

The Challenges Of Knowledge Management Practices Among Indigenuos Construction Firms In Katsina State, Nigeria

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Abstract—The construction industry comprised of processes that are quite complex in nature which require systematic but dynamic management of knowledge and information. Coupled with advancement in science and technology, todays construction industry has become more challenging and tough for managers. Knowledge management is one important strategy in this regard. This research explores knowledge management practices, their application and the inherent benefits derivable from them by indigenous construction firms in Katsina, Katsina state, Nigeria. It investigated the challenges of knowledge management practices among these companies. Using a cross-sectional research design, a questionnaire survey was used to obtain information from the targeted population. A total of 184 respondents were randomly selected from five study construction firms in the study area. Data generated was summarized and analyzed using descriptive statistical techniques. Results have shown that indigenous construction companies in the study area practice some form of knowledge management at different levels. It further shows that major benefits derived include the introduction of innovative construction methods and contracting services, improvement in coordination and communication among project participants, reduction in the cost of operations and processes, improving timelines for construction operations and processes, enhancing the quality of contracting services and constructed facilities. The results have also revealed several challenges in the level of implementation of Knowledge management practices. Major challenges included lack of proved method for carrying out project in KM, and low involvement of police which moderately affects implementation of knowledge management among the companies. A number of recommendations were made in order to enhance the implementation of KM and overcome the challenges identified. These recommendations include enhanced KM awareness among employees of construction firms in order to allow for maximum participation among parties, use of modern ICT tools should be encouraged by construction firms; This will enable knowledge

generation, capturing and processing with effectiveness.

Keywords—Challenges, Construction Firms, Indigenous, Knowledge Management Practices

INTRODUCTION

The construction process comprises of several individuals and organizations involved in the processing, delivery and production of construction products. It is a knowledge-based organization (Nunes, Ferrada, Neyem, Serpell, Sepulveda, 2018) that is enveloped in a highly complex process of production. In both the developed and developing countries of the world, the type of construction markets prevailing has resulted to greater demands from clients and increase in the level of involvement of the clients in the execution of contract agreements (Egbu, 2005). Clients and contractors seeks quicker outcome from construction processes, and practitioner's needs to decide quickly on alternative solution to problem by integration of ideas from construction professionals (Anumba, 2005). As projects gets more complicated, they therefore require increasing collaboration between the client and contract administrators and this has made the construction industry increasingly becoming a more knowledge-intensive industry. Organizations in the construction industry complement one another. During the construction process, there is need for knowledge to be developed, transferred and managed within the organizations responsible for these processes (Oke, 2013). Effective knowledge management (KM) is an important strategy that is believed to be a performance enhancer for organizations to remain successful in a highly competitive global construction industry (Kim, 2014).

The Concept of Knowledge Management

Knowledge management is the systematic management of an organization's knowledge assets for the purpose of creating value and meeting tactical & strategic requirements that consists of the initiatives, processes, strategies, and systems that sustain and enhance the storage, assessment, sharing, refinement, and creation of knowledge. (Gupta, *et al* 2000). It is a process that deals with the development, storage, retrieval, and dissemination of

information and expertise within an organization to support and improve its business performance.

The Practice of Knowledge Management in the Construction Industry

Knowledge Management Practices are all the actions and activities which are either explicitly intended to perform some Knowledge management function, or those practices which are believed to additionally have Knowledge management dimensions. Four key KM practices are identified in the literature. The two primary knowledge management practices include Knowledge management processes and Knowledge management enablers.

Knowledge management processes according to Gold *et al.* (2001) refer to the acquisition (i.e., capturing knowledge), conversion (i.e., making captured knowledge available), application (i.e., degree to which knowledge is useful), and protection (i.e., security) of knowledge. On the other hand, knowledge management enablers refer to the organizational mechanisms that stimulate creating and developing knowledge within an organization and also facilitate its sharing, diffusion and protection (Lee, Choi 2003). These enablers according to Chuang (2004) comprised of both the technical and social knowledge enablers and they provide a foundation on which effective knowledge management can be built.

The Technical knowledge enablers include a number of information and communication technologies (ICT) such as data processing, storage, communication, and management information systems used by the firm to support and enhance the creation, storage/retrieval, transfer, application, and sharing of organizational knowledge. Information and communication technologies constitute the technical infrastructure that enables firms to Facilitate the rapid collection, storage, and exchange of knowledge; Integrate fragmented flows of knowledge and Create new knowledge. On the other hand, the Social knowledge management enablers are all the components of the construction process that integrate and enhances the volume of knowledge flows originating from different phases of the construction process, department/units and locations through a wide range of information and communication technologies. These enablers more importantly according to Tseng (2008). improve collaboration and teamwork, intensify and expand interactions among its social actors (i.e., employees and departments/units), overcome time and geographic location constraints in communication and coordination, improved the creation, search for, accumulation and diffusion of organizational knowledge, facilitate the storage, arrangement and sharing of organizational knowledge and increase transmission and response speed in business and construction operations by organizing organizational knowledge and making it available whenever and wherever it is needed in the firm.

Benefits of Knowledge Management

Knowledge management is a crucial component to a successful project delivery in the construction industry. It presents a lot of advantages to the parties and stake holders in the construction process. Benefits that are associated with KM practices in the construction industry as summarized by Chuang (2004), Claver-Cortés *et al.* (2007) and a host of other researchers include the introduction of innovative construction methods and contracting services, improving coordination and communication among project participants, reduction in the cost of operations and processes, improving timelines for construction operations and processes, enhancing the quality of contracting services and constructed facilities, sharing best practices, lessons learned, techniques and processes for construction operations and their management and thereby increasing client satisfaction. Other benefits include the improvement in the overall firm's performance, creating and sustaining competitive advantage, identifying opportunities for new construction projects and markets and developing consciousness within the firm about the idea that knowledge assets do matter.

Scope of the Study

This study is limited to data obtained from selected indigenous construction firms comprising of contractors and consultants in Katsina, Katsina state, Nigeria. It is based on information generated from the selected firms about their respective Knowledge management practices. The respondents involved in the study were made up of Architects, Builders, Quantity Surveyors, Engineers, Estate Surveyors, Land surveyors and other management professionals within the organizations.

The Research Methodology

Research methodology as defined by Fellows & Liu (1997) referred to the principles and procedures of logical thought processes which were applied to a scientific investigation while the method concerned the techniques which were available and those which were actually employed in a research project.

A cross sectional research design was adopted for this research because the information about how Knowledge is managed within indigenous construction firms is subjective; generally based on respondents' views. Thus, it requires a focus from informants' 'point of view. The general understanding or the distant panoramic shot is not sufficient to establish this understanding. Second, this design provides a snapshot of knowledge management practices from construction professionals in the construction industry.

The Research Population, Sampling Design and Procedure

In order to effectively satisfy the needs for the study, a fair representation must be obtained for the research. According to Fellows and Liu (2003) a sample should be a good representative of the

population. The research population was made up of professionals from the five selected indigenous construction firms in Katsina state comprising of Akumau Ventures, SIY Consults, Afdin Construction Company, Muntasrab Construction Company and Sabon Aiki, Nigeria Limited made up of an estimated full and part time staff strength of 372. Using the Cochran's formula cited in Bartlett (2001) for determining sample size, (n) of 372, the sample size for this study was obtained as follows;

$$N_0 = \frac{p(1-p)z^2}{e^2} \text{ Where; } Z = 1.90 \text{ or } 1.96 \text{ } p = 0.5 \text{ } e = 0.05$$

$$\text{Sample Size} = \frac{no \times N}{n_0 + (N-1)}$$

$$N_0 = \frac{0.5(1-0.5)1.90^2}{0.05^2} = 361$$

$$\text{Sample size for the study} = \frac{361 \times 372}{361 + (372-1)}$$

Sample size is therefore 134,292/732 = 183.4

Or approximately 184 respondents.

Data Type, Instruments for Data Collection and Analysis

Secondary data for the research comprised of records and reports on company operations relevant to the work. Questionnaires were administered to the respondents in order to obtain primary data for the research. The Questionnaires consist of three sections, sections A consist of respondents' information, section B aims at collecting information on knowledge management among the firms while the third section, explores the benefits and challenges of knowledge management practices among the indigenous firms in the study area.

Data generated was analyzed with the aid of the Statistical Packages for Social Science (SPSS 22.0). Data measured on nominal scale were analyzed using descriptive statistics. Inferential statistics was used to analyze data measured on ordinal scale.

RESULTS AND DISCUSSIONS

Demographic Information

With reference to Table 1, of the 184 respondents used in the study, 39.6% were in the age bracket of 41-50 years, 25% of respondents were in the age bracket of 21-30 years, 21.3% in the age bracket of 31-40 years while 14.1% in the age bracket of Above 50 years. A greater percentage of the respondents were old who have stayed long in the industry and have acquired experience. With a *p* value less than 0.01, the difference in the variation among age groups was highly significant. The uniform distribution across age groups was not represented by 25% in each of the age groups.

Table 1: Age of Respondents

Age Group Frequency (n=184) Percentage		
21-30 years	46	25.0
31-40years	39	21.3
41-50years	73	39.6
Above 50 years	26	14.1
Total	184	100.0

Gender of Respondents

The results obtained from the analysis shows that there was a highly significant variation in the gender distribution among the respondents with a *p*<0.000. The males constituted 72.0% of the research sample while the females made up the remaining 28 % of those who participated in the study.

Respondents' Professional Inclination

The result of the survey in Table 2 showed that 44% of the respondents are Quantity surveyors in their firms and 31.5% were Architects in the firms. Analysis also indicated 11% of the respondents were Engineers, 5.9% of the respondents were Builders, 4.9% of the respondents were Estate Surveyors and 2.7% of the respondents were land surveyors.

Table 2: Respondents' Profession Frequency(n=184) Percentage (%)

Architect	58	31.5
Builder	11	5.9
Quantity surveyor	81	44.0
Engineers	20	11.0
Estate Surveyor	9	4.9
Land Surveyors	5	2.7
Total	184	100.0

Table 2: Respondents' Professional Inclination

Level of Respondents' Educational Attainment

Results in Table 3 shows a significant difference in the educational levels of respondents with the highest composition of 43.4 % of respondents having a Bachelor's degree, 25.5% had a master's degree, 19.7% had Higher National Diploma, 8.1% had Post Graduate Diploma, 0.6% had Ph. D and 2.7% had other qualification. Majority of the respondents had attained minimum academic and professional qualifications. This is a clear indication that the respondents had attained educational statuses to play a role in influencing the economic and social situations of the organizations.

Highest Percentage	Qualification	Frequency(n=184)	
	HND	36	19.7
	B. Sc	80	43.4
	PGD	15	8.1
	M. Sc	47	25.5
	Ph. D	1	0.6
	Others	5	2.7
	Total	184	100

Table 3: Educational Qualification of Respondents

Working Experience

Years of service of the respondents in construction business explains their volume of experience gathered and their exposure to construction processes and management; and particularly Knowledge Management. The results presented in Table 4 shows that a greater percentage of the respondents have been in the industry for more than 16 years representing 37.5% of the population. 23.4% of the respondents have been in the industry for 5-10 years, 25.5% have been for less than 5 years and 13.6% of the respondents have been for 11-15years. The mixture with a good composition makes Knowledge management important between the well experienced and the younger members of the industry.

Table 4: Working Experience of the respondents

Duration	Frequency	Percentage
0-4 years	47	25.5
5-10years	43	23.4
11-15years	25	13.6
Above 16 years	69	37.5
Total	184	100.0

Benefits of Knowledge Management Among the Construction Firms

With reference to Table 5, respondents were fully aware of "Introducing innovative construction methods and contracting services" as the main benefit of knowledge management and was ranked 1st with a mean of score 4.77. The finding was closely consistent with the results obtained by Liebowitz (2000), Beckam (1997) and Wiig (1999) cited in Davis (2007) in their works that "Developing consciousness within the firm about the idea that knowledge assets do matter." The importance and ranks of other benefits presented by Knowledge management are presented in Table 5 below.

Table 5: Benefits of Knowledge Management to the construction Firms

Type of Benefit	Mean Score	Rank
Introducing innovative construction methods and contracting services	4.77	1st
Improving coordination and communication among project participants	4.61	2nd
Reducing the cost of operations and processes	4.47	3rd
Improving timelines for construction operations and processes	4.36	4th
Improving overall firm performance	4.33	5th
Enhancing the quality of contracting services and constructed facilities	4.30	6th
Increasing client satisfaction	4.25	7th
Sharing best practices, lessons learned, techniques and processes for construction operations and their management	4.22	8th
Creating and sustaining competitive advantage	4.19	9th
Identifying opportunities for new construction projects and markets	4.13	10 th
Developing consciousness within the firm about the idea that knowledge assets do matter.	4.07	11 th

Identifying Various Knowledge Management Practices

Several Knowledge Management Practices were discovered among the construction firms by this study each at different levels and efficiencies. However, respondents were generally of the opinion that "Knowledge Management Processes" highly affects knowledge management practices and was ranked 1st. Other Knowledge management practices by the firms and their respective ranks of influence are presented in Table 6 below.

Table 6: Knowledge Management Practices by the Construction Firms

Type of Practice	Mean score	Rank
Knowledge Management Processes	4.61	1 st
Knowledge acquisition process	4.27	2 nd
Knowledge application process	4.24	3 rd
Knowledge protection process	4.22	4 th
Knowledge conversion process	4.14	5 th
Knowledge Management Enablers	4.11	6 th
Create new knowledge	3.97	7 th
Integrate fragmented flows of knowledge	3.95	8 th
Facilitate the rapid collection, storage, and exchange of knowledge	3.94	9 th
Improve collaboration and teamwork	3.90	10 th
Facilitate the storage, arrangement and sharing of organizational knowledge	3.88	11 th
Intensify and expand interactions among its social actors	3.81	12 th
Increase transmission and response speed in business and construction operations by organizing organizational knowledge and making it available whenever and wherever it is needed in the firm	3.68	13 th
Overcome time and geographic location constraints in communication and coordination	3.58	14 th
Improved the creation, search for, accumulation and diffusion of organizational knowledge	3.49	15 th

Challenges Faced by Indigenous Firms in the Implementation of Knowledge Management

Major barriers that influenced the effective implementation of KM were “Lack of proved method for carrying out project” ranked 1st with a mean score of 4.07. this was in agreement with Kelleher and Levene (2001). Other barriers were “Low involvement of police” which moderately affects the implementation of knowledge management and was ranked 18th with a mean of 3.47.

Table 7 Challenges of Knowledge Management Practices among the Construction Firms

Type of Challenge	Mean Score	Rank
Lack of proved method for carrying out project in KM	4.07	1 st
Time needed and high cost of implementing a KM system.	3.98	2 nd
Organizational culture	3.93	3 rd
Insufficient funding	3.93	4 th
Lack of seeking advice	3.91	5 th
The concept is unknown	3.89	6 th
Lack of an incentive system	3.84	7 th
Organizational structure	3.82	8 th
Lack of incentives to encourage knowledge sharing	3.82	9 th
Low involvement of top management	3.80	10 th
lack of networking	3.80	11 th
Layout of work space	3.79	12 th
Change of mentality needed to use these systems.	3.77	13 th
Employee resistance where the organizations are trying to adopt enterprise	3.75	14 th
Employees not understanding the benefits of KM	3.75	15 th
Lack of standard work processes	3.66	16 th
Not enough time	3.66	17 th
Low involvement of police	3.47	18 th

Existence of a Knowledge Management System Among the Construction Firms

Results from the analysis show that 62% of the respondents indicated that there was a KM system available in their firms, 18.4% of the respondents indicated that there was no KM system available in their firms at the moment, but were working on one; 19.6% of the respondents indicated that there is no Knowledge management system established in their firms and were either working on one or are considering a possibility for its introduction.

Discussion of Finding

Results obtained from the statistical analysis of the data generated from the respondents have shown that “Introducing innovative construction methods and contracting services” was the main benefit of knowledge management among the construction firms. This was closely consistent with the results obtained by Liebowitz (2000), Beckam (1997) and Wiig (1999) cited in Davis (2007) in their separate studies. “Knowledge management process” has been the major means of Knowledge management practice by the construction firms. There was also the challenge of “lack of proved method for carrying out project in KM” which is one of the important constraints to KM implementation by the firms.

Summary of Findings

Several benefits of KM were identified by this study. The most important of these benefits were introduction of innovative construction methods and contracting services among the firms, improving coordination and communication among project participants, reducing the cost of operations and processes, improving timelines for construction operations and processes, enhancing the quality of contracting services and constructed facilities among others. However, consciousness within the firms about the idea that 'knowledge assets do matter' as the benefit of knowledge management among the respondents were less developed.

A large percentage of the respondents believed that Knowledge Management is a methodology for the identification, optimization and active management for intellectual asset, while a small percentage sees ICT system as an important tool for the management of intellectual assets. Indigenous Companies largely recognizes knowledge management as a strategic asset. In addition, the study established that "Knowledge Management Processes" highly influences knowledge management while "improvement in the creation, search for, accumulation and diffusion of organizational knowledge" moderately affects knowledge management.

Several challenges in the level implementation of Knowledge management practices have been identified by the research. Major challenges included lack of proved method for carrying out project in KM, and low involvement of police which moderately affects implementation of knowledge management among the firms.

The existence of a KM system among the construction firms has also been established by the research in the majority of the firms. In a few others, there is no KM system available at the moment, but were working on one.

Conclusion

From the foregone analysis and discussions, it can be concluded that Knowledge management is an important component of the success of constructions firms in Katsina. This is particularly evident in the sets of benefits and advantages associated with its implementation. The firms very well practiced a number of KM processes. These however were not with a number of constraints. The most important of these constraints is the lack of proved method for carrying out project in KM.

Recommendations

In order to make the findings of this study useful to the society, the following recommendations are made for policy and for practical implementation to improve on the application of KM for companies to derive the maximum benefits out of KM.

1. There should be an enhanced KM awareness among employees of construction firms in order to allow for maximum participation among parties.

2. Modern ICT tools should be provided by construction firms. This will enable knowledge generation, capturing and processing with effectiveness. The use of standard practices platforms to capture and share knowledge in order to prevent loss of project knowledge should be encouraged.

3. Innovation and knowledge creation, building of right knowhow and expertise, and the use of knowledge in decision making should be encouraged.

4. Government should make favorable policy that will enhance the regulation and implementation of knowledge management among businesses in the country.

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