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KNOWLEDGE MANAGEMENT PRACTICES AND COMPETITIVE ADVANTAGE OF SMALL AND MEDIUM ENTERPRISES IN NORTH CENTRAL NIGERIA

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ABSTRACT

The study investigated the effect of knowledge management (KM) practices on competitive advantage of small and medium enterprises (SMEs) in North Central Nigeria. Specifically, the study sought to determine the effects of four dimensions of KM practices (knowledge acquisition knowledge conversion, knowledge application, knowledge protection) on competitive advantage of SMEs in North Central Nigeria. The study adopted a cross-sectional research design. The population of this study was made up of 13,378 SMEs in North Central Nigeria. A total of 388 owners/managers of these SMEs formed the sample size of this study. Hence, 388 questionnaires were distributed to owners/managers of the sampled SMEs in North Central Nigeria, but only 315 (81.2 %) of them were found useful for data analysis. Data collected were analyzed using regression analysis. Four hypotheses were tested using multiple regression statistics at 5 % level of significance. Findings showed that knowledge acquisition, knowledge conversion, knowledge application, and knowledge protection had significant positive effects on competitive advantage of SMEs in North Central Nigeria. The study recommended among others that owners/managers of SMEs in North Central Nigeria should install the necessary machinery for knowledge

acquisition so that their employees can speedily acquire the relevant knowledge that would enhance their contribution to the attainment of the firms' competitive advantage.

Keywords: Knowledge management practices, knowledge acquisition, knowledge conversion, knowledge application, knowledge protection, competitive advantage, small and medium enterprises (SMEs)

INTRODUCTION

The need for adoption and effective implementation of knowledge management (KM) practices in Small and Medium Enterprises (SMEs) has received considerable impetus in the 21st century the world over. Admittedly, there has been conscious and significant increase in the necessity for ensuring the adoption and effective implementation of KM practices in many forward-looking SMEs in the world today. Thus, the role of KM in enhancing competitive advantage of SMEs in a global business environment has always been acknowledged. KM is found to play a key role in enhancing firm's competitive advantage and performance globally.

KM can be defined as the capability to acquire, create, codify, apply and protect knowledge within the organization (Massingham, 2019). Thus, KM practices are observable organizational activities that are related to knowledge management (Gold *et al.,* 2001). The indicators/dimensions of KM practices as advanced by Gold *et al. (*2001), Abdul *et al*. (2008), Daud and Yusoff (2010), Mills *et al*. (2010), Lee *et al.* (2013), and Shiaw-Tong *et al.* (2016) as knowledge acquisition, knowledge conversion, knowledge application, and knowledge protection are adapted for the study. Competitive advantage is the ability of a firm to outperform its competitors. It refers to the ways that a firm can produce goods or deliver services better than its competitors (Abdulkareem, 2008). The constructs of competitive advantage such as innovativeness, quality of product/service delivery, cost advantage, differentiation/price advantage, market segmentation/focus, customer loyalty and market share are adapted for this study from the works of Porter (1998), Molina *et al.* (2004) and Abdulkareem (2008). SMEs are the unit of analysis in this study. According to National Bureau of Statistics /Small and Medium Enterprises Development Agency of Nigeria (NBS/SMEDAN) survey report (2017) SMEs are those enterprises whose total assets (excluding land and building) are up to 5 million naira but not exceeding 500 million naira with a total workforce of between 10 and 199 employees.

The purpose of KM is to increase resources of organizational knowledge, improve performance and create a competitive advantage (Massingham, 2019). The management of knowledge is imperative as part of today's globally competitive business environment. Without proper knowledge management, an organization cannot be fully competitive, much less maintain a competitive advantage (Massingham, 2019). The benefits of implementing KM practices in an organization are wide-ranging and include an increase in profitability and more efficient and effective business processes, among others. KM practices in SMEs can provide specific benefits such as improved customer service, more efficient processes and procedures and better communication (Durst, 2012).

Consequently, many forward-looking SMEs in advanced western countries such as USA, Australia, United Kingdom, Germany; and the newly industrialized Asian countries like Taiwan, Hong Kong, South Korea, Malaysia, China, Japan among others have recognized the need to completely adopt and implement KM

practices to enhance their competitive advantage (Shiaw-Tong *et al*., 2016; Hassan and Razid, 2019; Samir, 2020; Eren and Cicekliogu, 2020). KM practices have been identified as one of the important key ingredients for superior performance and global competitiveness in SMEs. The success or failure of SMEs is said to rests in part on the nature and types of KM practices they employ (Shiaw-Tong *et al*., 2016; Shraft, 2018).

In Nigeria, the role of KM in achieving completive advantage in SMEs has been established by scholars such as Olayemi *et al.* (2012), Aliyu *et al*. (2015), and Ibidunni *et al*. (2022). However, some extant researchers argued that the level at which SMEs in Nigeria attains competitive advantage is relatively low as compared to their counterparts in developed nations (Poopola, 2016; Ayodele, 2018; Pricewaterhouse Coopers-PwC, 2020). This is evident in their high mortality rate, 60-70 % of them find it difficult to survive between the first year to the fifth year of operation, a minor segment of them survives six to ten years before going into extinction, while less than 5 % of them attain maturity stage (PwC, 2020; Bhola, 2020; and Okere *et al.,* 2020).

In spite of the adoption of KM practices by the SMEs in Nigeria, majority of them have continued to go under due to competitive weaknesses while a few numbers of them have been able to perform well (PwC, 2020). This is a clear indication that the adoption of KM practices by the SMEs in Nigeria has not yielded the desired result. Besides, extant studies conducted in Nigeria have revealed insufficient explanation as to whether KM practices can enhance the competitive advantage of SMEs in North Central Nigeria (Aliyu, 2015; Aliyu *et al.,* 2015; Alaneme, 2017; Eromafuru *et al.*, 2017 and Muddah *et al.,* 2018). Hence, this study investigated the effect of KM practices on competitive advantage of SMEs in North Central Nigeria.

Statement of the Problem

Despite the adoption of KM practices by SMEs in Nigeria to boost their competitive advantage and achieve better performance; their level of competitive advantage in terms innovativeness (introducing new products or services, new processes, new practices of doing business, new marketing methods), quality of product/ service delivery (low product/service defect rates, high product performance and reliability), cost advantage through leadership, price advantage through differentiation among others do not in most cases match with that of their counterparts in advanced western countries of USA, Australia, United Kingdom, Germany; and the newly industrialized Asian countries like Taiwan, Hong Kong, South Korea, Malaysia, China, Japan, Singapore, and India (Poopola, 2016; Ayodele, 2018; PwC, 2020).

Additionally, extant researchers (Olayemi *et al.,* 2012; PwC, 2020 and Ibidunni *et al.,* 2022) have highlighted cases of weak competitive advantage position of some SMEs in Nigeria in terms of poor quality of service delivery, high rate of defective products, high cost of production, and low product differentiation among others. This makes one doubt whether the various KM practices adopted by SMEs in Nigeria are effective to achieve competitive advantage. It is in this respect that this study was conducted to investigate the effect of KM practices on competitive advantage of SMEs in North Central Nigeria.

Objectives of the Study

The main objective of this study was to investigate the effect of knowledge management (KM) practices on competitive advantage of small and medium enterprises (SMEs) in North Central Nigeria. The specific objectives of the study were to:

i. determine the effect of knowledge acquisition on competitive advantage of SMEs in North Central Nigeria;

ii. ascertain the effect of knowledge conversion on competitive advantage of SMEs in North Central Nigeria;
iii. determine the effect of knowledge application on competitive advantage of SMEs in North Central Nigeria;
iv. examine the effect of knowledge protection on competitive advantage of SMEs in North Central Nigeria.

Statement of Hypotheses

This study was based on the following testable null hypotheses:

Ho_1: Knowledge acquisition has no significant effect on competitive advantage of SMEs in North Central Nigeria.

Ho_2: Knowledge conversion has no significant effect on competitive advantage of SMEs in North Central Nigeria.

Ho_3: Knowledge application has no significant effect on competitive advantage of SMEs in North Central Nigeria.

Ho_4: Knowledge protection has no significant effect on competitive advantage of SMEs in North Central Nigeria.

LITERATURE REVIEW

Theoretical Framework

Knowledge-based theory (KBT)

The knowledge-based theory was developed by Grant (1996). The knowledge-based theory is the underpinning theory for this study. The knowledge-based theory of the firm holds that knowledge is the main resource for a firm's competitive advantage and the primary driver of a firm's value. KBT identifies knowledge as the most fundamental asset of the firm which all other resources depend on (Grant, 1996 and Spender, 1996). The theory further stated that innovative knowledge is what companies require to outperform others in an industry (Malik and Malik, 2008).

The knowledge-based theory of a firm illustrates that knowledge assets may produce long term sustainable competitive advantage for firms because knowledge-based resources are socially complex to understand and difficult to imitate by competitors (Grant, 1996). Knowledge-based theorists have supported the idea that when knowledge is effectively managed, it creates sustainable competitive advantage (Grant, 1996; Curado, 2008). Thus, SMEs that have completely adopted KM practices and effectively utilized them within their organizations have an edge over their competitors (Adman, 2019; Hassan & Razid, 2019). KBT postulates that KM practices such as knowledge acquisition, knowledge conversion, knowledge application and knowledge protection play a critical role in achieving high level of productivity, innovation and human resource performance and finally improving sustainable competitive advantage (Spender, 1996; Soderberg and Holden, 2002). KBT provided the most relevant theory for investigating the effect of KM practices on competitive advantage of SMEs in North Central Nigeria.

Conceptual Framework

Concept of knowledge management practices

KM can be defined as the capability to acquire, create, codify, apply and protect knowledge within the organization (Massingham, 2019). This definition is adapted for use in this research and KM is defined as the capability to acquire, convert/codify, apply and protect knowledge within an SME. KM practices are observable organizational activities that are related to knowledge management (Gold *et al.,* 2001). Thus, KM practices were operationalized in this research as deliberate SMEs activities such as: knowledge acquisition, knowledge conversion, knowledge application and knowledge protection conducted within the SMEs with the aim of achieving competitive advantage and improving performance in SMEs.

In this study, KM practices are operationalized as four-dimensional

constructs: knowledge acquisition, knowledge conversion, knowledge application and knowledge protection. These constructs were adapted from extant researches such as Gold *et al.* (2001); Mills *et al*. (2010); and Shiaw-Tong *et al.* (2016) among others. The four dimensions of KM practices adopted by this study were explained as follows:

i. Knowledge acquisition: Knowledge acquisition is the process an organization uses for obtaining new information and knowledge (Gold *et al.,* 2001; Zahra and George, 2002). It entails obtaining new information about customers, suppliers, competitors, products/services offered by the SMEs in an industry.
ii. Knowledge conversion: This is a KM practice by which knowledge is converted from tacit to explicit form and vice versa through the sub-processes of externalization and internalization (Becerra-Fernandez & Sabherwal, 2015). It is the practice of transforming acquired knowledge concerning products or services, customers and competitors into accessible formats in SMEs.
iii. Knowledge application: Knowledge application is the process involving the actual use of knowledge for decision making and problem solving (Gold *et al*., 2001). It is the actual usage of knowledge acquired for decision making and problem solving in SMEs.
iv. Knowledge protection: This is a security-oriented KM practice that is designed to protect the knowledge within an organization from illegal or inappropriate use or theft. For a firm to generate and preserve a competitive advantage, it is vital that its knowledge be protected (Gold *et al.,* 2001). Knowledge can be protected from competitor imitation through formal mechanisms, such as patents, trademarks, and other intellectual property rights.

Concept of competitive advantage

Competitive advantage (CAD) refers to the distinctive competencies that set an organization apart from its competitors (Tiwana, 2002). A distinctive competence is any advantage that a firm has over its competitor because it can do something which they cannot do, or do something better than they can do (Aluko *et al.,* 2007). Competitive advantage was operationalized in this study as the advantage that the SMEs has over their competitors in terms of innovativeness, quality of product/service delivery, cost advantage, differentiation/price advantage, market segmentation/focus, customer loyalty and market share.

Nexus between KM Practices and Competitive Advantage of SMEs

KM is a vital source of sustainable competitive advantage for firms and has more positive influence on firm performance in recent times (Ibidunni *et al.*, 2022). The type of KM practice adopted by an SME in a given situation determines its level of competitiveness in the global business environment. When knowledge is properly managed, SMEs are likely to gain competitive advantage in various ways. The nexus between KM practices and competitive advantage of SMEs is examined as follows.

Knowledge acquisition and competitive advantage of SMEs

Knowledge acquisition is expected to have a significant influence on competitive advantage of SMEs. It involves the process of acquiring knowledge from either inside or outside of the organizations (Cho and Korte, 2014). Appropriate acquisition of knowledge increases the stocks of knowledge available to the organization, thereby providing organizations better capability to make timely decisions that are essential to superior

organizational performance (Chen, 2004). Knowledge that is acquired has to be organized, integrated and presented in a more effective way in order to be useful (Reisi *et al*., 2013).

Research suggests strong and positive links between knowledge acquisition and performance measures. For example, Song (2008) showed that knowledge creation practices were significantly related to organizational improvement and competitive advantage. Further, when acquired knowledge is used appropriately, a significant and positive link is observed between knowledge acquisition and organizational performance (Lyles & Salk, 1996; Seleim & Khalil, 2007). Prior studies such as: Samir (2020), Gnawali (2020), Akpa *et al.* (2020), Hassan and Razid (2019), Bayo and Hamilton (2019), Adelekan *et al.* (2019), Hussain et *al.* (2019), Obeidat *et al.* (2018), Rafique and Mahmood (2018), Ngoc-Tan and Gregar (2018), Mtawal and Kiiru (2018), Shrafat (2018), Shiaw-Tong *et al.* (2016) Daud and Yusoff (2010) have also revealed that knowledge acquisition contributes positively to competitive advantage and performance of firms.

Knowledge conversion and competitive advantage of SMEs

Knowledge conversion enables organizations to improve their expertise and efficiency by converting acquired knowledge into applicable organizational knowledge, and distributing the knowledge to where it is needed (Bhatt, 2001; Gold *et al.,* 2001; Daud and Yusoff, 2010; Mills and Smith, 2011). It is expected that the knowledge conversion practices could influence competitive advantage outcomes in SMEs. Gold *et al.* (2001) in their study found a significant relationship between conversion practice and organizational effectiveness. Various previous studies such as Eren and Cicekliogl u (2020), Alaneme (2017), Eromafuru *et al*. (2017), Patma *et al.* (2017), Shiaw-Tong et *al.* (2016), Liu and Deng (2015), Mills and Smith (2011), Daud and Yusuf (2008) also showed that knowledge conversion significantly and positively affected firms' competitive advantage and performance in general.

Knowledge application and competitive advantage of SMEs

Knowledge application is the process involving the actual use of knowledge for decision making and problem solving (Gold *et al.,* 2001). Besides, knowledge application can help to transform knowledge from being a potential power tool into actual innovations or inventions which can enhance overall performance of organizations (Madhoushi *et al*., 2011; Matin *et al*., 2013). The assumption that the source of competitive advantage resides in the application of the knowledge rather than the knowledge itself, is an important aspect of the knowledge-based theory of the firm (Alavi and Leidner, 2001, Grant, 1996).

Droge *et al.* (2003) also argued that in the long run, firms that create new knowledge at a lower cost and more speedily than competitors, and then apply that knowledge effectively and efficiently, will be successful at creating competitive advantage. Thus, for knowledge to impact organizational performance it has to be used to support the firm's processes. Hence, it is through knowledge utilization that acquired knowledge can be transformed from being a potential capability into a realized and dynamic capability that impacts organizational performance (Seleim and Khalil, 2007). The role of knowledge application in achieving competitive advantage and improving firms performance has also been established by extant researchers such as Eren and Cicekliogl u (2020), Gnawali (2020), Samir (2020), Muddah *et al.* (2018), Shrafat (2018), Shiaw-Tong et *al.* (2016), and Gold *et al*. (2001).

Knowledge Protection and Competitive Advantage of SMEs

Knowledge is considered as an important source of sustainable competitive advantage for modern business. Nowadays, increasing attention is paid on protection of knowledge in order to prevent imitation by competitors (Desouza & Vanapalli, 2005). The use of certain knowledge protection practices such as patents, trademarks, trade secrets or nondisclosure contracts are essential in order to allow knowledge to be secured (Cho & Korte, 2014). Knowledge protection is a process that is important in an organization not minding the difficulty or challenges of doing that. For an asset to be a source of competitive advantage, it has to be rare and inimitable (Barney, 1991). Without security-oriented processes, knowledge losses these important characteristics. The competitive advantage of a firm can be maintained if it has mechanisms in place to protect its knowledge (Gold *et al.,* 2001). Also, extant researches conducted by scholars such as Eren and Cicekliogluu (2020), Mtawal and Kiiru (2018), Patma *et al.* (2017), Shiaw-Tong et *al.* (2016), have found that knowledge protection had a significant positive effect on competitive advantage and performance of organizations.

Table 1: Population of the Study

State	Number of Owners/Managers Based on Number of SMEs	Percent
Benue	1,811	13.5
Kogi	1,027	7.7
Kwara	1,416	10.6
Nasarawa	2,604	19.5
Niger	2,121	15.9
Plateau	1,574	11.8
FCT	2,825	21.0
Total	**13,378**	**100**

METHODOLOGY

The study adopted a cross-sectional research design and data on all the relevant variables under study were collected from the study sample at a single point in time for analysis. The population of this study was made up of 13,378 SMEs operating in North Central Region of Nigeria (NBS/SMEDAN, 2017). The study therefore, focused on only 13,378 owners/ managers of SMEs in North Central Nigeria because they were presumed to be the main people charged with the responsibility of managing knowledge in the SMEs. The composition of the study population was depicted in Table 1. The study population presented in Table 1 showed that 1,811 SMEs (13.5 %) are located in Benue State, 1,027 SMEs (7.7 %) are in Kogi State, 1,416 SMEs (10.6 %) are in Kwara State, 2,604 SMEs (19.5 %) are in Nasarawa State, 2, 121 SMEs (15.9 %) are in Niger State, 1,574 SMEs (11.8 %) are in Plateau State, whereas 2, 825 SMEs (21 %) are located in Federal Capital Territory (FCT)

Source: Extracted from NBS/SMEDAN Report of National Survey of Micro, Small and Medium Enterprises (2017)

Sample Size Determination

Yamane (1964) formula was used to determine the sample size for this study. The adoption of Yamane formula in determining sample size for this study is justifiable because the study population is finite and known. According to Udofia (2011) the formula can only be used when the study population is finite and known. The formula was stated as follows:

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

Where: n = the sample size required.
N = Finite population.
e = level of significance

1 = constant.

Using the Yamane's formula, the researcher calculated the sample size for this study as follows:

$$n = \frac{13,378}{1 + 13,378(0.05)^2}$$

$$n = \frac{13,378}{34.445}$$

n = 388 owners/managers

The Bourley's 1964 population allocation formula in Nzeribe and Ilogu (1999) was adopted in determining the number of owners/managers of SMEs sampled in each state. The formula was stated as follows:

$$nh = \frac{nxNh}{N}$$

Where:

nh = The number of owners/managers of SMEs sampled in each state

n = Total sample size

Nh = Total number of owners/ mangers of SMEs in each state

N = Total population size.

The Bourley's 1964 population allocation formula was used to allocate the sample to each state as presented in Table 2.

Table 2: Proportionate Sample Size Determination by State

State	Nh	Nh
Benue	1,811	53
Kogi	1,027	30
Kwara	1,416	41
Nasarawa	2,604	75
Niger	2,121	61
Plateau	1,574	46
FCT	2,825	82
Total	**13,378**	**388**

Source: Researchers' Computation, 2025

Sampling Technique and Instrument of Data Collection

The researcher adopted proportionate stratified random sampling technique to select 388 owners/managers of SMEs in North Central Region of Nigeria. The survey questionnaire was the main research instrument used to collect the appropriate data from owners/ managers of the sampled SMEs. The questionnaire was developed on a five-point Likert scale measuring from strongly agree (5), agree (4), not sure (3), disagree (2), to strongly disagree (1).

Validation and Reliability of the Instrument

The instrument was subjected to content validity evaluation by giving it to a panel of experts or professionals in the field of investigation who carefully checked the content of the items for their relevance to the variables being measured. The essence of content validation was to fish out possible problems of ambiguity and unclear instructions. Content validity of the questionnaire was established by the panel of experts. On the other hand, reliability of the research instrument was verified using Cronbach's Alpha method. The Cronbach's

coefficient alpha was computed using data obtain from a pilot survey conducted on a sample of 129 owners/ managers of SMEs in six (6) states in North Central Nigeria and Federal Capital Territory through the instrumentality of SPSS version 23. The Cronbach's coefficient Alpha values of each variable in this study as shown in Table 3 were all above the threshold of 0.7 as recommended by Udofia (2011). The results of Cronbach's Alpha reliability test as presented in Table 3 showed an average value or overall reliability coefficient of 0.913 for all the five variables of the study which indicated that the instrument was reliable.

Table 3: Results of Reliability Test for Pilot Study Data

Variable	Number of Items	N	Cronbach's Alpha	Remarks
Knowledge Acquisition	10	129	0.914	*Reliable*
Knowledge Conversion	10	129	0.965	*Reliable*
Knowledge Application	10	129	0.867	*Reliable*
Knowledge Protection	10	129	0.896	*Reliable*
Competitive Advantage	15	129	0.925	*Reliable*
Overall Reliability Coefficient	55	129	0.913	*Reliable*

Source: Researcher's Computations from IBM SPSS 23.0 (2025)

Model Specification

A multiple regression model was adopted for the study. The model used in the study was stated using both implicit and explicit functions. The implicit form of the model was stated as follows:

CAD = f (KMPs) - - - (i)

CAD = f (KAQ, KCV, KAP, KPT) - - - (ii)

Where:

CAD = Competitive Advantage
KMPs = Knowledge Management Practices
KAQ = Knowledge Acquisition
KCV = Knowledge Conversion
KAP = Knowledge Application
KPT = Knowledge Protection.

The explicit form of the model was stated as follows:

$CAD = b_0 + b_1KAQ + b_2KCV + b_3KAP + b_4KPT + \varepsilon$ - - - (iii)

Where:

b_0 = Constant or intercept
$b1_{-4}$ = Parameter estimates or regression coefficients
ε = error components.

The a priori expectations of the model were that all the coefficients of the explanatory variables in the study should be positive. That is $b_1 > 0, b_2 > 0, b_3 > 0$ and $b_4 > 0$ meaning that there should be a significant positive effect of KM practices on competitive advantage of SMEs.

Data Analysis Techniques

Both descriptive statistics and inferential statistics were used for data analysis. Specifically, descriptive statistics such as frequency counts and percentage ratings were used to examine the sample characteristics and the way respondents have answered the questions regarding the variables of the study. Whereas multiple regression statistics was used

to test the research hypotheses at 5 % (0.05) level of significance. The decision rule adopted for accepting or rejecting hypotheses in the current study was that if the P (Sig.) value was greater than 0.05 (P > 0.05), the null hypothesis (Ho) would be accepted. However, if the P (Sig.) value was less than 0.05 (P < 0.05) the null hypothesis (Ho) would be rejected and the alternative hypothesis (Ha) would be accepted.

RESULTS AND DISCUSSION

Descriptive statistics on questionnaire distributed and response rate

A total of 388 questionnaires were distributed to SMEs' owners / managers in North Central Nigeria, but only 341 of them or 88 % were actually returned. This implied that 47 of them representing 12 % were not returned. Of the 341 questionnaires returned, only 315 or 81.2 % were found useful for data analysis.

Descriptive statistics on respondents' demographic information

In the demographic sub-section of this study, data were presented on the distribution of the owners/managers of the sampled SMEs according to characteristics such as *business sector, years of enterprise operation, number of employees in the enterprise, position in the enterprise, highest level of education, gender, age bracket and marital status.* The data at this level were considered as discrete and thus analysis was based on the description of distribution according to frequencies and percentages as shown on Table 4. The first section of the survey questionnaire aimed to identify the demographic characteristics of the sample. First, there was a question which sought to determine the business sector of the respondents. Results revealed that most of the respondents (159 or 50.5 %) were engaged in manufacturing activities; 78 or 24.8 % were in the service industry; 42 or 13. 3 % were engaged in wholesale/retail trade; 31 or 9.8 % were involved in agricultural activities; while 5 or 1.6 % were involved in real estate activities. The second question focused on the years of enterprise operation. According to the responses, majority of the enterprises (189 or 60 %) covered by the study had been in operation for 5-10 years, followed by 74 enterprises (23.5 %) who had been in operation for 11-15 years, while 52 or 16. 5 % of them had operated for 16 years and above. Third, there was a question concerning the position occupied in the enterprises by the respondents. Results revealed that most of respondents (217 or 68.9 %) were occupying the position of owner/manager, while 98 or 31.1 % of them were only managers in the enterprises. This implied that majority of the respondents (68.9 %) were managing their enterprises by themselves.

Fourth, there was a question regarding the highest level of educational qualification of the respondents, The results showed that majority of them (105 or 33.3 %) held HND/ first degree certificates; followed by those who held NCE/OND certificates (99 or 31.4 %); 59 respondents (18.7 %) held postgraduate certificates; 42 respondent (13.3 %) held O' level certificates while 10 respondent (3.2 %) had other certificates. The fifth question was concerned with the respondents' gender. According to their responses, majority of the respondents (232 or 73.7 %) were male while 83 or 26.3 % were female. The sixth question sought to find out the age bracket of the respondents. Results revealed that most of the respondents (110 or 34.9 %) were in the age bracket of 35-45 years; followed by 107 respondents (34 %) who were under 35 years, with the least being 98 respondents (31.1 %) who were 46 years old and above. Finally, there was a question concerning the marital status of the respondents. Responses showed that majority of the respondents (246) accounting for 78.1 % of the sample were married while 60 respondents constituting 19 % of the sample were single, whereas the remaining 9

respondents representing 2.9 % of the sample were in the others' category

.

Table 4: Analysis of Respondents' Demographic Information

Demographic Variable	Description	Frequency	Percentage
Business Sector	Manufacturing	159	50.5
	Agriculture	31	9.8
	Wholesale/Retail Trade	42	13.3
	Services	78	24.8
	Real Estate Activities	5	1.6
Total		**315**	**100**
Years of Enterprise Operation	5 - 10 years	189	60.0
	11- 15 years	74	23.5
	16 years & above	52	16.5
Total		**315**	**100**
Position in the Enterprise	Owner/Manager	217	68.9
	Manager	98	31.1
Total		**315**	**100**
Highest Level of Education	O' Level	42	13.3
	NCE/OND	99	31.4
	HND/ First Degree	105	33.3
	Postgraduate	59	18.7
	Others	10	3.2
Total		**315**	**100**
Gender	Male	232	73.7
	Female	83	26.3
Total		**315**	**100**
Age Bracket	Under 35 years	107	34.0
	35- 45 years	110	34.9
	46 years and above	98	31.1
Total		**315**	**100**
Marital Status	Married	246	78.1
	Single	60	19.0
	Others	9	2.9
Total		**315**	**100**

Source: Researcher's Computation from Survey Data, 2025

Regression Analysis

In this sub- section the study presented the results on the multivariate regression model used to ascertain the effect of KM practices on competitive advantage among SMEs in North Central Nigeria. The results of regression model summary, analysis of variance (ANOVA) and regression model coefficients used for hypotheses testing are presented.

Analysis of regression model summary

Results presented in Table 5 (the model summary table) revealed a correlation coefficient (R- value) of 0.897, which indicated that there was a high positive relationship between the predictor variables (knowledge acquisition, knowledge conversion, knowledge application, knowledge protection) and the response variable (competitive advantage of SMEs). The R-square value indicated the proportion of the total variation in the dependent variable (competitive advantage) that was explained by the predictor variables. Therefore, 80.5 % of the total variation in competitive advantage of SMEs in North Central Nigeria was attributed to all four constructs of KM practices, while the remaining 19.5 % could be explained by some other variables not captured by this study.

Table 5: Model Summary [b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.897[a]	.805	.804	.043568	1.762

a. Predictors: (Constant), Knowledge Protection, Knowledge Acquisition, Knowledge Application, Knowledge Conversion

b. Dependent Variable: Competitive Advantage

Source: IBM SPSS 23.0 Output (2025)

Analysis of Variance (ANOVA)

The results in Table 6 showed that the overall model was statistically significant at 0.05 level of significance [F (4,310) = 12.269, Sig.= 0.000 < 0.05], thus confirming that the dimensions of KM practices (knowledge acquisition, knowledge conversion, knowledge application, knowledge protection) were predictors of competitive advantage in SMEs. This implied that all four (4) independent variables collectively contributed significantly to changes in the dependent variable. This confirmed that the model was overall fit for forecasting.

Table 6: Analysis of Variance (ANOVA) Results

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2032.704	4	508.176	12.269	.000[b]
	Residual	12839.581	310	41.418		
	Total	**14872.286**	**314**			

a. Dependent Variable: Competitive Advantage

b. Predictors: (Constant), Knowledge Protection, Knowledge Acquisition, Knowledge Application, Knowledge Conversion

Source: IBM SPSS 23.0 Output (2025)

Hypotheses Testing and Discussion of Findings

The study used multivariate regression analysis to empirically test the four hypotheses that the current study was based on at 5 % (0.05) level of significance. Table 7 showed the results of multiple regression model coefficients analysis used to measure the effect of independent variables (knowledge acquisition, knowledge conversion, knowledge application, knowledge protection) on the dependent variable (competitive advantage).

Test of hypothesis one

Ho_1: Knowledge acquisition has no significant effect on competitive advantage of SMEs in North Central Nigeria.

From Table 7, the results indicated that the standardized regression coefficients beta of Knowledge Acquisition (KAQ) on competitive advantage (CAD) was 0.644, t-value was 9.478, and the P (Sig.) value was 0.001 < 0.05. This implied that at the percentage of 95 of confidence level, there was statistical evidence to reject the null hypothesis (Ho_1) using the P (Sig.) value criterion. On the basis of this result, the researcher rejected the null hypothesis (Ho_1) and concluded that *knowledge acquisition has a significant positive effect on competitive advantage of SMEs in* North *Central Nigeria.* This finding is consistent with the findings of prior studies, such as: Samir (2020), Gnawali (2020), Akpa *et al.* (2020), Hassan and Razid (2019), Shrafat (2018), and Shiaw-Tong *et al.* (2016), which revealed that knowledge acquisition contributes positively to competitive advantage and performance of firms.

Test of hypothesis two

Ho_2: Knowledge conversion has no significant effect on competitive advantage of SMEs in North Central Nigeria.

Results of multiple regression coefficients analysis presented in Table 7 showed that the standardised regression coefficient beta of Knowledge Conversion (KCV) on competitive advantage (CAD) was 0.374, t-value was 4.660, and the P (Sig.) value was 0.000 < 0.05. This suggested that at the percentage of 95 of confidence level, there was statistical evidence to reject the null hypothesis (Ho_2) using the P (Sig.) value criterion. Based on this result, the researcher rejected the null hypothesis (Ho_2) and inferred that knowledge conversion has a significant positive effect on competitive advantage of SMEs in North Central Nigeria. The finding is in consonance with the findings of previous studies conducted by: Eren and Ciceklioglu (2020), Alaneme (2017), Eromafuru *et al*. (2017), Patma *et al.* (2017), and Shiaw-Tong et *al.* (2016) which also showed that knowledge conversion significantly and positively affected firms' competitive advantage and performance in general.

Test of hypothesis three

Ho_3: Knowledge application has no significant effect on competitive advantage of SMEs in North Central Nigeria.

As shown in Table 7, the standardised regression coefficient beta of Knowledge Application (KAP) on competitive advantage (CAD) was 0.463, t-value was 4.567, and the P (Sig.) value was 0.004 < 0.05. Thus, it was evident that at the percentage of 95 of confidence level, there was statistical evidence to reject the null hypothesis (Ho_3) using the P (Sig.) value criterion. The researcher, therefore, rejected the null hypothesis (Ho_3) and concluded that knowledge application has a significant positive effect on competitive advantage of SMEs in North Central Nigeria. The third finding concurred with the findings reported by Eren and Ciceklioglu (2020), Gnawali (2020), Samir (2020), Adman (2019), Shrafat (2018), and Shiaw-Tong et *al.* (2016) which indicated that knowledge application had positively and significantly contributed to improvement in firms' competitive advantage and superior performance.

Test of hypothesis four

Ho_4: knowledge protection has no significant effect on competitive advantage of SMEs in North Central Nigeria.

According to the results of multiple regression coefficients analysis depicted in Table 7, the standardised regression coefficient beta of Knowledge Protection (KPT) on competitive advantage (CAD) was 0.360, t-value was 4.380 and the P (Sig.) value was 0.021 < 0.05. The implication of the

results revealed that at the percentage of 95 of confidence, there was statistical evidence to reject the null hypothesis (Ho_4) using the P (Sig.) value criterion. Based on this result, the researcher rejected the null hypothesis (Ho_4) and inferred that knowledge protection has a significant positive effect on competitive advantage of SMEs in North Central Nigeria. The fourth finding is in accord with the findings of earlier researchers such as: Eren and Cicekliogluu (2020), Mtawal and Kiiru (2018); Patma *et al.* (2017), Shiaw-Tong et *al.* (2016), and Mills and Smith (2011), who have all found that knowledge protection had a significant positive effect on competitive advantage and performance of organisations.

Table 7: Multiple Regression Model Coefficients Analysis

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.438	.144		23.875	.000
	Knowledge Acquisition	.654	.069	.644	9.478	.001
	Knowledge Conversion	.482	.103	.374	4.660	.000
	Knowledge Application	.556	.122	.463	4.567	.004
	Knowledge Protection	.403	.092	.360	4.380	.021

a. Dependent Variable: Competitive Advantage
Source: IBM SPSS 23.0 Output (2025)

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary of Findings

The following major findings emanated from this study: Knowledge acquisition has a significant positive effect on competitive advantage of SMEs in North Central Nigeria (Beta coeff = 0.644, t-value = 9.478, P-value = 0.001 < 0.05). That knowledge conversion has a significant positive effect on competitive advantage of SMEs in North Central Nigeria (Beta coeff = 0.374, t-value = 4.660, P-value = 0.000 < 0.05). That knowledge application has a significant positive effect on competitive advantage of SMEs in North Central Nigeria (Beta coeff = 0.463, t-value = 4.567, P-value = 0.004 < 0.05). That knowledge protection has a significant positive effect on competitive advantage of SMEs in North Central Nigeria (Beta coeff = 0.360, t-value = 4.380, P-value = 0.021 < 0.05).

Conclusion

This study investigated the effect of KM practices (knowledge acquisition,

knowledge conversion, knowledge application, knowledge protection) on competitive advantage of SMEs in North Central Nigeria. Based on the findings of this study, the following fundamental conclusions were drawn: Knowledge acquisition has a significant positive effect on competitive advantage of SMEs in North Central Nigeria; that knowledge conversion has a significant positive effect on competitive advantage of SMEs in North Central Nigeria; that knowledge application has a significant positive effect on competitive advantage of SMEs in North Central Nigeria; and that knowledge protection has a significant positive effect on competitive advantage of SMEs in North Central Nigeria.

Recommendations

Based on the findings of this research, the following recommendations were made:

i. The study recommended that owners/managers of SMEs in North Central Nigeria should install the necessary machinery for knowledge acquisition so that their employees can speedily acquire the relevant knowledge that would enhance their contribution to the attainment of the firms' competitive advantage.

ii. Owners/managers of SMEs in North Central Nigeria should put in place effective machinery for converting acquired knowledge into applicable organisational knowledge, and organizational members should be encouraged to translate and articulate their ideas into a readily understandable form.

iii. The study also recommended that employees at the various functional levels in the sampled SMEs in North Central Nigeria should be closely monitored by the management of these SMEs to ensure that all knowledge acquired are effectively applied or utilized for the benefits of the firms.

iv. Since knowledge is considered as an important source of sustainable competitive advantage for modern business organizations, increasing attention should be paid on protection of knowledge in order to prevent imitation by competitors. The use of certain knowledge protection processes such as patents, trademarks and trade secrets are essential in order to allow knowledge to be secured.

Suggestion for Further Study

This study focused on the effect of KM practices on competitive advantage of SMEs in North Central Nigeria. The study adopted cross-sectional design approach and data were collected at a single point in time for analysis. Therefore, future research could be conducted using longitudinal research design approach so as to provide better insights regarding the effect of KM practices on the competitive advantage of SMEs in North Central Nigeria.

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