

DGAM METHODOLOGY TO DESIGN A KNOWLEDGE MANAGEMENT SYSTEM

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The “Subdirección de Ingeniería y Desarrollo de Obras Estratégicas” of “Petróleos Mexicanos” determined that it was necessary to accelerate the evolution of knowledge within this organization, in order to achieve this purpose the “Subdirección de Ingeniería y Desarrollo de Obras Estratégicas” decided to develop and implement a Knowledge Management System. However, when trying to implement a Knowledge Management System, it was found that knowledge management models only provide generic sets of steps on how to carry out Knowledge Management, without specifying how to develop and implement Knowledge Management Systems in any organizations; hence the need of developing a Methodology that may suit the specific purposes required by the “Subdirección de Ingeniería y Desarrollo de Obras Estratégicas”, this four stages Methodology of Knowledge Management, is denominated DGAM. This nomination corresponds to each one of the four stages of the methodology: Determination, Generation, Accessibility and Maintenance.

Keywords: Methodology, Knowledge, Management, System, Oil industry

(Received 22 Oct 2008; Accepted in revised form 10 Sep 2010)

1. INTRODUCTION

According to Agustí Canals (2003), knowledge is a resource that allows individuals to interpret their environment, it is found in people as well as in the objects -physical or not- that these people use, knowledge can also be located within the organizations, the processes and contexts of such organizations. Knowledge is a resource that enables individuals and organizations to take actions

Upon these ideas we may determine that Knowledge Management means improving and optimizing the usage of cognizance, through the creation of the necessary channels and conditions in which such knowledge could be transmitted appropriately, basically what is managed is not the knowledge itself, but rather the conditions and environment in which knowledge is transmitted.

Since, it is required to manage the conditions and environment, so they provide the knowledge management. It is also important to take into account other models of knowledge management that regard human resources experience as its main element. These models are applied through different techniques and tools, in such a fashion that they fit into a Knowledge Management System.

The main reason to develop a Knowledge Management System was the incapacity of traditional management practices to administrate efficiently tacit knowledge and its transformation on explicit knowledge.

This article provides an explanation on what Knowledge Management is, as well as its application within organizations. The writers present the difficulties that caused the Subdirección de Ingeniería y Desarrollo de Obras Estratégicas” to install a Knowledge Management System, the series of analysis performed in this organization, and based on the results shown by these series of analysis, the stages followed to implement a Knowledge Management System, it also explains how other methodologies were used in this process.

2. KNOWLEDGE MANAGEMENT

Firstly, it is necessary to standardize the concepts concerning the use of knowledge management for development of this project, replying to the question that arises when required or read a speech about these topics, ¿What exactly is the management knowledge?.

According Peluffò A. and Catalan Contreras (2002), technically, Knowledge Management is a discipline which aims to create, share and use the tacit knowledge (know-how) and explicit (formal) in a given area (region, city, organization, environment), to respond to the needs of individuals and communities in their development.

However, it is considered necessary to provide that knowledge is to distinguish the data and information, which will take reference as follows:

According to Agustí Canals (2003), knowledge is a resource that not only allows us to interpret our environment, but gives us the opportunity to act. It is a resource that is in people and physical objects-or not-that these people use, but also in the organizations they belong, in processes and contexts of such organizations.

From the foregoing, we may determine that the Knowledge Management is to optimize the use of knowledge by creating the necessary conditions for such knowledge is transmitted best, which requires at first instance to clarify that knowledge differs from the information and establish a knowledge management strategy appropriate¹.

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3. INDUSTRY APPLICATION: DEVELOPMENT AND APPLICATION OF A KNOWLEDGE MANAGEMENT SYSTEM AT THE “SUBDIRECCIÓN DE INGENIERÍA Y DESARROLLO DE OBRAS ESTRATÉGICAS” OF “PETRÓLEOS MEXICANOS”

The “Subdirección de Ingeniería y Desarrollo de Obras Estratégicas” aims to develop the necessary infrastructure for the operation of “Petróleos Mexicanos”, through investments done by the federal government in public works. The “Subdirección de Ingeniería y Desarrollo de Obras Estratégicas” faced two main difficulties the first one was related with temporary personnel and the second with its organizational structure, the size and different locations of the working areas.

“Subdirección de Ingeniería y Desarrollo de Obras Estratégicas” has had a tremendous growth in the area of personnel since it was established 1997. Back then the labor force was only 77 people and nowadays, 11 years later there are 819, this is an increase of 1000%. However 59% of these personnel is temporary, workers that are hired for specific periods of work, and when they leave a great portion of the knowledge that was generated by these personnel is lost, this is the reason why standardization of knowledge has been so difficult.

Employees at “Subdirección de Ingeniería y Desarrollo de Obras Estratégicas” have ten different areas of work, some of these areas are located at different sites, buildings, office, and in some cases even in different states, each area has a specific type of expertise, according to the kinds of works and services they provided. Under these circumstances workloads are difficult to gather as well as the experts, who manage and generate knowledge in each working area,

To sort out these issues, it was required to develop and disseminate guidelines, monitoring mechanisms, and methods of work that involved accelerating the evolution of knowledge of the organization, It was also necessary that generated and required knowledge were managed efficiently².

According to Agustí Canals, there are three drawbacks when trying to manage knowledge, first it is not possible to identify the individuals who have the best knowledge of the organization, second it is difficult to demand these people to transfer their cognizance to others, and third, involving staff members in the task of transferring knowledge is also a problem. To sort out these difficulties is necessary to create devices or mechanisms that activate the collective dimension of knowledge. It is also essential to create a network of relationships among workers, suitable of generating and disseminating knowledge throughout the organization³.

To address the foregoing, it was determined to develop and implement a Knowledge Management System in the field of public works⁴ that uses as its main recourse human capital, which is the source of ideas, knowledge, and creativity⁵. The next part, describe the series of analysis performed to obtain stages to design and development a Knowledge Management System in the “Subdirección de Ingeniería y Desarrollo de Obras Estratégicas”.

Determination of the Required Knowledge: Knowledge management techniques and tools are designed to generate, to transmit and to share knowledge on specific projects; nevertheless, the Knowledge Management System needed by the “Subdirección de Ingeniería y Desarrollo de Obras Estratégicas” was not for a specific project, but rather for the execution of public work system. This situation, made it necessary to consider using a supporting tool that defines the systems and subsystems for public work execution, after consulting the literature on knowledge management system it was determined that The Methodology of Soft Systems in Action by Peter Checklan and Jim Scholess (1994) was the most appropriated supporting tool for this task. Furthermore, this methodology would also clarify the scope of a draft application of Knowledge Management, and define areas of opportunity to make desirable changes and improvements systematically to generate knowledge.

Generation of Required Knowledge: Given the organizational structure of the “Subdirección de Ingeniería y Desarrollo de Obras Estratégicas”, which is located at different work sites, and the fact that each of these sites has a specific field of expertise according to the types of works and services they provided, the workload created by this sites was difficult to gather, not only the amount of cognizance was a problem, bringing together the experts that generate most of this knowledge was a big inconvenient. Therefore, it was considered desirable to create a strategy that would optimize the participation of the experienced personnel that had created and generated knowledge, minimizing the need of physical

presence, it was also very important the participation of these experts in the creation of the Knowledge Management System, this measure, inviting experts to participate, would serve to earn the trust of these experts and motivate their participation, involvement and must important share their knowledge, the specific technique used in this case was "Learning from peers: someone has done before" by Collison Parcell (2003).

Accessibility to Generated Knowledge: Once that the required knowledge has been generated, the next stage was to make these knowledge available throughout the whole organization, it is also required to capture the knowledge. The option was to create a "seat of Knowledge" placed in such a way that it could live along with its "owners", a place of common access. Bearing in mind that variety of working sites of the "Subdirección de Ingeniería y Desarrollo de Obras Estratégicas", and that it already had a communication system, the mandatory channel of communication trough intranet, it was decided to develop a knowledge portal within this official channel. This knowledge portal is a set of personalized contents to which all members of the community will have access, it also includes a set of services that will allow user to find all the knowledge they need in one virtual site, through a single gateway (Peluffo A. and Catalan Contreras, 2002).

Keeping the Generated Knowledge: Given that knowledge is something that is constantly evolving along with the organization. It is required to keep knowledge alive, so it will not remain static, and to make sure that knowledge and organization evolve at the same pace. The option chosen for this purpose is the creation of a database which with the application of knowledge managements tools could be then considered knowledge bases.

Once, that the four previous stages, determination, generation, accessibility, and keeping have been identify, the next stage will be to integrate them to other elements of a specific Knowledge Management System. These elements are general guide lines, objective, scope and definitions. The integration of these elements plus the four previous stages gives birth to DGAM methodology to design a knowledge management system.

The next part describes the requirements that most be fulfilled to create a Knowledge Management System suitable for any organization.

4. DGAM METHODOLOGY TO DESIG A KNOWLEDGE MANAGEMENT SYSTEM

4.0 General Guide Lines

It should define the personnel who will be responsible for the Knowledge Management System in the organization. It is also necessary to appoint a moderator who is acquainted with the methodology, and a heterogeneous group of specialists of the different fields that would be reach by the Knowledge Management System.

Once that those responsible for Knowledge Management System had been found and appointed, the next step would be offering an induction course of knowledge management system in order to standardize the concepts that would be use in the developing of the project itself.

Objective.

It must be established what is main the purpose of the knowledge management project is, in order to find out what is wanted to be achieve ,and thus to be able to define adequately, if any strategies are necessary for achieving the purpose sought.

Scope.

We must establish the scope of the project management knowledge, namely defining at what levels it is intended to be develop, as a design?, as a Development?, or as a deployment?, an if it would be compulsory or indicative. It must establish the areas that would be involved in the development and implementation of project management knowledge.

Definitions.

A vocabulary of the terms that will be use in the project must be established, this vocabulary would include definitions of key terms that would be used throughout the development of the project.

4.1 Determination of the required knowledge

To determine what knowledge is required, the already existing problems within the organization must be analyzed. This is done with the aim of clarifying the organization's needs, it must be established what knowledge is required to generate. Since the resources of any organization are finite it must be redefined what are the changes required. It is also important to precise what situations make necessary to have a knowledge management system.

In order to evaluate the results to be obtained with the knowledge management system, we must assess the level of knowledge of the staff of the organization, to have results that ratify the needs of knowledge previously detected.

The determination of the required knowledge can be achieved through the use of Soft Systems Methodology described in the book "Soft Systems Methodology in Action" by Peter Checkland and Jim Scholes (1994). Furthermore, this methodology helps to recognize problems, and to identify the specific items of knowledge that need to be generated.

"Soft Systems Methodology in Action" by Peter Checkland and Jim Scholes (1994), consists of seven steps whose basic paradigm is the learning process. The seven steps move from the real world, go through an idealization of reality, and then go back to compare it to the observed reality-

4.2 Generation of Required Knowledge

According with the organization where the knowledge is going to be generated and the specific characteristics of the required knowledge, it is necessary to research for techniques and tools that can be applied to the organization, then based on the results of the research, use the ones that fit the aims of the organization better in order to obtain the results sought.

The following list provides some techniques by Collinson and Parcell (2003).

1. Learning From Partners: Someone has done before.
2. Learning While Doing: The moment of reflection.
3. Learning After Doing: When everything is over.
4. Finding the Right People.
5. Knowledge Map.
6. Network Work and Practice Communities.
7. Use what we have learned: Capturing Knowledge.

4.3 Accessibility to Generated Knowledge

According to the characteristics of generated knowledge, and the staff of the organization for whom access to knowledge will be provided, ways to give accessibility to this knowledge should be identify and implement. In this regard, and in accordance with the evolution of technology of information, within the organization itself, it must be established what strategy is considered more appropriate to be applied or adapted for the results that are sought.

Peluffo, Catalan and, Contreras (2002), suggest the following:

“Internet, intranet, extranet. The most used tool to display contents is Internet, and its derivatives, Intranet and Extranet. The basic differences among these concepts are the distinction of public and private. Internet is publicly accessible, while Intranet and Extranet have restricted access; another difference is the target population. The content handled in Intranet and Extranet tends to satisfy a limited number of users, with specific topics for the users, while Internet contents and the number of users are virtually unlimited. Typically Intranet and Extranet are unidirectional tools, designed to deliver specific contents which are handled by a specialized unit.

Portals. A more structured alternative, but with higher administrative cost is a Portal. Portals are defined as sets of personalized contents in which members of a community can access. Portals are usually accompanied by a set of services that allow users to find everything they require in a virtual place, accessible through a single gateway. Portals are closer to desktop tools, since they are designed to deliver ease of use facilities to any member of the organization, in an amicably and graphically pleasing fashion, allowing interaction with other members of the community who have access to the same portal.”

4.4 Maintenance of the Generated Knowledge

In line with the principle of continue evolution of knowledge, and according to the characteristics of the generated knowledge as well as the personnel and organizational goals of managing knowledge, means to give life to this knowledge must establish and implement, this means not letting it become obsolete, at least through the creation of databases, that in turn can be changed into bases of knowledge by applying knowledge management methodologies to them.

5. RESULTS

1. Analyze the implementation of public works through the definition of systems and divide it into subsystems, helped us to define the scope of the implementation of a Knowledge Management System, which facilitated its analysis.
2. Methodology with Soft Systems is achieved identify areas of improvement required in the organization, identifying each subsystem for the corresponding areas of opportunity.
3. Of the management techniques of existing knowledge, to learn from colleagues believe that is recommended for organizations with different work sites and much staff.
4. Convert tacit knowledge to explicit to facilitate their dissemination through of the organizations.

6. CONCLUSIONS

1. Once the specialized knowledge generated by the experts of the organization has been documented, the acceptance of it as true can be achieved. And once this generated knowledge is disseminated through conventional mechanisms compact discs, print media, or portals of knowledge, the standardization of the production processes of the organization can be achieve successfully.

2. The Soft Systems Methodology in Action helps to clarify the scope of application of Knowledge Management, and to define areas of opportunity in which changes and improvements are desirable viable systematically, optimizing the resources to be invested in the implementation of a Management System Knowledge.
3. From the techniques of knowledge management, we believe that “learning from colleagues” is the most recommendable for organizations with work sites located in different places and big staff.
4. It is necessary to turn tacit knowledge into explicit knowledge to facilitate its dissemination through the organizations, in our case, through a seat of knowledge placed in the intranet of the “Subdirección de Ingeniería y Desarrollo de Obras Estratégicas”.
5. With the tools and techniques of Knowledge Management, in addition to documenting the experience of staff organizations, we can make improvements in production processes.

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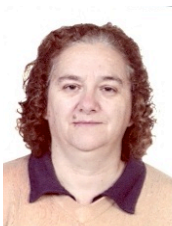
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