PERSPECTIVES ON KNOWLEDGE MANAGEMENT AND KNOWLEDGE MANAGEMENT SYSTEMS

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ABSTRACT

This paper explores the concepts of knowledge, knowledge management, knowledge management systems, and why an organization needs to consciously focus on developing and implementing an effective knowledge management system. A three-dimensional framework is proposed as a starting point for knowledge management and the development of knowledge management systems. This paper also suggests that some of the principles and concepts of knowledge management successfully used in other disciplines might be useful for business organizations. In the end of the paper, the technological platform to implement an effective knowledge management system is discussed.

Keywords: Knowledge, knowledge management, knowledge management systems.

INTRODUCTION

Much has been written defining and making distinctions between data, information and knowledge. This paper is not intended to be an exhaustive study of all the esoteric and abstract concepts of data, information, and knowledge. As such, in this paper, the discussions will be based on the following understanding on data, information and knowledge.

Data**,** is sometimes referred to as raw data, unprocessed data, or facts about persons, places, objects, concepts or things that answer simple questions such as who, what, where, when, what size, how many, how much etc. For instance, in an accounting information system, data would be (1) the facts about a customer who has a credit account with an organization and (2) the details about a transaction that may be entered as a debit or a credit against that customer's accounts receivable balance.

Information is processed data, or data that has been arranged according to a certain criteria, pattern, sequence or arranged by a certain set of rules. Information answers many of the same type of questions that data helps answer. For instance, after the transaction data of a customer is processed according to generally accepted accounting principles and procedures, the company has information about, " How much does this customer owe our company?"

The concept of knowledge can be defined from different perspectives. According to Davenport and Prusak (1998), knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices and norms. As a matter of fact, the term *organizational knowledge* is often used to refer to this type of knowledge –embedded knowledge. Knowledge can be classified as either tacit or explicit (Nonaka, 1998). Explicit knowledge is formal and systematic, can easily be communicated and shared. Tacit knowledge is highly personal, is hard to formalize and, therefore, difficult to communicate to others. It consists of mental models, beliefs, and perspectives so ingrained that we take them for granted, and therefore cannot easily articulate them.

ORGANIZATIONAL KNOWLEDGE

Organizational knowledge is the sum of everything everybody in an organization knows that gives the organization a competitive advantage or a competitive necessity. Organizational knowledge is peculiar to a particular and specific entity. Organizational knowledge is a way to describe knowledge that has been accumulated by the entity. It is the firm's knowledge about its customers, suppliers, products, and its competitors. It is knowledge about how the organization processes data to generate information, about how the organization makes quality decisions; about how it manufactures a quality product, and about how it provides quality customer services. Organizational knowledge largely lies in the minds of employees. It is invisible but its impacts are apparent. For example, if an IS project development team lost a key member, the project may not be completed as scheduled.

Various other terms have been used to describe organizational knowledge or some aspect of it. These include but are not limited to human capital, intellectual capital, intellectual property and intellectual property rights. The term capital itself can be a source of confusion and should be clarified. When an accountant uses the term capital, he or she is referring to a portion of the right hand side of the balance sheet also commonly known as shareholders equity or net equity. When an economist uses the term capital, he or she is referring to the fair market value of the total assets (tangible as well as intangible assets) of a firm. Usually the economist's value concept of capital and the accountant's value of a firm's total assets are quite different. This difference is attributable to the strict set of rules and guideline under which the accounting profession operates. Generally accepted accounting principles specify; "What is an asset"; "What is income"; and "When and at what value assets and income should be recognized and recorded on the financial statements of the organization".

Generally, from an accountant's perspective, intellectual capital is not recognized for financial statement accounting purposes *until it has been articulated*, put in a recordable form, considered to have some future value (the value must be able to be expressed in monetary terms and the value must be able to be ascertained by some objective standard), and it has some protection under the law. The accounting profession would include patents, copyrights, and trademarks in this category. Sometimes these items are referred to as intellectual property and the owners of such property have intellectual property rights. However, the accountant will only associate a historical cost with these intellectual properties, not their current fair market value.

There is a point in time when the economist's fair market value of capital (total assets) coincides and equals the value of the accountant's concept of historical costs of total assets. At that time, both professions recognize the market forces that have objectively and independently arrived at a fair market value for the organization's intangible human capital, intellectual capital, or any other term that is used to describe the company's organizational knowledge (The accounting profession uses the term, "Goodwill"). Such a situation occurs when a company is being sold for more than the sum of the fair market value of the individual assets of the business. The accounting profession refers to this excess selling price over the sum of the fair market value of the individual assets being sold as "Goodwill". The market recognizes that this firm has value over and above the sum of the fair market value of its individual tangible assets and is willing to pay a price for the human capital of the firm, its organizational knowledge. As an example, if someone is willing to pay $3,000,000 for a company that has assets with a total fair market value of $1,000,000, the accounting profession will recognize the other $2,000,000 of the purchase price as the value of the firm's unclassified intangible assets and refer to this purchased asset on the Balance Sheet as, "Goodwill".

Much has been written in the financial journals about management's responsibility and duty to maximize the value of the owners of the organization, the shareholder's equity. One approach to doing this would be to preserve and maximize the value of the current organizational knowledge base as well as increasing the size of this knowledge base by creating new and additional organizational knowledge, with the adoption of knowledge management systems. There are companies who are aggressive in managing organizational knowledge. For example, LG Precision created sixteen learning teams to construct knowledge warehouses, and the company has developed the "knowledge mileage system" based on employee's contribution to the knowledge warehouse. Samsung Coning's knowledge management plaza is also a way to preserve intellectual capital.

KNOWLEDGE MANAGEMENT AND KNOWLEDGE MANAGEMENT SYSTEM

Management has often been referred to as the processes, steps and/or procedures of going from an existing state or condition to a desired state or condition. For an organization then, knowledge management involves the process, steps and/or procedures of going from an existing state or condition of knowledge to a desired state or condition of knowledge. Knowledge management focuses on issues related to acquiring, creating, storing, codifying and utilizing knowledge within an organization.

What is a knowledge management system? A system, in a general sense, has been described as an algorithm, a set of steps, rules, or procedures to accomplish a particular function or goal. In the context of knowledge management, a knowledge management system implements a set of rules or procedures established by an organization for the purpose of acquiring, codifying, storing, and accessing and distributing knowledge within the organization.

Why does an organization need to consciously focus on developing and implementing an effective knowledge management system? Knowledge can be a fleeting commodity. When we look back at the history, humanity has lost immense amounts of knowledge. How did the Egyptian, Inca, Maya, Aztec and other ancient civilizations cut stone so smooth and perfectly planed that no mortar had to be used between the stones when building their pyramids? How did these ancient civilizations move and lay these large stones for their pyramids and obelisks with their existing technologies? The knowledge of these civilizations has been lost and is now a mystery to us.

Organizational knowledge can be lost if not properly managed. If the knowledge were tacit knowledge, residing in a particular person or embedded in a small group of people, such knowledge would be difficult to transfer since by definition it could not be articulated let alone recorded. This type of knowledge would be lost with the loss of the person or persons who possessed such knowledge. Knowledgeable employee may be lost for one of several reasons including but not limited to the following: Retirement, illness or death; Job change outside the organization; dismissal due to organizational changes or downsizing because of business process reengineering (BPR), mergers or acquisitions, or other organizational structural changes.

If the knowledge is explicit, it can be articulated and even recorded in writings, books, maps, formulas, programs, processes, and procedures. Explicit knowledge that is articulated but not recorded (culture with a spoken language but without an alphabet, characters, or symbols for writing) may be lost when members of that society stop articulating the knowledge. Recorded knowledge is explicit knowledge that has been articulated and preserved in some type of a

written form in a permanent or semi-permanent media such as a magnetic storage device, a book, papyrus, stone, etc. Recorded knowledge can be lost when the storage media containing that knowledge is lost. It is universally accepted that there is far less likelihood of loosing recorded knowledge than any type of non- recorded knowledge.

A SIMPLE FRAMEWORK FOR KNOWLEDGE MANAGEMENT

In this section we will propose a simple framework to manage organizational knowledge already accumulated and preserved, and discuss some strategies that a business organization may employ for the preservation of its organizational knowledge. The core idea is to create mechanisms to make knowledge transferable – either from one person to another, or from human being to a knowledge management system. By making knowledge transferable from person to person, a business preserves and protects the value of its organizational knowledge or intellectual capital.

In this paper, we propose a simple framework as a starting point for organizations to implement knowledge management systems and to manage organizational knowledge. The framework consists of the following dimensions:

- Knowledge in key areas (Areas of focus: key functional areas)
- Knowledge transformation (tacit to explicit, and explicit to electronic storage)
- Knowledge organization using knowledge cases and unified classification code like organizational projects, tasks, and knowledge classification taxonomy

These dimensions are discussed in detail as follows. Each dimension also represents an area where an organization may develop its knowledge management strategies.

1. Recognize key knowledge in key functional areas

A firm should concentrate on its most important knowledge. The firm should capture this knowledge and make it transferable from one individual to another individual. Intellectual capital of this type would include but is not limited to knowledge that a) is mission critical, b) relates to the business's core competencies or c) gives the organization a competitive advantage over other firms in the industry. The business might focus on the following five traditional functional areas for determining what are its most important areas of knowledge: operations and/or manufacturing, sales and marketing, finance and accounting, human resources, and research and development.

2. Knowledge transformation: Capture tacit and explicit key knowledge in a recorded, transferable forma, so that organizational knowledge can be stored in knowledge management systems.

Converting tacit knowledge into explicit knowledge is no easy task. Such a conversion, however, is a necessary step before that knowledge can be transformed into a recordable, transferable form. One may argue that all explicit knowledge evolved from tacit knowledge through some transformation, articulation or conversion process. So what is this evolutionary process of transforming or converting tacit knowledge into something that can be articulated? Sometimes it involves the development of new concepts, theories or ideas. Often, the development of these new ideas is limited by the vocabulary of the language. Can you think or dream of ideas or concepts for which there are no words?

It is needed to formulate a process to transform key tacit knowledge into explicit knowledge. The preferable way of capturing this knowledge would be in a recordable format (magnetic storage, paper, etc.) to a knowledge management system so that this knowledge can be stored and accesses when needed. This involves a process of decoupling the knowledge from the source of the knowledge. Decoupling does not mean separating the knowledge from the source, in the sense that the source would then be devoid of the knowledge. Knowledge can reside in more than one person or place at the same time. Decoupling of knowledge from a person is more akin to making another copy of that individual's knowledge available to others. This decoupling process will assures that a company's organizational knowledge is a separate and independent entity apart from its source. All key organizational knowledge that is explicit knowledge should be articulated and captured in a recordable format. This knowledge will then be able to be transferred to others in the organization if and when needed independent of the employment status of the original source.

3. Knowledge organization: Organize knowledge in a way that knowledge can be represented, stored and retrieved not only by keywords but also by semantic meanings.

Regarding the organization of knowledge, a great example is at point. Justice is an abstract concept, yet the legal profession through the ages has transformed much of the abstract, tacit knowledge regarding justice into an explicit, recorded, transferable form of knowledge. Through the ages uniform codes have developed (e.g., Uniform Commercial Code, Uniform Partnership Act, Uniform Probate Act, and Uniform Civil Procedure Act). How did the abstract tacit concept of justice get formulated into these articulated, explicit, recorded codes of rules and procedures?

Before these codes were developed, the legal profession recorded the 1) facts, 2) issues, 3) decision, and 4) rational supporting the decision for disputed cases decided by the judges.

Eventually these cases were categorized according to areas of the law such as but not limited to the following: Contracts, Banking, Probate, Criminal Law, Marriage, Criminal Procedure, Divorce, Civil Procedure, Taxation, Property and Patents. Within these areas of law, cases were categorized by the issues that had to be decided. For instance, within the area of contract law, common issues repeatedly surfaced, regarding a) what is a contract, b) what makes a contract valid, c) who are the parties to the contract, d) what are the terms and conditions of the contract, and e) what are the consequences of nonperformance of the terms of the contract. After a period of time and numerous cases deciding the same or similar issues, a recognizable pattern began to emerge as to how this abstract concept of justice was being applied. This pattern was eventually articulated and recorded as the code of law.

Business organization may be able to use this same concept to create new knowledge or convert abstract tacit knowledge to explicit, articulated, recorded knowledge. As mentioned earlier, businesses have their four functional areas as Operations and/or Manufacturing, Sales and Marketing, Finance and Accounting and Human Resources, and research and development. Within these functional areas of business, cases will arise and will be decided on particular issues. For modern organizations, projects are important organizational undertakings to accomplish important and temporary tasks. Projects can make good business cases. The cases could be categorized by issue within the pertinent functional area of the business. A record of the cases could be maintained describing the 1) facts, 2) issues, 3) decision, and 4) rational for the decision, similar to what is done in the legal profession. After sufficient cases regarding a particular issue in a particular functional area have been decided, one may discern a pattern as to what has been successful and what has not been successful. The discovery of a discernable pattern should lead to the articulation and codification of business rules, prohibitions, policies, procedures, etc. regarding what to do or what not to do in certain situations.

DISCUSSIONS AND CONCLUSIONS

This paper proposed a simple three-dimensional framework to help determine the content for a knowledge management system. Ultimately, we need to develop a knowledge management system on a technological platform. The web technology can provide a common technological infrastructure to support the collective nature of knowledge management (Zhang and Chen, 1997). The content collection and the access of the content will be conducted as a collective behavior. As a matter of fact, different web-based knowledge systems have already been developed to effectively manage knowledge (Zhang, 2000).

References available upon request.