Knowledge Management in Construction Organizations: A Study of the United Kingdom

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Abstract— Knowledge management has become an intangible asset that organizations use in gaining competitive advantage and improving organizational processes in their operations. Various forms of knowledge management strategies have been employed in construction organizations. However, the result from practice shows social mechanisms are not exploited to their full capacity which therefore, reduces the level of benefits organizations can accrue from effective KM implementation. This work investigated and identified that social processes where been unheeded in construction organizations in the United Kingdom. Quantitative analysis was carried out within organizations to determine if the hypothesis is true and to identify the social mechanisms in place to support knowledge sharing. The results identified coaching , mentoring, communities of practice among other mechanism were implemented in construction organizations, however, priority seems to be placed on some mechanisms more than others based on the most easily implementable for the company.

Index Terms— Community of Practice, Knowledge Management, information System, Knowledge Management System

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1 INTRODUCTION

Knowledge management (KM) is an area that has drawn significant attention in modern day operations. Significant amount of research has been conducted in KM, emphasis on the technical aspect and socio cultural aspect of KM from a practitioner's perspective has been debated upon by both the academic community and practitioners, significant benefits have been accrued by some organizations whereas some have collapsed due to ill structured KM implementation. However, issues are still being generated and it has reached a point that one should ask the question, why do organizations still have problems in KM implementation?

In recent times, the Kaieteur Institute of Knowledge Management (KIKM)[1] carried out a review of over 100 KM projects, the researchers concluded that "the business impact of KM or learning organizations programs is modest at best, we estimate that about one – sixth of these programs achieve very significant impact within the first two years; half achieve small but important benefits; and the remaining third – the failures – have little business impact [1].

Also, key human economic indicators continue to show that we may have reached the bottom of the current recessionary cycle. However, trading conditions are still extremely challenging in the construction sector [2]. The extent of the issues in the industry covers a wide spectrum but in these research circumstance where there is a need to have an area of attention, the author focused on the core competencies of KM which is improving business practices in organizations. It can be concluded that the construction industry in the UK can still benefit significantly from effective KM implementation.

Knowledge management is a branch of social science that is interwoven into different fields and constitutes a large number of themes some of which are; processes of managing knowledge, types of knowledge, the role of information technology, human resource practice in KM, organizational culture

and so on ([3],[4],[5],[6],[7],[8])

This work focuses its beam light on managing knowledge within construction companies in the United Kingdom. Knowledge management processes of knowledge capture, transfer and learning in project settings rely very heavily upon social patterns, practices and processes ([9], [10],[11],[12],[13]). Having said that, there is very little detailed analysis available of the social mechanisms that support knowledge sharing, especially across projects and the communities that they link together [14]. The aim of this research is to identify factors and processes used by practitioners in implementing KM in order to clarify if social mechanisms are being unheeded in construction companies. This will be carried out by investigating how critical KM acquisition and sharing are to practitioners and also identifying the sort of tools which are required or being used to facilitate knowledge acquisitions and sharing and how effective it is. The research work primarily focused its attention on the social aspect of knowledge management implementation in the construction industry.

2 LITERATURE REVIEW

In an economy where the only certainty is uncertainty, the one source of lasting competitive advantage is knowledge [7]. Also "to remain competitive – maybe even to survive, businesses will have to convert themselves into organizations of knowledgeable specialist [15].

Knowledge management originated from the theory of knowledge creation based upon the ideas of the "spiral process" ([9], [16], [17]). The use of the term itself has been observed since 1986 and grew exponentially from 1995 to 2002 [18].

The significance of knowledge management (KM) can be seen in how it has helped companies in the reduction of management levels, changing decisions from opportunistic financial decisions to increase chances of alternative strategic plans, improvement in return on investment (ROI), delivery of pro-

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[1] The kaieteur institute for knowledge management was founded in 1997 by Bryan Davis, the institute is dedicated in developing innovative solutions to improve KM in organizations

jects based on agreed time frame, quality management and improvement initiatives of services, so many other numerous benefits can and have been attributed to effective KM implementation.

2.1 Developing knowledge management strategy in project environments

[10] Cited ([14], as to have identified that Research on project-based learning consistently generates problems in attempting to capture, share and diffuse knowledge and learning across projects.

In order to enhance knowledge management development strategy in a project based environment, Organizations have adopted a number of relevant technologies for KM purposes. A consulting firm investigated knowledge management practices in an organization and revealed these results: 93% of respondents used the Internet to access external knowledge, 78% used an intranet, 63% used data warehousing or mining technologies, 61% document management systems, 49% decision support, 43% groupware and 38% extranets [18]. This statistic can affirm the fact that Companies still see knowledge management as a purely technology solution. however, The literature of knowledge management' provides information showing the 'people' dimension is more important than the technological dimension in spite of the fact that most of the same literature is heavily oriented towards technology use as noted earlier.[19] holds that the 'management of people' is one of the two tracks of 'knowledge management', and the work of the World Bank is held up by a number of writers as evidence for the power of the 'people management' track of 'knowledge management' [18].

The central message to emerge from the analysis is that the diffusion and embedding of new management knowledge in project-based organizations is influenced by a complex interplay between structural conditions within the organization and existing project management practices. How this works itself out will, of course, vary significantly depending upon the precise combination of circumstance [10].

2.2 Performance evaluation of KM for strategic benefit achievements

Knowledge management process has been categorized into knowledge creation, knowledge validation, knowledge presentation, knowledge distribution, and knowledge application activities. To depend on KM, an organization must be agile in balancing its knowledge management activities; such a balancing act requires changes in organizational culture, technologies, and techniques. A number of organizations believe that by focusing exclusively on people, technologies, or techniques, they can manage knowledge. However, that exclusive focus on people, technologies, or techniques does not enable a firm to sustain its competitive advantages. It is, rather, the interaction between technology, techniques, and people that allow an organization to manage its knowledge effectively. By creating a nurturing and "enabling" kind of workplace, an organization can sustain its competitive advantages.

Capturing and diffusing knowledge and learning across projects (or even between project phases) therefore becomes a

major problem, as does avoiding the tendency to 'reinvent the wheel' when faced with a problem that needs to be resolved [20]. Additional complications emerge in the construction sector in particular due to the complex organizational division of labour between professional and other groups involved in the construction management process [10]. Such fragmentation has important implications for attempts to develop shared perspectives on innovation, knowledge and learning [21].

2.3 Challenges in the construction industry

In any endeavour being executed, challenges are inevitable; KM is also an area witnessing a significant amount of progress also associated with the increase in challenges and new frontiers yet to be exploited. These challenges can be grouped into various segments that influence the adequate management of knowledge in any organizations.

These challenges are time, culture, work process, insufficient funding [11]. Knowledge management plays a significant role in work processes which when improved has direct impact on the other problematic factors listed.

The construction industry has witnessed mishaps due to its one time endeavour and its limitation to a specific period, groups of specialist with different specialism come together with different skills and from different backgrounds to work together for a limited period, there is always the likely chance that this members have not worked as a team before therefore, without effective KM, as highlighted by([11],[22]) knowledge is likely to be lost and not captured or transferred between team members in construction projects.

Organizational memories are motivated by the desire to motivate people into preserving and sharing knowledge and the experience that resides in an organization [22].

2.4 Emerging Trends and Issues

A new generation of information systems is shifting towards the integrated support of structured and unstructured processes and information sources, formal and informal communication and different levels of activity coordination [22]. In the construction industry knowledge management can be well recognized as an area yet to be explored completely, research points out that primarily so much attention is been concentrated on the design of knowledge management software's to enhance construction practices some of these software's entails the integration of knowledge management with supply chain management. However, eyebrows just started to rise recently on identifying that there is a huge setback on research to innovative knowledge sharing processes.

3   RESEARCH STRATEGY AND RESULT DISCUSSION

This research carried out an exploratory analysis to determine if there is high level of integration between the technological and social aspect of KM in construction organizations in the UK.

The UK construction industry has a significant reputation worldwide and also a high level of participation in construction activities and practices globally, it has a vibrant research community and wide range of institutes all in support of construction thereby making it a worthy sample scenario in were

reliable data in regards to construction practice can be obtained.

A distinctive research verification processes would be used to investigate if this is the case. The distribution of questionnaire was carried out to determine the issues, challenges and theoretical perspective based on an extensive literature review were used to develop the research aim and objective. [23] Argues that it is possible to enrich results by combining methods to give an added dimension to research.

3.1 Target Population

In carrying out this research, a target population was identified to be very useful in verifying the claims. A sample is a proportion or subset of a larger group called a population, the population is the universe to be sampled. Sampling ensures that a significant level of attention is directed towards the group of interest. However, it has its own downsides. Attention must be paid to ensuring it is a faithful and representative sample of the target population.

3.2   Stratified sampling

Stratified sampling allows the use of all eligible units with distinct categories that could be a part of a population, in this type of sampling a distinction is carried out and then used in selection. Companies considered to be eligible for this research work were all construction companies In the UK, However. Due to their large population a reasonable sample population was decided upon to be used by grouping the companies into two subsets totalling to about 400 construction companies in the UK. Companies were considered eligible once they were construction companies but other factors were also put into consideration to reduce the population through grouping. The groupings were:

Ranking of top 100 construction companies in the UK (See construction news, 2010)

Membership and registration with professional bodies such as the CIOB, RICS

These two criteria's shows significant level of participation of these companies in the construction sector of the UK. Also, Various research conducted in the UK such as, "A survey of current cost estimating practice in the UK and also supply chain management in the UK construction sector" using the CIOB database to gain access and contact different companies in order to distribute questionnaire and conduct interview for reliable responses in the UK

For this research work, the Likert or Summative scaling method was employed for both the dichotomous questions and the scale questions; they are often used to analyze data resulting from questions answered with a yes or no.

3.3   Data Analysis and Discussion

Questionnaire were distributed in two groups, the first were to a list of top one hundred construction companies in the UK from the construction news website and the second was to an archive of contacts for experts in the construction sector of the UK obtained from the chartered institute of builders' website (CIOB), A list of more than 500 experts in the construction sec-

tor were obtained from that database.

Nine (20) responses were received from the participant of the first phase and twenty (60) responses were received from the participants of the second group. The questionnaire targeted people in constant practice in the construction companies. Responses were mainly from directors to senior project management personnel.

The following subheadings are the core themes targeted by the questionnaire distributed and an analysis of the responses received.

3.4   Organizational Policy and Strategy

The significance of policy and strategy existence in any organization cannot be overemphasized, it serves as a fuel that feeds and keeps improving the main aim and core value of the organization. One of the objectives of this research work set out to identify how construction organizations in the UK set out to implement KM, how critical it is, and also see how social processes are being used to enhance KM implementation in order to identify if social processes are unheeded. Particularly trying to identify if knowledge sharing is encouraged and to provide clarity on how that is being achieved.

The questionnaire to the top 100 one hundred companies and the CIOB list provided the following information for years of experience in the industry. Years of experience were evenly distributed between less than five years to over 25 years in practice. See figure 2 below.

The questionnaire results of respondents totalled to a sum of twenty (29) companies, male staffs dominated the response rate by bagging a 90% of the total gender of respondents, most importantly majority of respondent ranks were project managers and then a small minority were directors.

Figure 1: Years of Experience of respondents
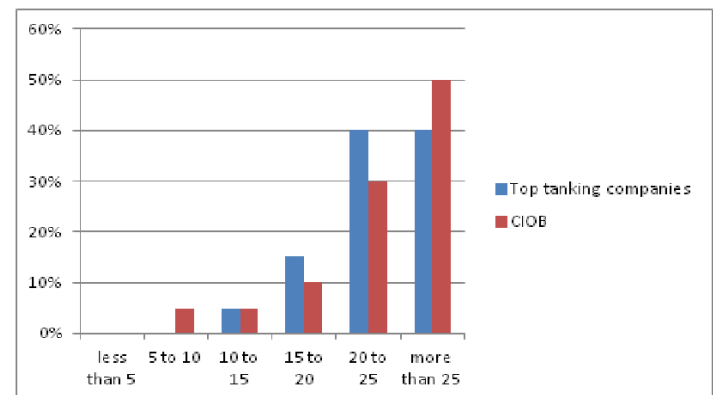
This reinforced the assurance that the respondents were knowledgeable to the issue been elaborated upon.

3.6   Policy and strategy

Out of the Twenty (20) responses received, 55.6% agreed that they were aware of internal strategies /policies in relation to managing knowledge in their organization whereas 44.4%

responded that they were not aware of any strategies in relation to managing knowledge in their organization. Also, 44.4% responded that these policies were being adhered to while 55.6% responded that the policies were not being adhered to. The sixty (60) respondents from the CIOB company list acknowledged the fact that their companies had strategies and policies in relation to knowledge management in their organization whereas 20% indicated that their organizations did not. 65% of the 20 respondent's claimed that the policies are adhered to whereas 35% are of the opinion that the policies are not adhered to. Figure five below illustrates.

Figure 2. The existence of KM strategy
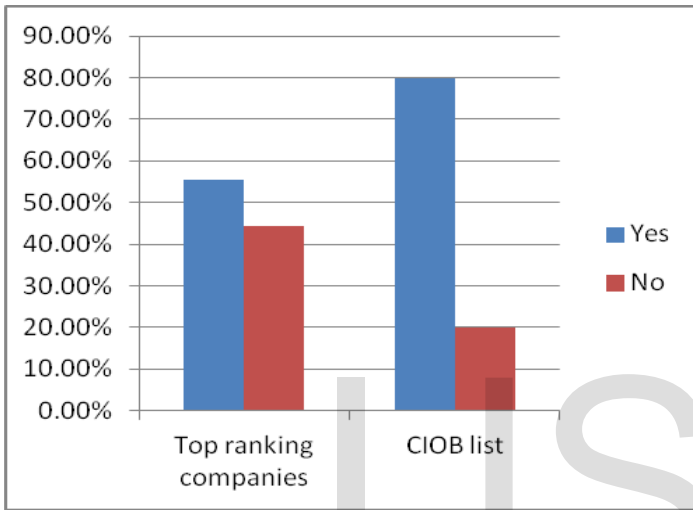
3.7 Structure and culture of the organization

This question analyzes ask respondents to identify if a suitable culture and structure exists in their organization that supports KM implementation. Out of the twenty (20) respondent from the top 100 companies, 22.2% responded that there structure and culture supports innovation and problem solving while 77.8% are of the opinion that the structure of the organization does not support problem solving and innovation at all levels in the organization. Whereas the CIOB list responses are: out of the 60 respondents 55% are of the opinion that there organizational structure supports the issue mentioned whereas 45% responded that their organization structure does not.

**Figure 3: structure and culture existence response**
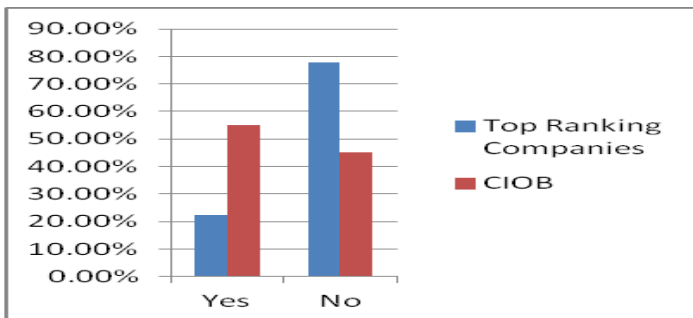
3.8 Significant improvement in organizations

out of the twenty (20) responses received from the top ranking companies, 44.4% are of the opinion that there organization benefited from its knowledge management practice by significant improvement in its business activity, whereas 55.6% responded that there organizations did not improve in its business activity by KM implementation.

Whereas 80% of the respondents from the CIOB believe that their firms have improved significantly due to their KM practice whereas 20% of the respondents believe that their organizations have not witnessed improved business practices due to KM.

Figure 4: significant improvement response
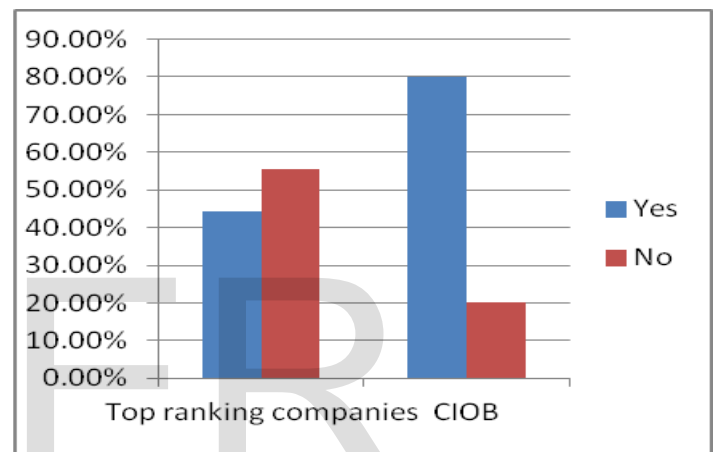
3.9 Knowledge management tools

Tools have been identified to be enablers and even inhibitors of effective KM implementation; the construction industry has invested heavily in tools and aiding mechanism in achieving success in projects. Tools in so many aspects of project execution, however, the research question tries to identify these tools and if they support knowledge sharing, the questionnaire provides the following research findings based on the responses in this regards. The figure below deduced from responses sheds more light into this issue. The question was designed to find out which of the social practices were implemented more in construction organizations in the UK. It revealed: 62.5% of the respondents indicated that mentoring was observed in their organization, 50 % of the respondents indicated that they also observed coaching, 25% agreed that their organization had incentives in place, 62.5% indicated that their organization also encouraged networking, 50% also attested that their organizations encourage communities of practice and 12.5% indicated that story telling was observed.

Whereas, the CIOB response revealed that coaching, incentives, networking and communities of practice all had 60% in the rate at which they were being observed, coaching indicated a 65%, staff secondment a 10% whereas mentoring and storytelling indicated a 40% and 30% respectively.

Figure 5: Social mechanisms in both groups of companies.
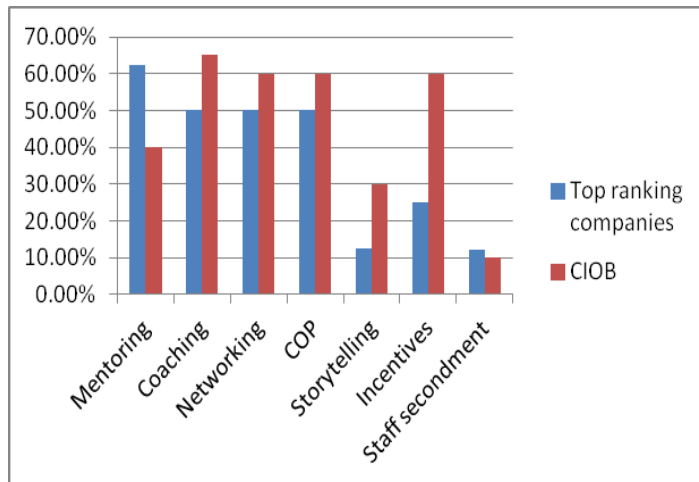
The data from the questionnaire illustrates that networking and mentoring are observed to a significant extent compared to other social processes in the top 100 companies in the UK.

3.10 Knowledge management policy/strategy

In every organization knowledge is one of the most strategic weapons that can lead to sustained increase in profit[24].the knowledge management strategies that firms take have a significant influence on knowledge management processes [25], which therefore would influence the amount of benefits achievable from its implementation.

In the implementation of KM, firms cannot achieve effective implementation without having a strategy in place of how to achieve it. Various researchers have emphasized on the need for a strategy in KM implementation ([24],[26],[27],[28]) states that before the formulation of a KM strategy there should be a clear understanding for the need of a KM. this review draws our attention to the research findings from the questionnaire pointing out that not all high ranking companies in the UK have KM strategies in place. The companies on the CIOB database surprisingly had more companies claiming to have KM strategies in place in their respective organizations. This may be as a result of the difficulties in establishing and supporting a KM strategy in large organizations were there are other issues to be attended to. Small companies are able to create such strategies due to the little nature of the organization.

This can be seen as an issue or a limitation for these organizations (both top ranking and the CIOB list) because just as the reviewed literature has revealed, without the existence of a KM strategy in an organization. Implementing knowledge management would be impossible.

3.11 Significant improvement in Business operations

Each and every effort to improve business performance is most likely expected not to fail and even yield beneficial results and competitive advantage in an organization. [30] States that

knowledge embedded in the interactions of people, tools and tasks provides a basis for competitive advantage in firms. The issue taking the centre stage here is being able to sustain competitive advantage in organizations. [29]States that competitive advantage requires resources that are id-iosyncratic and therefore scarce, this scarce resource points out to tacit knowledge. The response from the questionnaire points out that in large construction firms in the UK an average of them believes there firms keep gaining competitive advantage in the industry. This shows that good tacit knowledge capture and sharing exist in these firms. The other less large firms claimed to have also gained competitive advantage in their KM practice. However, some percentage indicated that some firms have not been able to gain improvement from KM. various context were revealed in the literature from the need of knowledge mapping at the inception of KM implementation to other processes such as understanding KM lifecycle and learning in project environment.

In the construction sector the use of competitive advantage is not necessarily declaring high turnout in profits, it also goes along into developing new and improved business processes.

3.12 Social aspect of KM

In order for strategies, framework , models and even KM processes to be effectively benefited upon, tools play an important role in KM implementation, the research objective was to identify if social processes were being unheeded compared to the use of information systems in the UK construction industry. The responses from the questionnaire revealed some interesting findings.

[31], states that "KM tools in a sense are the "face and place" as well as the "nuts and bolts" of knowledge in the 21st century workspace" furthermore, [31] went ahead to provide a list of these tools in a more elaborate detail as show below.

The questionnaire provided information that top ranking companies in the UK have identified KM initiative to be of essence people- centric as stated [31]. This can be agreed upon by the large percentage of different social processes observed by these companies, although the practices slightly vary in extent form each other depending on the company, most importantly the social processes were not unheeded, similarity with the statistic in big companies was also observed in other construction companies. One can say safely that construction companies have identified technology is not the sole instrument here but that knowledge sharing processes and infrastructure would play a quite positive and significant role in achieving success in KM.

The bar charts reveal a good level of participation of both sets of companies in Knowledge sharing processes. The bar charts also show networking, COP, mentoring and coaching to be both prevalent in both sets of communities. The use of incentives were not been employed significantly in large scale companies. Whereas, storytelling and staff secondment had little level of implementation in practice.

The analysis here can be further discussed by using Madanmohan's work [31].

- The companies should ensure Knowledge sharing which seems to stand out from the literature reviewed as an issue should be emphasized upon more keenly;

mechanisms and processes should be put in place to encourage knowledge sharing within construction companies. Periodical assessment of employee performance should have incorporated in it the ability to detect if staffs is cooperative to the knowledge sharing policy of the firm, however, the difficulty of measuring individual effort would prove to be a challenge, but the collective effort would be visible in the general performance appraisal of these construction companies.

- Collaboration which is also a social mechanism in place to foster KM might pose a significant challenge in the construction industry due to the harsh climate within, although efforts are being channelled to encourage its practice. Companies might view collaboration mostly within other companies for knowledge sharing as a drawback although collaboration can take place of other purposes such as business and investment. In terms of knowledge it would also prove to be useful but would be carried out with privacy and high level of secrecy to disallow knowledge leak.

- The research has also shown that construction companies need to have strategies in place which is aligned to business goal that would go a long way in helping the organizations. The literature review has suggestions that different departments in companies could even have different knowledge strategies in place.

4 CONCLUSION

The research was able to identify that social processes were not been unheeded in construction companies but they were been implemented along with knowledge management systems KMS, although larger companies had more systems in place compared to the other classification of companies. The responses showed that top ranking companies believe knowledge sharing should be leveraged with the use of technical tools whereas other sets of companies do use KMS for knowledge sharing and some focus on social processes only.

The first objective set out to identify how important knowledge sharing is in organizations, the research work reviewed articles in line with the major identified theme here which is "knowledge sharing" and the questionnaire tried to deduce if what the literature review confirmed is actually the case. The results identified that in both sets of samples used knowledge sharing still poses a significant issue in KM implementation and companies are still finding it hard to get it right regardless of the high level of investments to enhance knowledge sharing, the reason behind this cannot be attributed to the use of IT but as a human factor problem. Therefore culture and organizational structure would forever play a significant role in effective KM implementation in improving bonds within personnel thereby creating a knowledge sharing environment.

The second objective set out to identify the tools being used to facilitate KM, the aim of the second objective was to identify clearly the tools being used by companies to implement KM,

these tools according to the literature ranged from knowledge management systems to social processes such as establishing social networks, mentoring, staff secondment, storytelling, and coaching. The work was able to identify that both mechanisms are being used in the construction industry in implementing KM, however the top ranked company's responses indicated a significant application of IT tools alongside to aid implementation of the social processes, whereas the companies on the CIOB list depended solely on social processes in achieving effective KM implementation.

The final objective set out identify how organizations decide on implementing KM, this is quiet an interesting question because the questionnaire failed short to identify the exact key role that comes to play here which enables companies to decide, but the literature identified that so many organizations have realised the benefits of KM. KM has enabled companies to achieve improvement on business practices, return on investment an so many other benefits attributed to KM, therefore companies that need to improve their business activities need to implement a knowledge management strategy in order to always stay competitive in the market.

4.1 Recommendations

As the conclusion of this research work point out, People interact better when a supportive atmosphere is established within a community, this process helps in creating a descent environment where people can learn freely even outside the barriers of information tools and systems by simply through interaction and mutual understanding, this could be useful to both sets of companies analyzed in this research. If a descent culture exist within the organization it is easy for every member of the community to associate his or herself with the company goal right at his inception into the company.

Top ranking Construction companies should understand that achieving successful KM implementation does not depend exclusively on deploying advanced technology for knowledge capture and dissemination nor implementing core theoretical concepts and recommendations, but by enhancing communication, training, building will of participation between co workers and creating an environment where all believe and want to contribute to his or her job whole heartedly.

Construction companies have realised that the need for KM is essential but they also need to understand that no KM implementation can yield positive results without the companies realising they do need to have in place a buoyant business assessment plan. This plan should be willing to inculcate the use of KM processes and tools in order to achieve success.

The top 100 ranking companies showed significant signs of the deployment of IT infrastructure in order to support their KM implementation. However, research has shown that (see KPMG) high rate of success has been achieved in companies that deliver KM with simple and uncomplicated tools in response to certain issues encountered in business operations.

4.2 Areas for Further Research

Looking at the objectives and limitations encountered in this research carried out. It should be noted clearly that the research findings are not applicable to other sectors such as the

IT industry and can also be exempted from construction companies in other parts of the world.

There is still a disconnection between the literature and practice. There is quite a lot of emphasis on technological approaches to KM, yet the practitioners place more credence on social practices. So, explaining this disconnection is critical for future research.

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