



KNOWLEDGE MANAGEMENT AND ORGANIZATIONAL INNOVATION OF REFINING COMPANIES IN NIGERIA

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ABSTRACT

This study investigated the relationship between Knowledge Management and Organizational Innovation of refining companies in Nigeria. A cross-sectional survey approach was adopted. The study covered the three refining companies in Nigeria located at Port Harcourt, Warri and Kaduna. Purposive Sampling technique was adopted. Structured questionnaire using the 5-point Likert Scale was used to obtain primary data from respondents. Knowledge management is the independent variable while Organizational Innovation is the dependent variable. Organizational innovation was measured using process innovation, product innovation and administrative innovation. A total of four null hypotheses were tested. A total of 157 respondents were used for the study. Data analysis was carried out using IBM SPSS AMOS Version 21 software. Structural Equation Modelling technique was utilized to carry out multivariate analysis and test of hypotheses. The study found out that there is a strong positive relationship between knowledge management and organizational innovation of refining companies in Nigeria. The results of the analyses showed that knowledge management is significantly and positively correlated with process innovation. knowledge management is significantly and positively correlated with product innovation. Knowledge management is significantly and positively correlated with administrative innovation. The study recommended that the refining companies should strive to create an enabling work environment and managerial style that stimulates innovation and discourage work environment or managerial style that pose as obstacles to knowledge management and organizational innovation. Also efforts should be made by Federal Government of Nigeria to insulate the management and operation of the refining companies from government and political interference.

KEY WORDS: knowledge management, organizational innovation, Process innovation, product innovation, administrative innovation.

1.0 INTRODUCTION

1.1 Background to the Study

In today's competitive business environment, organizations compete not only on the basis of efficiency and effectiveness but its success also depends upon how particular organizations identify, gather, manage, integrate, share and disseminate relevant knowledge to their workers in order to bring about innovation in processes, products and administration. The rapid advancement in technology and new inventions in the market have made many organizations to strive to maintain competitive advantage. One of the ways organizations can achieve this is through organizational innovation. The importance of organizational innovation can be captured from Dougherty and Hardy(1996) who defined organizational innovation as the mechanism applied by firms to adapt to changes in business environment,

competition, technological advancement and market expansion by producing newer products, techniques and system. Herkema (2003) defines innovation as a knowledge process aimed at creating new knowledge geared towards the development of commercial and viable solutions. Innovation involves the adoption of an idea or behaviour that is new to the organization. Thus Innovation requires that an organization will leverage on the knowledge available to it, acquire new knowledge and apply this knowledge to its operations that will result to production of new product, new service or a new technology. In other words innovation can be said to be dependent on the availability of knowledge. There is therefore need for organizations to undertake proper knowledge management practices that will help it to be more innovative by finding better ways of carrying out its business, create new products or services or improve on its current products and services.



Organizational innovation of refining companies is very important. Innovation is a concept that is closely linked to knowledge management. In order to survive in the present dynamic and highly competitive business world, all organizations especially the refining companies in Nigeria, need new and innovative ideas that will help them to achieve their goals and position them to compete globally. Innovation does not only help organizations to gain competitive advantage over competitors but also improves organizational performance (DeghanNajm, 2009). Innovation involves the support and performance of fresh thoughts, procedures, amenities or goods. Innovation permeates various parts and operations of the organization (Burcu & Ceyda, 2013). Innovation, according to Gloet and Terziovski (2004), can be seen as the implementation of discoveries and interventions and the process by which we produce new outcomes, whether products, system or processes. The authors went on to distinguish between two types of innovation namely radical and incremental innovation.

Radical innovations often make existing skills and knowledge redundant thus necessitating different management practices. Radical innovation usually requires development and application of new technology, some of which may change existing market structure. On the other hand incremental innovations usually involve line extensions or modifications of existing products. Incremental innovation does not require significant departure from existing business practices and are therefore likely to enhance existing internal competencies by providing the opportunity to build on existing know-how (Gloet & Terziovski, 2004).

Some other scholars like Damanpour (1991), Gopalalrishnan and Damanpour (1997), as cited in Burcu and Ceydu (2013), have approached organizational innovation from different perspective. These authors are of the opinion that there are three pairs of organizational innovation which are: 1). Administrative and technical 2) Product and process, and 3). Radical and incremental. There is no consensus among scholars on any particular approach to the study of organizational innovation. This study used process innovation, product innovation and administrative innovation as measures of organizational innovation.

1.2 Statement of the Problem

Nigeria is Africa's largest producer of crude oil and sixth largest oil producing country in the world with maximum crude oil production capacity of 2.5 million barrels per day. On the contrary its three oil refineries have a combined production capacity of 445,000 bpd which is just about 18% of the daily crude oil production capacity. To worsen matters, the current

combined production of the three refineries operating in Nigeria are not able to meet the 305,000bpd daily domestic consumption requirement of the nation. The refining companies operating in Nigeria have been operating below installed capacity for several years. In order to bridge the shortfall in supply of refined petroleum products, the Federal government of Nigeria through the Nigeria National Petroleum Company (NNPC) embarked on massive importation of refined petroleum products. The importation of refined petroleum products takes big toll on the nations scarce foreign exchange reserve and negatively affects the Nigerian economy. Many scholars and public commentators have blamed several factors as responsible for the perceived poor performance of our refining companies. Some of the factors blamed for the current state of affairs in Nigeria refining companies are: lack of technological innovation and lack of needed expertise (Faga, Uchechukwu & Obiekwe, 2016). Other factors of interest are aging plants, lack of maintenance culture, destruction of oil supply pipelines, crude oil theft, non adoption of current technology available in the industry (like modular refineries), lack of adequate infrastructure, insufficient funding, debts owed, political interference, corruption and culture of inefficiency that characterize most public owned organizations in Nigeria.

The political interference in the management and administration of the refineries is a serious factor affecting the performance of the refineries. The three refineries are all owned by the state through Nigeria National Petroleum Company (NNPC). Thus government appoints the management board of the refineries. More often the appointments are based on political considerations. All major projects to be undertaken by the refineries have to get the approval of the Nigerian Federal Executive Council(FEC) before commencement. Most times urgent projects like TAM proposals are unduly delayed while waiting for approval of FEC.

These problems have become intractable over the years and there is need to develop innovative approach to solving these problems. The refining companies need to leverage on the knowledge and experience they have acquired over the years, seek new knowledge and technology that will enable them to combat these problems. This study seek to examine the application of effective knowledge management in the achievement of organizational innovation of the refining companies in Nigeria.

Faga et al (2016) in their study titled " The Role of Innovation in the Economic Development of Nigeria" observed that despite the fact that innovation is imperative for the economic development of any nation, the level of innovation and technology in Nigeria is low. The oil and gas sector is characterized by a low



prevalence of technological innovation. Jegede (2011) in his research titled “Assessment of Technological Innovations in Selected Indigenous Oil Field Servicing Firms in Nigeria” observed that the dominance of product innovation was 17% while process innovation was 22%. Therefore the dominance of technological (product and process) innovations was low. The foregoing research also suggests that a significant proportion (84.8%) of the Nigerian indigenous oil and gas firms do seek information from external sources to support their innovativeness. Less than one quarter of the firms (15.2%) depended on internal information for innovation, either within the firms or from the parent’s firm. Thus there is lack of effective knowledge management within the organizations. Knowledge management is very important for building innovation capacity of the organizations.

In our current globalised world that is knowledge and information driven, it is only those companies that are able to build capacity to identify, create, acquire, process, share and apply new knowledge to their business and produce innovative and competitive products that can survive and grow. Even though there are many scholarly works available in literature in the area of knowledge management and innovation, most of these studies were carried out in middle east, Asia and Europe. There is scarcity of research done in Nigeria in the area of knowledge management and organizational innovation in the Nigeria oil industry. This study is therefore a contribution to solving the deficit in available literature in the area of Knowledge management and organizational innovation in the Nigeria oil industry particularly the oil refining companies.

It is against the background of the above stated problems which is partly attributable to lack of innovation that we examined, in this study, knowledge management and organizational innovation of refining companies in Nigeria with a view to identify the processes, procedures and problems that may be responsible for the current state of things in Nigerian refineries. The findings and recommendation of this study will assist policy makers and the management of these companies to build innovation capacity, achieve their goals & objectives, and contribute to the diversification of Nigeria’s economy.

1.3 Aim and Objectives of the Study

The aim of this study is to determine the relationship between Knowledge Management and organizational innovation of refining companies operating in Nigeria. Specifically the objectives of the study are to:

- (i) Determine the relationship between knowledge management and process innovation.
- (ii) Ascertain the relationship between knowledge

management and product innovation.

- (iii) Examine the relationship between knowledge management and administrative innovation.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1. Schumpeter’s Innovation Theory

Joseph Schumpeter was an Austrian economists who viewed innovation as the critical dimension of economic change. He believed that economic change takes place due to innovation, entrepreneurial activities and market power. Schumpeter was particularly interested in how market innovations affect capitalist systems. In a book titled *Capitalism, Socialism and Democracy* published by Schumpeter in 1942 he used the term *creative destruction*. He defined *creative destruction* as a ‘process of industrial mutation that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one.’ Thus *Creative Destruction* takes place when something new replaces something older. It can be new technology(or process), new product or new administrative or management style. Creative destruction is an important economic concept that can be used to explain the dynamics of industrial change, such as the transition from a competitive market structure to a monopolistic one or vice versa. Schumpeter’s theory of innovation focuses on understanding the reason why some companies are able to innovate better than others and linked this ability to the size of the firm. Schumpeter’s initially postulated that small firms, due to its relative flexibility, are in a better position to innovate when compared with large firms that suffer from their bureaucratic structures. However he later changed his views and stated that larger firms with monopolistic power that possess better resources and market power could have innovativeness advantage (Naqshbandi & Kaur, 2015). Based on this theory flexible organizational structure, market power and organizational resources are stimulants for innovation. Thus the refining companies operating in Nigeria which enjoy monopolistic market power and huge resources are well placed to be innovative.

2.1.2 Knowledge- Based Theory

The underlining theory that helps to understand the concept of knowledge management is the knowledge-based theory developed by Grant (1996). The author argues that the source of competitive advantage in a dynamic business environment is not because of the knowledge that is repository to the organization since the value of such knowledge is lost quickly due to imitation and obsolescence. On the



contrary sustained competitive advantage is determined by non-proprietary knowledge in the form of tacit individual knowledge which is both unique and relatively immobile. Given that the knowledge is possessed by individual employees in the organization there will be need for the organization to integrate the specialized and tacit knowledge of the individuals in order to achieve competitive advantage. The knowledge-based theory contends that organizations are all heterogeneous knowledge-bearing entities that use and store internal knowledge, competencies and capabilities that are vital for the survival, growth and success of the organization (Hakanson, 2010). The main import of knowledge-based theory is that organizations exist the way they do based on their ability to manage knowledge efficiently and as knowledge-bearing entities that apply knowledge to the production of their goods and services (Foss,1996). Understanding of knowledge based theory will enhance management of knowledge within and outside the firm and its application to achieve product, process and administrative innovation which is at the centre of this study.

2.1.3 The Concept of Knowledge Management

Knowledge management first came into prominence in the 1970's and has since then gained more popularity as a key subject in Human Resource Management. Starting from the late 1960s societies started to experience a new era that is called knowledge era or information age. This knowledge era or information age, which continues till today, provides information technology competitive advantages that depends on learning faster than competitors and finding exclusive knowledge (Grant, 2001). Knowledge management efforts have a long history which includes on-the-job discussions, formal apprenticeship, discussion forums, corporate libraries, professional training and mentoring programs.

Knowledge management as stated by Armstrong (2012) is concerned with storing and sharing the wisdom, understanding and expertise accumulated in an organization about its processes, techniques and operations. It involves transforming knowledge resources by identifying relevant information and then disseminating it so that learning can take place.

Knowledge management can be described as a process which helps organizations to identify, select, organize and publish (transmit) information and important specialities. It is part of the organizational memory and often exists in an unstructured form in the organization (Turban & McLeans, 2002). Knowledge management requires the awareness of the existing knowledge in the organization. It involves the creating, sharing and transferring of knowledge, employing the

existing knowledge and acquiring, storing, and accumulating new knowledge through organizational learning in line with the strategy and culture of the organization (Sallis & Jones, 2002).

Recent developments in data processing and network technologies, have increased real time global access to data and information via the internet. Following this development Malhotra (2001) stated that knowledge management “embodies organizational processes that seek a synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of human beings”. Alavi and Leidner (1999) define knowledge management as “ a systemic and organizationally specified process for acquiring, organizing, and communicating both tacit and explicit knowledge of employees so that other employees may make use of it to be more effective and productive in their work.”Malhotra (2000) is of the opinion that “knowledge management caters to the critical issues of organizational adaptation, survival and competence in the face of increasingly discontinuous environmental change..” knowledge management focuses on knowledge identification, description, organization, and increasing its value through the possibility of reusing it..

Scarborough (2003) defined knowledge management as ‘any process or practice of creating, acquiring, capturing, sharing and using knowledge wherever it resides, to enhance learning and performance in organizations. The authors went on to state that knowledge management focuses on the development of firm – specific knowledge and skills that resulted from organizational learning processes. Knowledge management involves both stocks and flows of knowledge. Stocks include expertise and encoded knowledge in computer system while flows represent the way in which knowledge is transferred from people to people or from people to a knowledge database. Tan (2000) also defined knowledge management as ‘the process of systematically and actively managing and leveraging the stores of knowledge in an organization’.

Knowledge is possessed by both the organization and people in the organization. Organizations operational, technical and procedural knowledge can be stored in databanks and found in reports, libraries, policy documents, manuals and presentations, it can be shared in the organization through information systems, meetings, seminars, workshops, courses, publications and ‘communities of practice’ (Armstrong, 2012). ‘Communities of practice’ was defined by Wenger and Snyder (2000) as ‘groups of people informally bound together by shared expertise and a passion for joint enterprise.’ The intranet and internet also provides effective medium for knowledge



dissemination. Knowledge is acquired by individual employees in an organization through their own experiences at work that will not necessarily be shared formally or even informally with their colleagues. Such knowledge possessed by individual employment may be crucial to the operation and growth of the organization. The knowledge in the organization may be critical to the operation and growth of the business and could be lost or taken elsewhere by employees if they leave the organization. So one of the key issue in knowledge management is how such individual knowledge (tacit knowledge) can be identified, documented and converted to organizational knowledge (explicit knowledge).

Knowledge management refers to a systematic and organizational specific framework to capture, acquire, organize and communicate both tacit and explicit knowledge of employees so that other employees may utilize them to be more effective and productive in their work and maximize the organizations knowledge (Alavi & Ierdner, 1999; Davenport & Prusak, 1998). Nonaka (2007) prefers the term knowledge – based management which he describes as connecting people to people and people to information to create competitive advantage.

Knowledge management is considered as a structured method that offers approaches for recognising, evaluating, organizing, storing and applying knowledge in order to meet the requirement and objectives of the association. Knowledge management is a procedure in that association or business organization can identify, choose, establish, allocate and convey important information and involvements that would be applied in events like problem resolution, dynamic education, strategic programming and decision making (Choi & Lee, 2002).

Knowledge management is the process of creating, capturing and using knowledge to enhance organizational performance (Alawneh et al, 2009). Lee and Yang(2000) argue that knowledge management is the collection in process that govern the creation, dissemination and leveraging of knowledge to fulfil organizational objective. An effective knowledge management should enable an organization to improve operational efficiency, reduce cost, achieve higher productivity and boost revenue.

According to Armstrong (2012), Knowledge management “ is about getting knowledge from those that have it to those who need it in order to improve organizational effectiveness”. While relying on the resource-based view of the firm Blake (1988) stated that the purpose of knowledge management is to capture a company’s collective expertise and distribute it to wherever it can achieve the biggest payoff. The resource –based view of the firm suggests that the source of competitive advantage lies within the firm ie

in its employees and their knowledge and not in how it positions itself in the market. Thus a successful company is a knowledge-creating company. We are now in information age where knowledge rather than physical assets or financial resources is the key to competitiveness. It can thus be said that knowledge management allows companies to make best use of their employees creativity and expertise. The purpose and significance of knowledge management was captured by Boxall and Purcell (2000) statement that “ Managing Knowledge inevitably means managing both the company’s proprietary technologies and systems (which do not walk out of the door at the end of the day) and the people (who do)”.

2.1.4 The Concept of Organizational Innovation

There are many definitions of Innovation in literature. According to Chen et al (2004) “innovation refers to the introduction of a new combination of the essential factors of production into the production system. Innovation capital is the competence of organizing and implementing research and development, bringing forth the new technology and the new product to meet the demands of customers. It involves new product, the new technology, the new market, the new material and the new combination.”

Broadly speaking, innovation can be seen as the implementation of discoveries and interventions and the process by which we produce new outcomes, whether products, systems or processes (Gloet & Terziovski, 2004). The authors went on to distinguish between two types of innovation: radical and incremental innovation. Radical innovations often make existing skills and knowledge redundant thus necessitating different management practices. Radical innovations are important in considering long-term success as they require development and application of new technology, some of which may change existing market structures. Radical innovations often put the business at risk because they are more difficult to commercialize. On the other hand incremental innovations usually involve line extensions modifications of existing products. Incremental innovations does not require significant departure from existing business practices and are therefore likely to enhance existing internal competencies by providing the opportunity to build on existing know-how.

Herkema (2003) described innovation as a knowledge process aimed at creating new knowledge process aimed at creating new knowledge geared towards the development of commercial and viable solutions. Innovation is a process wherein knowledge is acquired, shared and assimilated with the aim to create new knowledge, which embodies products and services. Further more Herkema (2003) stated that



innovation is the adoption of an idea or behaviour that is new to the organization. The basic and foremost purpose of innovation is to produce new knowledge which can be developed into practical solutions to societal problems. The innovation can be a new product, a new service or a new technology.

The main objective of innovation is to create value for the business. In today's competitive world, innovation is the soul of business because it helps organizations to produce unique products and services. The rapid changes in taste and preferences of customers in both emerging and developed markets underscores the importance of innovation. Organizations that are not able to produce innovative products and services are not likely to survive in the industry because of competition. Innovation fuels organization's growth in any type of environment (Kashif et al, 2011).

2.1.4.2. Measures of Organizational Innovation

The innovation process is essential to the performance of organizations (Marins, 2008). In this study three measures of organizational innovation were used. These are process innovation, product innovation and administrative innovation. Leonard and Waldman (2007) described process innovation as the creation of process, new improvement to existing process. This has to do with the implementation of a new and significantly improved production or delivery method, which includes changes in techniques, equipment and or software (Bi, Sun, Zheng & Li, 2006). However it should be noted that minor changes, or improvements, an increase in production or service capabilities through the addition of manufacturing or logistical systems which are very similar to those already in use, ceasing to use a capital replacement or extension, changes resulting purely from changes in factor prices, customisation, regular seasonal and other cyclical changes, trading of new or significantly improved products are not considered innovations (Innoviscop, 2006).

Product innovation is defined by Damanpour and Gopalakrishnan (2001) as the development and commercialization of new product to create value and meet the needs of the external user or the needs of the market. Product innovation is a systematic work process which draws upon an existing knowledge gained from research and practical experiences directed towards the production of new materials, products and devices, including prototypes. Product innovation can simply be defined as the creation and subsequent introduction of a good or service that is either new, or improved version of previous goods or services. Organizations can use product innovation to differentiate their product and gain competitive advantage. Thus one of the advantages of product

innovation is that it stimulates growth and expansion. It also gives the organization a competitive advantage. One of the disadvantages of product innovation is that it usually requires the injection of lots of capital and time into it, which requires constant experimentation which incurs higher cost which may ultimately cause business failure.

Administrative innovation can be described as the performance derived from the changes to organizational structure and administrative process, reward and information system, and it compasses basic work activities within the organization which is directly related to management (Chew, 2000; Damanpour & Evan, 1984). Administrative innovations are defined as those that occur in the administrative component and affect the social system of an organization. The social system of an organization consists of the organizational members and the relationships among them (Trist & Bamforth, 1951). It includes those rules, roles, procedures, and structures that are related to the communication and exchange among organizational members and between the environment and organizational members (Cummings & Srivastva, 1977). Administrative innovation involves the introduction of a new management system, administrative process, or staff development programme. However it should be noted that administrative innovation does not bring forth a new product or new service, but indirectly influences the introduction of products or services or the processes required to produce them (Kimberly & Evanisko, 1981).

3.0 METHODOLOGY

A cross sectional survey approach was used. A structured questionnaire was used to collect primary data from respondents while secondary data was sourced from management books, journals, newsletters and online publications. There are a total of 35 questionnaire statement items. Knowledge management has twenty items while organizational innovation has fifteen items that included process innovation (5 items), product innovation (5 items), administrative innovation (5 items). The response format was based on 5 point Likert Scale ranging from Strongly Disagree (SD) = 1 to Strongly Agree (SA) = 5.

The three refining companies in Nigeria located at Warri, Port Harcourt and Kaduna constitute the population of the study. The study is an organizational level study with managers and heads of departments of the companies as target respondents and unit of analysis. Based on the data obtained from the company the total sample size; made up of total number of managers, heads of departments and their deputies, is about 150 for the three refining companies in Nigeria. A



total of 210 questionnaires were distributed out of which 157 were properly completed and returned, giving a response rate of 75%. Purposive sampling technique was used since the respondents are restricted to certain category of workers.

3.1 Method of Data Analysis

Descriptive and inferential mode of data analysis was used. The descriptive mode involved the use of mean, standard deviation, percentages, frequencies and bar charts while the inferential mode is mainly for multivariate data analysis. The multivariate data analysis technique employed is the Structural Equation Modelling (SEM). The bivariate relationship between the predictor variables and the criterion variables were tested using Pearson Correlation Coefficient. Also the correlation between knowledge management and organizational innovation was tested using Pearsons correlation coefficient.

Partial correlation was used to determine the effect of the moderating variable (organizational culture) on the relationship between knowledge management and

organizational innovation. The Structural Equation Model was used to test the hypotheses. IBM SPSS Version 21 and AMOS version 21 were used to carry out data analysis of this study.

3.2 Validity and Reliability of Instrument.

The validity of the instrument means that the instrument used for primary data collection have correct contents as to measure exactly what it is meant to measure. According to Baridam (2001) validity is perhaps the most important criterion for evaluating sufficiency and efficiency of criterion measures. was tested using face content method whereby the questionnaire is rated by experts in the field of study and their verdict that the instrument is valid means that the instrument has passed validity test. A pilot survey was conducted and the assessment of responses by experts in the field was used to pass the validity test of the instrument.

The reliability of all the constructs were tested by computing its Cronbach's Alpha Coefficient as shown in Table 3.1 below.

Table 3.1: Results of Cronbach's Alpha Computations For Construct Reliability Test

S/NO	FACTORS	NO OF ITEMS	CRONBACH'S ALPHA
1	KNOWLEDGE MANAGEMENT	20	0.88
2	PROCESS INNOVATION	5	0.74
3	PRODUCT INNOVATION	5	0.82
4	ADMINISTRATIVE INNOVATION	5	0.78
5	ALL MEASURED ITEMS	35	0.93

Source: SPSS Output Result For Research Data (2019).

Table 3.1 shows that the values of the Cronbachs Alpha ranged from 0.74 (Process Innovation) to 0.93 (All measured items) which are all above 0.70 threshold suggesting reliability and consistency of instrument. Thus the instrument of the study passed validity and reliability tests.

4.0 RESULTS AND DISCUSSION

The descriptive statistics of the univariate analysis of the measured constructs were carried out for the purpose of having an overview of the responses from

the respondents for each of the measured variables as contained in the 20 measuring statements in the questionnaire. The result of the normality test as indicated by the Skewness and Kurtosis was also analysed. The multivariate analysis using structural equation modeling (SEM) was used to test the three null hypotheses.



4.1 Data Analysis

The descriptive statistics of the univariate analysis of the predictor variable and the criterion variables is as shown in table 4.1 below.

Table 4.1 Descriptive Statistics of the Predictor and Criterion Variables

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
KNOW_MGT	157	4.07	.488	-1.372	.194	2.187	.385
PROC_INV	157	3.95	.634	-.816	.194	.896	.385
PROD_INV	157	3.91	.875	-.697	.194	.428	.385
ADMN_INV	157	3.97	.797	-.846	.194	1.188	.385
Valid N (listwise)	157						

Table 4.1 shows that the predictor variable (knowledge Management) have a mean value of 4.07 with a standard deviation of 0.488. Based on the 5 point Likert scale, which has Agree = 4 and Strongly Agree = 5, it means that most respondents agree that their organization carry out proper knowledge management which takes into account identification, organization, storage, dissemination and application of knowledge. Similarly the values of process innovation, product innovation and administrative innovation are 3.96, 3.91 and 3.97 respectively. This also suggests that most respondents agree that their organizations are innovative and this involves process innovation, product innovation and administrative innovation.

The normality of the data for this study is analysed using the parameters of the level of skewness

and kurtosis. Table 4.1 shows that the skewness of the variables range -1.2 to -0.8 while the Kurtosis range from 0.9 to 2.0. The indicators for skewness and kurtosis of the data are generally within acceptable range of -2 to +2 which suggests that the data is normally distributed,

4.2 Test of Hypothesis

The test of hypothesis was carried out using IBM SPSS AMOS Version 21 software. The structural model linking the predictor(knowledge management) and the criterion variables (process, product and administrative innovation) is as shown if figure 4.1.

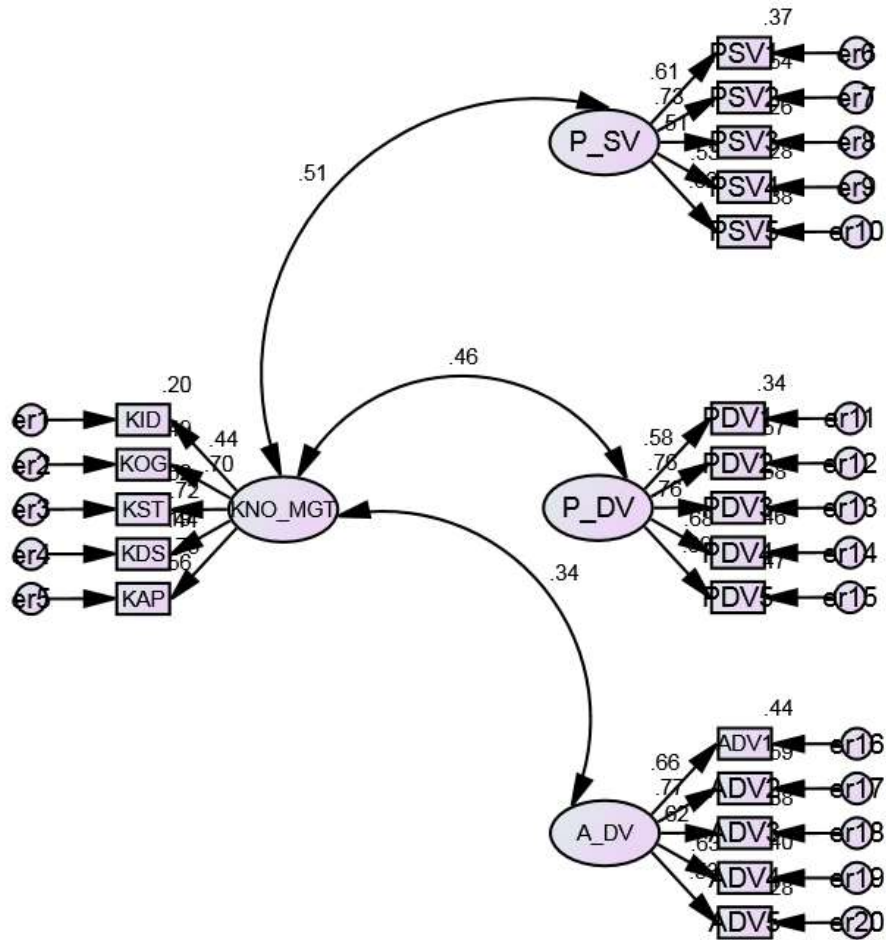


Figure 4.1. Structural Model Linking Predictor and Criterion Variables



The IBM SPSS AMOS Version 21 output result of the test of the three null hypotheses is as shown in table 4.2 below,

Table 4.2: Result of Test of Hypothesis (Ho:1 to Ho:3)

S/NO	PATH	TESTING RELATIONSHIP	r	S.E	P	REMARKS
1	KNOW_MGT TO PROC_INV (Ho:1)	Knowledge Management And Process Innovation	0.51	0.11	0.000	NULL HYPOTHESIS NOT SUPPORTED ACCEPT ALTERNATIVE
2	KNOW_MGT TO PROD_INV (Ho:2)	Knowledge Management And Product Innovation	0.46	0.10	0.000	NULL HYPOTHESIS NOT SUPPORTED ACCEPT ALTERNATIVE
3	KNOW_MGT TO ADMN_INV (Ho:3)	Knowledge Management And Administrative Innovation	0.34	0.09	0.000	NULL HYPOTHESIS NOT SUPPORTED ACCEPT ALTERNATIVE

Table 4.2 shows that the first null hypothesis that “there is no significant relationship between knowledge management and process innovation” has correlation of 0.51 and probability level of 0.000 which is less than 0.05 for a two tailed test at 5% level of significance. Thus there is a significant positive relationship between knowledge management and process innovation. Therefore the null hypothesis (Ho:1) is not supported and the alternative is accepted. Similarly Ho:2 and Ho:3 have the correlation coefficients as 0.46 and 0.34 respectively with both p=0.000 which leads to the rejection of Ho:2 and Ho:3 and acceptance of their alternative hypotheses. Therefore the result of the test of the hypothesis shows that there is a significant positive relationship between knowledge management and product innovation. Also there is a significant positive relationship between knowledge management and administrative innovation.

5.0 CONCLUSION AND RECOMMENDATIONS

The purpose of this study was to evaluate the relationship between knowledge management and the measures of organizational innovation which are process innovation, product innovation and administrative innovation. The findings of the study revealed that there is a significant and positive relationship between knowledge management and each of the three measures of organizational innovation namely; process innovation, product innovation and administrative innovation. Based on order of level of influence starting with the one with the greatest impact, we have strong positive relationship between knowledge management and process innovation,

followed by significant positive relationship between knowledge management and product innovation; significant positive relationship between knowledge management and administrative innovation. The findings of this study emphasizes the need for the refining companies in Nigeria to focus on creating work environments and managerial practices that encourage employee innovativeness such as putting in place appropriate reward system that will enhance the generation of new ideas that will promote organizational innovation. Team work and sharing of knowledge among employees .The management of refining companies should be create friendly work environment that promote trust, knowledge acquisition and sharing among workers. These is need for supportive organizational structure and managerial style that shape employee attitude and behavior to foster organizational innovation.

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