Project Knowledge Management in Civil Engineering Construction Firms In Nigeria

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Abstract: During the construction phase, knowledge and experiences are generated within the construction firms and if these knowledge and experiences are not recorded, captured, stored and shared among the employees for re-used in subsequent projects, such knowledge and experiences will be lost. This may lead to reinventing of the wheel, because the problems, mistakes, solutions and errors that have occurred and solved will be repeated in subsequent projects. The aim of the paper is to evaluate the project knowledge management (PKM) practices in the CE construction firms in Nigeria. The research methodology adopted is a questionnaire survey approach because of the nature of CE construction firms and the nature of the data required for this research work. A total of three hundred and fifty (350) numbers of questionnaires was distributed to Architect; Quantity Surveyors; Engineers; Project manager; and foreman etc., across the selected the CE construction firms in Nigeria. The method of analysis employed for this research work is regression analysis to test the relationship between the PKM practices and its effectiveness in the CE construction firms. The results show that PKM is not fully practiced in the CE construction firms, since the knowledge generated during the construction stage of projects are not captured, stored, and shared among the employees for re-use in future projects. Therefore, the paper suggests that the government should enact a policy/strategy that supports the KM practice in the construction organization, by organizing seminars/workshops for manpower development for the contractors and the employees.

Key words: knowledge management, project knowledge, construction industry, Knowledge capture and sharing

INTRODUCTION

The civil engineering (CE) construction projects accumulate a lot of intellectual knowledge which can be later used by the same firms to add value, innovation, competitiveness and improve future project performance. The CE construction firms use knowledge management (KM) to create, identify, share the knowledge best practices, lesson learnt and experiences within the organisation. Therefore, as CE construction projects have specific goals and unique deliverables that are not the same, may possibly lead to difficulty in efficiency in recording, and capturing project knowledge. KM has been accepted in the construction organisation as a significant resource that enhance the performance of project success. This success or failure of construction projects is highly dependent on the employee’s willingness to capture, store and share the knowledge and experience gained in the past project for future projects. However, capture and re-use of project knowledge minimizes the need to refer explicitly to past projects, thereby reducing the time and cost of solving problems and improves the quality of solutions during the construction phase of projects. If experiences and knowledge are shared, then the same or similar problems in construction projects do not need to be repeatedly solved.

Accordingly, the CE construction firms in Nigeria are facing problems of poor quality works, poor planning and design, time and cost over runs, repetition of works as a result of mistakes and disputes. These aforementioned problems can be addressed when the best practices, experiences, lesson learnt from past projects are captured for re-use in subsequent projects to avoid reinvention of the wheel. In addition, Tserng and Lin (2008) stressed that the best effective means of improving construction management is through sharing knowledge, experiences, lesson learnt from past projects among engineers, and experts to prevent mistakes that have already been encountered. Therefore, for every successful construction organisation, knowledge, competencies, lesson learnt, best practice and skills built up by the members of the project team should be captured and stored in the organizational repositories for re-use in subsequent projects. Lin and Lin (2006) expressed that knowledge can be reused, and shared among the engineers and experts that are involved in the construction works to better the construction process and reduce the time and cost of solving problems, and if skill and knowledge are shared, then the same problems in construction projects will not be repeatedly solved. Therefore, the aim of the paper is to evaluate the PKM practices in the CE construction firms in Nigeria. To achieve this aim, the following objectives were formulated.

- To determine the current level of KM practice in the construction firms in Nigeria.
- To evaluate the effectiveness of KM practices in the construction firms in Nigeria.

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To suggest way forward.

Knowledge Management In Construction Industry:

According to Maqsood et al. (2006) construction industry is a workplace that is dominated by heuristic construction companies and their staffs are more likely to carry out their project management task based on their past experiences, rather than following a textbook approach, or established logical approaches. Therefore, the construction project team has to work jointly to realize a successful construction project. Working jointly involves sharing ideas, lessons learnt, best practices and information that strengthen the successful execution of complex construction projects. Each construction employee contributes his knowledge in a form of people, processes and technologies at varying degree of strength to the construction process. Kim and Park (2006) asserted that management of people at construction site successfully has been a major challenge since industrialization, because construction site is a place where intensive knowledge tasks are performed with highly intellectual people (Hinkelmann et al. 2004). Similarly, Fong and Chu, (2006) have noted that management of knowledge within the construction project setting is very essential as information and knowledge are scattered over different processes, trades and people in different construction projects and in different organisations. This view has been convincingly presented by Fong, (2003) that KM has a role in improving more collaborative behaviour among organisations and individuals that are involved in the construction processes. However, KM is seeming as one of the significant ways for the organisations to identify, transfer and internalize external knowledge. Since there are different organisations working in a construction project and the documents shared between these organisations vary from technical drawings, contract documents, project reports, and schedule (El-Gohary, & El-Diraby 2010 and Titus and Brochner, 2005). Construction projects usually consist of temporary design teams from different organisation charged to produce a unique product. It is generally difficult to set up a channel for the exchange of information and knowledge within the construction project teams, since the project team members may not be familiar to each other and possibly have not worked together before. Robinson, et al., (2004) discussed the issues further noting that lack of common goals make project participants focus only on their part of work and ignore the knowledge needs of the other project members. This resulted in the causes of delay and cost overrun due to the continuous mistakes and construction reworks (Nicolini et al., 2001). It is of that view, Maqsood et al, (2003) drew the attention that, construction workers have to work together to realize a successful construction project; working jointly involves sharing of ideas, information’s and knowledge which underpins the success in carrying out complex construction projects. The same notion was taken up by Krogh (2002) that construction project performance can be improved when employees communicate by sharing and utilizing, best practices; lessons learnt; experiences, insights; as well as create new knowledge. However, Figure 1 below demonstrated the nature of the fragmentation and diversification of the construction industry.

Fig. 1: The fragmented nature of the construction industry (Adapted from Sarshar et al., 2000)

Nature And Characteristics Of The Construction Industry:

Construction industry focuses on the development of infrastructural works both building and civil Engineering infrastructures. Davis (1991) identified four primary areas distinctive of the contracting sector such
as construction of buildings, roads; railways; bridges and tunnels. The second are erection of harbours; docks; waterways; dams; reservoirs; sea defence and land reclamation works. The third area is energy industry such as, construction of power stations; transmission lines and electricity substations. The last area is water treatment and waste management plants.

**Capture And Re-Uses Of Project Knowledge:**

According to Orange *et al.*, (1999), the common approach used in the construction firms to capture the lesson learnt, experiences, best practice and knowledge from project is through post project evaluation. Post project review is useful in consolidating the knowledge of people involved in the project under review; nevertheless there are indications that the existing practices do not give an effective framework of capture and re-use of knowledge. Capturing knowledge prevents the loss of critical knowledge due to retirement, downsizing, and outsourcing and discards the experts and professionals at the expiration of the project. Noordmit *et al.* (2012) expressed further that fail to capture the knowledge and experiences during the construction phase is a great loss to the construction organization and also represent unnecessary wastage of assets. Therefore, there is a need to develop an appropriate strategy for capturing of construction project knowledge by using technology, techniques, concept and tools. Nonaka and Takeuchi (1995) highlighted four main types of knowledge capture and creation such as internalization, externalization, socialization and combination. From the Nonaka and Takeuchi principle, construction project knowledge can be captured through socialization that is the process of converting tacit knowledge into new tacit knowledge in the course of shared experiences in the daily social interaction. This can be triggered within an organisation or externally with other team members in a formal or informal ways. In the case of outsourcing or discords of experts and professionals, tacit knowledge is converted to explicit knowledge for it to be shared by other employees. Every project has informal sector and formal approaches, such as minutes of meetings, workshops, project documents and code of practices etc. kivrak *et al.*, (2008) outlined the various kind of re-usable knowledge in the construction projects such as: process knowledge; costing knowledge; legal and statutory requirement knowledge, best practices knowledge; lesson learnt knowledge; knowledge of who knows what etc. The re-use occurs largely through social interaction of knowledge networks (Demain&Fruchner, 2006). In addition Tan *et al.* (2007) believes that knowledge capturing encompasses three sub-processes such as: identifying and locating knowledge: concern with the discovering of the natures of knowledge to be managed, and the location where such knowledge is situated for learning (Markus, 2001); representing and storing knowledge: this means indexing, organizing, and structuring knowledge into exact knowledge areas and knowledge authority in the standard (Carrillo, 2004 and Robinson *et al.*, 2006). The validating knowledge: this means to ensure the credibility of knowledge captured, and proper storage of valid knowledge captured with all the relevant related facts and in the appropriate format.

However, Kamara *et al.* (2003) outlined the benefits derived from live capture and re-use of project knowledge, such as: It smooth the progress of the reuse of joint learning on a project by individual firms and teams involved in its delivery; it makes available knowledge that can be used at the construction organisation and maintenance stages of the property lifecycle; it enriches construction organisation with the knowledge of development, construction, and management of their assets; improved the management of construction projects; it prevents the loss of knowledge since it will be captured and re-used at the right time; it facilitates knowledge to be distributed for re-use as soon as possible; and encourages collaborative effort to capture knowledge for recycling within the construction projects. The capture of an employee’s knowledge is vital for construction firms, since the key decisions are made based on experience, lesson learnt and information that is shared informally.

**Knowledge Storage:**

Alavi and Leidner (2001) stressed that the knowledge are created, share and used, but not record and store for re-use in the future projects. The knowledge is stored in the repository sometimes referred to as organizational memory. This organizational memory is in different forms such as written documentation, structured information (stored electronic database), codified human knowledge (stored in expert systems), and documented organizational procedures. In a construction organisation the storage of knowledge and experiences such as: process knowledge; costing knowledge; legal and statutory requirement knowledge, best practices etc. are kept in the project repository. The validating knowledge: this means to ensure the credibility of knowledge captured, and proper storage of valid knowledge captured with all the relevant related facts and in the appropriate format.

**Project Knowledge:**

Project knowledge is usually established by the participant of construction project, such as project manager, project team, stakeholders and clients. However, knowledge comes from different sources such as: Internal source (risk, lesson learnt and experiences;); External source (seminars, benchmarking, workshops, conferences, and competitor analysis). Therefore, in the project based organisation there is needed to clearly understand the types of knowledge and knowledge bases that could be included in effective knowledge management system. Conroy and Sultan (1998) outlined three knowledge bases in projects as:
• Organisation knowledge base - This includes specific knowledge required by the organisation and the environment where the project is implemented.
• Project management knowledge base - Knowledge of theory and application of project manager
• Project specific knowledge base - Knowledge acquired within the implementation of a particular project.

Project knowledge is created within each of project stages. Disterer (2002) emphasizes that during project definition and planning stage, the steps, time, and budget are dedicated to capture and transfer knowledge and expertise. These stages defined the responsibilities, in which knowledge generated is expected and how experiences would be documented, stored and perceived. Polyaninova (2011) stressed that ability to manage knowledge of construction projects includes the capacity to create, absorb and share project-related information, that are part of the organization’s culture. Figure 2 shows the relationship between the KM and project management components.

The relationship between the PM and KM in construction project.

Fig. 2: KM and Project Management components (adopted from Polyaninova, 2011)

Methodology:
The research methodology adopted for this study is a questionnaire survey approach, because questionnaire survey is the field that studies the sample of individuals from a population with a view towards making statistical inference about the population using the sample (Groves et al. 2009). It also Pull out about public opinion, such as beliefs, perception, ideas, views and thought about some things. However, questionnaire survey is used for scientific purposes. Its provide important information for all kinds of research fields, example about the current situation on the ground, psychological perception and views of the population. However, the CE construction firms in Nigeria is being one of the biggest construction sectors in the construction industry, with different categories such as multinational, national and local construction companies scattered all over the country. These categories of CE construction companies have different professionals with different kind of knowledge and work jointly to produce the product of the companies and sometimes these professionals were in different workplaces. Therefore, in order to obtain the data required for the research work, a survey questionnaire was adopted as a results fragmentation and diversification of the CE construction firms in Nigeria.

Population And Sample Techniques:
In order to have a reliable data for this paper, questionnaire survey method was adopted for data collection, because of the CE construction firms are fragmented and diversified in nature with different types of professionals involved in the construction projects and sometimes at different location as mentioned above. Therefore in order to obtain the require population for this study, the Nigeria CE construction companies were divided into three categories as: multinational CE construction companies (foreign companies); national CE construction companies (indigenous companies that operates in every part of the country with many branches) and local CE construction companies (local companies that operates within a community or a state). This division was done to facilitate the right selection without bias. However, the stratified random sampling technique was adopted for the selection of the CE construction companies that participated in this research work. Thirty five (35) CE construction companies that fully participated in the CE construction projects were selected for the questionnaire survey. A total of three hundred and fifty (350) questionnaires were distributed to Engineers, Architecture, Quantity Surveying, Builders, Project manager, Information manager and others experts across the selected CE construction companies in Nigeria. However 72.29% of the questionnaires distributed were filled correctly and returned; 12% were filled wrongly and returned, whereas 15.71% were not

returned. Then, 72.29% of the questionnaire returned represented the two hundred and fifty three (253) questionnaires that were used for the regression analysis.

A questionnaire Designed:
The questions in the questionnaire were designed based on the following items considered as KM attributes used to determine the level PKM practices in the CE construction firms, these KM attributes are: knowledge capturing and storing; knowledge sharing and re-using; using databases to create knowledge. The questionnaire that was used to record the responses of each participants contained mainly closed ended questions using a five-point Likert scale ranged from very high (1) to none (5). However, the scores of the participants were calculated based on the relevant items in the questionnaire as mentioned above.

Analysis of Data:
The starting point in data analysis was to convert the raw data recorded in the questionnaires into numbers and arrange them into SPSS version 18.0 databank for the analysis. The regression analysis was used to analyse the data collected from 253 participants in the CE construction companies in Nigeria. The regression analysis was employed, because regression analysis is the statistical technique that identifies the relationship between two or more quantitative variables: a dependent variable, whose value is to be predicted, and an independent or explanatory variable (or variables), about which knowledge is available. This paper is testing the dependent variable (current level of KM practice) with independent variables (its effectiveness). The technique is used to find the equation that represents the relationship between the variables. A simple regression analysis shows that the relationship between an independent variable X and a dependent variable Y is linear, using the simple linear regression equation $Y = a + bX$ (where a and b are constants). The reliability test was conducted to confirm the reliability and validity of the statistical data, and also the internal consistency method was adopted for the cronbach alpha reliability coefficient.

Discussions and Findings:
The results obtained from the descriptive analysis and cronbach alpha analysis were summarized in tabular form for clear understanding. The result was presented in tabular form as shown below.

<table>
<thead>
<tr>
<th>KM attributes measured</th>
<th>Cronbach’s Alpha</th>
<th>Cronbachs Alpha based on standardized items</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge capturing and storing</td>
<td>0.967</td>
<td>0.943</td>
<td>4</td>
</tr>
<tr>
<td>Knowledge sharing and re-using</td>
<td>0.865</td>
<td>0.872</td>
<td>3</td>
</tr>
<tr>
<td>Using database to create knowledge</td>
<td>0.754</td>
<td>0.756</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 1 shows the cronbach’s alpha values obtained from the KM attributes range from 0.754 to 0.967 respectively. This implies that the data is very statistical significance. Because the cronbach’s coefficient has a value of more than 0.5 (Nunnally, 1978) and 0.7 (Nunnally and Bernstein, 1994) is considered adequate for such exploratory work. This implies that there is a high degree of internal consistency in the responses of the participants in the questionnaires.

The Mode Of Current Level of PKM Practice In The Construction Firm In Nigeria: Knowledge Capturing And Storing:
Table 2.0 shows that the items measured under the knowledge capturing and sharing have the $F_{\text{stat}}:F_{\text{critical}}$ (1.039 < 3.904; 2.663 < 3.904; 0.017 < 3.904; 0.167 < 3.904) respectively. This implies that the items measured under the knowledge capturing and storing have rejected the null hypothesis. This shows that there is a statistical significant relationship between the current level of PKM practices and its level of effectiveness in the CE construction firms in Nigeria. This indicates that the PKM is practiced especially the explicit knowledge, but the aspect of the tacit knowledge is not yet fully practices in the CE construction firms, as knowledge and experiences are wastage at the construction site without assigning anybody to charge of this knowledge. In addition the record of new ideas, knowledge and experiences of engineers and other experts in the repositories for future use are not practiced in the CE construction firms, only the contract document and other paper works are stored in the database, excluding the tacit knowledge of the engineers and experts that are involved in the construction projects. The same result was obtained in the research conducted by Ozorhonet al (2005) among the leading Turkish contractors, that records of the knowledge and experiences of engineers and experts from the past projects is the best way to improve the organisation efficiency in term of the project delivery. This signifies that if the knowledge and experiences are recorded, captured, stored, shared among the employees in the construction firms, it improves the construction organisational performance in term project delivery. Carrillo et al. (2004) conducted a similar research in UK construction firms and discovered that knowledge and experiences of engineers and experts (tacit knowledge) play an important role in the success of the construction
process. The engineers and experts after the completion of projects they are discarded and leave with their domain knowledge without nothing to benefit the organisation if not capture store in the repositories for re-use. The result was supported by Sheehan et al., (2005) that in the construction projects 80% of the useful knowledge are tacit and cannot be written down. In spite of the fact that the CE construction firms being characterised by a wealth of experiential knowledge, yet employees retire or leave the construction organisation, potentially taking tacit knowledge and a potential source of competitive advantage with them.

Table 2: The mode of current level of PKM practices in the CE construction firms in Nigeria

<table>
<thead>
<tr>
<th>Items measured</th>
<th>( F_{stat} )</th>
<th>( F_{critical} )</th>
<th>( R^2 )</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge capturing and storing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recording new ideas, knowledge and experiences of engineers and other experts for future use.</td>
<td>1.039</td>
<td>3.904</td>
<td>0.064</td>
<td>S&lt;0.309</td>
</tr>
<tr>
<td>Recording problem's solution and experiences encountered in the past projects into the repositories</td>
<td>2.663</td>
<td>3.904</td>
<td>0.102</td>
<td>S&lt;0.104</td>
</tr>
<tr>
<td>Refining the knowledge to its sources</td>
<td>0.017</td>
<td>3.904</td>
<td>0.008</td>
<td>S&lt;0.895</td>
</tr>
<tr>
<td>Assigned a person or worker to take records of project reports, information, data, experiences and knowledge in database</td>
<td>0.167</td>
<td>3.904</td>
<td>0.026</td>
<td>S&lt;0.683</td>
</tr>
<tr>
<td>Knowledge sharing and re-using</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharing the knowledge, experiences, ideas and skills of engineers and other experts among for re-use in projects</td>
<td>0.351</td>
<td>3.904</td>
<td>0.037</td>
<td>S&lt;0.554</td>
</tr>
<tr>
<td>Using the internet to share knowledge and experiences among employees for futures re-use</td>
<td>0.819</td>
<td>3.904</td>
<td>0.057</td>
<td>S&lt;0.366</td>
</tr>
<tr>
<td>Using search tools to find the required knowledge for sharing among employees to re-use in future projects</td>
<td>3.220</td>
<td>3.904</td>
<td>0.113</td>
<td>S&lt;0.074</td>
</tr>
<tr>
<td>Using database to create knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluating the lesson learnt from the past project to create knowledge and experiences for re-use.</td>
<td>0.467</td>
<td>3.904</td>
<td>0.043</td>
<td>S&lt;0.495</td>
</tr>
<tr>
<td>Capturing the knowledge, experiences and skills of engineers in the repositories</td>
<td>0.390</td>
<td>3.904</td>
<td>0.039</td>
<td>S&lt;0.533</td>
</tr>
<tr>
<td>Using data analysis, mining and reporting tools to create new knowledge</td>
<td>0.747</td>
<td>3.904</td>
<td>0.054</td>
<td>S&lt;0.388</td>
</tr>
<tr>
<td>Recording the projects knowledge, problem/solution in the database for future re-use.</td>
<td>0.014</td>
<td>3.904</td>
<td>0.008</td>
<td>S&lt;0.905</td>
</tr>
</tbody>
</table>

Note: \( S= \) represent significant; \( NS= \) represent not significant; and \( R^2= \) represent the coefficient of determination. The level of significance is 5\% (0.05).

Knowledge Sharing And Re-Using:

Table 2.0 shows that the items measured under the knowledge capturing and sharing have the \( F_{stat}<F_{critical} \) (0.351 <3.904; 0.819< 3.904; 3.220< 3.904) respectively. This indicates that the items measured under the knowledge sharing and re-using have rejected the null hypothesis. This shows that there is a statistically significant relationship between the current level of PKM practices and its level of effectiveness in the CE construction firms in Nigeria. This signifies that the sharing the knowledge, experiences, ideas and skills of engineers and other experts among for re-use in projects and also using the internet to share knowledge and experiences among employees for future re-use are not fully practices as the concept of the KM is not well comprehended in the CE construction firms. This is because the CE construction firms have been criticized for producing the sub standard products with very high time and cost overruns, as a result of not share the knowledge and experiences during the construction phase. A research carried out within structural design firms by Al-Ghassani, (2003) showed that about 80% of knowledge used during the conceptual design stage is tacit compared to about 20% of explicit knowledge. Reuse of experiences, lesson learnt and knowledge minimize the need to submit explicitly to post projects, reduce time and cost of solving problems, and improves the quality of solutions during the construction stage of a project (Lin and Lin 2006; Fong and Lung, 2007 and Zhang and Faerman 2007).

Using Database To Create Knowledge:

Table 2.0 shows that the items measured under the knowledge capturing and sharing have the \( F_{stat}<F_{critical} \) (0.467 <3.904; 0.390< 3.904; 0.747< 3.904; 0.014<3.904) respectively. This indicates that the items measured under the knowledge sharing and re-using have rejected the null hypothesis. This shows that, there is a statistically significant relationship between the current level of PKM practices and its level of effectiveness in the CE construction firms in Nigeria. This implies that database was not used to create new knowledge in the CE construction firms as knowledge and experiences are not stored in the database for re-use. This is because the engineers and experts believed that knowledge is their power in the organisation, therefore, allow their knowledge to be recorded and stored in the database for re-use in future projects without their consent is like through away their power and personality in the organisation. However, in every construction project new experiences are typical situations and demand different skills, tactics, or solutions. Kasviet et al (2003) stressed that the identification of critical knowledge and ability to utilize it, is a challenge for any project organisation. In
addition, Quintas (2005) emphasises that, there are two possibly conflicting goals of KM, to build knowledge bases cumulatively and learn from previous experience in the construction projects; or ensure learning beyond core areas, generating the capability to assimilate new knowledge in order to be able to respond to change. The shows that store knowledge and experiences of the past projects in the database for re-use in the subsequent projects is a good strategy but the CE construction firms have not been fully practicing it, based on the result obtained from the analysis above.

Summary Of The Finding:

From the result obtained in the analysis, the CE construction firms have not fully practices PKM because the knowledge and experiences generate during the construction stage are not captured, store and share among the employees for re-use in the subsequent projects. This is as a result of lack proper understanding the concept and theory of PKM practices in the CE construction firms. However, it is believed that the common factors behind this, is that knowledge is still at infancy stage in the CE construction firms, since the knowledge and experiences generated during the construction phase are captured, recorded, store and share among the employees for re-use in the future project. Therefore, the knowledge and experiences are lost as engineers and experts completed the project and left with their domain knowledge and left the organization with nothing to benefits for future projects. The results imply that the CE construction firms in Nigeria have not documented processes such as post project reviews and lesson learnt reviews, in place to capture such knowledge and records the problems and their solutions that occur on the construction site in the repositories for re-use as reference guides for future projects, because nobody is assigned to take charge of such records during the construction process. Therefore, the result obtained from the analysis shows that the PKM practices is not effective in the CE construction firms in Nigeria. Then, there is a need to create awareness of the significant impact of PKM practices in the CE construction firms among the employees, senior management, contractors and other stakeholders in the CE construction firms. Figure 3 below demonstrate the importance of PKM practices in the CE construction firms in Nigeria. The figure 3 shows how the PKM improves the organizational performance in term of project delivery, enhance the competitive advantages and client's satisfaction.

Fig. 3: The importance of PKM practices in the CE construction firms.

Conclusion:

The CE construction firm is project based organisation with the delivered product changing from project to project under the influence of many different factors, one of them is contextual. This context could be the physical condition surrounding where such product is constructed. As a result each day on the construction site brings forth new problems and solutions. These problems and solutions are rarely well documented and valuable lessons learnt is confined to the minds of only those who experienced them. Although the concept of KM is to stimulate an incorporated approach to the creation, capture, sharing and reuse of the domain knowledge of engineers and other professionals obtained from projects that have been previously undertaken. Therefore the results obtained show that the CE construction firms in Nigeria have not fully practices PKM as the majority of project-related problems, solutions, experience and know-how are in the minds of individual engineers and experts involve in the construction phase of a project without documented for future re-use. However, these project-related problems, knowledge and experiences from past project can be detrimental to non-repetition of
past mistakes and the re-use of good solutions. Because within the CE construction firms valuable experiences and knowledge are lost primarily because of lack of proper recording, capturing and sharing mechanism. Therefore, the paper suggests the followings: The CE construction firms should organize in-house training to create awareness of PKM practice to the employees. The experienced engineers and experts should retain at the organization to coach and train the other employees in order to improve the organizational performance. Since valuable experiences and knowledge are created during the construction phase and lost as a result of not capturing and sharing, therefore, incentives and rewards should be introduce in the construction firms to stimulate the capturing and sharing of such valuable experiences and knowledge. The government should enact a policy/strategy that supports the PKM practice in the construction organization, by organizing seminars/workshops for manpower development for the contractors and the employees.

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