Knowledge Management

1. Introduction: In a highly competitive business environment, organizations are looking for improved tools which could provide them a greater opportunity to succeed and to create a strategic advantage in their market. Their primary concern therefore is continuous, effective and secure access to their accumulated knowledge. Knowledge Management tools and methods are emerging, primarily for the use of big organizations, but more and more small and medium enterprise (SME) are interested in adopting them. Knowledge is a step ahead of Information, and deals with the capturing and the gathering of Information along its steps and rules related to a Working Process, in order to perform the latter at an optimal level.

The dilemma is, that in order to access knowledge, one must store it, in the most effective and efficient way. This paper offers various definitions of *Knowledge* by differing authors, examines the general difficulties and the problems of Capturing and Storing Knowledge, and presents an attempt to map and store it into a database structure. Once knowledge is stored in such a structure, it will attain an effective and efficient access to knowledge that is stored in a secure manner.

Importance Of Knowledge

We are in an era of *Knowledge revolution,* where knowledge occupies the center stage. Its continuous generation, sharing and implementation have become crucial for firms and countries. This revolution is supported by the revolution in information technologies (Pillania, 2008). The latter is to support existing KM efforts in its various activities and possibly, to suggest newer and more effective ways to deploy them. The relevance of KM is not argued by the academic or the practionners communities, nor is it a subject of demonstrations. In today's highly competitive business environment, organizations are looking for KM tools, which could provide them the highest effectiveness, a greater opportunity to succeed and to create a strategic advantage in their market.

What Is Knowledge?

To make sure we are in the right direction and using a common vocabulary, let's examine some of the definitions of Knowledge. In recent years, the term Knowledge Management has been used, to describe the efforts of organizations to capture, store, and deploy Knowledge (Preece et al, 2001). For some, Knowledge is a somewhat elusive concept; here is a pragmatic description of knowledge in

organizations: *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* (Davenport and Prusak, 1998; 5).

We usually distinguish 'knowledge' from 'information', and information from 'data', on the basis of value-adding processes which transform raw material (for example, transaction records) into communicable messages (such as documents) and then into knowledge and other higher-order concepts. These value-adding processes include in the first instance contextualization, categorization, calculation, conversion and condensation; and in the second, connection, comparison, and conversation. Other authors - notably Thomas Stewart - dismiss the notion of a data-to-wisdom hierarchy as bogus and unhelpful on the grounds that "one man's knowledge is another man's data".

Knowledge Management And Its Facets

Another theme discussed amongst the experts is the distinction between the *explicit* Knowledge and the *tacit* knowledge. Here are some insights. A more important distinction - which is fundamental to the concept of knowledge management - is that between 'explicit' and 'tacit' knowledge, explained by Ikujiro Nonaka. "Explicit knowledge is formal and systematic. For this reason it can be easily communicated and shared, in product specifications or a scientific formula or a computer program. Tacit knowledge is highly personal. It is hard to formalize and therefore difficult, if not impossible, to communicate." (Nonaka, 1991)

Most authors identify the different facets of KM as being one of Capturing, Organizing and Storing, while everyone clearly insists on the Sharing Aspect of KM. It is obviously the goal of any KM efforts.

Ramjani (Ramjani, 2000) identifies the following steps or stages in KM:

- Develop Knowledge (acquire, capture, create,,)
- Preserve Knowledge (store, securing,,)
- Update knowledge (evolving, improving,,)
- Transfer knowledge (communication, deploying,,)

- Transform knowledge (compiling, standardizing,,)
- Assess knowledge (appraising, evaluating,,)
- Apply knowledge (using, enacting,,)

Rather than wax philosophical about what knowledge is, let's let it be any information that can further an organization's goals. If managing IT can be compared to herding cats, managing knowledge is comparable to ranching fleas on a cat herd.

Do You Know What You Know?

- A collection of data isn't information.
- A collection of information isn't knowledge.
- A collection of knowledge isn't wisdom.
- A collection of wisdom isn't truth.

— Neil Fleming, Lincoln University, Canterbury, New Zealand

These mysteries crop up with every new hire or responsibility change, wasting valuable time solving the same problem over and over. With knowledge management, systems are put in place to collect the answers and make them more accessible. This approach can be used anywhere in an organization but most often makes sense in customer support applications. Applications can include compiling solutions to MIS problems, offering human resources support for employees and providing self-service support for retail customers in many industries.

Though it's more a business model than a technology, knowledge management incorporates new technologies as they appear. Organizations networking their PCs in the late 1980s and early 1990s enabled more employees both to use and contribute to early knowledge management systems. These systems depended on centralized databases in which employees entered information about their jobs and from which other employees could seek answers.

Knowledge management systems have always relied on data management technologies such as relational database management systems, data warehousing and data cleansing. To track and analyze how knowledge management systems are being used, managers turn to the reporting utilities in their database systems. Such reporting tools also help generate knowledge for the organization and manage existing knowledge assets.

Practitioners of knowledge management have been quick to adopt advances in groupware tools, too. Distinguishing between knowledge management and groupware can be difficult: Knowledge management systems often rely on groupware technologies such as Lotus Notes, and, by definition, groupware facilitates the exchange of organizational information. One telling difference is a knowledge management system's emphasis on identifying knowledge sources, knowledge analysis and managing the flow of knowledge within an organization—all the while providing access to knowledge stores. The knowledge management model regards the sum of all knowledge within the organization as its "intellectual assets," and provides tools for managing those assets.

As a management tool, knowledge management systems require technology as well as consultants who advise on how to handle knowledge audits, analysis and flow. And knowledge management consultants are quick to apply new technologies. Over the past few years, just as groupware applications shifted from proprietary client/server models to a platform-agnostic Web model, knowledge management's embrace of Web technologies has extended its usefulness and cut costs. Web-based knowledge management systems require no (or minimal) change to users' desktops and can be simpler to install and administer.

More recently, knowledge management systems started using XML to identify relevant data elements and extract knowledge from them both in and out of the organization. XML offers document schemas and tags, allowing readers to collect meta-information about each piece of information. For example, a data object marked "" in a help desk application is more likely to have useful answers than one marked "."

Is It for You?

Knowledge management requires buy-in at the very highest levels of an organization. Costs can be quite high, as off-the-shelf products are unlikely to solve the typically massive and complex challenges facing large organizations. And knowledge management systems are rarely useful outside of large organizations. As a result, high costs for software and hardware may be dwarfed by

consulting fees for customizing knowledge management software or creating customized in-house applications.

Ultimately, whether you build or buy, creating a knowledge management system represents a significant management decision—one that must have support throughout the organization.

The Case Of PMGT Inc.

In an attempt to map Knowledge into a Database Model, we used the knowledge of an actual organization located in Montreal, Canada. PMGT inc. is a company that manages a real estate portfolio of about 1200 residential units, mostly rented to individuals. The company has over the years gathered extensive knowledge and vast experience in the various processes evolved around the management of rental units. This involves several uncontrolled factors, such as the credit checks of the candidates, references from employers and previous landlords, and so forth. Another important external factor is the Government legislation involved with the leases signed by parties. The lease itself, is a legal document and must obey to certain rules which are out of control, at the organization level. All these factors combined with the internal factors upon which the organization relies, make the Rental Management macro process, quite complex.

From the beginning PMGT had to divide the entire process into sub-processes which are outlined later on this article. All are presently well documented in various computer files, mostly Excel and plain text documents containing company's procedures to follow. This is the ''Knowledge Center'' and anyone acting on behalf the company, must follow the instructions, and the prescriptions outlined in details in those files. The Company also uses a standard Program for Property Management, used by many other Property management firms. The program is catered to respond to the country's juridical environment and context, managed by a government body called the Rental Board. These combined Resources are presently, the KM system of the company. PMGT Inc. has been using its KM rudimentary system, for any given situation which must be addressed, according to the company policies. The directors are very strict about following all the steps and actions, exactly as documented in the Procedures. Along the course of its use, it was evident that the system had many flaws. First, the employees complained it was often difficult to locate the right Knowledge pertaining to a given situation. At other times, it took a long time to find and access, and in some cases, it was reported that the Knowledge used was incorrect and even erroneous. This may be explained by the fact that the Knowledge stored

was imprecise, incomplete, and very often, was not up-to-date. These factors had negative repercussions on the quality of the decisions taken by the employees, to the point that it affected the global performance of the company in managing its properties in an effective way.

In other words, Management did not have a method of ensuring accountability for actions and decisions taken by employees, since the actual system could not provide the authors and origin of the Knowledge, nor the subjects who enacted the actions and decisions. At this point, the managers wanted to improve and bring their actual KM system, to the Next level, as they called it. This is when we stepped in, to use this opportunity as an experimental base for our study. We knew from the beginning that the resources of this small organization are not sufficient to maintain a very sophisticated KM program such as LOOM.

PMGT Inc, has managed real estate residential properties for more than 25 years. Along the years, it has accumulated most valuable experience in the various processes involved in their activities. The change and mobility of the employees and the will to retain all their experience in place, has motivated the company to invest in a Knowledge System where the objective is to capture the knowledge and store it as quickly as possible, in order to make it easily available to all employees. PMGT has established an edge over its competitors in terms of effectiveness and it is now the time to build a more structured KM tool . Our goal is to bring forward the present rudimentary system into an automated one which could be accessible in effective and secure manners. We must design and develop a more structured system, which will be mainly stored and supported by a Relational DBMS and later, if necessary, coupled with XML files. Our priority is the storage aspect of all the actual knowledge, held in these documents.

Knowledge Storage

Most knowledge management activities are a combination of business processes and information technology (Bukowitz, W. and Williams, 1999). In our KM system we are indeed using Business Processes, or as we call them, working processes. We investigated the literature and found that several authors have mentioned DBMS as means of Knowledge storage. *In terms of technology, most current knowledge management activities rely on database and internet systems: it is typically stored in databases either as simple tables or semi-structured text (for example, in Lotus Notes)* (Preece et al, 2001). In order to retrieve Knowledge in the best and most secure way, we must capture it in a system which allows rapid selective queries in a controlled environment. Therefore a DBMS is a good

effective tool. *Knowledge is broken down into permanent atomic "facts" which can be stored in a standard relational database and processed very efficiently. It also provides for the efficient querying of a knowledge base, efficient inference of new knowledge and translation into and out of natural language. Queries can also be processed with full natural language explanations of where the answers came from* (Tunstall-Pedoe, 2006).

How Is KM Stored?

Knowledge, in all of its forms, whether explicit or tacit, includes rules, steps, actions and so forth, must be stored in some manner.

- This order seems to be from the least to the most sophisticated tool.
- Plain or structured (ex groupware program) text format
- Hyperlink form using XML, used mainly within the Internet environment, XML is specialized to manipulate libraries. XML's purpose is to aid information systems in sharing structured data, especially via the Internet, (Bray et Al, 2006). The data is defined in a Hierarchal format, which enables, for example, a library, to input the reference data of all its the books. The user interface for entering the data is in a form of a Table. XML, the interface, will be a table, but the storage is Internet compatible using hyperlink, to access another structure, related to the present information linked..
- Database structures
- Sophisticated and costly KM representation systems such as Classic, Loom or G2, which are aimed for the larger scale organizations.
- Combination of the above.

Choice For KM Storage

From the start, we knew that it was an experimental project and as a SME, the option of the more sophisticated options, were discarded. There is little use of sophisticated knowledge representation systems such as Classic, Loom, or G2. Few organizations have a systematic process for capturing knowledge, as distinct from their conventional information-capture procedures (Preece et al 2001). Based on this premise, and based on the author’s experience, a lighter solution was wanted,

an inner solution, a self sufficient one, so as not to depend on any outside resources, using tools, unfamiliar to the employees. We also decided that a solution based on XML platform was not necessary at the moment. We had some evidence that KM can be stored and managed by a DBMS. However, we did not exclude the possibility, that in the course of the project, we may have to combine our system to an XML solution and build a more intelligent, effective and efficient tools, embodying the security of the very confidentiality of the Knowledge, captured in the system. Hence our decision was to start with a simple prototype involving one Process only. We chose the most important one for PMGT that is the Application Rental Apartment, (codified ARA).

Methodology

- We have the list of all working processes, that is: P(A,1) to P(A,n)
- Our Methodology is cautious and will follow this procedure:
- Keep and Maintain the present system in use
- Develop P(A,1) to P(M,1)
- Test P(M,1) in an operational working environment
- Bring the necessary corrections and modifications and validate P(M,1)
- Replace P(A,1) by P(M,1)
- Iterate procedure to all remaining P(A, n)
- Once the cycle is finished, the new system would replace the existing one and would become the operational KM System in use by PMGT.