

Unleashing Innovation and Creativity through Managing Knowledge in Supply Chains: Creating the Learning Chains

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Abstract

The research focus of recent construction industry knowledge management research has primarily been the development of knowledge management strategies for a certain 'single' organisation to unleash innovation and creativity by exploiting the resources available within the organisation. The emerging paradigm of supply chain management dictates that unit of competition from organisation vs. organisation will soon change to chain vs. chain. Hence, a collective collaborative effort of all supply chain partners would be required to achieve such innovation and creativity. This research explores the role of knowledge management to serve as such a vehicle in the emerging paradigm through which innovation and creativity can be unleashed by a collaborative effort of all the members of the supply chain. The research is built on the recently completed CRC for Construction Innovation Australia, research project "Delivering improved knowledge management and ICT diffusion in Australian construction industry" where a 'Knowledge Advantage' framework was developed for a certain organisation to unleash innovation and creativity. This paper explains how this framework can be extended to take into account the supply chain partners and create a culture of knowledge sharing through which a Knowledge Advantage for the whole supply chain can be developed and used to unleash creativity and innovation in the construction projects.

Keywords

Innovation, Creativity, Knowledge Management, Supply Chain Management, Knowledge Advantage

1. Introduction

As supply chain management reinforces the concept of whole supply chains working collaboratively to obtain business benefits, knowledge management principles adopted for the whole supply chain can unleash immense creativity and innovation providing significant competitive advantage to supply chain partners. In this paper it is argued that a combined knowledge strategy is required to enhance the creativity and innovation in the supply chain as organisations start to work together by embracing supply chain management and acting as one integrated entity rather than being discrete entities. A knowledge advantage

framework provides such a strategy. However, when adopted by organisations in a supply chain, the strategy must be coordinated among members. This paper gives a brief overview of knowledge advantage framework that has been devised in Royal Melbourne Institute of Technology (RMIT) University, Australia facilitated by Cooperative Research Centre for construction Innovation (CRC CI). This framework can be adopted by any organisation in a supply chain in order to accelerate its innovative and creative abilities and become highly competitive. The paper highlights how a knowledge advantage measurement framework can be applied across various organisations that forms a collaboratively working and practicing supply chain.

2. The Foundations of Knowledge Management and Supply Chain Management

Firms seriously addressing trust, commitment and collaboration have prompted a new management direction for the construction industry worldwide. Construction research has highlighted the importance of trust among project participants in order to establish a long-term commitment among them and to work collaboratively to benefit the construction industry (Walker and Hampson, 2002). This changing face of the industry is giving an impetus to the proliferation of business philosophies - including knowledge management and supply chain management - which have their principles strongly founded on the notion of trust, commitment and collaboration.

The notions of trust and commitment are complex. *Trust* is bound up with past experience both directly with the person(s) concerned and indirectly, through projected or anticipated experiences, thus trust is an intensely emotional and human phenomenon. *Commitment* is the physical and mental manifestation of the concept of trust. It is the proof of trust. It is the willingness to reciprocate energy invested through trust in the process of transformation of this energy into tangible results. Commitment means that another party will take this trust on board and 'live up to' the spirit of the bargain by probably committing more personal pride and obligation to 'do the right thing' than would otherwise be the case. The need for common or translatable value systems, language, symbolic artefacts and protocols or etiquette (Holden, 2002; Swierczek, 1994; Trompenaars, 1993; Brown, 1998; Hampden-Turner and Trompenaars, 2000) has been shown to be important for developing shared understanding and thus enhancing the chance of trust and commitment. The environment of this nature should be created not only in a certain organisation but across the whole supply chain so that trust of each trading partner on other increases and keep them committed.

Both Knowledge Management (KM) and Supply Chain Management (SCM) have taken more than a decade to evolve into mature disciplines where they can be exploited by enhancing business profitability and value. The challenge of knowledge management is to make it explicit through the balanced use of technology, and soft human-related factors like leadership, vision, strategy, reward systems and culture. An effective knowledge strategy is required to manage both tacit and explicit knowledge in the organisation. In projects, knowledge management can improve communications within teams, and provide more informed knowledge by sharing best practice documents, lessons learned, project management and system engineering methodologies, examples of review packages, and the rationale for strategic decisions. The failure to capture and transfer project knowledge leads to the increased risk of reinventing the wheel, wasted activity, and impaired project performance (Siemieniuch and Sinclair, 1999). SCM is an evolved form of purchasing and logistics-related activities (Croom *et al.*, 2000 and Tan, 2001). The most realistic and comprehensive definition of SCM is provided by the Global Supply Chain Forum (GSCF). This group defines SCM as the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders (Lambert and Cooper, 2000). This sort of integration reduces the product delivery time, reduces waste, minimizes errors and saves on transactional costs thus increasing productivity.

Organisations that develop the capabilities to foster learning are referred to as Learning Organisation. Mirvis (1996) stated that the learning organisation focuses on managing chaos and indeterminacy, flattening

hierarchies, and decentralization. It also encourages the empowerment of people, teamwork and cross-functional teams, network relationships, adoption of new technologies and new forms of leadership and mentoring. Knowledge management is a key to learning organisation. It creates an environment of trust and commitment in the organisation which his helpful in creating and sharing new knowledge. The continuous change in the organisation once it foster a learning environment through knowledge management would lead to an innovative output.

In the construction industry, organisations come together with their specialities and knowledge to complete a project. Through systematic knowledge management, trading partners are able to minimise wasteful activities and improve productivity and efficiency. Knowledge management, together with SCM, will ensure that knowledge, not information alone, is shared with the trading partners. Whereas the information may simply specify what is required of the trading partner, knowledge management can help to determine how best to deliver that product or ensure the swift availability of the related knowledge. Figure 1 gives the graphical description of two such trading partners who are bound together by trust and committed for long term relationship and have their key business process integrated under SCM. Each process gets assistance from a knowledge layer set under KM on the top of these processes.

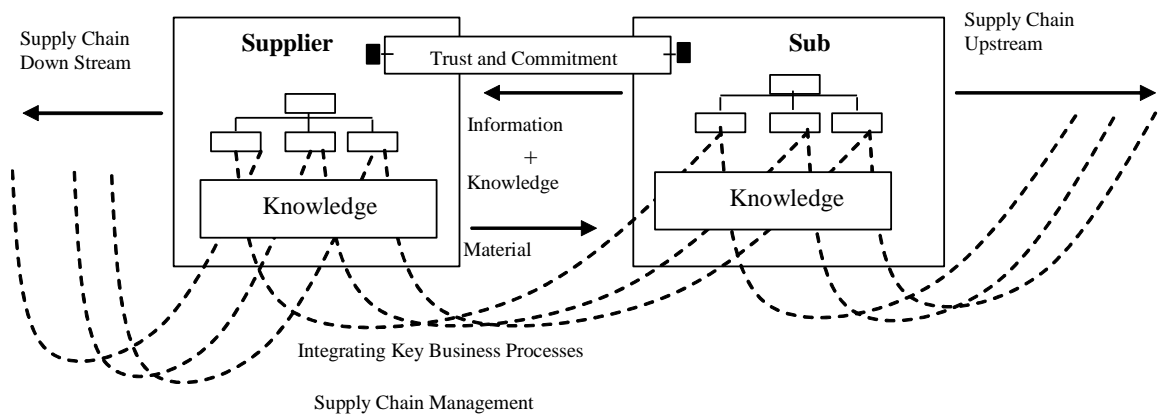


Figure 1: Trading Partners adopting SCM and KM

3. Knowledge Advantage Framework

Knowledge Advantage Framework shown in Figure 2 was developed in RMIT University, Australia as a part of Cooperative Research Centre for Construction Innovation research project “Delivering Improved Knowledge Management and ICT diffusion in the Construction Industry”. It is a detailed and an extensive framework—complete discussion of this framework is beyond the scope of this paper. For more details, see (Walker et al, 2005). The central and focal point of the concept is knowledge leadership. This is linked to the Information Communication Technologies (ICT) and people infrastructures that help turn the idealised knowledge advantage vision into reality. These three components or attributes dynamically interact to shape a preferred future.

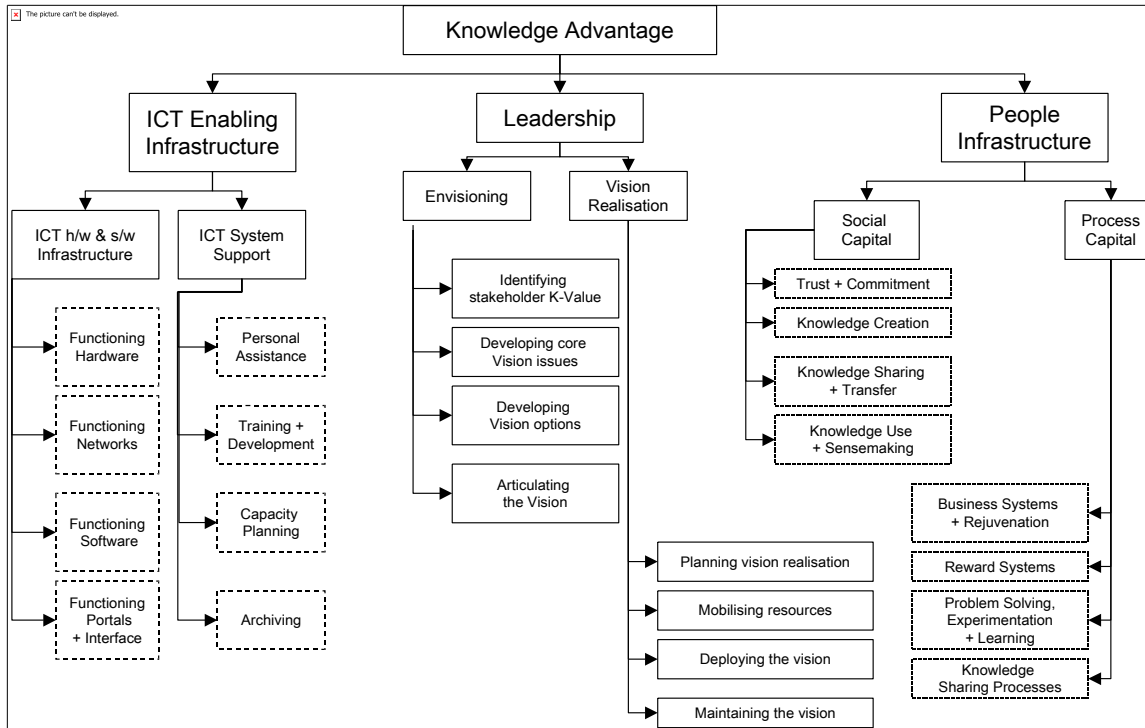


Figure 2: Knowledge Advantage Framework (K-Adv)

Leadership recognises that a K-Adv is realised through people and their creative energies and knowledge that is grounded in their individual experience and ability to interpret and re-interpret meaning from experience. Each subcomponent in the K-Adv framework can be further measured on a maturity scale of “Some/Small”, “Minor”, “Moderate”, “Substantial”, and “All” against performance characteristics defining that subcomponent. Table 1 shows one such subcomponent of Social Capital (a component of People Infrastructure) as a knowledge sharing and transfer that can be measured for its maturity in a certain organisation against performance characteristics (Network Ties Configuration, Anticipating value, Desire to Share, Capacity to Share) defining knowledge sharing and transfer. An organisation can map out its current processes over such the framework and establish the goals to advance to the next level in the maturity scale.

4. K-Adv framework Proliferation in the Supply Chain

For supply chains to act as a learning chain, knowledge management initiatives must be taken throughout the supply chain. Each trading partner has to adopt a knowledge advantage framework as described above. In this regard, a concrete effort from a specific trading partner who holds a vantage point is required. Maqsood et al., (2002) consider “Power Management” as an important component of SCM where a trading partner holding a vantage position is able to create a supply chain, and monitor and control the performance of a supply chain. Depending upon how the supply chains have been created at the first place, either by a contractor or client, a partner must take the control in order to synchronize the activities in the chain downstream or upstream. The party assuming power (e.g. contractor) needs to take the responsibility of establishing a knowledge leadership in whole supply chain on a similar basis as it would take for its own organisation. Based on this knowledge leadership throughout the supply chain, it needs to ensure that the other components (ICT-enabling infrastructure and people infrastructure) required to achieve knowledge advantage are appropriately addressed. It should ensure that each trading partner takes an internal assessment of their knowledge processes according to K-adv framework and help them to establish achievable targets to reach up on the scale of K-adv framework. Help should also be provided to adopt the

same ICT infrastructure across the chain. Supply chain members must be considered part of the people capital, and be rewarded for their trust and commitment.

Table 1: Knowledge Sharing and Transfer

Maturity	Performance Characteristic			
	Network Ties Configuration	Anticipating Value	Desire to Share	Capacity to Share
How can we develop knowledge networks to share and transfer knowledge □	by developing the ways that people are tied together and the configuration of COP.	by providing sufficient information about potential benefits from sharing knowledge	by encouraging people to want to participate.	by developing the capacity of people to share knowledge .
Some/ small	People are unaware of potential COP that they could participate in	People and organisations are vaguely aware of the existence of benefit	General lack of obligation and identification with a culture of sharing	There is little evidence of people sharing codes and language
Minor	Workplace level internal informal knowledge networks with limited support	People and organisations can articulate some of the benefits	Little or no encouragement or recognition by colleagues of the value of sharing	Isolated work units and groups share their own codes and language
Moderate	Organisation-wide level internal informal knowledge networks but with passive collegial and org. support	People are generally informally aware and can fully articulate benefit	People support and understand the value of knowledge sharing—in theory only	People have developed shared codes and language X-organisation
Substantial	Wider community level informal knowledge networks with active recognised support. Few boundary spanners	The organisation formally promotes discussion and exploration of the nature of benefit	A climate of trust and mutual dependency, and identification with COP is created	Organisation has developed initiatives for developing common codes. Sporadic internal R&D undertaken.
All	Organisations strategically identify COP, encourage and maintain them with an appropriate hands-off approach. Effective gatekeepers linked to outside world. Many boundary spanners.	The organisation celebrates benefits and embeds the concept of COPs into its culture. Individuals have a thirst for knowledge.	Assumed and embedded culture of sharing is intrinsically maintained and supported by all	Organisation and individuals maintain shared codes and language initiatives. High levels of experience with research and reflection.

The way that Table 1 can be used is for an assessment to be made, either using a rigorous supply chain (SC) external benchmarking team or an internal team, to evaluate the maturity level of each member of the SC. This should be done using a common methodology to ensure consistency of evidence used to make judgments of the maturity level. Once that is completed gaps can be identified between SC members and also the tool could be used to identify gaps between the ‘as is’ situation as demonstrated by evidence gathered and the ‘preferred future’ and some time ‘T’ in the future. Either way, Table 1 can provide a useful tool for aligning SC maturity in knowledge sharing and transfer

5. Conclusions

The learning organisation approach is not of itself an answer to the challenges of the growing complexities and dynamics of the business world. For an organisation to maintain its competitive edge and continually innovate it has to not only focus on transforming itself into a learning organisation but also to facilitate learning throughout the whole supply chain (of which it is part) to become a learning chain. SCM and KM are emerging business philosophies that place a great emphasis on trust and commitment, and are becoming a pre-requisite to achieve this aim. SCM would ensure that the key business processes of the trading partners in a supply chain are seamlessly integrated and an environment of trust and long term commitment is generated and fostered within the supply chain. This will create the appropriate environment to implement and harness KM principles. This will ensure that the best available knowledge is utilized by each trading partner - depending on its position in a supply chain - and help each partner to contribute its best towards a better and improved project outcome.

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