

Frameworks For Knowledge Management Initiatives In The Field Of Project Management-Using Metaphor for Improved Visibility

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Abstract

Collection and sharing of information and knowledge has remained a source of concern over the years. With better visualization tools at our command, we have the medium to allow knowledge sharing to take place conveniently and effectively. Knowledge management in most organizations is more left to individualistic initiatives of managers rather than having a structured system or process to be followed. Frameworks and models can provide a way of trying to tie together disparate initiatives and to also provide overarching strategies. Weaving metaphors into models or frameworks are useful ways of creating a highly understandable form of describing these in a way that is both context rich and resonates with the receiver's cultural perspective. Understanding a plan or framework for advancing innovation through knowledge should be made more tangible even though it may embed tacit cultural knowledge.

To help in this direction, this paper aims at discussing three frameworks which would assist project management teams to conceptualize and thus grasp the value in executing knowledge management initiatives. We offer a generic framework for promoting knowledge management implementation initiatives as it relates to project management. The aim of this paper is to provide a broad outline on which specific

knowledge management initiatives, as applicable to different project scenarios, can be described to those that will ultimately undertake them.

Keywords: Knowledge Management, Project Management, Innovation

Introduction

Knowledge management (KM) has attracted increasing interest by construction industry and project management academics and practitioners over the past five years or so. This has resulted in several books on the subject being produced that is specifically targeted at this sector (Kazi, 2005; Love, Fong and Irani, 2005) and (Anumba, Egbu and Carrillo, 2005), additionally, research reports have also focused on KM in construction for example in Australia (Walker, Wilson and Srikanathan, 2004). And in the UK with small and medium enterprises (SMEs) for further information see http://www.knowledgemanagement.uk.net/sme_intro.htm for the website developed by Professor Charles Egbu who has undertaken much collaborative work in this area at Glasgow Caledonian University. Part of the problem that these and other academics have found in communicating frameworks and models has been finding ways to describe KM initiatives that resonate with intended users.

While the field of KM gained substantial impetus from the late 1980's and early 1990's in the general management literature it has taken some time to be readily recognized within the construction project management community. The early models of KM proposed by (Nonaka, 1988) and later expanded upon (Nonaka, 1991; Nonaka and Takeuchi, 1995) revolved around what has become to known as the SECI process. Knowledge management is seen in terms of a knowledge creating cycle of: individuals sharing tacit knowledge through socialisation (S); articulating this either verbally or textually to make tacit knowledge explicit (E); combining the explicit knowledge shared with existing explicit knowledge such as operating procedures, manuals, and information bases (C); and then through reflection and embodying that re-framed explicit knowledge, internalising it so that it becomes refined tacit knowledge for many individuals across the organisation (I) (Nonaka, 1991). Further, the need for a supportive environment created for the knowledge creation, transfer and use was stressed and the concept of the importance of 'ba' or a shared space where learning and knowledge work takes place was offered (Nonaka and Konno, 1998; Nonaka, 2001).

At this time other concepts were being offered around the issue of providing a place, real or virtual, where people meet to create and share insights about knowledge. The community of practice (COP) was one such idea that extended the original concepts of guilds and collections of workers that used these gatherings as a means of creating and sharing knowledge (Lave and Wenger, 1991), this work started a new wave of KM thought and the COP ideas took hold with a widely cited book by Etienne Wenger and his colleagues (Wenger, McDermott and Snyder, 2002) along with others who also stressed the social side of KM (Sveiby, 2001), the strategic side (Zack, 1999) and the leadership side (Cavaleri and Seivert, 2005). Interestingly perceptions of the technology dominance of KM has been slipping as more and more KM thinkers explored the how knowledge is created and used with the view that KM initiatives should be 33% technology and 67% people-oriented (Davenport and Prusak, 1998).

Now, as information communication technology (ICT) and technology is seen primarily as an enabler, and more tools are offered on the market, it is clear that the primary focus should be on KM work being driven by people supported by both technology and all this should be supported by sound leadership driving a knowledge advantage strategy (Walker, 2005). The SECI model has been supplemented by refinements that show how individuals and groups and corporations attempt to manage knowledge. The 4 I's model- Intuiting, Interpreting, Integrating, and Institutionalizing put forward by Crossan, Lane and White (1999) in which knowledge flows forward from individuals to groups then to the entire firm to be recycled through feedback loops. This was augmented by a better understanding of the role of power and influence and how organisational culture mediates this process (Lawrence, Mauws, Dyck and Kleysen, 2005). Thus models of KM also take on a metaphor of stocks and flows of knowledge (Bontis, Crossan and Hulland, 2002).

With all these increasingly interesting ideas of complex interactions between the various players and elements of KM, it is worth trying to find some framework for KM that short circuits the complexity and provides a simpler way or visualizing what may be going on in KM work. Grisham, argued that metaphors are ideal ways of capturing complex, rich and knowledge-embedded concepts into simple to grasp symbolic representations (Grisham, 2006). He cites Gannon (2004: xiii):

"A cultural metaphor is any activity, phenomenon, or institution with which members of a given culture emotionally and/or cognitively identify. As such, the metaphor represents the underlying values expressive of the culture itself...Culture allows us to fill in the blanks, often unconsciously, when action is required, and cultural metaphors help us to see the values leading to action."

While metaphor and symbols are perceived through an appreciation, filtered by experience and culture, they can be dangerously misleading as well as useful. They should be applied within the context of the receiving group so that short cuts do not cut right across meaning. The frameworks and their metaphors presented in this paper are directed towards those with a construction or heavy engineering project management background.

We present three examples of metaphors to describe a KM initiative developed by three of the authors with a predominantly academic background. Our fourth author, being predominantly a practitioner, then briefly comments on the usefulness of this approach in presenting to senior management the concept behind the initiatives.

Metaphor 1 – A Framework of Knowledge Flowing Through Pipes

The first metaphor uses the 'stocks and flows' idea of KM. The metaphor illustrated in Figure 1 depicts a metaphor of knowledge transfer taking place through knowledge flows between contract parties. In this structure there is no contractual relationship between Company A and Company B, but there are contractual agreements between each of them and the Customer. In the construction industry Company A might be the designer and Company B the Constructor. In the information technology (IT) industry Company A might be the programmer and Company B the hardware supplier. In more complex procurement structures, Company A might be an end user, and company B might be a consortium, partnership, or alliance of firms. In these more complex structures the Knowledge Pipeline structure is repeated to include more and more

valves and filters depending upon the procurement structure existing between the respective companies.

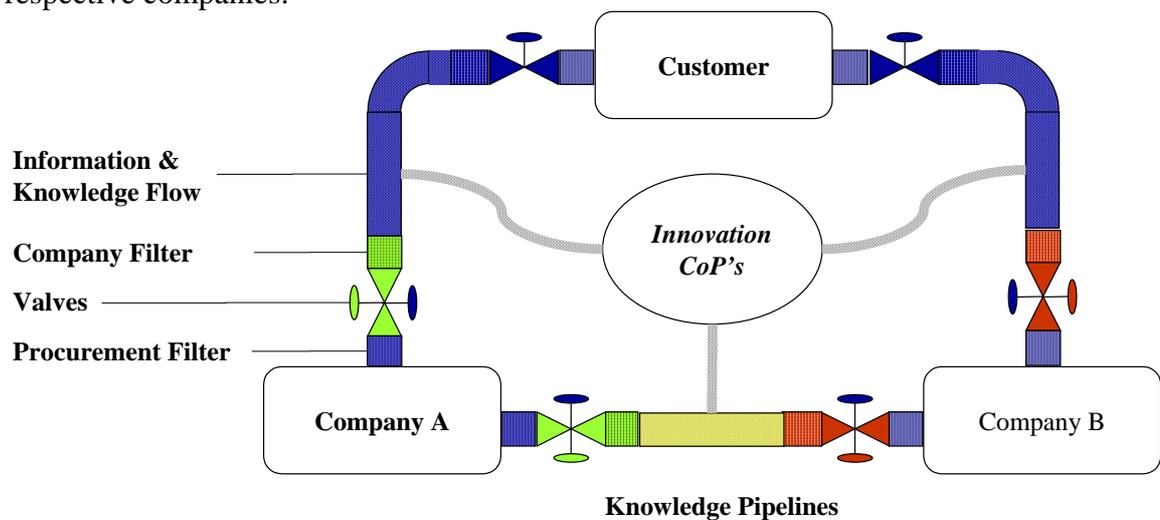


Figure 1: A Knowledge Pipeline Metaphor

The pipelines (customer to company A and customer to company B) that pass information and knowledge are installed by the contract agreement, and described in the general and special conditions. The pipeline (horizontally company A to company B) relies more heavily for definition of how to transfer knowledge and information between Company A and B to construct the project after contracts have been awarded. It also shows a Company Filter that is determined by the individual company (customer, designer, contractor, supplier, etc.). The culture of the company can often affect communication that is permitted and encouraged.

The Company Filters also include ethics, market forces, personalities etc.—some firms are open to improvement and change, others believe that they lead their professions and deserve to be followed; some firms are authoritarian, while others democratic; some firms empower their employees, others discourage personal risk taking; some firms are culturally diverse, others are not. The endless varieties of corporate cultures that exist determine the degree to which communications are actively encouraged or passively discouraged. Issues of profit, risk and power (to mention but a few) also filter information that is shared. The valves shown in Figure 1 are controls on the information and knowledge that can flow between the parties.

The customer to some extent, by reason of the General and Special Conditions, can control all valves. Valves can also be controlled by exercise of the customer's power to punish or reward, or by their right to change the contract agreement. However, the companies can also control the respective Company Valves. For example, Company A is a contractor that may cease providing information to the customer and/or Company B if it feels threatened by an impending lawsuit. This metaphor can be useful in developing the framework of COPs described by Grisham and Walker (2005) where the object is to link people within a variety of teams across and within large projects to achieve innovation. This metaphor describes a fixed contracting relationship that is likely unique and time constrained. If the relationship between Company A and Company B is a joint venture or partnership then a longer view must be taken. If the relationship is an alliance however, then there is a need for the relationship to grow, and be nurtured. The next metaphor considers this dimension.

Metaphor 2 – A Framework of Knowledge and Innovation

The second metaphor uses the metaphor of porosity, permeability and KM through effective experimentation and continuous development of absorptive capacity. Cohen and Levinthal (1990) describe absorptive capacity as the ability of a firm to recognize the value of new external information, assimilate it and use it for commercial ends. It is a measure of an ability to absorb ideas, information and knowledge and applies to both external and internal sources of information and knowledge.

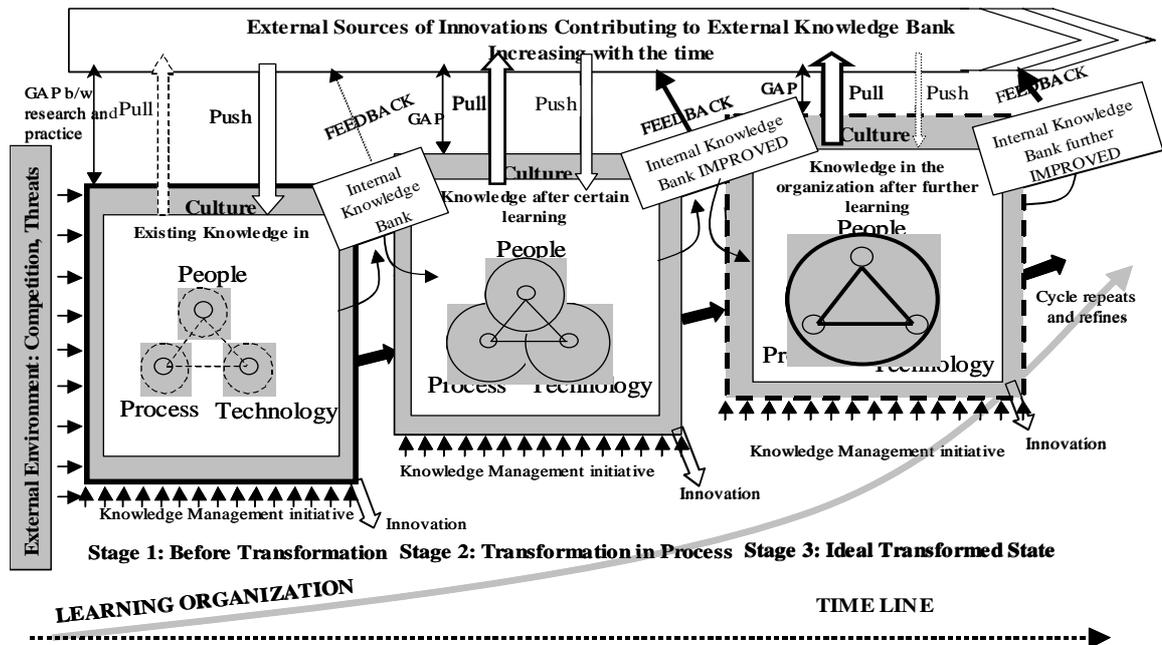


Figure 2: An Absorptive Capacity Metaphor

The framework for increasing absorptive capacity and through it developing a learning organisation that can increase its capacity to innovate and better manage knowledge is presented in Figure 2 that is explained by organisational learning and interaction with external sources of innovation (Maqsood, 2006). This KM framework model illustrates a number of interesting ideas presented as a metaphor. Within each of the boxes there is a progressive drawing together and closer interaction between people, processes and technology from the first stage being almost independent (very loosely coupled) move through subsequent stages of being more closely linked until they are wholly aligned and coherently deployed. Another aspect of this permeability metaphor is the nature of the boundary between the organisation and its surrounding environment. Initially it is isolated by a thick impermeable skin and that gradually dissolves to the third stage which is presented as being gossamer-like with a broken line.

The explanation for the transformation idealized in the framework is the interaction between the organisation and organization-external sources of knowledge. The metaphor is further developed through the degree of push and pull (feedforward and feedback mechanisms) illustrated by size and porosity of the arrows. Figure 2 indicates that KM initiatives place the illustrated organization along an upward innovation trajectory. This figure illustrates a complex theory or framework of how KM, innovation and learning impact and is impacted upon by external knowledge

sources in a way that uses rich imagery. This is developed around the metaphor of transparency (the dissolving boundaries) and absorption (merging of the three components of people, process and technology). The model provides a more tangible and vivid description of absorptive capacity that can be expressed in a textual hypothesis, assertion or definition and illustrates the power of visual metaphor. We all share experience of seeing things gradually melt or dissolve and so can better imagine what forces may be at work.

Given the first two perspectives, a major question exists about how to go about creating a model that would facilitate the necessary processes to facilitate, encourage, and nurture the SECI. Moreover, how to accomplish this in a world where teams can be spread across numerous countries and cultures is a challenge. The next metaphor addresses this dimension.

Metaphor 3 – A Framework for a Knowledge Advantage

Prusak (1996) described a decade ago how knowledge can provide sustained competitive advantage and questioned how knowledge could be measured. Over the past ten years a number of research groups have presented answers to that question. One KM approach came from a 4-year Australian study presenting a capability maturity model that can be used to describe the ‘as is’ as well as ‘preferred’ situation to measure KM initiatives (Walker, 2005) that can be linked into a web portal tool that identifies knowledge assets as well as navigate knowledge users to these assets (Walker, Maqsood and Finegan, 2007). The metaphor illustrated in Figure 3 describes the concept referred to as the Knowledge Advantage (K-Adv).

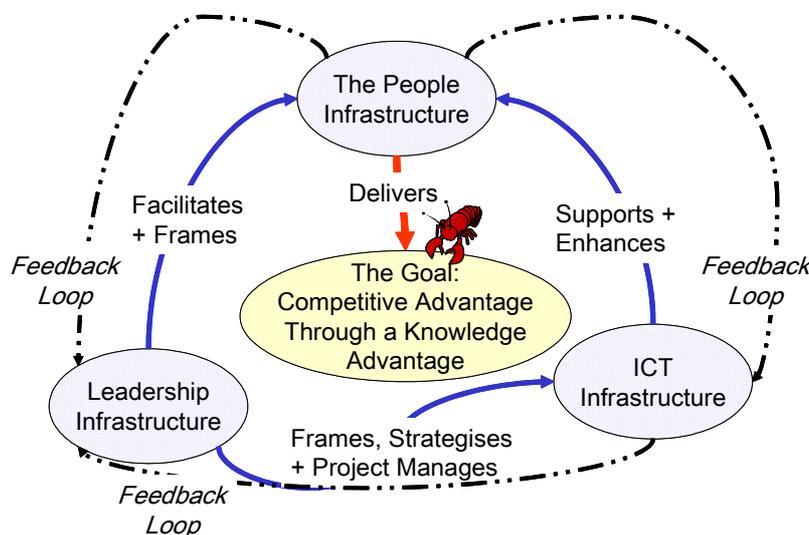


Figure 3: A Knowledge Advantage ‘Lobster Pot’ Metaphor

The model described in the K-Adv has three major infrastructure components. The key to this concept is competitive advantage. A number of metaphors could describe this, a Holy Grail, Rainbow or something that indicates the trickiness of achieving the result. A lobster pot symbol was used as the metaphor because the lobster is a prized and valuable item, it requires coaxing and tempting to be captured. Figure 3 illustrates the key to delivering the goal as clearly being the result of the efforts of the people

infrastructure. This is supported by a leadership infrastructure that provides resources and the necessary organisational support. An ICT infrastructure provides the linking support that allows people use business process to better collaborate and create, share and use knowledge.

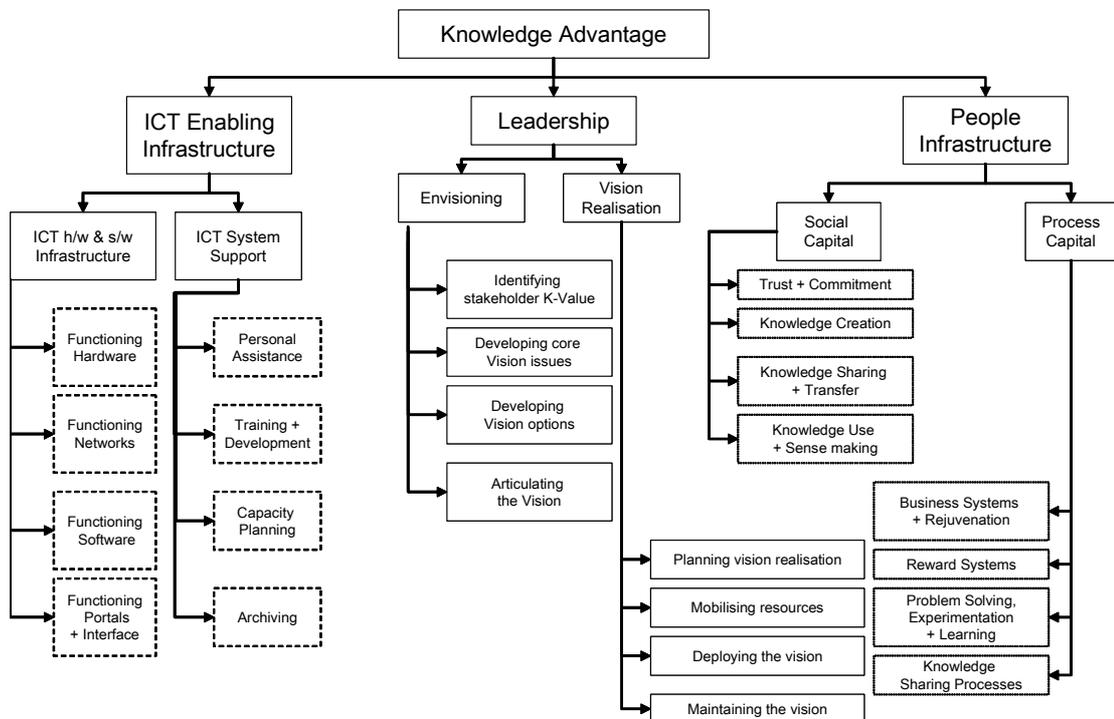


Figure 4: The K-Adv Model

Figure 4 illustrates the details of this model and provides an extension to the high level concept model presented in Figure 3. Figure 4 attempts to present no metaphor.

Discussion

Three high level concept models and frameworks involving KM were presented with Figure 4 providing a contrasting more detailed and prosaic representation of the concept illustrated in Figure 3.

As this is a conference paper, and as such is aimed to trigger debate and discussion, we have chosen to use a single representative of senior management to comment on the efficacy of metaphors in this context. That said, two of the three ‘academic’ authors have also served in senior project management team roles on major construction and engineering projects around the world so the questions we ask and seek to answer are ones that we have personally grappled with.

The question we pose as worth answering is, can such models, when using a theme derived from a suitable metaphor, provide an engaging tool for senior managers who need to be convinced of the advantages and value of any KM initiative to provide the supporting leadership infrastructure intimated in Figure 3 and described in slightly more detail in Figure 4? Can metaphors release the values illustrated in Figure 1 and provide the means to encourage engagement in knowledge sources ‘out there’ to help

dissolve boundaries that inhibit an organisation from adopting KM to become more innovative and grow into a learning organization? How can such an approach be useful to senior managers? These answers are briefly addressed below.

Knowledge Management initiative in the current business scenario is inevitable. The quicker the organization and senior managers (the enforcers) accept this it is better for all. Metaphor 1 is pretty much in existence with the customer insisting for greater interface between the parties engaged. However, the valves are pretty much throttled and at times totally shut off making the process ineffective. Greater realization that working together will not only help achieve customer goals but will also benefit the individual contractors needs to come. At times people learn the hard way only.

Metaphor 2 is not all that successful currently, possibly because many of the organizations are very inward looking in nature. Real sharing of knowledge amongst the organizations is still not very effective especially in the scenario of competing organizations engaged in the same or similar business. It would need lot more appreciation/awareness of the top/senior management that the industrial scenario today is a huge canvas in which multiple artists can paint simultaneously sharing the same colors. As regards Metaphor 3, most progressive organizations have the KA setup in some fashion or the other. Its effectiveness however will depend on the close linkage of the three key elements - people, leadership and ICT setup. In many cases these act independent of each other especially at working level with each group focusing on their own limited objectives. They do not take the time out to do due diligence to share, their ideas across all levels to enhance/leverage the knowledge initiative. An inter link to figure 4 linking the people leadership and ICT set up with the leadership taking the lead and setting an example in making this effective and real time will do the organization a world of good.

Conclusions

This paper provides three examples of KM frameworks and uses a metaphor-based approach to present the concepts as means to encourage senior management support and buy-in from project team members. This preliminary testing of the use of metaphor, while not extensive and experimental in nature, indicates a promising approach to developing a high level way of communicating innovative plans, in this case for KM initiatives in project environments.

We conclude that metaphors can be powerful in their potential to engage and convey rich hidden meanings. There is a danger of using a mixed-metaphor or poorly thought through one that does not culturally resonate with the intended audience so care must be taken when choosing a suitable metaphor. Figure 1 used a simple knowledge-as-flow metaphor using pipes and valves. Figure 2 used absorption and links through varying intensities of pull push forces to describe the way that organisations can draw in knowledge from external sources to transform their innovation and learning capacity. Figure 3 used a lobster pot metaphor for capturing valuable knowledge that can yield a competitive advantage.

Senior managers may find such approaches both appealing and engaging or confusing depending on the nature of the audience and the culture (organizationally and national) in receiving the message clearly. We suggest that metaphor could be more

bravely and thoughtfully used by academics and though leaders to encourage and facilitate support for innovation, particularly concerning KM initiatives.

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