

Knowledge Management and Information Technology Competency of Public Universities in Rivers State

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Abstract: The implementation of effective and efficient knowledge management practices stands as one of the most important dynamics for improving information technology competency. This dynamic has significant role in increasing information technology competence in public universities. Hence, implementation of appropriate knowledge management practices will influence information technology competency. This study therefore, investigates the influence of knowledge management on information technology competency of public universities in Rivers State of Nigeria. The target population for the study comprised all teaching staff from three universities within Rivers State. The total population of academic staff of the three universities combined as at December, 2017, was 2,517. The sample size of teaching staff studied was determined by the use of the formula developed by Taro Yamane (1967) and Krecjie and Morgan (1970). The study used simple random sampling and stratified sampling to decide on respondents from each of the universities, and a total of 365 respondents were obtained from the public universities studied. Primary data were processed using simple regression analysis, and the findings of the study revealed that, knowledge generation, knowledge transfer and knowledge codification and storage have a very strong, positive and significant influence on information technology competency. The study therefore concludes that, knowledge management significantly influence information technology competency, and recommends that university management should sensitize their teaching staff on knowledge generation, knowledge transfer and knowledge codification and storage standard being applied in their relevant institutions and channel them all the way through their profession conduit to attract an efficacious information technology competency process.

Key Words: Information technology competency, knowledge codification and storage knowledge generation, knowledge transfer.

I. INTRODUCTION

Knowledge management has materialized as a distinctive area in the study of business and is recurrently alluded to as a precursor of performance in establishments. The implementation knowledge management practices fruitfully will enable establishments to perform shrewdly to uphold their competitive advantage by budding their knowledge assets (Wigg, 1999). It is crucial to be acquainted with knowledge generation, method of dissemination in a business and what dynamics smooth the progress of these processes

(Stewart, 1997; Davenport & Prusak, 1998), especially the role of information technology in these processes.

Information technology (IT) is widely documented as the building block for establishments to survive and compete favourably with others. Hence, education managers are motivated to adopt information technology in their operations in order to achieve efficient and effective performance in their establishments. Establishments, especially those in the education sector operate in complex and competitive environment, characterized by altering circumstances and extremely capricious economic environment.

Information technology has been an innermost theme in the knowledge management text (Constant *et al.*, 1996; Hayes & Walsham, 2003) Information and communication technologies have been intimately associated with the development of the immense preponderance of knowledge management inventiveness. The influence of IT competency on knowledge

management may materialize as direct influence of information systems on knowledge management procedures; or they may indirectly influence information systems on knowledge management by affecting appropriate dynamics such as structure, which, subsequently, influence knowledge management

Information technologies are pigeonholed by their ability to power the traditional ways of appreciating assured structural sensations and behaviors and affect how firms wrestle with the trials flung up by the knowledge society. Information technology has been a fundamental theme in the knowledge management literature (Constant *et al.*, 1996; Hayes & Walsham, 2003). Information and communication technologies have been meticulously linked with the development of the great majority of knowledge management initiatives. Franco and Mariano (2007) predicted that virtually 70% of publications on knowledge management emphasis on the design of IT systems. The influence of IT competency on knowledge management can be well-thought-out to be twofold: direct and indirect. Information systems can directly influence the knowledge management processes. They can also indirectly influence knowledge management by affecting

contextual factors such as structure, which, in turn, influence knowledge management.

In recent years, several scholarly endeavours have associated knowledge management with the development of information and communication technologies, for instance Awara, Udoh and Anyadighob (2018) examined the impact of information technology (IT) tools on supply chain performance of online retailers in Calabar Metropolis, Cross River State., Ming-Liang, Kuo-Jui and Nguyen (2011) investigated the impact of information technology (IT) in supply chain management (SCM), and Attar and Sweiss, (2010) studied the relationship between IT adoption and job satisfaction within the Jordanian construction industry. None of the above-mentioned studies investigated the influence of knowledge management on information technology competency in the educational sector. Therefore, to fill this gap in literature, this current study investigates the influence of knowledge management (knowledge generation, knowledge transfer and knowledge codification and storage) on information competency of public universities in Rivers State.

II. LITERATURE REVIEW AND HYPOTHESES

Dynamic Capability Theory

Advocated by Teece, Pisano and Shuen, in their 1997, the major supposition is a firm's foundation competences should be used to generate immediate competitive arrangements that can be developed into longer-term competitive advantage. Dynamic capabilities, emphasize that the ability to react adequately and timely to external changes requires a combination of multiple capabilities. Dynamic capabilities theory concerns the development of strategies for senior managers of successful companies to adapt to radical discontinuous change, while maintaining minimum capability standards to ensure competitive survival. For this theory to be fully applicable, certain elements have to be taken into accounts. Some of these elements include process, learning, new assets, transforming existing assets and co-specialization.

The Concept of Knowledge Management

Defining the concept of knowledge management is not forthright, for the reason that it has been considered by numerous disciplines and from diverse methodologies. For example, Davenport *et al.* (1998) defines knowledge management as a method of assemblage, spreading and competent use of the knowledge resource. O'Dell and Grayson (1998) perceive knowledge management as a policy to be established in a company to guarantee that knowledge touches the right people at the right time, and that those people share and consume the information to progress the company's operations. Defining knowledge management, Bhatt (2001) conceptualized it as a method of knowledge creation, validation, presentation, distribution and application. Too Bounfour (2003) defines knowledge management as a set of processes, substructures, and methodological and decision-making tools, calculated to craft, share and power information

and knowledge inside and about the company. Despite the variations in the definitions of knowledge management, there appears to be a harmony to recognize knowledge management as a set of procedures permitting the use of knowledge as a strategic dynamic to enhance and engender value (Bueno & Ordoñez, 2004). Knowledge management can therefore, be professed as a logical mode to conducting and enabling an establishment's knowledge property which might hold close knowledge of the establishment's customers, products, market, procedures, finances and peculiar services. Knowledge management considers the establishment's improvement of knowledge with incalculable know-how, paraphernalia, and sequences to bring about conventional aspirations. Knowledge management has to do with management of data, information, unequivocal and contingent knowledge. The main stimulators of knowledge, in any industry, are employees, processes and technology.

Knowledge can also be famed from data, information, and wisdom (Anand & Singh 2011). Knowledge management is more than a decision-making exercise, it's a principal apparatus that powers organizational cultural, operational, and tactical influence on managerial efficacy (Zheng *et al.*, 2010). In an establishment, learning and selection processes are vital to build, capture and assimilate the knowledge (Kim *et al.* 2012). Healthily time-honored amalgamated apparatuses implanted in the business will turn into a principal competence for the company (Kim *et al.* 2012), permitting them to absorb and consume the information more meritoriously. knowledge management comprises three foremost procedures, which are explicitly: knowledge generation, knowledge transfer, and knowledge codification and storage.

Knowledge Generation

Knowledge generation can be defined as the procedure by which the business acquires knowledge, either from externally or engendered within (Lee & Hong, 2002; McCann & Buckner, 2004). In consequence, knowledge generation is not only about engendering fresh substances, but also concerns substituting, endorsing and bring up to date the company's prevailing knowledge (Alavi & Leidner, 2001; Bhatt, 2001). Organizations can obtain knowledge outwardly from diverse fonts, for example conversation with external representatives, collaborators and partners, buying copyrights or captivating new employees (McCann & Buckner, 2004). Within, knowledge creation can include developing fresh substances or substituting current substances (Alavi & Leidner, 2001). Acquisition of knowledge therefore, is a function of knowledge generation which may possibly emerge ostensibly or within, modernizing the business customary knowledge.

Knowledge Transfer

Knowledge transfer denotes the progression by which a firm shares knowledge amongst its divisions and associates, upholding unique appreciation (Alavi & Leidner, 2001). It is

necessary for the business to cultivate a passable arrangement of informative interface systems that permit entities of miscellaneous spheres, cultures, and geographic situations, to have admittance to similar information and as well come collectively through the system to carry out a specific scheme.

Knowledge Codification and Storage

Knowledge codification and storage is actually a significant piece in the operative management of knowledge (Casey, 1997; Cross & Baird, 2000). The prevailing knowledge need be taken, classified, presented and positioned in stores in a regulated mode, so it can be recycled far ahead (Choi *et al.*, 2008). Conversely, it is necessary to reminisce that organizational knowledge is disseminated and dispersed all the way through the business.

Information Technology Competency

The information technology upheaval has expedited the routes of searching for and recuperating information, however, simultaneously it has led to a significant development in the database business. Firms must be able to use information technology to acquire expedient information for their decision-making. In line with Tippins and Sohi (2003'), this study defines information technology competency as just how the establishment uses these technologies to bring about its information meritoriously.

In the sphere of information technology, managerial decisions on adoption of innovative technologies experience a number of encounters. The route of technological modernization is branded by intrinsic improbabilities. Investments in innovative technologies have wide-ranging altitudes of risk as novel groundbreaking technologies that propose value-added performance possibly will similarly propose a lesser possibility of efficacious expansion (Krishnan & Bhattacharya, 2002). Besides, information technology adoption resolutions may well be influenced by choices of other economic representatives. Given a network externality, the advantage to a business of decide on a technology lies with its inherent reckoning as well as the "network" value emanating from others espousing similar technology (Farrell & Saloner, 1986; Katz & Shapiro, 1986). Enquiries on technology adoption in management information systems (MIS) acknowledged a number of conceptual models and general frameworks for such decisions as well as the technology acceptance model (TAM) and the unified theory of acceptance and use of technology (Gangwar *et al.*, 2014; Roy, 2017) including precise variables and success factors that influence adoption behavior (Ghezzi *et al.*, 2013).

Knowledge Management and Information Technology Competency

Knowledge Management simplifies the development of information technology competency undertakings and advances its proficiencies. Knowledge management can be correlated to information technology competency in a number

of ways. The term embraces computers, ancillary equipment, software and procedures. The information technology is recognized by all those contrivances that lead to the construction and preservation of knowledge. Knowledge creation, sharing, storage, are enriched by the application of such technologies, which expedites communication, transmission and speed. Information technology is a worthwhile utensil to preclude knowledge loss and to stimulate its creation linking all the individuals among the business (Bhatt, 2001).

Empirical Studies

Awara *et al.* (2018) examined the impact of information technology (IT) tools on supply chain performance of online retailers in Calabar Metropolis, Cross River State by adopting the cross-sectional survey research design and the purposive sampling procedure. Data were analyzed by means of the multiple regression analysis, and the findings demonstrated that information technology (IT) tools have positive influence on supply chain performance of online retailers in Calabar Metropolis. The study concluded that supply chain management commences and culminates with the customers, and, the exclusive purpose of the integration and collaborations of the supply chain is to efficiently and proficiently gratify customers' demands and requirements, as well as add value to the supply chain potentials which would improve their performance, and recommends that operational retailers should construct an operative supply chain, assimilated with information technologies empowered logistic system that can expand supply chain performance and response speedily to unforeseen requirements of the consumers.

Ming-Lang *et al.* (2011) investigated the impact of information technology (IT) on supply chain management (SCM). The study used benchmarks that embraced the applications of IT to acquire the high firm performance encompassing marketing performance, financial performance, and customer satisfaction. The study used the fuzzy DEMATEL technique to demonstrate the interrelationships amongst all of benchmarks, and the result revealed that advanced IT is the cause criteria leading to marketing performance and customer satisfaction.

Attar and Sweiss (2010) studied the relationship between IT adoption and job satisfaction within the Jordanian construction industry, in order to fill the knowledge gaps by investigating the relationship between IT adoption and job satisfaction from the perception of Jordanian contracting firms. The study developed measures by means of MSQ and IT Barometer surveys. 50 questionnaires were circulated to investigate this relationship among different contracting companies in Jordan. Descriptive statistics were obtained and hypotheses were tested using multiple regression analysis, and the results portray that additional investment in technology would relatively increase employee job satisfaction concerning inherent and general perceptions.

From the review of literature, the study developed the following conceptual framework:

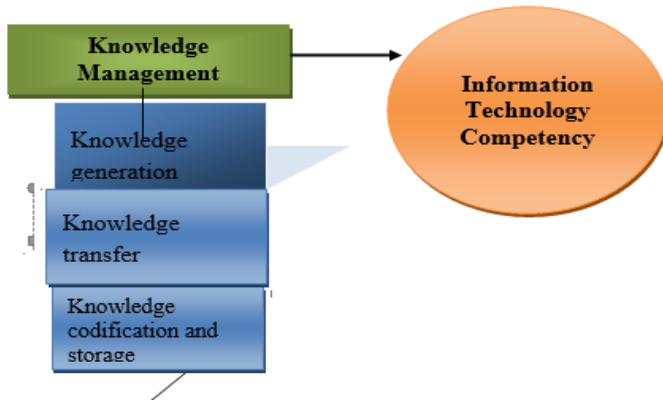


Figure 1: Conceptual Framework of Knowledge Management and Information Technology Competency

Source: Adopted from Ghezzi et al. (2013) and Kim et al. (2012).

Given this conceptual framework, three hypotheses developed are as follows:

H₀₁: Knowledge generation does not significantly influence Information technology competency in public universities in Rivers State.

H₀₂: Knowledge transfer does not significantly influence Information technology competency in public universities in Rivers State.

H₀₃: Knowledge codification and storage does not significantly influence Information technology competency in public universities in Rivers State

III. METHODOLOGY

The study adopted a causal research design. The study was cross sectional survey study, since it enables observational study that engrosses the analysis of data composed from a population, or a representative subset. It concerned compilation of primary data at precise point in time. The target population for the study comprised all teaching staff from the all the three universities within Rivers State (Rivers State University, Ignatius Ajuru University and University of Port Harcourt). The total population of academic staff in the three universities combined is 2,517. The University of Port Harcourt has a teaching staff, of 1,390 (Uniport Staff Profile, 2020), Rivers State University has a teaching staff strength of about 686, while, Ignatius Ajuru University of Education boast of about 441 teaching staff (University Official Staff Profile, 2017). The sample size of teaching staff that were studied was determined by the use of the formula developed by Taro Yamane (1967). According to Mugenda & Mugenda (2009) 30% of the total population is considered as adequate sample size. The universities were pulled out on the basis of number of teaching staff. The study used simple random sampling to decide on respondents from each of the universities.

Thus the formulae $n = N/1 + N(c)$ squared

Where n is the sample size

N is the population

1 is constant and

e is level of significance (i.e. 0.05).

Therefore; $n = 2517/1 + 2517(0.05)^2$

$$n = 2517/1 + 2517(0.0025) = 2517/1 + 6.2925$$

$$n = 2517/7.2925 = 345.$$

= 345 teaching staff respondents. The sub-sample of size for each university was determined using the formula by Krecjic and Morgan (1970) as follows:

$$s = XS/P$$

here;

s = Sub-sample size for each university

X = Population of teaching in each university

S = Total sample size for the study

P = Total population of all the universities based on job category of teaching staff

Based on this formula, a total sample size of 345 respondents was used. Simple random sampling was used to arrive at the respondents per institution from the target population. Information on the diverse departments and teaching staff per department were supplied by the human resource managers of the universities under study, who were supplied with the questionnaire until the sample size was arrived at. The study used self-administered questionnaires to assemble primary data.

Reliability

Table 1 shows the reliability assessment of our predictor variables using Cronbach's alpha. It indicates how the items for each factor were internally related in the manner expected. As we can see, the value of the Alpha coefficient for the composite scale and the subscales are all above the threshold ($\alpha \geq 0.70$); hence, they are all reliable.

Table 1 Test of Reliability

Scale	Dimension	Items	Reliability
KG	Knowledge Generation	5	0.776
KT	Knowledge Transfer	5	0.890
KCS	Knowledge Codification and Storage	5	0.754
ITC	Information Technology Competency	5	0.931

Source: Survey data, 2022

IV. RESULTS AND DISCUSSIONS

On the basis of the above analysis, the influence of knowledge management dimensions (knowledge generation, knowledge transfer, and knowledge codification and storage) on the beforehand acknowledged information technology competency is now evaluated.

The study sought after ascertaining whether knowledge management had significant effect on information technological competency in public universities in Rivers State. The results are expressed below:

Hypothesis One

Regression analysis of Knowledge Generation and Information Technology

Table 2. Regression analysis of Knowledge Generation and Information Technology

Model	R	R Square	Adjusted R Square	F (ANOVA)	Sig
1	.934a	.872	.869	293.198	0.000

a. Predictor (constant) Knowledge Generation

The model summary of the regression analysis in Table 2 shows that knowledge generation accounted for 87.2% of the variance in information technology competency among the respondents from public universities in Rivers State (R square = 0.872). This shows that 12.8% of the variance in information technological competency is explained by factors not in the study.

Hypothesis Two

Regression analysis of Knowledge Transfer and Information Technology Competency

Table 3. Regression analysis of Knowledge Transfer and Information Technology Competency

Model	R	R Square	Adjusted R Square	F (ANOVA)	Sig
1	.908a	.824	.820	201.531	0.000

a. Predictors: (Constant), Knowledge Transfer

The model summary of the regression analysis in Table 3 shows that knowledge transfer accounted for 84.2% of the variance in information technology among the respondents from public universities in Rivers State (R square = 0.824) and as such 15.8% of the variance in information technology competency was explained by factors not in the study.

Hypothesis Three

Regression Analysis of Knowledge Codification and Storage and Information Technology Competency

Table 4. Regression analysis of Knowledge Codification and Storage and Information Technological Competency

Model	R	R Square	Adjusted R Square	F (ANOVA)	Sig
1	.982a	.964	.964	5325.613	0.000

a. Predictors: (Constant), Knowledge Codification and Storage

Knowledge codification and storage accounted for 96.4% of the variance in Information technology competency among the respondents from public universities in Rivers State (R square = 0.964) and as such 3.6% of the variance in information technology competency was explained by factors not in the study

Based on the analysis results of knowledge management dimensions (knowledge generation, knowledge transfer and knowledge codification and storage) effects on information technology it is found that there are significant and positive effects, then the research hypotheses stating that knowledge generation, knowledge transfer and knowledge codification and storage does not significantly influence information technology competency have adequate evidence to be rejected, and the alternate hypotheses that knowledge generation, knowledge transfer and knowledge codification and storage does not significantly influence information technology competency be accepted. This finding indicates that increased knowledge generation, knowledge transfer and knowledge codification and storage for a university can describe the increased information technology competency in the public universities in Rivers State. Based on the empirical study, then, the increased knowledge generation, knowledge transfer and knowledge codification and storage support the increased information technology competency. Positive influence of knowledge generation, knowledge transfer and knowledge codification and storage on information technology competency means that increased knowledge generation, knowledge transfer and knowledge codification and storage will lead to better information technology competency. Therefore, positive management of universities perception to invest in knowledge generation, knowledge transfer and knowledge codification and storage will support the chance of the universities' growth in information technology competency. These research results support the findings of Ming-Lang *et al.* (2011) stating that advanced IT is the cause criteria leading to marketing performance and customer satisfaction. By higher information technology competency, it will attract patronage so that the value of the university will also increase, by the increased rating, then the universities worth will increase. There will be increased shareholder value when the increased universities worth can be seen through high ratings by stakeholders. This high ratings on of the universities depends on knowledge generation, knowledge transfer and knowledge codification and storage which stimulated meritorious information technology competency, resulting to enhanced teaching staff job satisfaction. This in line with Attar and Sweiss (2010)

whose results portray that additional investment in technology would relatively increase employee job satisfaction concerning inherent and general perceptions.

IV. CONCLUSION AND RECOMMENDATION

This study investigated the effect of information technology competency on knowledge management. The results of regression analysis showed that knowledge generation, knowledge transfer and knowledge codification and storage have significant positive effect on information technology. This means that, the success of information technology competency in public universities was as a result of their implementation of satisfactory knowledge generation, knowledge transfer and knowledge codification and storage, which have contributed significantly to their desire to remain productive in their jobs depending on how they have access to knowledge management tools. The study therefore, concludes that, knowledge generation, knowledge transfer and knowledge codification and storage significantly influence information technology competency in public universities in Rivers State, and recommends that university management should sensitize their teaching staff on knowledge generation, knowledge transfer and knowledge codification and storage standard being applied in their relevant institutions and channel them all the way through their profession conduit to attract an efficacious information technology competency process.

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