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Knowledge Sharing Tools and Technology: An Overview

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ABSTRACT

The study of knowledge sharing— the means by which an individual/organisation obtains access to any individual's own and other knowledge—has emerged as a key research area from a broad and deep field of study on technology transfer and innovation, and more recently from the field of strategic management. Increasingly, knowledge-sharing research has moved to an organisational learning perspective. Indeed, experience and research suggests that successful knowledge sharing involves extended learning processes rather than simple communication processes, as ideas related to development and innovation need. This paper provides basic concepts of knowledge sharing and its means of implementation.

Keywords: Knowledge sharing tools, knowledge management, knowledge sharing, knowledge sharing culture, knowledge creation, knowledge dissemination

1. INTRODUCTION

There have been diversified approaches in developing knowledge management (KM) technology as a solution to promote knowledge dissemination, knowledge creation, and knowledge sharing (KS) in an organisation or community. These approaches have strengths and weaknesses of their own with respect to technological advances, user's reception, adaptability, and success rate in the actual sense of generating knowledge.

Web-enabled infrastructures and practices are creating turbulent disruptions for virtually every institution and enterprise. Strategic responses to these disruptions are progressively leading to new practices, business models, and strategies in a variety of domains. The acquisition, assimilation, and sharing of knowledge is one such domain that is truly experiencing a revolution. Using technologies that are already developed or will be deployed over the next five years, and best practices in knowledge sharing are not only diffusing rapidly but will be substantially reinvented in all settings: education, corporations, government, associations, and nonprofit organisations. These will help individuals and organisations achieve quantum leaps in their abilities to exchange knowledge. Even the manner in which they experience knowledge will be transformed.

It is often said that it is essential to create a "Knowledge Sharing Culture" as part of a KM initiative. An isolated KM programme looked after by a privileged few is a paradox in itself and will not survive for long. Only effective collaboration and communication, which spans across the whole company structure will give KM the boost it really needs. Employees have a sphere of influence along with their own individual knowledge, and this is where one believes a KS culture can begin.

2. WHAT IS KS?

Knowledge sharing refers to "activities of transferring or disseminating knowledge from one person, group,

or organisation to another"[1]. In the context of information technology usage, KS involves the use of given knowledge bases or portions of knowledge bases either at sites other than those at which those knowledge bases were developed or in a context of new computer programs at the same site, possibly within software environments that are quite different from those in which the knowledge bases were first developed[2]. The process of KS involves both the creation and the transfer of knowledge through different artifacts such as documentation or communication, among entities. The entities may refer to individuals[3], groups[4], organisations[5] or networks of organisations[6]. Knowledge is initially created by the individuals[7] but it can be produced and held collectively[8]. When the sharing activity involves a larger number of individuals who are exposed to different values, environments, or interests as a result of being part of different organisations, the sharing may not be as straightforward.

3. IMPORTANCE OF SHARING KNOWLEDGE

Today, the creation and application of new knowledge is essential for the survival of almost all businesses. There are many reasons. They include:

- Intangible products—ideas, processes and information are taking a growing share of global trade from the traditional, tangible goods of the manufacturing economy.
- Increasingly, the only sustainable competitive advantage is continuous innovation. In other words the application of new knowledge.
- Increasing turnover of staff. People don't take a job for life any more. When someone leaves an organisation, his/her knowledge walks out of the door with him/her.
- Our problem as an organisation is that we don't know what we know. Large global or even small geographically dispersed organisations do not know what they know. Expertise developed and applied in one part of the organisation is not leveraged in another.
- Accelerating change—technology, business and social. As things change, so does our knowledge base erode in some businesses as much of 50 per cent of what you knew five years ago is probably obsolete today.
- The purpose of KS is to help an organisation as a whole to meet its business objectives. We are not doing it for our own sake.
- Learning to make knowledge productive is as important, if not more important, than sharing knowledge.

4. MOTIVATION FOR KS

Reasons that motivate knowledge users are:

- Knowledge is perishable. Knowledge is increasingly short-lived. If you do not make use of knowledge then it rapidly loses its value.
- Even with the low level of KS that goes on today if you do not make your knowledge productive than someone else with that same knowledge will do. You can almost guarantee that whatever bright idea you have, someone else, somewhere in the organisation may be thinking along the same lines.
- By sharing your knowledge, you gain more then you lose. Sharing knowledge is a synergistic process—you get more out than you put in. If I share a product idea or a way of doing things with another person, then just the act of putting my idea into words or writing will help me shape and improve that idea. If I get into a dialogue with the other persons then I will benefit from their knowledge, their unique insights, and improve my ideas further.
- To get most things done in an organisation today requires a collaborative effort. If you try to work alone you are likely to fail—you need not only the input from other people but their support and buy-in. Being open with them, sharing with them, helps you achieve your objectives.

Sharing knowledge is not just about giving. But it is about

- Soliciting feedback.
- Asking questions.
- Telling people what you plan to do before doing it.
- Asking other people for help.
- Asking someone to work with you in some way, however small.
- Telling people what you are doing and more importantly why you are doing it.
- Asking people what they think; asking them for advise.
- Asking people what would they do differently.

- Not just sharing information but know-how and know-why.

5. MEANS OF KS

Key KS behaviour includes:

- Seeking ways to document and share your own knowledge.
- Taking advantage of other people's experience when starting a new activity.
- Re-using and building on previous work from within your organisation or other sources.

There are three factors that contribute the most to successful mergers, consolidations and other major organisational changes. Successful organisations demonstrate these characteristics at all times, but these are most critical during times of organisational changes. The factors are:

- Leadership.
- Constant communication.
- Knowledge sharing.

Other steps in KS include:

- Quantify and communicate your service offering.
- Focus on benefits, not actions.
- Explain without defending.
- Increase connection points within the organisation.
- Volunteer and seek out opportunities to contribute.
- Take action to make things better.
- Become known as a source of organisational knowledge.

The key areas of knowledge likely to be considered are:

- Who our users are?
- Where our users "fit in"?
- Points of knowledge valuable to different users.
- Internal shorthand for communication.

During a period of change, the organisation will continuously ask the following questions:

- Why did we/you do that project?
- Who knows about this technology?
- When did we/you make that change?
- How does this system (software, process, etc.) works?

A few of the resources you may want to make available to the organisation are:

- Collections of project reports.
- Directory of staff expertise.
- Product literature and communications archive.
- Training on internal systems.

6. TECHNOLOGY SUPPORT FOR KS

Some people will argue that you do not need technology to implement a KM programme. To some extent they are right. KM is fundamentally about people, not technology. But there is absolutely no way that one can share knowledge effectively within an organisation, even a small one, never mind a large geographically dispersed one, without using technology. Information technology (IT) support can be classified into the use of proper repository for storing and sharing knowledge and the use of a communication medium for communicating and transporting knowledge among individuals.

The first approach is the use of proper repository or the repository model of a KM system, which is related to database management and organisational memory. IT can be used to capture knowledge, categorise, search, subscribe relevant content or information and present it in more meaningful formats across multiple contexts of use. IT can be used to convert tacit knowledge into an explicit form.

The second approach is the use of a communication medium or the network model of a KM system, which is an extension of the stream of computer-mediated electronic communication methods. It is used to support interactions, direct communication and contact among individuals. Facilitative IT tools in KM are shown in Fig. 1.

Technology plays a crucial transformational role and is a key part of changing the corporate culture to KS. In many ways, technology has made knowledge sharing a reality. In the past it was impossible to share knowledge or work collaboratively with co-workers around the globe. Today, it is a reality.

7. CONTEXT OF KS

Successful KS requires the use of the following interdependent types of KS activities:

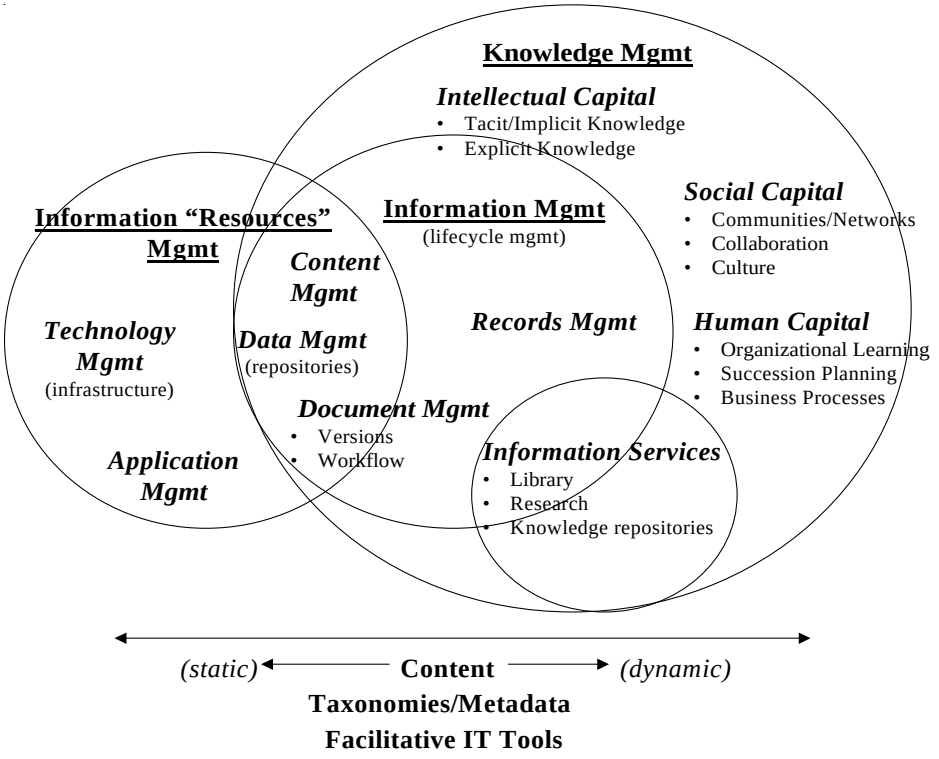


Figure 1. IT tools in KM.

- Those focused on assessing the form and embeddedness of the knowledge.
- Those focused on establishing and managing an administrative structure through which differences and issues between the parties can be accommodated and reduced.
- Those focused on transferring the knowledge.

The five primary contexts that can affect knowledge sharing are knowledge internalisation, including the relationship between the source and the recipient; the form of the knowledge; the recipient's learning predisposition; the source's KS capability; and the broader environment in which the sharing occurs. Collectively, these five contexts define the overall setting in which KS occurs (Fig. 2).

8. BARRIERS IN KS

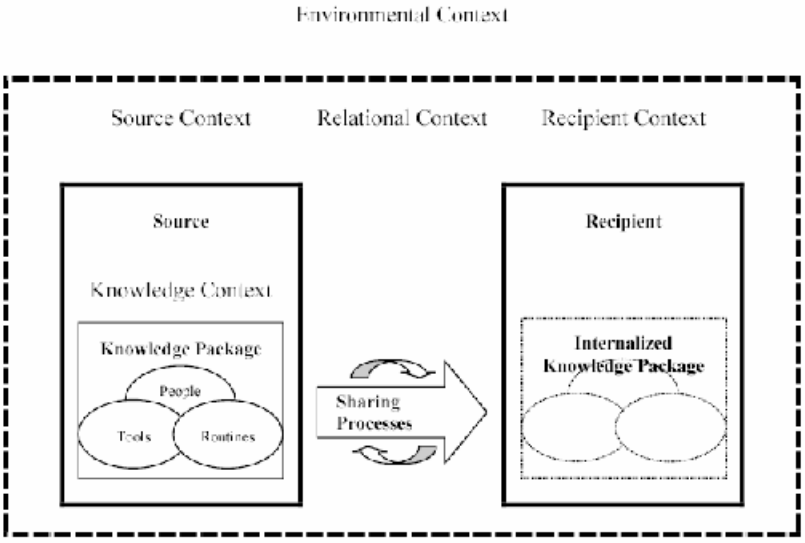
The barriers in KS can be divided into three categories[9]. They are

- Individual KS barriers.
- Organisational KS barriers.
- Technological KS barriers.

8.1 Individual KS Barriers

The individual KS barriers comprise:

- General lack of time to share knowledge, and time to identify colleagues in need of specific knowledge.
- Apprehension of fear that sharing may reduce or jeopardise people's job security.
- Low awareness and realisation of the value, and benefit of possessed knowledge to others.
- Dominance in sharing explicit over tacit knowledge such as know-how and experience that requires hands-on learning, observation, dialogue, and interactive problem solving.
- Use of strong hierarchy, position-based status, and formal power ("pull rank").
- Insufficient capture, evaluation, feedback, communication, and tolerance of past mistakes that would enhance individual and organisational learning effects.
- Differences in experience levels.
- Lack of contact time and interaction between knowledge sources and recipients.
- Poor verbal/written communication and interpersonal skills.
- Age differences.
- Gender differences.



Source: Cumming, J. *Knowledge sharing: A review of literature.* The World Bank, Washington D.C.

Figure 2. Context of KS.

- Lack of social network.
- Differences in education levels.
- Taking ownership of intellectual property due to fear of not receiving just recognition and accreditation from managers and colleagues.
- Lack of trust in people because they misuse knowledge or take unjust credit for it.
- Lack of trust in the accuracy and credibility of knowledge due to the source.
- Differences in national culture or ethnic background; and values and beliefs associated with it (language is part of this).

8.2 Organisational KS Barriers

The organisational KS barriers comprise:

- Integration of KM strategy and sharing initiatives into the company's goals and strategic approach is missing or unclear.
- Lack of leadership and managerial direction in terms of clearly communicating the benefits and values of knowledge sharing practices.
- Shortage of formal and informal spaces to share, reflect and generate (new) knowledge.
- Lack of transparent rewards and recognition systems that would motivate people to share more of their knowledge.
- Existing corporate culture does not provide sufficient support for sharing practices.
- Deficiency of company resources that would provide adequate sharing opportunities.
- External competitiveness within business units or functional areas and between subsidiaries can be high (e.g. not invented here syndrome).
- Communication and knowledge flows are restricted into certain directions (e.g. top-down).
- Physical work environment and layout of work areas restrict effect sharing practices.
- Internal competitiveness within business units, functional areas, and subsidiaries can be high.
- Hierarchical organisation structure inhibits or slows down most sharing practices.
- Size of business units often is not small enough and unmanageable to enhance contact and facilitate ease of sharing.

8.3 Technical KS Barriers

The technical KS barriers are:

- Lack of integration of IT systems and processes impedes the way people do things.
- Lack of technical support (internal and external) and immediate maintenance of integrated IT systems obstructs work routines, and communication flows.
- Unrealistic expectations of employees as to

Table 1. Process and practice approaches to KS

Category	Process Approach	Practice Approach
Type of knowledge supported	Explicit knowledge: codified in rules, tools, and processes[13]	Mostly tacit knowledge: unarticulated knowledge not easily captured or codified[14]
Means of transmission	Formal controls, procedures and standard operating procedures with heavy emphasis on information technologies to support knowledge creation, codification, and transfer of knowledge[15]	Informal social groups that engage in story telling and improvisation (Wenger and Snyder, 2000).
Benefits	Provides structure to harness generated ideas and knowledge[17] Achieves scale in knowledge reuse[11]	Provides an environment to generate and transfer high -value tacit knowledge[16,17] Provides spark for fresh ideas and responsiveness to changing environment[17]
Disadvantages	Fails to tap into tacit knowledge. May limit innovation and forces participants into fixed patterns of thinking	Can result in inefficiency. Abundance of ideas with no structure to implement them.
Role of information technology	Heavy investment in IT to connect people with reusable codified knowledge[11]	Moderate investment in IT to facilitate conversations and transfer of tacit knowledge[11]

what technology can do and cannot do.

- Lack of compatibility between diverse IT systems and processes.
- Mismatch between individuals' requirements and integrated IT systems and processes restrict sharing practices.
- Reluctance to use IT systems due to lack of familiarity and experience with them.
- Lack of training regarding employee familiarisation of new IT systems and processes.
- Lack of communication, and demonstration of all advantages of any new system over existing ones.

9. CRITICAL IMPEDIMENTS TO SHARING AND REUSE OF THE KNOWLEDGE

There are many senses in which the work that went into creating a knowledge-based system can be shared and reused. Neches identified four critical impediments in sharing and reuse of the knowledge[10].

- Heterogeneous representations.
- Dialects within language families.
- Lack of communication conventions.
- Model mismatches at the knowledge level.

10. PRACTICAL APPROACHES TO KS

The principal approach used in traditional intra-organisational KM is the process approach. The process approach is characterised as a formal and technologically-based process of gathering and storing explicit knowledge within the organisation[11]. The alternative approach to managing knowledge sharing is the practice approach. This approach is more effective in gathering tacit knowledge through informal networks with moderate use of information technology.

11. CONCLUSION

A successful knowledge-sharing effort requires a focus on more than simply the transfer of the specific knowledge. Instead, many of the activities to be undertaken need to focus on structuring and implementing the arrangement in a way that bridges both existing and potential relationship issues, and examining the form and location of the knowledge to ensure its complete transfer. In other words, while the activities used to share knowledge such as document exchanges, presentations, job rotations, etc., are important, overcoming the factors that can impede, complicate and even harm knowledge internalisation are equally important in determining the ultimate results of a KS effort. The KS effort is a consortium to develop conventions facilitating sharing and reuse of knowledge bases and knowledge-based systems. The goal of the effort is to define, develop and test infrastructure and supporting technology to

enable participants to build much bigger and more broadly functional systems than could be achieved working alone. KS should be incorporated into daily procedures and routines, thus making it part of the work and not an extracurricular, time-consuming activity where one feed reports into some system, and never know if someone else might use it.

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