Association for Information Systems
AIS Electronic Library (AISeL)

December 1999

Knowledge Management

Paul Gray
Claremont Graduate University

Follow this and additional works at: http://aisel.aisnet.org/amcis1999

Knowledge Management

Paul Gray, Claremont Graduate University, Claremont, CA, paul.gray@cgu.edu

Introduction

The next step beyond data and information is knowledge. Knowledge originates and is applied by knowledge workers. It includes their experience, values, insights, and contextual information and helps them evaluate and incorporate new experiences and information. People use their knowledge in making decisions. During the last several years, organizations realized they own a vast amount of knowledge and that this knowledge needs to be managed.

Knowledge is imbedded not only in people, but also in documents; repositories; and organizational routines, processes, practices, and norms. Knowledge is an asset, but its value is much harder to assess that of physical assets.

This tutorial examines the key ideas that have been developed about knowledge management (KM). It covers the following topics:
- definitions of knowledge management
- tacit and explicit knowledge
- generating knowledge
- transferring knowledge
- people issues
- technology issues
- relation to data warehousing
- case examples

The individual topics are woven together to develop a series of principles of knowledge management.

Knowledge management came to the fore in business when consulting firms realized that their prime product was the creation and dissemination of knowledge. They developed ways of preserving and enhancing knowledge in their own organizations and then decided they had a product they could sell. Corporations recognized that their drive to reduce cost through downsizing combined with turnover involved losing the knowledge of the people who left. The combination of a willing supplier and a needful consumer led to a multi-billion dollar industry.

Definitions of Knowledge Management

The best book on Knowledge Management is *Working Knowledge* by Davenport and Prusak (1998). They define knowledge as a fluid mixture of experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. They argue that knowledge originates and is applied in the minds of people who know. In organizations, it becomes embedded in documents and repositories, in organizational routines, in processes, practices, and norms.

A slightly different definition is given by Alavi and Leidner (1999). They see knowledge as a justified personal belief that increases an individual's capacity to take action. They uses Churchman's idea that 'knowledge resides in the user and not in the collection of information'. In their definition, action refers to physical skills and competencies, cognitive/intellectual activity or both (e.g., surgery involves both).

Knowledge As An Asset

Knowledge is an asset with four characteristics (McKinsey 1996)

(1) *Extraordinary leverage.* It is not subject to diminishing returns. Fixed cost to crete but not to manufacture or distribute.

(2) *Fragementation, Leakage.* Over time, knowledge assets become less valuable as they become more widely known. To be successful, knowledge must be refereshed to keep it as a source of competitive advantage.

(3) *Uncertain Value*. Value is difficult to estimate and steady growth in knowledge may suddenly halt.

(4) *Uncertain Value Sharing*. Can't predict in alliances who will capture the lion's share.

Tacit and Explicit Knowledge

Knowledge is divided into tacit and explicit. Explicit knowledge can be expressed by people directly. It may be highly structures such as in procedures manuals. However, much knowledge in organizations ranges from the rich, complex, accumulated expertise that resides in individuals and is partly or largely inexpressible(i.e., tacit) to structured and explicit content.

A large portion of the literature in knowledge management is devoted to finding ways to move knowledge from tacit to explicit. However, it is also the

case that as people become more expert, they increase their store of tacit knowledge because that is their value added. There is a natural tension between firms, who want to make knowledge explicit through sharing and individual workers who want to keep their tacit knowledge as a form of job insurance.

- Knowledge comes in several forms:

- Procedural: "How To", actionable

- Declarative: "What to do", descriptive

- Episodic: Similarity, analogy, based on cases

- Heuristic: Rules of thumb through experience; "Informed Shortcuts"

- Meta: Knowledge about knowledge

Another way of dividing knowledge is into

Formal Knowledge --recorded on media

Informal Knowledge --in human and organizational memory

Tacit Knowledge --in the unconscious and in organizational culture; much more difficult to obtain and elicit

Generating Knowledge

Knowledge can be generated in five ways:

(1) *Acquisition.* Knowledge can be acquired from internal and external sources. It can be bought or rented from consultants and universities Or by acquiring a company (eg IBM bought Lotus). The value of knowledge is hard to assess and hence knowledge markets are still inefficient.

(2) *Dedicated resources.* R&D departments, libraries, training departments are examples

(3) *Fusion.* Bring people together with different perspectives in multidisciplinary teams. Individuals in such teams have no familiar solution in common but must devise one. Requires both knowledge sharing and a shared language.

(4) *Adaptation.* Creating solutions to meet changing conditions

(5) *Networking.* Sharing and then creating knowledge by informal, self-organizing networks.

Transferring Knowledge

Although the best way to transfer knowledge from one individual to another is to hire smart people and let them talk to one another, this approach is hard to implement. People are kept too busy to exchange ideas. Yet, as J.Robert Oppenheimer pointed out, "What we don't know we explain to one another".

Knowledge is transferred in organizations whether the transfer is managed or not. However, transfer is random The larger the organization, the smaller the chance the right person is contacted yet the more likely the knowledge exists in the company. A variety of techniques (e.g., knowledge fairs, mentoring relations, directories of people who will share on specific subjects, debriefing of people who retire or leave) help overcome the problem. Transfer requires trust. It also requires that people absorb knowledge, not just have it available.

People and Culture

We are seeing the emergence of people who specialize in knowledge, including a Knowledge Officer degree at UC Berkeley. Knowledge officers are responsible for organizing, manipulating, filtering and presenting knowledge. Knowledge management rRequires both people skills and computer skills. At the top, organizations are appointing Chief Knowledge Officers(CKO), Chief Learning Officers, Director of Knowledge Transfer, and similar titles. What the job entails and where the person comes from reflects the title given. The CKO not only manages the process of knowledge creation and use, but also is an advocate for knowledge and learning.

Creating a knowledge focus into an organization also requires cultural change, particularly in organizations in which knowledge is not shared or in which little trust exists. Reward structures, management sponsorship, and resources are all part of a knowledge organization.

Technology Issues

Technology for knowledge management today principally involves Lotus Notes, Intranets, document management, search engines, and borrowings from expert systems and artificial intelligence. Lotus Notes (and similar products) are used for knowledge sharing. Publication is over the company's Intranet.

Document management refers to applications that share the management of documents. Electronic systems are available to create and capture documents digitally; store and organize large amounts of information without requiring large amounts of storage; retrieve and

synthesize basked on keywords and indices, and transmit them quickly for display.

Some companies use repositories for storing structured, explicit knowledge. These repositories contain internal product, marketing, and customer knowledge. Although the Web, which is easier to navigate than Lotus Notes, is the preferred means for transmitting knowledge, it lacks the needed replication, security, and application development tools. External data search engines (e.g., Hoover and GrapeVINE) are available.

Expert locators are used to locate people rather than documents. The user specifies the type of expertise wanted and the system gives names, phone, e-mail, resumes, and more. Problems include defining who is an expert and in maintaining systems.

Expert systems try to capture how an expert solves a specific problem. The major difficulty is getting experts to cooperate and then capturing and translating the expertise so others can use it. Case based reasoning and neural networks are other elements of artificial intelligence being used.

Relation to Data Warehousing

Data warehouses are perceived as basic building blocks in the Knowledge Management community. However, knowledge management is almost being ignored by data warehouse vendors and by leaders in the data warehouse profession. Clearly, the warehouse would have to be expanded considerably to absorb the large quantities of information in a knowledge repository. One proposal is to create middleware that will allow a single inquiry to search both the warehouse and a knowledge repository and report integrated results to the user.

Case Examples

Five companies who have benefited from knowledge management are McDonalds, Enron, Monsanto, Oticon, and Netscape (McKinsey 1998). Other firms who have benefited include consulting organizations such as Ernst & Young, Arthur Anderson Consulting, and industrial firms such as Microsoft, Hewlett Packard, Mobil, and 3M.

Principles

The following eight principles, enunciated in Davenport and Prusak (1997) reflect the current conventional wisdom:

- Knowledge originates and resides in people's heads
- Knowledge sharing requires trust
- Technology enables new knowledge behaviors
- Knowledge sharing must be encouraged and rewarded
- Management support and resources are essential
- Knowledge initiatives should begin with a pilot program
- Quantitative and qualitative measurements are needed to evaluate the initiative
- Knowledge is creative and should be encouraged to develop in unexpected ways

Conclusion

Knowledge management is a natural progression from data and information management. It is an important new area for both organizations and information systems. IS has a major role in providing the needed technology and infrastructure. Research in this area is much needed to move beyond the current impressionistic and anecdotal stage of the field .

References

Alavi, M. and D. Leidner "Knowledge Management Systems: Issues, Challenges, and Benefits" *Communication of AIS*, Vol. 1, Article 14

Davenport, T.H. and L. Prusak *Working Knowledge: How Organizations Manage What They Know* Boston, MA: Harvard Business School Press (1998)

McKinsey "Best Practice and Beyond: Knowledge Strategies" *The McKinsey Quarterly* (1998) Number 1, pp. 19-25