A LITERATURE REVIEW ON THE CHALLENGES ASSOCIATED WITH IMPLEMENTING KNOWLEDGE MANAGEMENT STRATEGIES IN CONSTRUCTION ORGANISATIONS

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The significance of knowledge management (KM) in any organisation is increasingly being realised. As a result, KM is increasingly being incorporated in the management agenda and in organisational strategic choices. KM is becoming an important tool in staying ahead in the competition between organisations. A review of the literature indicates that the construction industry has begun to realise the importance of KM. However, many construction firms are facing challenges to do with collating, assimilating and exploiting relevant information and experiences. Even if knowledge is captured, getting people to contribute and utilise stored knowledge assets is a challenge. With these come further challenges, which are precipitated either because people are not aware of the involved KM technologies or are not cognisant of the benefits of such KM initiatives. However, if these challenges are effectively addressed, organisations stand to derive a lot of benefits. Part of addressing these challenges is the development and implementation of a holistic and effective knowledge strategy. This paper reviews KM strategies together with the impact of such strategies on construction organisations. It concludes that aligning a KM strategy with the wider organisational strategy is vital. It recommends that effective communication of a KM strategy within the organisation is important as part of an effective implementation of a KM strategy. In addition, a balanced view is needed in considering the issues of finance, culture, technology and people issues in the development and implementation of an effective strategy.

Keywords: competition, culture, knowledge management, strategy.

INTRODUCTION

In recent years, most organisations have realised the importance of considering knowledge management (KM) concepts in ensuring organisational survival and competitive edge in a continuously changing environment (Martensson 2000). KM has been accepted as a necessity in the management agenda and in organisational strategic choices as knowledge is seen as one of the organisation's most important resources. As pointed out by Drucker (1995), "knowledge is the only meaningful economic resource". Knowledge can also be seen as a key source of advantage (Quintas *et al.*, 1997). Since knowledge is recognised as being important to organisations, it needs to be utilised to maximum advantage by organisations in possession of such knowledge.

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Knowledge has been used as a tool for organisations to place themselves above the competition. As such, organisations have gone to great lengths to procure and manage state-of-the-art resources and in turn guard these resources to prevent other organisations from plagiarising them. These involve extensive innovativeness and improvisations with the aim of cost and time savings in order to beat the competition (Egbu *et al.*, 1999). However, in the construction industry, such lofty aims are not so easily implemented due to the nature of modern construction practices and technology which are more complex. KM is largely seen as a challenge in the construction organisation. Hence, KM in construction needs a more in-depth study to identify the root cause of the challenge and to come up with a more resilient strategy in managing knowledge (Mohamed and Anumba 2004).

This paper is based on a thorough review of extensive literature of an on-going PhD study and is in its literature review stage. The aim of this paper is to explore the relevant literature on the challenges in the development and implementation of a holistic and effective knowledge strategy together with the impact of such strategies on construction organisations.

LITERATURE REVIEW

Main concepts of KM

In understanding KM, it is important to have a working understanding of the differences between data, information and knowledge. 'Data' and 'information' is commonly misunderstood to be synonymous with knowledge. Many do not realise that there are subtle differences in their meanings (Nonaka and Takeuchi 1995). Data becomes information if one adds context, categories or calculations. Information has little value and will not become knowledge until it is processed by the human mind (Ash 1998). Information turns into knowledge if humans add their experience, judgement, values and beliefs to use it for comparison, decision-making and conversations (Davenport and Prusak 1998).

According to Davenport and Prusak (1998), "Knowledge is a fluid mix of framed experiences, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers". Knowledge can be tacit or explicit (Nonaka and Takeuchi 1995). Tacit knowledge is information understood but not expressed in writing. Explicit knowledge is knowledge that has been or can be articulated, codified and stored in certain media. It can be readily transmitted to others. The most common forms of explicit knowledge are manuals, documents and procedures.

In the construction industry context, KM is especially difficult to define precisely owing to the lack of general consensus on a single unified meaning of the concept (Egbu 2004). Bhatt (2001) states that KM is a process which enables organisations to learn, create, develop and apply necessary knowledge. In any organisation, KM aims primarily to tap knowledge from all members of the organisation and manage it to enable all members to share and access the resource without fuss. KM is critical considering the nature of knowledge that has no definite boundaries and which is subject to change (Davenport *et al.*. 1998). From these definitions, we can infer that KM basically involves the synthesis of diverse but supporting procedures, processes, technologies and fields of study needed to bring about a sustainable environment

enabling knowledge to be celebrated and exploited to create value for the organisation.

KNOWLEDGE MANAGEMENT STRATEGIES AND THE CONSTRUCTION INDUSTRY

The construction industry is a knowledge-based industry; it is diverse, being made up of different professionals providing a range of services for clients, customers and the wider community (Egbu and Robinson 2005). Construction organisations have many reasons to practise sound KM initiatives. The construction industry faces several problems in managing knowledge due to its characteristics. It usually maintains some characteristics in the operation determined by their properties such as the high physical labour-intensity, the obvious function of human factors, the low entry threshold for staff, increased turnover of subcontract labour besides its short term and temporary project-based nature with considerable fragmentation. Hence, most of the knowledge of the industry is generated in projects during the process to deliver a custom-built facility in accordance with the client's requirements and business objectives (Tan *et al.,* 2005).

In the construction industry, KM strategies are particularly important for the following reasons:

- Projects are inter-related thus it is crucial that good practices within the project environment be adhered to and kept accessible to ensure smooth project transition. The unique characteristics of individual projects prevent the adoption of a standard set of practices applicable to all projects. From the KM perspective, it is these unique characteristics comprising procedures, processes and technologies that contribute the most value.

- Each day on the construction site brings forth a new problem and a new solution. The management of these unique problems and their solutions form tacit knowledge confined to the minds of only those who experienced them. The persons in possession of these tacit knowledge will prove valuable to the industry as they help prevent 'reinvention of the wheel' and repetition of similar mistakes. This knowledge also becomes the basis for innovation, overall improvement and sustaining competitive advantage (Tan *et al.,* 2005)

- The very nature of construction witnesses continual changes in job location and transfer of line workers amongst construction companies. It is for these reasons that practical experience and tacit knowledge becomes critical and hence, should be transformed as the organisation's knowledge assets. The management of this tacit knowledge via proper documentation and record-keeping is crucial for future employee training and cost-cutting exercises options.

- Traditionally, the construction industry has low productivity and poor performance despite its importance in the national economy (Egbu *et al.,* 1999). Effective KM has a role to play in improving performance.

The construction industry must adopt KM strategy to improve its management and for the purpose of survival in an environment of competition. It is therefore imperative that the construction industry start to pay more attention to knowledge (especially tacit knowledge) and KM strategies.

RESEARCH QUESTIONS

This research aims to answer a few pertinent questions: what are the perceptions of construction organisations on KM and whether the size of organisations impacts these perceptions; how are KM strategies perceived to affect organisational performance; what are the challenges faced by construction organisations in setting up and implementing KM strategies; how ready are these construction organisations in setting up and implementing KM strategies; what are the main benefits of KM strategies; and how do organisational structures, cultures and HR practices influence the implementation of KM strategies?

- To answer those questions, the following research objectives are proposed:

- To critically review the literature and document the perceptions of construction organisations (small, medium and large) on formal and informal approaches to KM.

- To appraise and document the different formal and informal approaches employed by construction organisations for KM.

- To explore and document the main challenges that face construction organisations in the 'setting-up' and implementation of formal and informal approaches to KM

- To specifically explore the readiness of organisations to 'set-up' and implement formal and informal approaches to KM.

- To investigate the significance (importance and benefits) of formal and informal approaches to KM in organisations.

- To specifically investigate the degree of influence that organisational structures, culture and human resource management practices play in the implementation of formal and informal approaches of KM.

- To develop and validate a conceptual model that encapsulates the key factors that impact upon the successful implementation of formal and informal approaches to KM in organisations.

- To develop an appropriate training material (for CPD purposes) that would help improve awareness and understanding of the challenges and significance of formal and informal approaches to KM in construction organisation.

However, due to the limited scope present, this paper will only address the challenges faced by the construction industry in developing and implementing KM strategies and the impact these challenges have on this industry.

CHALLENGES IN IMPLEMENTING KNOWLEDGE MANAGEMENT STRATEGIES IN CONSTRUCTION ORGANISATIONS

The processes of KM are replete with various barriers, making management of knowledge a very challenging task (Wunram *et al.*, 2001). Many of the barriers to effective KM are arguably people-related as KM has a human component at its core. A UK study done by Carrillo *et al.* (2004) on large construction organisations revealed four main barriers in KM strategy; insufficient time, organisational culture, lack of standard work processes and insufficient funding. Dainty *et al.* (2005) highlighted three principal barriers to the creation of a knowledge sharing culture and that

organisations need to overcome these through an effective KM strategy. The three principal barriers are: an unsupportive culture, poor communications structure and time constraints. Robinson *et al.* (2001) have carried out KM research in large construction organisations in the UK where they examined the perceptions and barriers in implementing KM strategies. Some of the challenges found were; organisational culture, lack of standard work processes, time constraint, employee resistance, poor IT infrastructure, insufficient money, long term organisational commitment, lack of understanding of KM and conflicting priorities on the demand for resources.

Egbu (2004) also conducted a study on KM issues in three empirical studies conducted in construction organisations in the UK. In this study, he investigated the incoherent and lack of ownership of knowledge vision in the industry. There was a prevalent lack of appreciation of knowledge as an important asset. Organisations in the industry do not promote an information-sharing culture and there was a lack of appropriate methods and tools for measuring and valuing knowledge. In addition, there were inadequate standardised processes in place. There was evidence of inflexible organisational structures, time constraints and enormous pressure on key staff (knowledge "experts"). There was an endemic reluctance to, or fear of, the use and application of IT tools for KM (technophobia). Some members of the industry only see the "knowledge is power syndrome" and not the "law of increasing returns" associated with knowledge creation whereby shared knowledge stays with the giver while enriching the receiver Egbu (2004). Overall, there was a lack of a clear purpose or shared language and meaning of KM in the industry.

While some companies have implemented KM projects, not all have succeeded; most were partial successes or outright failures. Table 1 reveals some obstacles to success in such initiatives.

Judging by the wide-ranging studies conducted above, the key issues associated with the development and implementation of KM strategies are critical. In implementing KM strategy, the construction organisation needs to be aware of the challenges that may inhibit the successful implementation of KM initiatives. Key issues affecting KM strategies identified are finance, culture, technology and people.

Finance Issues

Critical financial management is necessary in ensuring organisations allocate the right resources to the right purposes in support of KM strategies. This presents a major challenge even equipped with ample funds in the budget as unscrupulous management of the finances may set back funds set aside for training, maintenance and other KM-related activities. To successfully implement KM requires adequate funding but this poses another challenge as top management often resists increased budg*et al.*location for administrative purposes. The budget needs to address resources, outside expertise, technology, and subscriptions (access to additional information sources). A research done by Egbu *et al.* (2004) highlights that KM specialists are unlikely to get the resources they need until they can provide justification in terms of returns in investment. According to Carrillo *et al.* (2004) this line of thinking is rampant in the construction industry because their profit margins are low and they are conservative in nature.

Table 1: Some obstacles to the success of KM initiatives in construction industry

Authors	Survey results
Robinson *et al.* , 2001	• Organisational culture, • Lack of standard work processes, • Time constraint, • Employee resistance, • Poor IT infrastructure, • Insufficient money, • Long term organisational commitment, • Lack of understanding of KM; and • Conflicting priorities on the demand for resources.
Egbu *et al.,* 2003	• Trust, • Resistance, • Litigation, • Power, • Confidence, • Buy-ins, • Benefits expectation/motivation, • Insularity due to project-based tasks, • Lack of soft skills (different skill levels and communication skills), • Admitting what you do not know/be prepared for question; and • Time.
Egbu 2004	• Incoherent knowledge vision/ lack of ownership of the knowledge vision, • No appreciation/ lack of appreciation of knowledge as an important asset, • Lack of an information-sharing culture and climate, lack of/ or inappropriate methods/tools for measuring and valuing knowledge, • Lack of/ inadequate standardised processes, • Rigid /inflexible organisational structures, • Time constraints and pressure on key staff/ knowledge "experts", • Fear of the use and application of IT tools for KM (Technophobia), • The "knowledge is power syndrome" and failure to see the "law of increasing returns" associated with knowledge creation – shared knowledge stays with the giver while enriching the receiver and • Lack of a clear purpose and shared language and meaning of KM.
Carrillo *et al.,* 2004	• Inadequate time, • Organisational culture, • Lack of standard work processes; and • Insufficient funding.
Dainty *et al.,* 2005.	• Unsupportive culture, • Poor communication structures and • Time constraints.
Carrillo and Chinowsky 2006	• Not enough time, • Cautious approach to new 'management' idea, • Not enough money, • 'Not invented here' culture, • Knowledge is power' culture and • Use of Coessential was not mandatory.
Isa and Haddad 2008	• Organisational culture, • Trust and • IT.

Culture Issues

Knowledge sharing is considered the core 'driver' of KM, but there is a common belief that people are reluctant to share knowledge. It is argued that the organisation culture itself does not support openness and the sharing of expertise. According to Bollinger and Smith (2001), an inconsistent or non-existent culture of sharing may be present in many facets of an organisation leading to poor knowledge transfer and lack of workplace openness and trust. Team members may be reluctant to share knowledge for fear of peer criticism or top management recriminations. Support of group efforts is only possible through mutual respect, trust and goals (Bollinger and Smith 2001). An arguably effective way of overcoming this reluctance towards knowledge sharing is through the reward system but a major constraint is it is difficult to measure. In some organisations, the reward system as a source of career advancement is implemented based on extent of personal background knowledge and individual effort. Once a reward system has been instituted, the quantity of knowledge share is likely to increase, but the quality may decrease (Scheraga 1998).

Technology Issues

Technology is a key enabler for the implementation of KM. The technology element explores whether the organisation has the appropriate software, hardware and expertise needed as a strategy for sharing feasible information in the right environment. However, it requires the management of some major elements like motivation and willingness to share information (Goh 2002). The subjective elements inherent in these tools negate their ability to fully capture the complexity of context and the richness of knowledge. Clearly, there is a need to rethink the approach in designing and developing information systems (Al-Hawamdeh 2002).

People Issues

Human resource management in construction organisations remains a critical challenge especially in ensuring a ready supply and retention of highly skilled employees (Dainty *et al.* 2002).This is becoming increasingly difficult, further compounded by the pull factor from rival construction organisations in an improving economy, the demanding pace of construction operations and the high employee turnover. Employee turnover represents a critical problem to an organisation in terms of loss of talent, additional recruitment and training costs (Loi *et al.*, 2006). The company places a high value on experienced and knowledgeable staff, if they leave the organisations the tacit knowledge in their possession is lost by the organisation. This "brain drain" phenomenon could be avoided if the organisation realises the importance of managing knowledge through formal approaches to KM and take steps towards its implementation. Workers are also prone to producing low quality work and lose talent over time. In a demand-driven market environment, it is imperative that HR departments recruit the right people for the right jobs and provide continuous training to ensure improved performance. According to Pathirage *et al.* (2007), managing construction knowledge workers with softer human resource policies based on empowerment and commitment is important, specifically when it comes to the professional service firms within the construction industry who invest heavily in knowledge-based services

IMPLICATION FOR KM STRATEGIES

A number of issues have been discussed in the previous sections relating to the challenges associated with implementing KM strategies in construction organisations.

These issues have profound implications for the development and implementation of KM strategies in construction organisations.

Construction organisations must adapt and change parallel to the rapid changes in technology and in view of the impact from globalisation demands. It is the role of the KM strategy in construction organisation to strengthen the construction market and mould the industry to suit demands placed on it.

At the beginning, the most suitable part in construction organisation to implement KM strategy is in visioning and strategy. A strong vision prevents organisations from losing sight of their corporate objectives, helping the success of KM to become more quantifiable and measurable.

The Construction Task Force (1998) advocated that the industry needs to radically shift its culture in order to achieve its full potential. A culture change is recognised as an important aspect of KM development, in line with changing global business environments. In implementing the KM programmes introduced by knowledge managers, they have to face various hurdles along the way. The main challenge remains people-related as attitudes and habits are the most difficult factors to change (Dainty *et al.*, 2005).

To encourage knowledge sharing among team members, the development of knowledge-sharing proficiencies is needed; brokered by a team wielding specialist knowledge skills. This team will educate people across the organisation on the meaning of knowledge sharing. One management tool is motivation which may be either intrinsic (intangible nature) or extrinsic (tangible form for their knowledge sharing efforts). Assigning a job of specific interest to an employee develops intrinsic motivation and needs to be encouraged. Rewarding and recognising people with knowledge-sharing behaviours are additional tools to encourage knowledge sharing. Rewarding can be planned, explicit, and purposeful. It is necessary for the manager's job function to include knowledge performance objectives to facilitate knowledge sharing among employees. Managers must entrench a knowledge sharing culture among employees and make it a natural behaviour.

Knowledge sharing among employees should be in line with the organisational strategic objectives and is very much influenced by the nature of business of the organisation. Organisations in the construction industry must acknowledge that an effective KM strategy is multi-pronged; addressing culture, technology, finance and people as well as communication issues. The success of a KM strategy requires continuous dissemination of information, active engagement of staff to share knowledge and appropriate training so that they can be exploited. Organisations also need to introduce corresponding measures such as material, spirit and emotional encouragement to help organisations set up an environment of knowledge sharing.

While technology is not the most important aspect of KM, it does play a crucial role in facilitating communication and collaboration among knowledge workers in an organisation. Technology may be important to successfully implement KM initiatives but the organisation also needs to analyse the reliability of the data in their possession. These data may be irrelevant, inaccurate, out-of-date, incomplete or duplicated. Organisations must have in place state-of-the-art data quality efforts focused on ensuring that the data supporting the most critical business processes and decisions is of the highest quality.

It is vital that the KM strategy is aligned with the wider organisational strategy and effective communication of a KM strategy within the organisation is important as part of an effective implementation of a KM strategy. These are not so easily achievable given constraints posed by the need for motivation at various levels: teams, business units, departments and offices. Another constraint, also intangible, is in the form of variable levels and quality of employee contribution impacting annual employee performance review (Robinson *et al.,* 2001). To ensure the success of KM initiatives within an organisation, it requires integration of various perspectives namely support of top management, HR management, organisational structure, technology, culture and augmented by motivation and leadership throughout the ranks

CONCLUSION AND FURTHER RESEARCH

Developing a KM strategy requires a well-balanced approach incorporating all the key issues present in the KM environment. The basic aim of KM strategy is to enhance organisational performance, capitalising on individual or group interactions. It is not the all-in-one cure to prevailing organisational ailments. KM is one of the most promising issues of the newly emerging knowledge era. For it to succeed, it must be fully understood and readily accepted. KM strategies can dictate the survival of construction organisations in the global competition, hence they need to have proper planning and overcome any problem or difficulty in order for the KM strategies to be implemented smoothly. KM requires a major shift in organisational culture and a commitment at all levels of a firm to make it work. A strong technological infrastructure, customised for the needs of each organisation, provides the tools necessary for ensuring the success of KM efforts. Simultaneously, a KM strategy needs to consider communication networks and address people issues which have been identified as the major hurdles faced by KM. When KM is introduced properly, with concurrent efforts to manage change in the organisation; great things are achieved enabling organisations to be more competitive.

This paper has highlighted the key issues and challenges associated with the implementation of KM strategy together with the impact of such strategies on construction organisations. This paper could serve as a basis for future studies but further work needs to be done to establish approaches in managing knowledge in construction organisations. The succeeding stages of this ongoing study involve developing a conceptual framework and conducting a pilot study. Findings from the study should positively inform the proposed main study.

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