

# KNOWLEDGE MANAGEMENT STRATEGIES TO IMPROVE CONSTRUCTION BUSINESS DEVELOPMENT PROCESSES - A PRELIMINARY CASE STUDY

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Industry generally is developing knowledge management strategies and companies have been found to be delivering significant results; improving decision making, increasing productivity and profitability. In the UK construction industry, key reports such as Latham and Egan, recommend increased collaboration, knowledge exchange, new networks and relationships, to increase the competitiveness and profitability of construction. They highlight the increasing value of knowledge in delivering competitive advantage. Knowledge management is vital in construction, especially with the dependence on project work and geographic disparate teams. If it is to be successful in this procurement environment, it will require far more than investment in software.

This paper examines the core processes of knowledge management and key enablers. The focus will be on how a leading edge construction organisation is benefiting commercially from implementation of a knowledge management initiative.

Keywords: knowledge management, competitive advantage.

## INTRODUCTION

Is "Knowledge Management" the latest saviour for the construction industry? Knowledge Management is nothing new. Over the centuries, people have passed their wisdom from generation to generation. In the 1990's attention has been given to knowledge management. The drive behind this movement is that the nature of industrialised economies has moved from being reliant on natural resources to being more intellectually driven. It is this change that has resulted in more attention being given to knowledge and the manner in which it is used.

Writers such as Stewart (1998), Davenport and Prusak (1998), Nonaka(1995) and Leadbeater(1999) write increasingly of a knowledge economy driven by intellectual capital. These views suggest that knowledge will be the commodity that drives competitive advantage in the future. This paper explores the underlying concepts of knowledge management and provide an insight into how a construction firm is implementing these concepts.

### **Defining Knowledge**

It is appropriate prior to examining knowledge management, to define the key knowledge concepts. There exists some confusion as to the difference between knowledge, information and data.

Most people have an intuitive sense that knowledge has a deeper, richer and broader meaning than either information or data. Davenport and Prusak (1998) provide the following definition:

*"Knowledge is a fluid mix of framed experience, 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 the knowers. In organisations, it often becomes embedded not only in the documents or repositories but also in the organisational routines, processes, practices and norms."*

This definition suggests that knowledge is not a simple concept but is a rich mixture of data combined with contextual information and evaluated through the wisdom and expertise of the person. Knowledge exists through people and its value is achieved through people. Unlike physical assets knowledge assets are difficult to pin down as they are tied up in people.

Knowledge can be tacit or explicit. Tacit knowledge is subconsciously understood and applied, difficult to articulate and is developed from direct experience and action. It is shared through interaction, through conversation and through shared experience. Explicit knowledge on the other hand is more formally articulated and is removed from the original context in which it was developed. A mathematical formula, procedure or manual that is not used in their original context of development may be examples of explicit knowledge. Explicit knowledge should be more clearly understood and its application in manuals, processes and procedures is easily recognisable. Explicit and tacit knowledge are both potential intellectual assets that the organisation possesses.

Knowledge is an important asset; therefore, it is not surprising that organisations are paying more attention to knowledge. Organisations are concerned with what is knowledge, how it arises, how it is transferred and how it used. It is out of this interest that knowledge management has blossomed.

### **What is Knowledge Management?**

Knowledge Management refers to the organisational processes that seek the combination of data and information processing capacity, with the creative potential of people. It is concerned with the management of knowledge processes, interactions with individuals and teams and the means through which they acquire and exploit knowledge. This process of managing knowledge does not operate in isolation but is an integral part of achieving the objectives of the organisation. Knowledge management is about getting the right knowledge to the right people at the right time. It is about sharing and acquiring knowledge in ways that can be translated into improved organisational performance. The intellectual capital of individuals and teams are presented in a tangible form facilitates the adding of value to the organisation and ultimately its customers.

This process of added value is achieved through the continuous recycling and creative use of shared knowledge and experience. This is followed by the structuring of the shared competencies with the help of technology, process maps and descriptions, manuals, networks and so on, to ensure that the competence remains in organisation even when staff leave. The knowledge, once packaged, becomes part of the capital of the organisation. This creates an environment for the rapid sharing of knowledge and sustained and collective knowledge growth. Lead times between learning and

knowledge sharing are shortened and human capital becomes more productive through intelligent work processes. Knowledge management is about acquiring, structuring, and transmitting intellectual material for the benefit of the organisation. One of the major misconceptions of knowledge management is that it is about information technology. The technology is a support tool. (McDermott, 1999)

### **Knowledge Management Strategy**

Knowledge management, like all other organisation activities, can fail if it is not developed correctly. The problem facing most initiators of knowledge management is that it is an evolving field with no set standards for what is required. A useful starting point would be to articulate the specific business management objectives that a knowledge management initiative would serve. This ties in the activity to a business objective that makes acceptance easier. The next stage of the process is to identify the objectives of knowledge management in relation to the business objectives. This creates focus and should help prevent unnecessary information from cluttering up the system. One of the major criticisms often levelled in this information age is that the technical solutions may be brilliant but do they necessarily fit the purpose of the organisation.

In many ways all knowledge management projects will have similar objectives. Davenport, *et al* (1998), in their study of thirty-one knowledge implementation projects found that the following similarities existed in the objectives of the projects: to create knowledge repositories, to improve knowledge access, to enhance the knowledge environment and to manage knowledge as an asset. While some projects tried to achieve all the above, others had at least one of the above as a core requirement. Each of these knowledge management projects also sought to achieve organisational goals or they would falter.

There are two strategic philosophies associated with knowledge management, a personalised knowledge strategy and codified knowledge strategy. The personalised strategy is very much tied into the person that developed the knowledge and sharing is achieved through person to person contact. There is an opportunity to transfer tacit knowledge. This is almost like the apprentice learning from the master craftsman. The modern equivalent will be a form of structured mentoring for the learner. Information technology under this system provides a means of communication but does not act as a knowledge repository.

The codified knowledge approach is associated with explicit knowledge, which can be more precisely expressed and formulated, even when removed from its context. (Zack, 1999) These are the training manuals, process and systems that are generated in organisation context. The key to this approach is create a knowledge asset that can be used a number of times. This is almost a person to document approach. The knowledge is extracted from the person who developed it, made independent from that person and used many times. Electronic document systems help facilitate the codifying, storage, dissemination and reuse of knowledge. Information technology can be a great help when this type of system is used.

The question that arises as to which is the most appropriate strategy for the management of knowledge? In common with almost every management application, the appropriate decision is contingent on the nature of the business, the organisation structure, the products or service and the customers that receive the product. The knowledge management strategy is dependent on how the organisation perceives itself. Does it wish to adopt a knowledge management approach that seeks the re-use

of knowledge to implement solution through the use of knowledge objects that are easily accessible, reliable and easy to use? This approach stresses the economics of re-use and “ready to wear” solutions.

Alternatively the company can go down the route of a highly personalised approach to knowledge strategy where the investment is in tacit knowledge transfer. Under this approach the knowledge is transferred to the individual and customer solutions are specifically tailored for the individual project. Research conducted by Hansen, Nohria and Tierney (1999) on management consultants suggest that a firm should choose to adopt one of the strategies with the other acting as a support mechanism or the focus of the approach will be lost. They suggest an 80% -20% approach that indicates that one strategy or the other will be dominant. A mixed approach is not advocated, as the focus of the knowledge strategy will be reduced.

The ensuing case study provides an example of how knowledge management is being applied within one company.

## **CASE STUDY**

### **Aims**

The principal aims of this case study were to identify ways in which KM was being implemented in practice, what barriers to success the company could envisage for their initiative, and how they were planning to counter these. The company was questioned on strategy, objectives, planning and implementation.

### **Methodology**

This is an exploratory study. The case study was identified through first contacting the top 50 UK construction organisations according to turnover. The company selected for further in-depth analysis demonstrated that it was involved in implementing a KM initiative in line with the issues addressed earlier. Only 5 companies had any real understanding of the concepts and the company selected for the case study may be considered to be a benchmark for the industry.

Information was provided by a key strategist and co-ordinator for the KM initiative which aims to increase profitability through quality and lower risk via best practice knowledge transfer throughout the organisation. The Case Study examines in some detail the company’s business case for the KM initiative and provides input where appropriate. Through detailed exchanges of knowledge many significant issues regarding successful KM from the construction industry perspective were dealt with and explored.

### **Background**

Company A is an international company with a turnover of approximately £400M, which employs approximately 10,000 people. Employees are to be consolidated within a reduced number of locations, and it is hoped this “will encourage knowledge sharing and promotion of a single culture”. Company A has a best practice initiative active throughout the organisation, and pioneers new methods that reduce time, yield lower costs and improve quality. Company sees the development of a KM System as one way of working towards these objectives.

### **Knowledge Strategy**

From a construction perspective, Company A has the desire to manage more effectively the knowledge that exists currently within the company and is captured at site. Presently Company A operates purely on a project basis. The knowledge or lessons learnt, from one project and their teams are not shared with the rest of the company. The team merely takes with them the knowledge and experience they have acquired on to the next project where they may or may not utilise it or share it with new project members.

The major opportunities that Company A is pursuing are the potential to partner and the increased profitability that can be gained through an increased level of corporate knowledge when applied to projects. Company A is currently in the process of redefining its strategy to incorporate the value of continuous improvement. A more effective management of its knowledge is seen to be central to this.

What Company A aims to do is move from a project based organisation, in terms of knowledge, to a corporate one where knowledge is available to all and expertise and advice is at hand if required. In doing so Company A hope that project risks will be reduced, and the performance requirements of time, cost and quality will be met in the long term. Although the KM System is geared towards the construction process primarily, the system has wide ranging applications and implications for the other divisions in the future.

*“[We] develop profit through the management of the supply chain, the construction process, risk and finance. It is our knowledge of how to manage these aspects that generates our workload and converts the work done into profit.”*

### **Drivers**

Incentives to produce such savings obviously have their roots in the market place. The fact that Company A's competitors are developing knowledge systems and other initiatives is a major incentive to Company A to develop their own. The Egan report and its calls for continuous improvement, greater efficiencies and innovation have prompted Company A to look at new ways of mobilising the combined 'Company A Knowledge', and deploying it on projects to deliver new construction methods, time and cost savings, and reduced risk of failure and defects. It was also stated during the interview that the rate of change, in terms of the service provided to the client and new methods, within the construction industry is accelerating and failure to keep up with this pace would seriously affect the competitiveness of Company A in the long-term.

### **Leadership**

For the knowledge strategy to succeed in the long-term it was identified that an authoritative figure was needed to identify knowledge needs and generally push the importance of knowledge on site and within the company. At a strategic level Company A identified that Director support was needed to push knowledge strategies from the top down, and this was seen as vital to the long-term success of any strategy. At implementation level, the role of Knowledge Co-ordinator was created to collect, sort, and publish knowledge, provide input to strategy formation, and act as a 'knowledge policy enforcer' on site and within the company. It was seen that a fundamental acceptance of the value of knowledge was vital and needed by these three key leadership centres for unilateral 'buy in' from Project Managers and personnel to take place. Strategy implementation and success would then be easier to achieve.

## **Culture**

It is accepted that the culture of Company A as it presently stands will not facilitate a more effective management of its knowledge. There needs to be a pronounced cultural shift to value the role of knowledge and its value to the company in the long-term. Failure, however far removed from the overall project success, is still jealously guarded and it is this culture of not admitting mistakes that is the major barrier to the success of the KM System. The culture of Company A must change to a more open and corporate centred culture. The concept of sharing bad experiences with the rest of the company will benefit Company A, as it will learn more when things are going badly than it will when things are going well.

## **Performance**

It is realised that all best practice initiatives developed by Company A, especially knowledge initiatives, should be closely monitored and key performance indicators are required to measure the success of those initiatives to ensure value for money, effectiveness, and that they are indeed delivering the savings they promised.

## **THE KM SYSTEM – A BUSINESS CASE**

A workshop was organised and the participants included the Facilitators, Information Technology (IT) staff and some senior management. Their agenda was to review current practice and to brainstorm three key knowledge issues:

- *Knowledge Capture*
- *Knowledge Storage*
- *Knowledge Transfer*

They identified that knowledge was already captured effectively within employees and storage was easily enabled using IT, but it was the issue of transferring this knowledge that posed the most significant problem to the company. It was decided that a formal KM System be devised.

This KM System will not only make experiences and lessons learnt from projects more accessible, but will also include relevant contact numbers and photographs, and more detailed project information if required, together with links to appropriate legislation.

Specific benefits from a greater management of Company A's knowledge through a system have been identified by the workshop. They are:

- *Improving the service to Client*
- *Reducing the construction process risk*
- *Reducing the amount of deflective work*
- *Reducing the time required solving problems that have already been overcome*
- *Improving the presentation of core capabilities to secure new work*
- *Ensuring Client recognition of the continuing evolution of business strategy*
- *Reducing the time to search for information*
- *Retaining knowledge should employees leave the company*
- *Optimising technology already in use within the company*

Through a detailed cost benefit analysis gains have been estimated at nearly 2½ times that of the costs per year of the system and the Knowledge Co-ordinator role. The intangible long-term financial benefits from an increased level of corporate knowledge are indeterminate, but clearly they are unarguably an advantage to the company.

The workshop identified good and bad site experiences as knowledge that would give the most benefit to the company. The knowledge that needs to be retained within Company A are primarily the 'lessons learnt' from these experiences.

### **Implementation - The Lessons Learnt File**

It has been planned that a Lessons Learnt file be established as a new project commences. The lessons learnt file is then updated during the duration of the project. It is the responsibility of the Project Manager to review the file periodically, depending on the length of the contract, summarise the findings and forward them to the Knowledge Co-ordinator for authentication and inclusion on the 'knowledge-base'.

It is the responsibility of the Knowledge Co-ordinator to authenticate the knowledge collected from site. Authentication is gained by liaising with an 'expert' within Company A who will decide on an objective level whether the knowledge is in fact best practice and has no side effects. This will require a type of framework to be outlined and linked with observed performance (time, cost, quality). The criteria will then provide guidelines for Projects Managers and the Knowledge Co-ordinator as they collect the knowledge. Once authenticated, the Knowledge Co-ordinator posts the quanta of knowledge on the Intranet for general access. Company A has realised that this person will need a balance of authority and approachability. He or she will need enough authority to enforce the knowledge process and policy, but not too much as to dissuade employees from sharing their experiences.

The responsibilities of the Knowledge Co-ordinator will be wide ranging. As mentioned above the Knowledge Co-ordinator will have the duty of collecting the lessons learnt file summaries from the Project Managers, authenticating the knowledge, and then posting an accessible, easily understood piece of knowledge onto the Intranet. Furthermore, he or she will ensure that knowledge remains within current trends and is not superseded by new methods. Other duties will involve listening to Project Managers' needs and changing the system accordingly, which leads to a certain responsibility for prioritising the knowledge needs of the company and making those needs more visible to the technical directors, which is necessary for investment.

### **Marketing the System**

For the system to work there is a need to encourage staff to contribute to and utilise the knowledge available. Incentives and procedures are required. The benefits and nature of the system, along with the names of the contributors will be publicised via media such as, the company newsletter

The system will be pushed from three angles. There will need to be Director support of the system in the form of leading by example. There is a strong feeling that the system will need to be pushed from the top down if it is to succeed in the long-term. In addition, progressive Project Managers will be highlighted as being front-line knowledge champions acting as role models for the rest of the group. The Knowledge Co-ordinator will act as policy enforcer and encourage the use of the system at all times.

Incentives alone are not enough. It is recognised that KM needs to become company policy rather than merely a management exercise, and to facilitate this it needs to be incorporated into company procedures. The knowledge agenda will be pushed through training staff to use the KM System, graduate induction, and incorporating KM into the Quality Assurance (QA) procedures. Through these methods, knowledge sharing will be seen as a performance goal, and will be rewarded accordingly.

### **Barriers to Success.**

The first is the issue of reporting bad site experiences. It is realised that generally the company learns more from bad experiences than it does when things go well. However, there is a clear acknowledgement that it is likely that bad experiences will not be communicated at all outside of the project team. It is hoped that the Knowledge Co-ordinator will have the authority and approachability to be able to go to site and talk with the project team and objectively discuss what lessons can be learnt from the bad experience.

There is the possibility that Project Managers will see reviewing the lessons learnt file as more work over and above what they have to do already. There will therefore be a certain amount of resistance to the new procedures and to combat this there needs to be sufficient motivation the form of which is not clear. It is hoped that some Project Managers will champion the management of knowledge and this will gradually spread to other teams. In addition, procedural demands should push Project Managers into active KM.

## **ANALYSIS OF CASE**

A single company case does not provide conclusive evidence of practice but often highlight areas of interest. The case does demonstrate an age old problem when applying new management techniques to construction, the problem of balancing project environments with corporate environments. In order for knowledge management to have a chance in construction, new corporate structures have to be drawn up, such as the 'hypertext organisation'. (Nonaka and Takeuchi, 1995) The structure of the company blends projects and corporate responsibility within the same framework.

It was evident in the case that knowledge management requires a change in organisation culture. The cultural considerations include an attitude of sharing, openness and willingness to learn. It is not easy to get individuals to be open about failure and a 'blame culture' is present in a great deal of construction. As no immediate rewards are present when contributing to knowledge development this represent extra work. It requires a change in attitude for people to contribute to the system.

A great deal of the knowledge management approach being adopted by the company is based around an IT strategy. This immediately suggests that most of the knowledge creation is expected to be explicit. The creation of knowledge data bases is good but the danger exists that the IT solutions become the answer in themselves. This problem is widely acknowledged in the work of McDermott (1999) The knowledge strategy of the company can be criticised for not featuring tacit knowledge in any context which may not help develop human resources appropriately.

Leadership is critical for the implementation of knowledge management. A clear recognition by management of need to champion knowledge management is evident. As knowledge management is the fad of the moment, the true test comes when the



next big idea arrives. A long term approach that is properly resourced is needed. The case does highlight the need for knowledge management to be championed at all levels.

Knowledge management success in this case is dependent on changing the organisation structure to facilitate KM, a change in culture, ensuring explicit knowledge is the correct route to follow and leadership.

## CONCLUSIONS

Consultants and contractors are beginning to value knowledge and see that it is the key to competitive advantage and differentiation. Furthermore, they are realising that they must manage it to a greater degree if that competitive advantage is to be sustained and improved. However, they lack a coherent KM strategy that places the business strategy of the company as the focal point of their efforts. The challenge they face is understanding what KM fully entails in terms of culture, technology, processes and people, and how this can be translated into focused initiatives that effect the bottom-line of the firm, not just in the short-term, but through the benefits that a learning organisation can bring.

Strong top-down leadership is needed to ensure that KM is taken seriously throughout the organisation, and cultural change, infrastructure, and technology are planned, implemented, and strategically aligned for competitive advantage and KM. The cultural barrier to KM and transfer is likely to be significant within the construction industry. Construction firms must realise that if cultural change does not occur, to a more empowered, questioning, open, and collaborative one, then knowledge will not be harnessed and shared, and competitive edge will be lost in an increasingly competitive and dynamic environment.

There must be a balance between pull and push strategies to encourage and support knowledge sharing and transfer. Pull strategies of indirect reward, status, praise, and advancement must be balanced with an approach that makes knowledge sharing and transfer policy, procedure and a career performance objective. All employees should see it as their duty and responsibility to identify, gather, and share the knowledge they have, under a shared purpose to improve organisational competitiveness.

Technology should facilitate the strategic knowledge processes of creation, identification, capture, storage, and transference. Through this, technology should be designed to promote, and not hinder, collaboration, conversation, connection, and communication to ensure full corporate knowledge is easily accessible and packaged in a format for direct application.

Clearly, organisations are looking for knowledge and KM to go beyond short-term system.

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