Cormican, K. (2004) Key challenges for inter and intra enterprise knowledge transfer. Proceedings of the 5th European Conference on Knowledge Management, Conservatoire Nationale des Arts et Metiers (CNAM) 30th September – 1st October, Paris, France.

Key Challenges for Inter and Intra Enterprise Knowledge Transfer

Kathryn Cormican, Digital Enterprise Research Institute (DERI), Industrial Engineering, National University of Ireland, Galway, Ireland.
Email: Kathryn.Cormican@nuigalway.ie

Abstract: Knowledge is a key resource that must be managed if improvement efforts are to succeed and businesses are to remain competitive in global markets. In recent years, researchers, consultants and practitioners have developed approaches in an attempt to identify and leverage critical knowledge for product and process innovation. Most of these approaches has been technology oriented. However, research indicates that enterprises are currently failing to convert individual skills and competencies into tangible and successful products and services. This paper examines the key problems with sharing knowledge across teams and organisational boundaries. By identifying and prioritising these problems and challenges managers and decision makers can focus their efforts on critical areas that must be improved.

Key Words: Enterprise knowledge management, challenges, exploratory study.

1. Introduction

Contemporary organisations are becoming increasingly dependent on managing their knowledge assets in order to successfully design, develop and deploy new products and services. As a result of this, a new paradigm often referred to as the "knowledge organisation" has emerged. Peter Drucker (1993) notes that "knowledge is the only meaningful resource today". He adds that, "the traditional factors of production have become secondary, they can be obtained easily, provided there is knowledge". In this view, the generation and implementation of new knowledge is fast becoming the only remaining sustainable source of competitive advantage for today's enterprises. According to Knock et al (1996), "the single most important factor that ultimately defines the competitiveness of an organisation is its ability to acquire, evaluate, store, use and discard knowledge and information". Nonaka and Takeuchi (1995) note that "in an economy where the only certainty is uncertainty, the one sure source of competitive advantage is knowledge".

In this view, knowledge is a key resource that must be managed if improvement efforts are to succeed and businesses are to remain competitive in global markets. For a few progressive organisations information is now their most valuable work in progress and knowledge their most useful tool. Learning and creativity are replacing manual skills and long hours as their basis for adding value. This is depicted in the new, virtual value chain as illustrated in figure 1. In this view, the intangible activities of the virtual value chain are replacing the material activities of Porter's physical value chain. Like the materials used in the manufacture of goods, knowledge is a transferable unit, whose value is enhanced when it satisfies a practical need in a timely, cost effective manner. Therefore, it seems that organisations that manage knowledge as a strategic asset will gain competitive advantage over companies that do not.

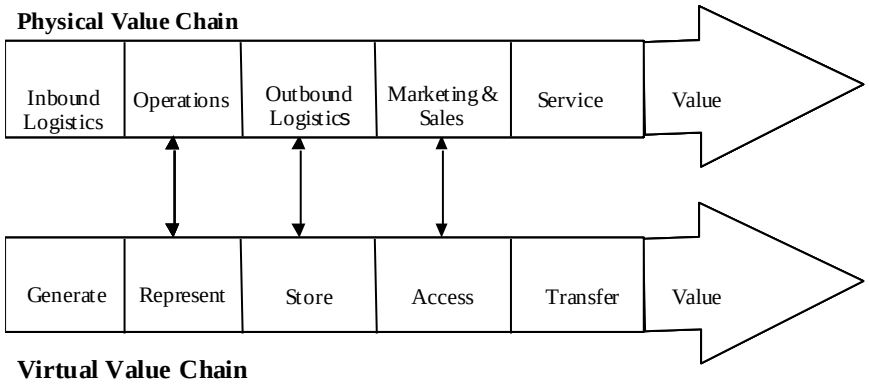

Figure 1. The Virtual Value Chain.

Thus, a viable approach to optimising knowledge resources is critically needed. However, organisational knowledge creation and transfer are intricate, complex matters, which are difficult to manage. To date, much of the knowledge management solutions developed are technology based and focus on managing existing knowledge (Takeuchi 1998). However, a great deal of an organisation's knowledge is personal (Nonaka and Takeuchi 1995). In other words, it resides in the individual and remains in their minds. Research indicates that enterprise knowledge management is not effective. More specifically, critical knowledge does not flow seamlessly between individuals and teams to the point of action or decision. In other words, knowledge transfer is restricted and learning opportunities are often missed or not exploited. According to Kreiner (2002), knowledge must be explicated and separated from the knowledge workers, so that the critical knowledge is not forgotten or lost. To this end, organisations should seek to transform individual tacit knowledge into a collective company asset. Leaders and decision makers must facilitate the development of a knowledge enriched culture. They should also develop systems that are capable of converting individual skills and competencies into corporate knowledge and know how. This paper attempts to address some of these issues. The goal of this paper is to provide a better understanding of knowledge and knowledge related issues. It aims to help researchers and practitioners understand how to effectively manage their intellectual assets. It focuses on identifying and understanding the critical impediments or barriers to sharing knowledge within and across organisations. To do this, an exploratory study was conducted using focused workshop techniques. A hands on participative approach was used together with affinity techniques to organise the event. This involved engaging key knowledge workers and leaders across Europe and organising their ideas and thoughts into useful information needed for solving problems. The aim of the workshop was to identify and prioritise the current problems and future challenges associated with sharing knowledge across teams and organisations. Findings from this study are presented and discussed. By understanding where these impediments lie managers can focus their efforts to improving those areas that require attention and thus facilitate effective knowledge transfer and reuse.

2. Towards a Definition of Knowledge

Knowledge is an elusive concept and therefore it is important to define it in context in order to understand it. The term is used in several different ways in the literature. For example, Nonaka and Takuechi (1995) two of the early researchers in this field adopt a philosophical angle and define knowledge as "justified true belief". In this view, knowledge is an opinion, idea or theory that has been verified empirically and agreed upon by a community. According to Wilson (1996), knowledge at the most basic level is "that which is known". Quinn et al (1996) associate knowledge with professional intellect where professional intellect in organisations centre on know-what, know-why, know-how and self motivated creativity. On the other hand, Bohn (1994) examines knowledge in terms of a company's processes. He believes that an organisation's knowledge about its processes may range from total ignorance about how they work to very complex and formal mathematical models. According to Davenport et al (1998), knowledge is information combined with experience, context, interpretation and reflection. It is a high value form of information that is ready to apply to decisions and actions. Knowledge can be defined as the integration of ideas, experience, intuition, assertions, skills and lessons learned that have the potential to create value for a business by informing decisions and improving performance. In this view, knowledge is a key enabler to organisational success. However, in order for knowledge to be useful it must be available, accurate, effective and accessible.

3. Knowledge Typologies

Many types or classifications of knowledge have been suggested in the literature. These are summarised in table 1. This list is not exhaustive but it does provide some indication of the intricacy of the topic. Considerable attention has been paid to the distinction between tacit (implicit) knowledge and explicit (codified) knowledge (Kreiner 2002; Hildreth et al 2000; Haldin-Herrgard 2000). Explicit or codified knowledge refers to knowledge that can be communicated in formal systematic language. Such knowledge can be captured in formulae, designs, manuals or books or in pieces of machinery and it is normally easy to share. The term tacit was originally coined by Michael Polanyi (Polanyi 1966). According to Wilson (1996) tacit knowledge is personal knowledge, which consists of highly subjective insights, intuitions and instincts. Tacit or implicit knowledge has a personal quality that makes it hard to formalise and communicate. It is obtained by internal individual processes like experience, reflection, or individual talents, deeply rooted in action and involved in a specific context. Many researchers note that that tacit knowledge is difficult to articulate and share (Haldin-Herrgard 2000; Zack 1999; Nonaka and Konno 1998).

Knowledge is of little use unless it can be applied. In other words, it must be translated into creating some observable product or service. Therefore, the focus of attention should shift from the individual to organisational knowledge management. Contemporary enterprises must be able to develop an environment, which can facilitate the creation or generation of tacit knowledge while simultaneously be capable of converting individual skills and competencies into corporate knowledge and know how. In order to do this, knowledge management initiatives (such as those aimed at enhancing product innovation initiatives) should be put in place. The following sections

focus on defining knowledge work and understanding the concept of knowledge management in an industrial setting.

Classification	Description	Reported By
Tacit	Implicit personal	Ploanyi 1966
Explicit	Codified, can be communicated	
Migratory	Shared, can move	Badaracco 1991
Embedded	Can not be separated from an entity	
Cognitive	Know what something is about	Stewart 1997
Advanced skills	Know who to do something	
Systems understanding	Know why something should be done	
Self motivated creativity	Care why something should be done	
Process	Methods for doing things well	Ruggles 1997
Factual	Basic information about people and things	
Catalogue	Knowing where things are	
Cultural	Understanding values rules and norms	

Table 1 Classification of Knowledge Types

4. Knowledge Work

The specialisation of work leads to an increasing need for knowledge workers. For example, as activities such as new product development becomes more complex there is a greater need for expert workers. In this environment what flows most between knowledge workers is information and data as opposed to physical material. However, unlike knowledge relatively few researchers have attempted to define knowledge work. The nature of knowledge work is ad hoc, demand driven and creative. Davenport et al (1998) contend that knowledge work focuses on the acquisition, creation, packaging or application of knowledge. In this view, it is complex and diverse and it is performed by professional or skilled workers with a high level of expertise and competence. A knowledge worker can be defined as one who gathers, analyses, adds value and leverages information to enable decision making. A knowledge worker's job entails doing work for which there is no finitely determined process. Their tasks are not prescribed in advance, but are determined just in time in response to issues, opportunities or problems as they arise. Each event may require a customised unique content and collaboration with a different group of people. According to Laudon and Laudon (1999) not only do knowledge workers use their knowledge to interpret incoming information, but they also create new knowledge as well. Knowledge work processes include such activities as research and development, product development and professional services such as software development, law, accounting and consulting. Knowledge workers hold expertise composed of competence and skills and they are typically more productive and better paid than non-experts. Knowledge workers value is acquired through formal education. Such people understand how to learn and will continue to learn throughout their productive lives. What is learned and how it is applied will determine competitive success. According to Takeuchi (1998) knowledge workers now constitute up to 35-40% of the workforce and these will become the

leading social group. Therefore, organisations' core competencies will focus on managing knowledge and knowledge workers. Furthermore, industrial growth and productivity gains will depend heavily on improvements in knowledge work. Drucker (1993) believes that the great management task of this century will be to make knowledge work productive. In spite of this, Wiig (1995) provides a list of knowledge related problems found in organisations. These include:

- Knowledge is not managed as a valuable asset.
- There is insufficient knowledge at the point of action.
- Learning opportunities are often missed or not exploited.
- Knowledge transfer is confined.

Accordingly, organisational structures and systems must be designed, developed and deployed in an attempt to address these deficiencies.

5. Enterprise Knowledge Management

The central problem of knowledge management is its lack of an absolute definition. For example, many computer scientists define knowledge management in terms of understanding the relationships of data, identifying and documenting rules for managing data and assuring that data are accurate and maintain integrity. On the other hand, other researchers propose a community or social model of knowledge management (Nonaka and Takeuchi 1995; Blackler 1995). They believe that interpreting knowledge in terms of rules and procedures embedded in technology does not take into consideration critical elements such as emotions, values or instincts. The social model implies that knowledge is "embedded in and constructed from and through social relationships and interactions" and is "achieved through shared understandings and attitudes" (Scarbrough and Swan 1999). Sharing knowledge across organisational boundaries is seen as the key to the effective exploitation of knowledge (Gibbons et al 1994).

Many researchers agree that knowledge management encompasses both the creation or generation of knowledge as well as its representation and integration. Bassi (1998) defines knowledge management as the process of creating, capturing and using knowledge to enhance organisational performance. Blake (1998) believes it is "… the process of capturing a company's collective expertise wherever it resides and distributing it to wherever it can help produce the biggest payoffs". Taking these definitions into consideration knowledge management can be considered to be a systematic and organised attempt to use knowledge within a company to transform its ability to generate, store and use knowledge in order to improve performance. In short, the overriding purpose of enterprise knowledge management is to make knowledge accessible and reusable to the organisation.

Knowledge, knowledge creation and knowledge dissemination in organisations are complex matters, which are difficult to manage systematically. Thus, a practicable approach is critically needed for improving knowledge work. However, managing knowledge is intricate, complex and often very difficult and consequently companies are finding it difficult to implement knowledge based practices. Moreover, current published work in this area is very prescriptive, and as a result it does not offer practical insights to organisations attempting to manage their knowledge base. Consequently, it becomes apparent that these research deficits need to be addressed.

6. Research Methodology

In order to understand the key problems with knowledge transfer a focused workshop was arranged. The aim of the workshop was to identify and prioritise the current problems and future challenges associated with sharing knowledge across teams and organisations. The workshop was targeted at European researchers and industry leaders who operate in a knowledge intensive, often technology driven environment. A total of 28 people who actively engage and manage knowledge work participated in the workshop. The group consisted of management consultants, senior managers as well as senior researchers representing many European countries. A socio-technical systems approach was also adopted. In other words, both hard (i.e. information technology solutions, enabling technologies) and soft (e.g. culture, climate, management) issues were explored and analysed. A hands on participative approach was used in the workshop. Affinity techniques were used to organise the event. This involves engaging all participants and organising their ideas and thoughts into useful information needed for solving problems. Affinity techniques are often used to understand complex problems. Those using this method collect original ideas and assembles them into groups by affinity. The grouping helps to develop a common understanding of the problem. These individual groups are titled and the process is repeated using the group titles as original data. Eventually conclusions are discovered in the organised set of original ideas. This method is particularly useful when (a) the issues that surround a problem appear large and complex, (b) the information relevant to the problem appears in unorganised thoughts and ideas and finally (c) where group consensus is required (or desired). This approach is an effective use of both time and effort and also facilitates the cross fertilisation of ideas. Findings from this workshop are discussed in more detail below.

7. Findings: Key Challenges with Knowledge Transfer

While it is apparent that there are many factors that facilitate and thus can potentially impede effective knowledge transfer within and between teams and organisations some issues came to the fore by mutual consensus. These include (in order of importance) (a) motivation and skills, (b) trust (c) method and tools and (d) resources. These are discussed in more detail below.

7.1 Motivation and Skills

Motivation and skills were identified and ranked as the most important challenge for effective knowledge transfer. According the findings of our workshop many employees are unclear of the benefits for inter firm collaboration. In other words, they do not know what are the drivers, advantages, rewards and returns of sharing information and knowledge with others. This makes it difficult for leaders to initiate successful inter firm collaboration. Furthermore, many participants feel that their employees and colleagues are not equipped with the appropriate skills for sharing knowledge. In other words, they are uncertain as to what information and knowledge to share and the format in which it could or should be transferred. Therefore, unless mutual benefits to collaboration are established and communicated to all parties, people will remain unwilling to participate and reluctant to learn new procedures for information exchange.

Motivation may be the most straightforward component to address in an attempt to stimulate knowledge sharing. The establishment of clear goals provides the form and focus for knowledge generation and transfer. Long term goal clarity is achieved when all employees know where the organisation is attempting to go in the future and why knowledge transfer is important to get there. Short term goal clarity is achieved when managers set tangible and measurable goals for employees work, which are in alignment with the overall goals of the organisation.

7.2 Trust

According to our discussions people often lack the confidence to share propriety information with other organisations. They often fear that competitors may gain access to proprietary data if they share information such as sales forecasts, or promotional plans with collaborating partners. Nevertheless this kind of real-time sharing of vital operational information is essential if companies want to work together towards a common goal. Establishing trust is potentially the greatest barrier to overcome in collaboration, and it must be established from the outset to allow knowledge sharing.

7.3 Methods and Tools

Knowledge management initiatives are just beginning to appear in organisations and there is little research and field data to guide the development and implementation of such initiatives. Participants in the workshop believe that in many instances there is a tendency to buy tools rather than diagnose the core problems and challenges. In other words, off the shelf tool and methods are often bought and deployed in an attempt to address some of the organisation's deficiencies. These tools are often not appropriate to the problem at hand and are often not sufficiently user friendly or person centric. Diagnosing the real problem and understanding the root problem or cause of failure may be more appropriate to effective knowledge transfer. From this analysis, an effective and structured approach to knowledge transfer can be designed and deployed. Such methods and tools can enable knowledge transfer to happen quickly and predictably. It is important to remember that a methodology for effective and successful knowledge transfer should:

- Address business processes not functions.
- Focus on the customer.
- Be aligned with organisational goals and strategies.
- Help provide information and arguments to decision makers.
- Make appropriate use of proven and available management techniques and tools.
- Take into consideration the organisations culture and value systems.

7.4 Resources

All participants asserted that effective knowledge sharing and transfer demands time, energy and resources. However these resources are often in short supply and most employees do not have sufficient time and support to rethink and redesign their knowledge processes. Organisational resources may be categorised as tangible such as money and equipment, or intangible which would include, time and support. Management demonstrates tangible support for effective knowledge transfer through a specific budget allocation. For example, management can demonstrate their support by

providing funding for content creation, profiling and systems maintenance. Time is also cited as an important resource. Employees need sufficient time to capture and transfer critical knowledge. Furthermore attention must be paid to redesigning and restructuring internal processes to support effective knowledge transfer.

The findings from the workshop revealed that organisational factors such as motivation and skill, trust, methods and tools and resources impede effective knowledge transfer within and between teams and organisations. It seems that the key problems with knowledge sharing are soft i.e. the problems and challenges lie with the individual and organising the individual in an organisational setting. This is quite surprising considering that most of the participants came from technology based organisations. Astute changes in the work environment, can make substantial increases in knowledge transfer. Therefore, if organisations wish to knowledge sharing they must explore the range of identifying factors. However, the task of managing a climate conducive to sharing is not trivial. Management can influence what the company wants to do and what it can do. By focusing on specific new strategies and measures, the employees can change their motivation and goals, and by generating better resources the company can improve its sharing potential. Successful initiatives require top management support and backing to overcome the natural resistance of organisations to change. Inter firm collaboration may demand even greater leadership and support than previous internally focused initiatives. Therefore leaders must focus on the specific, tangible business benefits of these efforts, and participants across collaborating organisations must understand and support those benefits.

8. Conclusion

Progressive organisations are paying more attention to the concept of managing their knowledge base in order to gain and maintain competitive advantage. The two major challenges that face these organisations are, (a) ensuring that they have the appropriate knowledge to support their operations and (b) ensuring that they optimise the knowledge resources available to them. However, knowledge management is an emerging discipline and it is not very well understood or managed in industry. European organisations are currently finding it very difficult to implement knowledge initiatives. In particular, they are finding it increasingly hard to identify critical knowledge and leverage it to the point to action and/or decision. This is even more difficult when they operate outside the four walls of the enterprise. Consequently, new knowledge initiatives are not exploited to their full potential. In other words, companies are not reaping the full benefits of knowledge management projects.

This paper aims to provide a better understanding of knowledge and knowledge related issues. It examines the key problems with sharing knowledge across teams and organisational boundaries. An exploratory study was conducted using focused workshop techniques. The aim of the study was to identify and prioritise the current problems and future challenges associated with sharing knowledge across teams and organisations. The findings of this study suggest that the key challenges to effective knowledge transfer are person oriented. Knowledge workers often do not understand the need or rationale for sharing relevant information and knowledge with others. They often feel that knowledge is power and they do not trust others with this power. Many knowledge workers think that the current methods and tools are inappropriate and unwieldy and finally they believe that there is insufficient resources in terms of time

and money available to effectively restructure internal processes to support useful knowledge transfer. In light of this, it seems that more attention must be paid to creating suitable work environments and structures that promote, enable and support effective knowledge transfer. Such systems must be person centric and meet the real needs of the individual and/or team. More specifically, they should consider social aspects such as the organisations culture, climate and value system as well as technical factors such as information technology solutions to facilitate successful knowledge transfer.

Acknowledgements
Managing Enterprise Networks (MENS) project funded by the European Commission under the Leonardo Da Vinci initiative.

References

Bassi, L. (1998) "Harnessing the power of intellectual capital", *The Journal of Applied Manufacturing Systems,* Summer, pp29-35.

Blackler, F. (1995) "Knowledge, Knowledge Work and Organizations: An Overview and Interpretation", *Organization Studies*, Vol.16, No.6.

Blake, P. (1998) "The knowledge management expansion", *Information Today,* Vol. 5, No.1.

Davenport, T.H., De Long, D.W. and Beers, M.C. (1998) "Successful knowledge management projects", *Sloan Management Review,* Winter, pp43-57.

Drucker, P. (1993) *Post Capitalist Society*, Harper Business, New York.

Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., and M. Trow (1994) *The New Production of Knowledge: the dynamics of science and research in contemporary societies*, London: Sage.

Haldin-Herrgard, T. (2000) "Difficulties in diffusion of tacit knowledge in organizations", *Journal of Intellectual Capital*, Vol.1, No.4 pp357-365.

Hildreth, P., Kimble, C.. Wright, P.. (2000) "Communities of practice in the distributed international environment". *Journal of Knowledge Management*, Vol. 4 No.1, pp27.38.

Knock, N., McQueen, R., and Corner, J. (1997) "The Nature of data, information and knowledge exchanges in business processes: Implications for process improvement", *The Learning Organization,* Vol.4, No.2, pp70-80.

Kreiner, K. (2002) "Tacit knowledge management: the role of artefacts". *Journal of Knowledge Management*, Vol.6, No.2 pp112-123.

Laudon, K.C. and Laudon, J.P. (1999), *Management information systems: Organization and Technology in the Networked Enterprise*, Prentice Hall, New York.

Nonaka, I, and Konno (1998) “The concept of BA – building a foundation for knowledge creation”, *California Management Review*, Vol.40, No.3, pp40-54.

Nonaka, I. and Takeuchi, H. (1995) *The Knowledge Creating Company,* Harvard Business Press, Boston.

Polanyi, M. (1966) *The Tacit Dimension,* Routledge and Kegan Paul, London.

Quinn, J., Anderson, P. and Finklestein (1996) “Managing professional intellect: Making the most of the best”, *Harvard Business Review,* Vol.74, pp71-80.

Ruggles, R.L. (Ed.) (1997) *Knowledge Management Tools*, Butterworth Heinenmann, Boston.

Scarbrough, H. and Swan, J. (1999) *Cases in Knowledge Management. People Management Series*. London: Institute of Personnel Development.

Takeuchi, H. (1998) *Beyond Knowledge Management: Lessons from Japan*. www. Sveiby.com, pp1-11.

Wiig, K.M., de Hoog, R. and van der Spek, R. (1997) “Supporting knowledge management a selection of methods and techniques”. *Expert Systems with Applications*, Vol.13, No.1, pp15-27.

Wilson, D.A. (1996) *Managing knowledge*. Butterworth Heinnmann: Oxford.

Zack, M (1999) “Managing codified knowledge”, *Sloan Management Review*, pp45-58.

Kathryn Cormican (PhD) is a lecturer in the Faculty of Engineering at the National University of Ireland Galway. Her research interests lies in the area of innovation management and she leads a number of research projects in this area. Kathryn works closely with many leading organisations helping them to diagnose, develop and deploy new processes and systems.