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PERCEPTIONS AND BARRIERS IN IMPLEMENTING KNOWLEDGE MANAGEMENT STRATEGIES IN LARGE CONSTRUCTION ORGANISATIONS

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ABSTRACT

A significant proportion of large construction organisations have, or plan to have a knowledge management (KM) strategy and some are at various stages of implementation to increase their competitiveness and improve organisational performance. However, the successful application of such strategies requires at the very least an understanding of how KM is perceived, what constitute a good KM strategy and the barriers to implementation. A survey was conducted to establish current KM practices in major construction organisations. The results suggest that while most construction organisations are aware of the benefits of a KM strategy there are major issues to be addressed. Significant barriers identified are organisational culture, lack of standard work processes and time constraints. It is concluded that such barriers need to be overcome and KM strategies appropriately supported by change management programmes, performance measurement system and a reward and incentive structure for a successful implementation in construction organisations.

Keywords: Construction, knowledge management, barriers, organisational culture

1 INTRODUCTION

1.1 Background

Knowledge Management (KM) is an innovative approach increasingly seen as a source of competitive advantage, with corporate spending on KM activities expected to rise significantly over the next few years. A multi-sectoral survey (consisting of organisations from manufacturing, retail/wholesale, utilities and telecommunication, financial services and other sectors) revealed that 43% of organisations have a KM initiative in place, and one in ten considered knowledge management to be transforming the way they do business (KPMG Management Consulting, 1998). However, construction organisations are often reluctant to invest in new initiatives or innovative approaches citing low profit margins often militating against investment in research and development (R & D). The construction industry has also been criticised for its strong resistance due to a variety of factors, most notably its cultural practices.

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The transition to a knowledge economy is affecting many industries. Professional service organisations, particularly management consultancies whose primary product is knowledge are among the first to make heavy investments in the management of knowledge (Hansen, Nohria and Tierney, 1999). Other organisations, including construction, are beginning to follow as knowledge is increasingly recognised as the most powerful asset and a source of competitive advantage to improve business performance. Major construction review reports and initiatives identified a number of improvement themes including the need for organisational learning and innovation. Knowledge is undoubtedly central to organisational learning and innovation, and a knowledge management strategy should therefore be the cornerstone for improving performance in construction organisations.

The role of KM and learning as a source of potential advantage for construction organisations have also been addressed by Kululanga, Price and McCaffer (1998), Kululanga (1999), Carrillo, Anumba and Kamara (2000), Patel, McCarthy, Morris and Elhag (2000). However, construction organisations do not have a good uptake record for introducing innovative ideas. An earlier study of major construction contractors shows a disappointingly low proportion of firms have or plan to implement knowledge management systems (McConalogue, 1999). However, recent evidence suggest that whilst an increasing number of construction organisations now perceive KM strategies as an important aspect in improving business performance, there are major difficulties. Understanding how KM is perceived is important, so are the barriers that needs to be addressed in the formulation of KM strategies.

This paper explores the perception of KM and identifies the barriers in the implementation of KM strategies in large construction organisations. The survey objectives and methodology are outlined in the context of an on-going research project investigating the relationship between KM and business performance. Based on the survey results, the perception of KM and the barriers affecting the implementation of KM strategies are discussed. The paper concludes with the implications for the implementation of KM strategies in construction organisations.

1.2 Definition of KM

There are various definitions for knowledge management (KM) generally illustrating the variations in the scope and content. KM is defined narrowly, in some instances, to emphasise the capture, access, and reuse of information and knowledge using information technology (O'Leary, 2001). This narrow definition concentrating on explicit knowledge assumes that tacit knowledge cannot be managed as it is in people's head. Whilst it is generally accepted that tacit knowledge is more difficult to manage, KM is now increasingly recognised to include the management of tacit knowledge. The definition used in the survey is that proposed by KPMG Management Consulting (1998) which defines KM as 'a systematic and organised attempt to use knowledge within an organisation to transform its ability to store and use knowledge to improve performance.

1.3 Research Objectives and Methodology

This study is part of an on-going research project¹, supported by the EPSRC and industrial collaborators, looking at the relationship between knowledge management and business performance in construction organisations. In order to develop a viable knowledge management framework for industrial applications, a series of interrelated research questions need to be addressed: why are construction organisations motivated to have a KM strategy? What factors do construction organisations consider important for KM activities, and how can KM strategies be successfully implemented? The aim of the study is therefore to establish the extent to which construction organisations are involved in Knowledge Management, and to identify factors that could hinder or facilitate the successful implementation of KM strategies.

The literature review on knowledge management provided the basis for identifying the issues to be investigated in the context of construction organisations. A questionnaire was designed to examine specific issues such as how KM is perceived, whether organisations have a strategy, the motivation for a strategy, what the elements of a strategy are, and the barriers to the implementation of KM. The questionnaire was sent out to senior managers and directors of large construction organisations. This includes knowledge managers, business improvement or development managers, IT managers, marketing managers, construction directors and other directors dealing with KM related issues. The research focussed on the top 170 construction organisations in UK with estimated turnover of over £50 million. Large organisations were specifically targeted for a number of reasons. They tend to have the greatest need to implement knowledge management initiatives and are also likely to have the financial and human resource capacity to implement such initiatives. This is because large organisations often tend to rely mainly on a minority of experts to share their knowledge with a majority of people who are less experienced (Conheaney, Stephenson and Griffiths, 2000). Also, staff turnover which is a key factor relating to knowledge retention and distribution (Gann, 2001) may be significant in the context of such organisations. Small organisations do have a need to share knowledge but tend to lack the skill base, financial muscle to implement even the most basic KM projects.

2 RESULTS AND DISCUSSION

A total of 35 completed questionnaires were received representing a response rate of about 20%. This response rate is reasonably good given that KM is a relatively new subject and an emerging discipline. The responses were analysed to provide the basis of the discussion in the next sections.

2.1 Perception of KM

Knowledge Management offers a distinct competitive advantage to construction organisations in an increasingly competitive environment. But there are those who believe that KM, like fashion will come and go. Whilst this may be true for the new and often fashionable job titles increasingly associated with the KM function such as chief knowledge officer (CKO), director of intellectual capital and knowledge network facilitator, innovative organisations will always be shaped by what Mintzberg described as the forces of learning and innovation. And just like the brand names and

¹ KnowBiz Project: www.lboro.ac.uk/KnowBiz

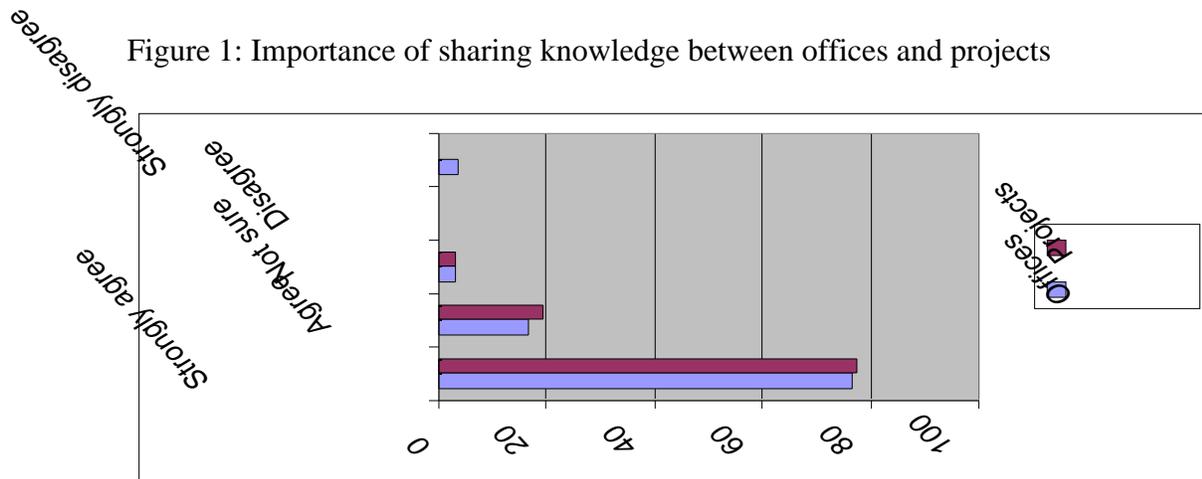
labels that do not change but underpin changing fashion, KM will remain central to learning and innovative organisations.

For a KM strategy to be successfully implemented, an organisation has to be motivated. Davenport, Long and Beers (1997) noted that the presence of motivation to create, share and use knowledge as an intangible asset is a critical success factor for virtually all knowledge management projects. Respondents perceived their organisations as motivated to introduce KM for a number of reasons. Based on a rating scale from most significant (1) to least significant (5) the survey responses were averaged to give an overall rating score for each factor. The most significant motivating factors identified in the survey are;

- dissemination of best practice to key sets of employees (average rating of 1.83)
- retention of the tacit knowledge of key employees (average rating of 1.88).
- continuous improvement (average rating of 2.20)

Other motivating factors include the need to respond to customers more quickly or to reduce rework. There is also an increasing awareness for the need to share knowledge. Most large construction organisations have global operations with the need to transfer knowledge of best practice across different geographical and office locations. Over 75% of the respondents strongly agree that it is important to share knowledge between projects and offices. Only about 3% were not sure about the importance of sharing knowledge between projects and offices (Figure 1).

Figure 1: Importance of sharing knowledge between offices and projects



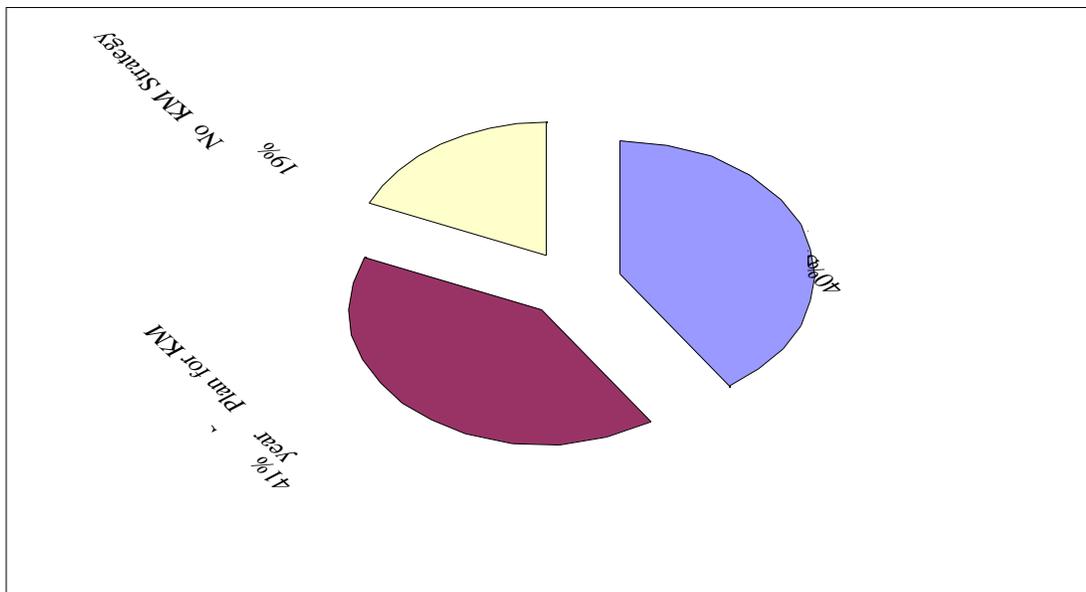
About 80% of construction organisations also perceive KM as a potential to provide benefits to their organisations, and some have already appointed a senior person or group of people to lead their KM strategy. As one CKO put it 'the appointment at a senior level signals our intention that we are very serious about knowledge management'. Another senior manager took a slightly different view, noting that the subject of KM is, and will remain very important for their organisation, and this is reflected in the appointment of a knowledge management group with some representation at the executive level. But a deliberate decision has been made not to jump on the bandwagon and appoint a Knowledge Manager, as the excitement phase may not last long.

The above does illustrate a difference in approach, but KM will remain an important issue in construction organisations. Other important aspects of KM are strategy formulation, and the barriers that affect the successful implementation of KM projects.

2.2 Development of KM Strategy

The availability of budget is considered to be one of the crucial elements of a KM strategy, so are the IT infrastructure, the number of staff, as well as the identification of knowledge champions. Most of the respondents identified budget, staff and IT infrastructure as the key elements of their strategy. The person or group leading the knowledge management strategy needs to be identified and so should the budgetary implications and the spending plans. The survey shows that less than 30% of construction organisations have KM policy document. About 40% already have a KM strategy, another 41% plan to have a strategy within a year and 19% do not have a strategy (Figure 2).

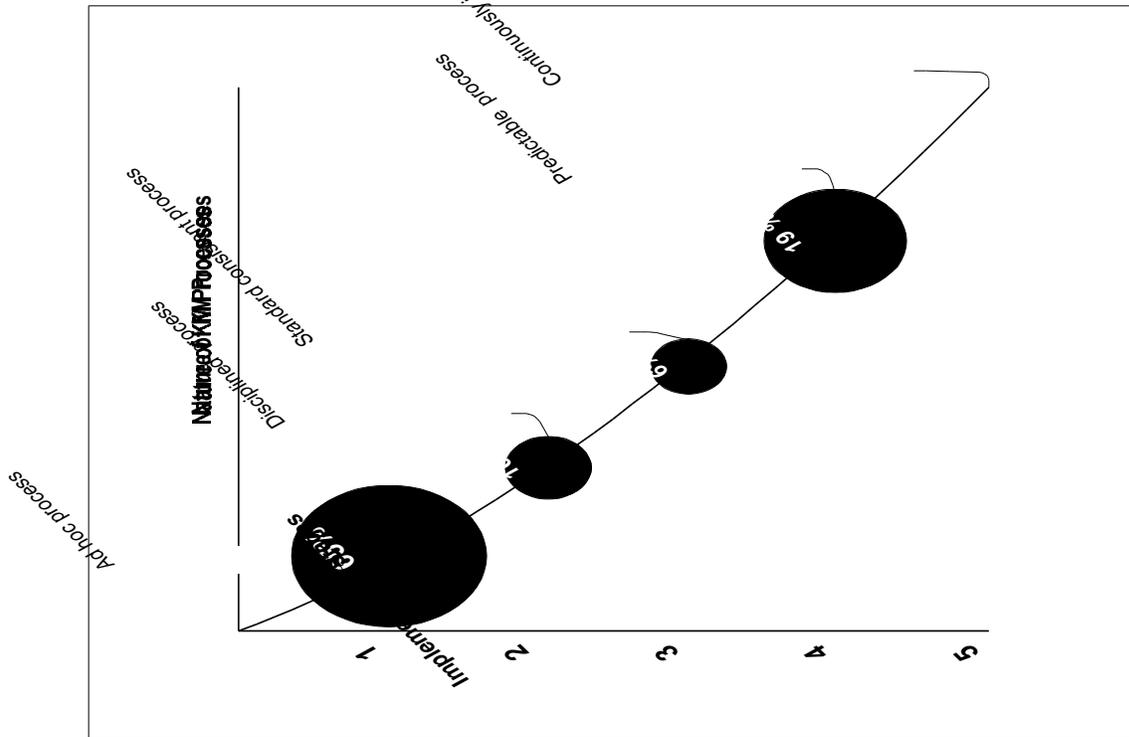
Figure 2: KM strategy in Construction Organisations



The findings of the construction survey compares favourably with the multi-sectoral survey, which shows that a third of the organisations at the time had a strategy, and a further third were planning to develop one (KPMG Management Consulting, 1998). Although the multi-sectoral survey is somehow outdated for any valid or conclusive comparison to be made, the result does show increasing awareness of the potential benefits of KM in the construction sector. Another important factor in the KM strategy is the allocation of responsibilities at senior level. About 50% of construction organisations have already appointed a Knowledge Manager or a special group with responsibility for implementing their KM strategy. The appointments tend to be recent ranging from the past 3 to 18 months with an average of 9 months, indicating that KM is only beginning to be taken seriously in the construction industry. Preliminary evidence from on-going case studies of selected construction organisations also suggest that appointments tend to be from middle to senior management level with representation at the executive board level in some cases.

The nature in which KM initiatives are implemented is also important. Figure 3 shows the nature of the implementation process of various construction organisations based on the concept of the Capability Maturity Model (Aouad *et al*, 1998). About two thirds (65%) have or intend to adopt an 'ad hoc' approach in the implementation of their KM strategies. The result shows that most construction organisations are at the infancy stages of implementing their KM strategies.

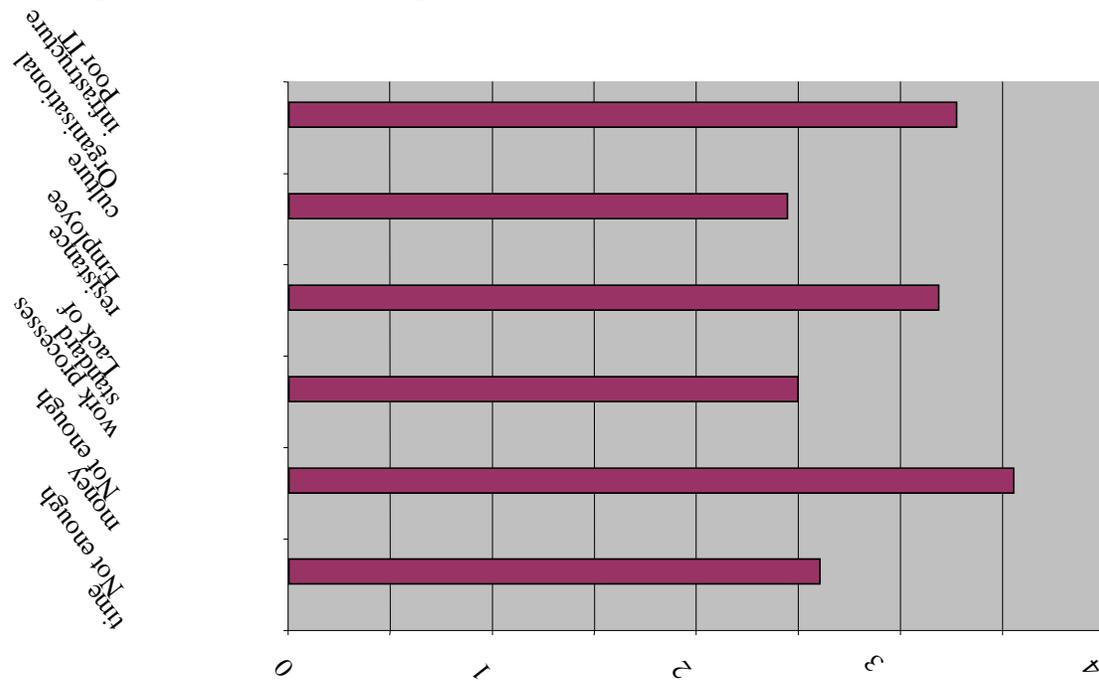
Figure 3: Position of construction organisations in the KM trajectory



2.3 Barriers to the Implementation of KM

Culture has been a recurrent theme in the KM literature as it can enable or inhibit an organisation's KM strategy. 'Culture concerns the values, beliefs, history and traditions, which reflects the deeper foundations of an organisation (Coopers and Lybrand, 1999). It has also been identified as one of the most crucial factors contributing to the success of a KM project and 'perhaps the most difficult constraint that knowledge managers must deal with' (Davenport, De Long and Beers, 1997). The survey shows that culture has been identified as the most significant barrier in the implementation of KM strategies in construction organisations. This is also consistent with the findings from a survey of 431 US and European organisations which identified culture as the biggest impediment to knowledge transfer (Ruggles, 1998). Based on a rating scale from 1 (most significant) to 5 (least significant) barrier, the survey responses were averaged to give an overall rating score for each factor (Figure 4).

Figure 4: Barriers in the implementation of KM



The culture of formal and informal sharing of knowledge is important. 'Culture cannot be changed directly but only through indirect means such as incentives, role models and the like (Wiig, 1997). One senior manager felt that the culture of the organisation is such that KM is not always taken seriously and there is a need to 'repeat the message' continuously.

The lack of standard work processes has also been identified as a key barrier. The significant merger and acquisition activities over the past decade have transformed many construction organisations, and the implication is that organisations have inherited new processes. Many construction organisations now suffer from having too many different processes for performing similar activities. Gann (2001) argued that construction organisations may have strong capabilities in project management but are often much weaker in organising their internal business processes. However, preliminary evidence from on-going case studies with selected organisations reveal that there is a now a recognition in some organisations for a rationalisation or synchronisation of some processes to improve the possibility of re-using knowledge of best practice and sharing experience.

Time constraint is a key barrier in construction organisations given that projects are characterised by fixed time scales, associated with clients' need to deliver at particular times. Many construction organisations consider their organisational structure too lean to exploit knowledge management to full, as people wanted to share knowledge but the pressure to deliver under tight project schedule does not often permit the recording of experience and sharing of knowledge before, during and after projects. According to Gann (2001), the poor organisation of internal business processes means that project-based construction organisations often struggle to learn from project to project. This means that the scope for reduction in project duration and the subsequent time available to document lessons learnt from previous projects are often very limited.

Another key barrier to the implementation of KM is employee resistance, which is closely associated with cultural factors. Cultural factors tend to be either negative or positive in orientation with respect to employees. Positive orientation refers to situations where individuals have a positive attitude to the creation and sharing of knowledge. Negative orientation reflects the reverse situation where there are knowledge inhibitors as people feel insecure about their job situation, do not trust their employers and are therefore less likely to share knowledge. Other barriers identified include long term organisational commitment, lack of understanding of KM, and conflicting priorities on the demand for resources.

3 IMPLICATIONS FOR KM STRATEGY

A number of issues have been discussed in the previous sections relating to the perception of KM, elements of a KM strategy and barriers to the implementation of KM. These issues have profound implications for the development and implementation of KM strategies in construction organisations.

Firstly, there is a need for a change management capability assessment. This is necessary to identify organisational and resource requirements and to implement the necessary changes that would be needed to overcome cultural, time, process and other related barriers to the implementation of KM. Gann (2001) also argued for a critical mass of technical capability to develop, absorb and use new ideas in construction organisations and to facilitate knowledge sharing. But investment in research and development (R&D) by construction firms is relatively very low.

Secondly, there is a need for a measurement system to be able to assess the benefits of implementing KM strategies. Organisations are motivated to implement a KM for a variety of reasons. However, the overall objective is to create some benefit in the form of money saved or earned as a result of disseminating best practice, retaining the tacit knowledge of key employees, responding to customers more quickly or reducing rework etc. Davenport, De Long and Beers (1997) argued that KM is expensive and is likely to get support only in an organisation where it is linked to economic benefit or competitive advantage. It is further argued that changes in performance measurement are key to changing motivation. The need to link KM to business performance in construction organisations has already been identified by Carrillo, Anumba and Kamara (2000). The development of a link between KM and business performance is being addressed through an on-going research project (Robinson, Carrillo, Anumba and Al-Ghassani, 2001)

Thirdly and arguably the most important, is the need to develop an incentive and reward structure. The survey shows that reward schemes were introduced but only in 20% of the organisations surveyed. Where such schemes exist they are mostly financial based rewards (75%); not promotional or related to other non-pecuniary benefits such as peer acclaim or goodwill. Lawton (2000) noted that many knowledge management strategies relying on the 'goodwill knowledge philanthropy' which assumes that staff will contribute ideas and knowledge out of their own goodwill are hard to achieve. Davenport, De Long and Beers (1997) argued that in order to get creative people to share their knowledge, changes in incentive and reward systems are necessary.

Two distinct types of incentive systems are identified by Hansen, Nohria and Tierney (1999) - rewarding people for using and contributing to quality information on document databases (codification strategy) or rewarding people for directly sharing knowledge with others (personalization strategy). However, this is not as simple as that because there will be a need to motivate teams, business units, departments and offices as well. There is also the problem of variable level and quality of employees' contribution, which needs to be considered as part of annual performance reviews. This is useful in order to avoid what Lawton (2000) described as the 'development of knowledge landfills'. Appropriate incentive structures that do not cause conflict between people, projects, offices, time and budget needs to be introduced. This view is supported by a senior manager who argued that 'knowledge management projects are often seen as adding a burden to people's work utilising vital time needed for project activities, and at the moment there are no carrots but sticks associated with KM activities. The incentive structure has therefore been identified as one of the critical success factors for KM (Hall, Sapsed and Williams, 2000).

4 CONCLUSION

This paper presents the results of a survey investigating key aspects in the formulation and implementation of knowledge management strategies in construction organisations as part of an ongoing research project aimed at developing a framework to understand the relationship between knowledge management and business performance. The result shows that a significant proportion of construction organisations are aware of the benefits, and most of them have or plan to have a KM strategy, with some already at various stages of implementation. It is argued, however, that KM strategies are not likely to be implemented successfully, unless major barriers due to organisational culture, lack of standard work processes, time constraints are identified and addressed. The need for a change management programme, a performance measurement system linked to KM, and the role of an incentive and reward structure are discussed as crucial for the successful implementation of KM strategies in construction organisations.

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