

CIEA 2002

**Technical and organizational aids for knowledge
management and networks**

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CIEA – Technology and Knowledge Sharing

Role of Technology in KM

In order to employ technology in service of knowledge management / sharing, it is important to understand the relationship between information and communications technologies (ICTs) and knowledge.

Collect vs. Connect

Knowledge Management as a body of practices can be roughly broken down into two categories: 1) practices which facilitate the collection / harvesting / organisation of knowledge; and, 2) practices which facilitate the sharing / flow of knowledge between people. These two broad distinctions have come to be known as Connect vs. Collect or also Personification vs. Codification. While the two are often presented in opposition to each other, it is not a case of selecting one or the other but rather developing the right balance between the two.

The Value of Information

We have a natural tendency in society to place a high value on useful things that are in short supply. Until recently codified knowledge or information fell into that category of mostly useful and there not being as much of it available as we would like. The rapid growth of the Internet has changed all that and now most people (at least in industrialised countries) feel they have more information than they know what to do with.

Knowledge Management, at least in part, is a reaction to this overload of information. It asks the question “How do we find out what we need to know?” The answer to this question has implications for the way in which we apply technology to support knowledge sharing.

It is a typical assumption that if some information is good, more is better. But with a resources of over 2 billion pages of information on the Internet, how do we find the information that we need? Are larger databases of information the answer?

Connect Technologies

Connect Technologies refer to all information and communication technologies that support interaction between people. The basic premise of the “connect” side of Knowledge Management is that the bulk of human knowledge is locked up in people’s heads and is largely resistant to be written down in any usable form. We refer to this kind of knowledge as “tacit” from the Latin word for silent. Much traditional knowledge fall into the category of tacit. In spite of its resistance to capture, it is capable of being shared between people through their interaction over time. Thus, the best knowledge sharing technology in the world is simply putting two or more people in face-to-face contact.

All Connect Technologies aspire to Face-to-Face

Based on the above then, all connect technologies aspire to the level of communication that we achieve in a face-to-face environment. That is to say that the extent to which we can apply technologies to help people get to know each other, to build trust, and to communicate effectively, the better we get at knowledge sharing. To draw a parallel with the Internet, we refer to face-to-face communication as “high-bandwidth” communication. The word “bandwidth” is typically used to refer to the speed of one’s connection to the Internet.

Why is Email still so important then?

While it would be nice to be able to video-conference with all of our partners around the world, the practical reality is that technology is not yet capable of delivering that kind of service, particularly in developing countries. In non-industrialized nations, email has a great deal more reach than the web and other Internet technologies.

For countries with comparatively expensive and often unreliable Internet access, the difference between being able to log on briefly and collect all of one's communication via email versus having to stay on line to interact in a web forum is profound. Often the latter is simply not feasible. In addition, many organisations offer email access to staff but not full Internet access.

Another key strength of email is that it is one of the few successful "push" technologies on the Internet. Push technology refers to tools that put information in front of you whereas a "Pull" technology refers to a tool that you must go to and retrieve information from. The World Wide Web is an example of a "pull" technology.

What about other ICTs?

Having extolled the virtues of email, it is important to recognize that all information and communication technologies have a role to play in creating an environment that facilitates knowledge sharing. Recognising that different ICTs have different strength and should be applied where they can have the most significant impact is central to a successfully applying technology in support of KM.

Collect Technologies

Technologies for codifying knowledge predate the advent of computers by thousands of years, however, computers and the Internet have profound implications for how we now address the issue of codifying knowledge. The ability to store vast amounts of information electronically and make it accessible globally means that we suddenly have much more information than we know what to do with. One significant impact of this is the need for better tools to manage information. Tools to manage and display information on the World Wide Web are in particular demand.

The Importance of Content Management Systems

In the early days of the Internet managing a website of 20-30 pages was easily handled by simply creating HTML pages using an HTML editor and placing the pages on a webserver. Today however, even the smallest websites often involve hundreds of pages and maintaining a website has become a burdensome task that involves not just managing content but ensuring a consistent look and feel, easy navigation, searchability, and checking for broken and out-of-date links.

Many organisations have attempted to deal with this problem by decentralizing the maintenance of the website. This has the positive effect of putting control in the hand of the content creators but added the burden of training staff in the use of tools such as [DreamWeaver](#). Also, it did not address the other issues raised above.

Content Management Systems or CMSes offer the possibility to decentralize content production which maintaining control over design and functionality. A CMS separates the content of a website from the style and navigation allowing more participation by non-technical users and greater control for administrators.

Order – Taxonomy & Vocabulary

The World Wide Web consists largely of unstructured information. Free-text search engines such as Google and AltaVista attempt to make sense of this morass of information by indexing large parts of it in very large databases. Unfortunately, unstructured text can make it particularly difficult to search for information in a meaningful way.

The evolution of the Extensible Markup Language or XML now offers the possibility to structure information in meaningful ways on the Web. In a manner similar to the way in which HTML uses stylistic tags to information in order to display it on the Web, XML uses semantic tags to apply meta-information tags to information on the Web. In this manner, it is possible to tag the abstract of a document so that smart search engines can identify, search, and collect the abstract alone. This can be applied to any clearly identifiable part of a document, author, date of publication, title, chapters, etc. XML has the potential to integrate information resources and make them searchable according to a variety of criteria.

One weakness that XML does not address though is the issue of vocabulary. By defining unique fields within documents to search, it becomes important that authors use a common vocabulary in filling in those fields. This works well within specialized disciplines that have a well recognized vocabulary and usage but less well in sectors which cross a variety of disciplines. It becomes even more problematic when trying to match vocabularies across different languages.

The IDML initiative (<http://www.idmlinitiative.org>) is an example of how XML has been applied to bring together development project information in a consistent manner.

Quality

Another significant problem for codifying knowledge is the issue of quality. When one is overwhelmed with information, how does one evaluate information resources for quality. Very often we rely on the opinions of people we trust to judge whether information is worthwhile or not. Technologies which support the codification of knowledge need to take this factor into account and allow interested users to offer their opinion on the resources being made available.

Amazon (<http://www.amazon.com>) is an excellent example of this process in action. The search engine Google (<http://www.google.com>) also uses a human driven ranking system to select search results. One of its key criteria for determining popularity is measuring the number of times a website is linked to by other sites. It is based on the premise that if others think the site is important enough to link to, it must be more worthwhile.

Historically, we have tended to rely on publishers to vouch for the quality of the works they release. With the growth of the Internet, publishing has come within the reach of millions of people. While this is a great democratizing force, it does mean we have to think differently about how we determine quality.

How does Connect relate to Collect?

Having broadly defined the two areas of KM and the technologies that support them, how do the two relate to each other. Very often network initiatives start with the premise that they must build a large base of codified knowledge in order to attract people to the network and foster the process of knowledge sharing.

In practice this often doesn't work very well.

Recognising that most knowledge is socially constructed has implications for developing a knowledge sharing strategy. It places a greater emphasis on human interaction as a key component of knowledge generation. It also implies that our ability to capture knowledge in direct proportion to our interaction or the extent to that there is knowledge “flow”.

Thus, most codified knowledge begins its life as tacit knowledge and the generation of codified knowledge is a continuous process of “surfacing” tacit knowledge. However, this does not mean that the body of tacit knowledge is diminishing as more is revealed but rather it implies a continuous process of revelation.

Open Source

An interesting parallel for Knowledge Management is the Open Source software movement. Much of the Internet is built either directly on Open Source software or on the principles of Open Source and Open Standards. Very simply, Open Source is a mechanism for freely sharing intellectual property (software source code) in a manner which promotes its use and growth.

The principles of Open Source are now being applied in a variety of diverse areas including:

Legal Cases – [The OpenLaw Project](#)

Documentation – [The OpenContent License](#) and the [GNU Documentation License](#)

Scientific Publications – [The OpenArchives Initiative](#)

University Course Materials – [MIT OpenCourseware](#)

These principles could also be usefully applied to promote knowledge sharing in development initiatives.

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