

KNOWLEDGE MANAGEMENT AS A STRESS MEDIATOR

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The last decade has seen an upsurge in the recognition of job stress as a significant occupational health problem. Much research has focused on job stress in other industries, but construction lags behind these leading efforts. A key stressor within many organisations may be the accessibility and sharing of knowledge within the enterprise. Within this paper we focus on the link between knowledge management (KM) and the impact of KM approaches on the people within the enterprise i.e. engendering hardiness. The findings from an extensive literature review indicates that within the construction industry we do not as yet fully embrace “soft issues” and therefore extract the full value from them in terms of reducing stress within the enterprise.

Keywords: EDMS, Knowledge Management, Stress.

INTRODUCTION

The number of stress cases finding their way to the courts has risen since the early days of Walker (Walker v Northumberland County Council [1995] IRLR 35). Many of these cases are predicated on a failure to ensure that knowledge within the organisation is shared and managed. What has become clear is that we have not yet fully grasped the opportunity to take the lessons learned from the Walker experience and integrate them within the broader context of human resources and enterprise knowledge management. Better sharing of knowledge within the organisation may facilitate the individual’s self-stress management approach.

Knowledge Management (KM) is the way that organisations create, capture and re-use knowledge to achieve organisational objectives. Within the construction industry, we have a limited understanding of what underpins any organisation's ability to harness and exploit knowledge more effectively than its competitors. This in part may be due to the fact that knowledge and learning cannot be treated as commodities; they are neither readily identifiable nor measured. They are closely bound up with the way organisations and the people within them think, work and interact. The drive to increase knowledge management very often means that interaction become strained and the individuals concerned see the KM initiative as one more stressor within the work environment.

At the level of practice then the key challenges arise from the need to bring about the changes in managerial and organisational behaviours required to constitute learning and knowledge sharing as a productive resource for the organisation and as a stress mediator (Sommerville & Dalziel 1998).

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This has implications for the design of strategies, structures, technologies, work processes and also, for the underpinning fabric of social relationships which emerge from, and provide the context for KM's development within construction organisations.

KM can be viewed as a systematic process of discovering, choosing, arranging, refining and presenting information in such a way that it improves an employee's comprehension (reduction in confusion and stress) within a specific area of interest. KM within organisations can be said to have the same degree of importance as labour, plant and materials (Fernie et al., 2003). Some would go further and argue that knowledge is now regarded as the '*primary economic resource*' within an organisation (Fong 2003). Whilst the underlying definitions and approaches to enterprise knowledge will gravitate around the balance of explicit and implicit knowledge, the knowledge still predominantly resides within the brains of the workforce (Sommerville and Craig 2004).

KM is linked to such processes as information technology (IT), information systems and e-business, all processes which interact with and influence effective supply chain management. It is therefore argued that, with the potency of KM, the effective management of the knowledge sharing process is tantamount to management of the composite construction supply chain (Ribeiro and Lopes 2001).

Given this view, we would expect to see much work on the understanding and management of the structures and processes which facilitate human interaction within the construction enterprise e.g. understanding the individual and group cognitive processes. On the contrary, we still do not fully comprehend the most appropriate structures and processes for knowledge transfer, nor the fundamentals of how knowledge is transferred from one brain to another. Chater and Oaksford (1999) whilst attempting to explain the function and purpose of rational cognition indicate that cognition is intricately related to the structure of the surrounding environment.

KNOWLEDGE SHARING

Knowledge sharing is also seen as a vehicle to promote the effective integration between members of the supply chain i.e. a conflict reducer and therefore a stress mediator. Ingirige et al., (2003) argue that the construction industry has not grasped the importance of the sharing of knowledge between members of construction alliances. They identify four main variables which require to inter relate when analysing knowledge sharing i.e. the strategic direction of the alliance, people, knowledge transfer and mechanisms and types of knowledge sharing.

The culture of an organisation can have a profound effect on the implementation of a knowledge sharing strategy, organisations that promote trust and co-operation, are more likely to benefit from a tacit sharing environment. Fong (2003) argues that organisational culture is extremely important to knowledge creation. The view expressed by Fong (2003) is that the culture of Japan promotes innovation due to a high degree of socialisation, i.e. sharing tacit knowledge. The knowledge sharing process should be designed to link the sharing of knowledge to tangible benefits for the parties involved, this is best achieved by understanding and building on the human networks which already exist within the organisation.

Industry reports of the late 1990's (Latham & Egan) emphasised the importance of team work, it could be argued that construction has still to truly understand the philosophy of team work and therefore is missing out on the important resource of knowledge. Fong (2003) alludes to the fact that knowledge sharing promotes integration between team members, which in turn fosters innovation. The

construction project environment is generally considered to be a hostile (stressful) environment to the promotion of KM and learning, due to their temporal, spatial and multi cultural attributes. The project environment generally fosters a constant flow of personnel and information, with the regular scenario of “Reinventing the wheel”. However, Bresnen et al., (2003) argue that the project environments could in fact be a haven for innovative processes and products to be developed, due to the unique nature of the project environment.

Kasvi et al., (2003) identify four main areas applicable to KM within a construction project environment:

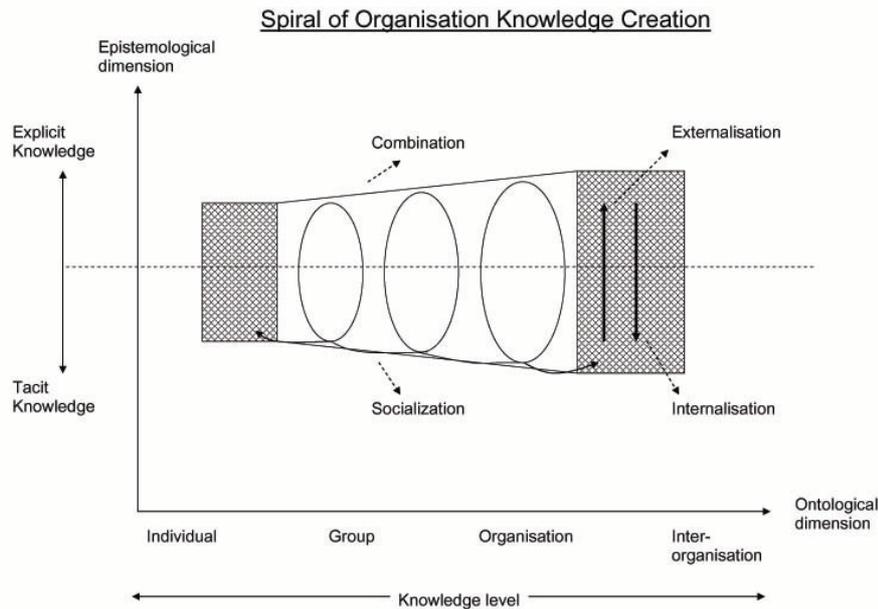
1. Knowledge creation, for example collection, combination and refinement.
2. Knowledge administration, for example storage, organisation and retrieval.
3. Knowledge dissemination within and outside the project.
4. Knowledge utilisation and productisation, for example integration into products and decisions, and application in other projects.

To apply the areas identified, demands the utilisation of hard and soft systems, the hard systems being the utilisation of IT, the soft systems being the codifying of the knowledge gained and the personal interaction, integration and sharing between all stakeholders involved both internally and externally in a project.

A study carried out by Koch and Thuesen (2002) on the validity of KM at project level, identified that to implement KM techniques demands connectivity between IT and human resource management. The realisation of this paradigm, demands a review of existing cultural (macho) and social-political trends, which remain entrenched within the industry. It could be argued that until organisational and project dynamics, truly foster integration of all internal and external stakeholders, whereby the sharing of knowledge is considered to imply a win-win scenario, KM will not realise its full potential as a stress mediator, rather it will remain another catchword within the broader IT vocabulary.

Figure 1 encompasses the nature and magnitude of relationships which arise from organisational KM. The Y axis denotes the two distinct forms of knowledge i.e. Explicit and Tacit. The X axis identifies a range of parties from the individual through to inter-organisational level. The dynamics of the various interactions are demonstrated by the spiral effect in the cone, resulting in knowledge being created in one of, or a combination of, the four mechanisms for the development of knowledge i.e. Socialisation, Externalisation, Combination and Internalisation. Depending on the individuals cognitive processing, this internalisation may give cause to the most discernable forms of stress i.e. overload.

Figure 1: Spiral of Organisation Knowledge Creation. Nonaka and Takeuchi (1995)



STRESS IN THE CONSTRUCTION INDUSTRY

Stress as a term is bandied about yet is only rarely understood: the term is often subject to interpretational and social difficulties i.e. stigma often attaches to someone who fails to work because of stress. Selye (1976) takes a broad overview when defining stress as 'the rate of wear and tear caused by life'. Cox (1978) saw stress as a by-product of the many demands made on the individual which they feel they are unable to cope with adequately.

When related to an organisational setting, Cranwell-Ward (1987) perceives it as the outcome of an individual's perception of inherent capabilities and resources being unable to meet the requirements placed on them. This view complements earlier work as to whether there is too much to do or it is too difficult. Tung and Koch (1980) tied much of the argument back to the workplace by showing that stress is conditional upon the individual's environmental interfaces. It can be argued that the environment surrounding the individual has a significant effect on their motivational state and degree of stress: a key element being the knowledge environment.

The cost of occupational stress is high in both financial and in socio-economic terms: the impact in organisational terms may be considered in terms of true financial cost or organisational disruption, away from some desired norm. A decade ago, Sommerville and Langford (1994) highlighted the broad range of interfaces which act as primary stressors for construction managers. This work was developed further by Ramdane (1996), Campbell (2000), and Lingard and Sublet (2002). Haynes and Love (2004) have also emphasised the need for greater investigation of stress and study of its management within the specific construction industry environment.

When considering stressors – the prime suspects appear time and time again in the construction context. The work carried out by Kobasa (1979a, b) suggests that individuals who may be perceived as stress resistant can be understood by considering three aspects: control, commitment and challenge. Control is viewed as the tendency

of the individual to perceive and believe, or act as if, they can influence the cause of events and to seek explanations of why something happened in terms of not only their own responsibilities but in conjunction with those of other peoples'. This of course is predicated upon having sound knowledge of the environment and issues that face the individual when seeking to arrive at some form of decision. In practical terms, it may be suggested that managers in charge of construction sites are well able to exercise such control over events and others actions but limited in their ability to control information channels and flows.

Commitment focuses on the belief in the work at hand and the interest value of this work. In essence, this involves considering and valuing not only the practicalities of what work is being carried out, but also the underlying reason for the work in the first place i.e. what is the deliverable or expected outcome of the task. This in itself is a vital piece of knowledge that very often is, at the best confused, and at the worst is lost completely.

Challenge is based on the notion that change is inevitable and the norm, rather than stability i.e. the only thing that is constant is change. The accepted transition from one construction site to another, of both managers and operatives, is a clear indicator of willing acceptance of this challenge that in itself is predicated upon a sound knowledge map of the forthcoming project and the anticipated outturns.

These three elements, which require considerable underpinning knowledge, are held to work in conjunction with each other to mitigate the effects of stressors and so bring about both a reduction in the levels of stress felt by individuals.

THE CAPTURING OF KNOWLEDGE IN THE CONSTRUCTION INDUSTRY

With the emphasis in today's construction industry, on meeting client's needs, construction organisations tend to look at projects in the short term. Therefore they fail to look beyond the traditional fragmented and non-integrated methods of communication and KM. The underlying culture, predicated on this traditional approach, ensures embedding of the approach within the culture of the construction industry.

Construction professionals however, all of whom have conflicting priorities and differing objectives, play varying roles and all use their own unique processes to undertake tasks. Crucial to the success of any construction project is the sharing of knowledge. The distinct construction professionals have become so reliant upon information that has to be supplied by many members of the construction supply chain although the information provided is rarely captured, retained or indexed in a compatible format. This in itself contributes significantly to fragmentation within the industry and gives rise to many instances of conflict (which are stressful events). The uncertainty and uniqueness of the industry ensures that there is little appeal to the smaller organisations to capture and disseminate knowledge once the construction project is complete since the complex construction supply chain tends to split and go their separate ways (Craig et al., 2003). More importantly the knowledge they have created tends to go with them because there is no institution or corpus left where existing knowledge can be accessed (Disterer 2002).

Historically, the transfer of information and documentation within the construction industry has been inherently poor and has resulted in decisions being made on the basis of imperfect information received or by a lack of knowledge and understanding on the part of the individuals. The huge amounts of data that are currently being created on construction projects emphasises the need for a control mechanism and has

resulted in the construction industry adopting new knowledge capture tools which aid the creation, capture, storage and transfer of knowledge. Organisations that do not systematically secure and capture knowledge created in projects for later use are at risk that the knowledge and experiences gained from within the project will get lost at the end of the project (Disterer 2002).

Disterer (2002) states that “the documentation of projects rarely contains valuable knowledge for following projects”, which suggests that project documentation addresses the needs of individuals at project level only and can only be a useful commodity on projects of a similar nature. On larger completed projects, key personnel who often hold the knowledge that will unlock the problem cannot be identified or tracked down without considerable effort.

Electronic Document Management Systems (EDMS) allow for easy identification of key personnel involved in a project and provide a solid foundation for the exploration of new working methods that aid the movement of information and knowledge within the construction supply chain. The issue of isolation and fragmentation can be overcome with the implementation of EDMS and the dispersed information and knowledge assets can be centrally located for easy accessibility and application by construction project team. The adoption and application of EDMS as a KM tool will aid knowledge capture and indeed the systems have proven their worth in the distribution, creation, and management of project information (Craig et al., 2003). Many EDM systems are very efficient and effective in the way they capture project knowledge simply because they are implemented and heavily utilised at the most important stage of a project where the bulk of knowledge is created: the construction stage. EDMS can be used to facilitate the development of innovative ideas during both the construction and maintenance stages of a project. The technology is extremely useful when queried to provide background information for similar projects because the information held provides a good reference point for projects to be planned and executed in an improved manner (Craig et al., 2003).

Construction organisations are inherently paper based and many contractors still insist on communicating with each other using this old traditional method. Construction organisations can share and more importantly capture information effectively through the use of EDMS which otherwise could not be achieved if other forms of information storage and knowledge collection systems were used i.e. paper based systems. The adoption of EDMS will bring about cultural change but as is the case with most new technologies the human element is resistant to change from their existing methods of working to new innovative methods of working.

A KM process used in conjunction with sophisticated EDM systems will improve the performance of employees and enable them to make more informed decisions (so reducing their anxiety). Any KM process will also play an important role in re-engineering the culture of the construction organisation towards a culture of collaboration and sharing. This change in culture towards a more open and sharing aspect will in itself act as a stress moderator.

An effective KM process will also generate less stress for organisations and employees trying to do more with fewer resources (Bollinger and Smith 2001). EDMS must be implemented and put in place to aid the capture of knowledge from existing working processes and make it available to existing and future workers on future projects. EDMS has become a crucial component for collecting knowledge although how the knowledge is then used, is highly dependent upon the working ways of the organisations within the construction industry. The sharing and dissemination of

knowledge is not however commonplace within the construction industry because of a lack of KM protocols.

Figure 2: Repositories of Corporate Knowledge (Xerox, 2002)

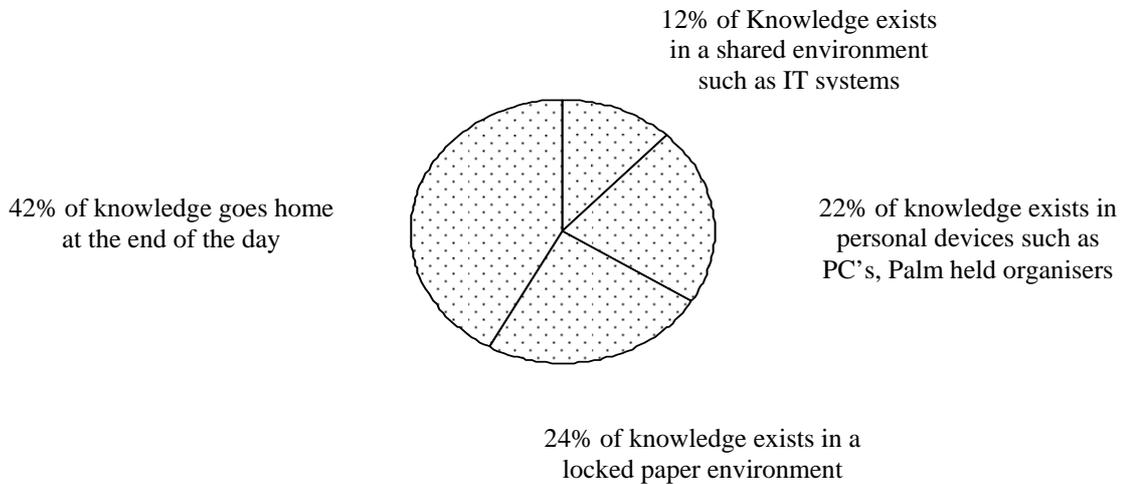


Figure 2 illustrates that the emphasis on managing knowledge needs to move away from managing paper based knowledge to managing knowledge electronically. The diagram further highlights the fact that most knowledge is held within the repository (brain) of key personnel and is not available for use by anyone else because it is held in a non-transferable format and can only be passed on by face to face communication. Indeed over 64% of knowledge held in two of the four main repositories can be attributed to personal/personnel knowledge and of the remainder 24% is held on paper which means only 12% of knowledge exists in shared electronic environments such as EDM systems.

With the establishment of an effective KM strategy, cultural issues such as resistance to change can be identified and dealt with accordingly. For individuals and organisations to become accountable and responsive to their specific area of knowledge, EDMS will provide a platform for this across the construction supply chain. Construction organisations that adopt EDMS to capture knowledge stand to gain or maintain a competitive edge. The role that EDMS can play in relation to the capture of knowledge can be of significant advantage to a construction organisation. As the awareness and implementation of EDMS increases, project knowledge will be captured in a meaningful format which will aid the future construction of projects and more importantly increase the knowledge of construction personnel from information created by their predecessors. The use of EDMS will aid and bring together the distinct professions of the construction industry.

CONCLUSIONS

Stress in the construction environment has the potential for claims that may well damage the individual, the enterprise, and ultimately the image of the industry. With the use of an appropriately designed and implemented EDMS the knowledge pervading the organisation can be captured and shared in such a manner that it reduces one of the primary stress inducers.

Knowledge Management is an eclectic term: in order to extract its maximum potential, concentration on particular facets within its broad constituency is required.

Knowledge sharing has been shown to bring about an increase in competitive advantage and act as a stress mediator. Focusing on how the individuals within the organisation are treated in terms of knowledge generation and sharing will aid the organisation in its efforts to reduce workplace stress.

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