enterprises in Lagos State, five hundred and thirty-nine (539) which is about 82 percent copies of questionnaire were valid and returned for data analysis and reporting. The remaining (118) copies of questionnaire were not used in the data analysis because of different invalidity issues. Hence, all the valid questionnaires returned were processed for data analysis, and the response was revealed in Table 1.

Table 1. Response rate of respondents

Questionnaire	Frequency	Percentage
Administered	657	
Returned	539	82
Not Returned	118	18

Source: Field Survey (2020).

Fadare and Adeniran (2018) posit that a response rate of fifty percent and above regarding the copies of questionnaire returned is appropriate for data analysis. Hence, the response rate of eighty-two (82) percent copies of questionnaire returned for this study is appropriate for establishing data analysis.

Factor analysis was adopted to achieve this aim. Several variables have been employed to explicate the complex interconnections and interrelationships of variables. In this regard, the few fundamental variables that are germane to this study remained to be determined. The systematic relationships among these established variables are presented on rank order scales data (Nimalathasan, 2009).

Factor analysis is a technique adopted in achieving statistical analysis. It belongs to the family of General Linear Model (GLM) procedures. It is designed to inform the essential structure for understanding a phenomenon (Spearman, 1904). Factor analysis entails the following such as correlation matrix, communality, eigenvalues, factor rotation, factor loadings, entire variance explained and others.

Table 2 below shows the correlation matrix to identify the direction, and degree of relationships between the variables on five point Likert scales. Correlation matrix in Table 2 revealed the interconnection between the ten (10) variables: Innovation Product Capacity (IPC), Sales Growth Capacity (SGC), Strategic Decision Making Capacity (SDMC), Enterprise Survival Capacity (ESC), Efficiency Enterprise Capacity (EEC), Technological Capacity (TC), Strategic Flexibility Capacity (SFC), Competitive Advantage (CA), Competitive Intensity (CI), and Complexity in Technology or Technological Turbulence (TT). The interconnection between SGC and IPC is very strong and positive at 0.840. The interconnection between ESC and SDMC is very strong and positive at 0.803. The interconnection between TC and EEC is weak and positive at 0.288. The interconnection between CA and SFC is very strong and positive at 0.866. The interconnection between CI and SDMC, CI and ESC are very strong and positive at 0.769 and 0.953 respectively. The interconnection between TT and SDMC, TT and ESC, TT and CI are very strong and positive at 0.791, 0.927, and 0.886 respectively.

It is pertinent to note that there are suspects of multicolinearity (high correlations) between the following interconnected variables: CI and ESC, TT and ESC which correlation values are more than 0.85. Table 3 depicts the Kaiser Meyer Olkin (KMO) test. According to Adeniran & Olorunfemi (2019), Kaiser Meyer Olkin (KMO) is used to determine the level of numerical adequacy of factor analysis that is supposed to be carried out. The determination of KMO that is between 0.9 and 0.8 is excellent, KMO that is between 0.7 and 0.6 is very good, KMO that is between 0.6 and 0.5 is good, From Table 3, the KMO result of 0.685 is very good and acceptable for performing factor analysis, and it is significant at 0.000 which implies that the data do not generate an identity matrix, the data is normal, suitable and acceptable multivariate for factor analysis.

Table 2. Correlation Matrix

Correlation Matrix[a]		IPC	SGC	SDMC	ESC	EEC	TC	SFC	CA	CI	TT
Correlation	IPC	1.000	0.840	-0.023	0.016	0.018	-0.095	0.031	-0.002	0.038	-0.025
	SGC		1.000	-0.051	-0.069	0.072	-0.044	-0.008	-0.005	-0.056	-0.105
	SDMC			1.000	0.803	0.183	0.052	-0.012	-0.027	0.769	0.791
	ESC				1.000	0.193	0.071	0.032	0.005	0.953	0.927
	EEC					1.000	0.288	0.182	0.085	0.199	0.164
	TC						1.000	0.145	0.102	0.066	0.090
	SFC							1.000	0.866	0.007	-0.007
	CA								1.000	0.001	-0.019
	CI									1.000	0.886
	TT										1.000

Source: SPSS Version 20 (2020).

Table 3. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**0.685**
Bartlett's Test of Sphericity	Approx. Chi-Square	4486.783
	Df	45
	Sig.	0.000

Source: SPSS Version 20 (2020).

Table 4 depict communality through Principal Component Analysis (PCA). Communality is the percentage measure of a variable's variation that is being explained by the factors. It is the portion of variance that an initial variable shared with the other variables that is entailed in the analysis. From Table 4, four factors that were identified are SDMC (1), TC (2), EEC (3), and TT (4). The Technological Turbulence (TT) however shows a sign of multicolinearity. Table 5 revealed that the four variables account for 36.414 percent variance explained.

Table 4. Communalities

Variables	Initial	Extraction	Hierarchy
IPC	1.000	0.920	
SGC	1.000	0.920	
SDMC	1.000	0.785	1
ESC	1.000	0.954	
EEC	1.000	0.637	3
TC	1.000	0.683	2
SFC	1.000	0.935	
CA	1.000	0.935	
CI	1.000	0.918	
TT	1.000	0.912	4

Note: Extraction Method: Principal Component Analysis.
Source: SPSS Version 20 (2020)

Table 5. Entire variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.641	36.414	36.414	3.641	36.414	36.414	3.579	35.788	35.788
2	1.957	19.570	55.984	1.957	19.570	55.984	1.865	18.650	54.438
3	1.850	18.495	74.479	1.850	18.495	74.479	1.854	18.538	72.976
4	1.152	11.522	86.001	1.152	11.522	86.001	1.303	13.025	86.001
5	0.693	6.928	92.929						
6	0.284	2.842	95.771						
7	0.160	1.595	97.366						
8	0.118	1.176	98.542						
9	0.109	1.093	99.635						
10	0.037	0.365	100.000						

Note: Extraction Method: Principal Component Analysis.
Source: SPSS Version 20 (2020)

When the original ten variables were analysed, four variables were extracted from the analysis with eigenvalues greater or equal to 1, which accounted for 36.414 percent of the entire variance. Hence, the mediating factor influencing the capacities of enterprise network performance are Strategic Decision Making Capacity (SDMC), Technological Capacity (TC), Efficiency Enterprise Capacity (EEC), and Complexity in Technology or Technological Turbulence (TT).

This study is corroborates the findings of Ibidunni *et al*. (2014); Jegede *et al*. (2012); Mohd *et al*. (2013); Olamade *et al*. (2013); Obembe *et al*. (2014) which discover one or more variables as mediating factor influencing the capacities of enterprise network performance. Also, it is also in connection with other studies that were earlier carried out in Europe, Asia, and America. For example, Strategic Decision Making Capacity (SDMC), Technological Capacity (TC), Efficiency Enterprise Capacity (EEC), and Complexity in Technology or Technological Turbulence (TT) in Malaysia can be properly traced out in the effect of government policy framework for improving business as it is circumspectly considered for enterprises (Rasiah, 2002). There seems to be focus on innovation policy in the studies conducted in the U.K. (Foreman-Peck, 2013). This is the same with the studies in Brazil on the impact of development policy on enterprises' performance (Garone*et al*., 2015).

CONCLUSIONS

The study examined the mediating factors influencing the capacities of enterprise net-work performance of food and beverages enterprises in Lagos, Nigeria. Six hundred and fifty seven (657) middle and top level management staff of six food enterprises and beverage enterprises particularly the manufacturing ones through a purposive sampling technique. The study made

use of primary source of data. The data collected from five hundred and thirty nine (539) respondents was analysed with the use of factor analysis which brings out the beauty and reality of the study. From the study, Statistical Package for Social Sciences (SPSS) version 23 was used alongside Excel (Window 10) to code, compute, and process the data.

When the original ten variables were analysed, four variables were extracted from the analysis with eigenvalues greater or equal to 1, which accounted for 36.414 percent of the entire variance. Hence, the mediating factor influencing the capacities of enterprise network performance are Strategic Decision Making Capacity (SDMC), Technological Capacity (TC), Efficiency Enterprise Capacity (EEC), and Complexity in Technology or Technological Turbulence (TT). Finally, factor analysis revealed that the mediating factor influencing the capacities of enterprise network performance are Strategic Decision Making Capacity (SDMC), Technological Capacity (TC), Efficiency Enterprise Capacity (EEC), and Complexity in Technology or Technological Turbulence (TT).

Policy Implications: The result that stemmed out of the study is essential because of its significant contribution to the body of knowledge and literature regarding strategic management. Finally, From the findings, recommendations were suggested that among the mediating factors examined on enterprise network capacities, factor analysis revealed that the mediating factor influencing the capacities of enterprise network performance are Strategic Decision Making Capacity (SDMC), Technological Capacity (TC), Efficiency Enterprise Capacity (EEC), and Complexity in Technology or Technological Turbulence (TT). It is therefore essential for the management of enterprises to prioritize those indicators for realizing better performance.

Suggestions for Further Research: Since this study is limited to ten variables, and six food and beverage enterprises across Lagos, Nigeria, future studies may consider more variables that will be more robust for factor analysis. Also, samples may be drawn from enter-prises across south-western states. Comparative analysis with other countries may be conducted by the researcher in future studies. It may also be conducted by researchers that want to imitate the study.

Research Limitations: Since this study is limited to ten variables, and six food and beverage enterprises in Lagos. These enterprises were among the large-scale quoted food and beverages enterprises (Honeywell Flour Mills Nigeria, 7-Up Bottling Company, Nestle Nigeria, Flour Mills Nigeria., Dangote Flour Mill Nigeria, and Unilever Nigeria) in Lagos State, Nigeria. Finally, factor analysis was adopted for data analysis

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