

MANAGEMENT OF NUCLEAR INFORMATION AND KNOWLEDGE IN CUBAN INSTITUTIONS

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Abstract. In the framework of the management of information and the knowledge, the Cuban Agency of Nuclear Energy and Advanced Technologies recognizes as needful the establishment of the nuclear knowledge management system. In the rank of the Nuclear Ramal Program are executed projects, with the participation of all the Cuban nuclear institutions, focused to develop the web site and the intranet of the proper agency as support to the process of taking decisions, to develop the networking education system for human resources of these institutions and others that belong to the energy sector in Cuba, to introduce the datawarehousing process for all institutions on corporate levels, to develop technology watching system for all the scientific and technical activities linked to the use and application of the peaceful use of nuclear energy, based on the information and knowledge contained in the databases of INIS, WIPO and RRIAN, between other purposes.

1. Introduction

The Agency of Nuclear Energy and Advanced Technologies (AEN&TA) clusters all institutions committed of the peaceful use and application of nuclear energy in Cuba, which demands a wide domain of the capabilities and an inherent knowledge for technicians employee and a part of the personnel linked to the nuclear specialties, the application of the generated and accumulated information in databases and the organization in an integral culture that allows the socialization of the generated and acquired knowledge, supported on a solid infrastructure based on the use of the information and communication technologies. That's why the AEN&TA recognizes as main priority the establishment of the nuclear knowledge management system, being necessary the assimilation by its technicians and specialists of the technologies in the state of art for the framework of the knowledge management, which have been developed and applied successfully in several contexts.

2. Experiences for the institutionalization of the management of information and knowledge in organizations belonging to the Agency of Nuclear Energy and Advanced Technologies

The Nuclear Energy Information Centre (CIEN), actually denominated the Energy Development and Information Management Centre (CUBAENERGIA), is committed since its foundation of the management of the information about the peaceful use and application of nuclear energy in Cuba and the world and as centre representing INIS in Cuba has the function to distribute the output products of this system: the base of data in CD-ROM, the referative review INIS Atomindex, between others, and also to select, to process and to send the generated articles in Cuba about the included material in the INIS agenda.

Taking into consideration the obtained results by CUBAENERGIA on the establishment of own strategies for institutionalization of the process of management of the information, knowledge and TIC (1) and the development of its corporate intranet site through of the project denominated "Development of the corporate intranet site of CIEN and AEN"(2) so as of its Corporate Intelligence System (3), this organization has been designed by the AEN&TA to coordinate the institutionalization of the processes of information and knowledge management to level of agency, so its specialists have headed projects focused:

- to develop the executive intranet of the AEN&TA, for the management of the corporate information as support to the process of taking decisions;

- to develop the web site of the AEN&TA;
- networking education system for human resources of the institutions belonging to this agency;
- application and implementation of datawarehousing process for all institutions on corporate levels;
- to develop a methodology to evaluate the impact of applied projects of Nuclear Ramal Program;
- approaches and concepts for managing nuclear information supported on a collective catalogue of scientific and technical publications of nuclear profile;
- application of technology watching system for all the scientific and technical activities linked to the use and application of the peaceful use of nuclear energy;
- to promote and disclose the peaceful, efficient and safety use of nuclear energy, to evaluate a perception on Cuban population about the use of nuclear energy.

These projects are co-operative efforts between all the institutions belonging to AEN&TA and have required of the introduction of the TIC as support to the institutionalization of these processes to level of each organization and level of agency.

2.1 AEN&TA's executive intranet site

The AEN&TA has an executive intranet site, which has been created and developed as part of the project denominated "Development of the executive intranet site of the AEN&TA" (4). This executive intranet site is supported over a virtual private network (VPN), which has a technical architecture composed by a VPN server, allocated in CUBAENERGIA, and VPN clients in each organization belonging to the agency (Fig. 1). In this VPN connexion the private data is encapsulated and encrypted to guarantee your confidentiality.

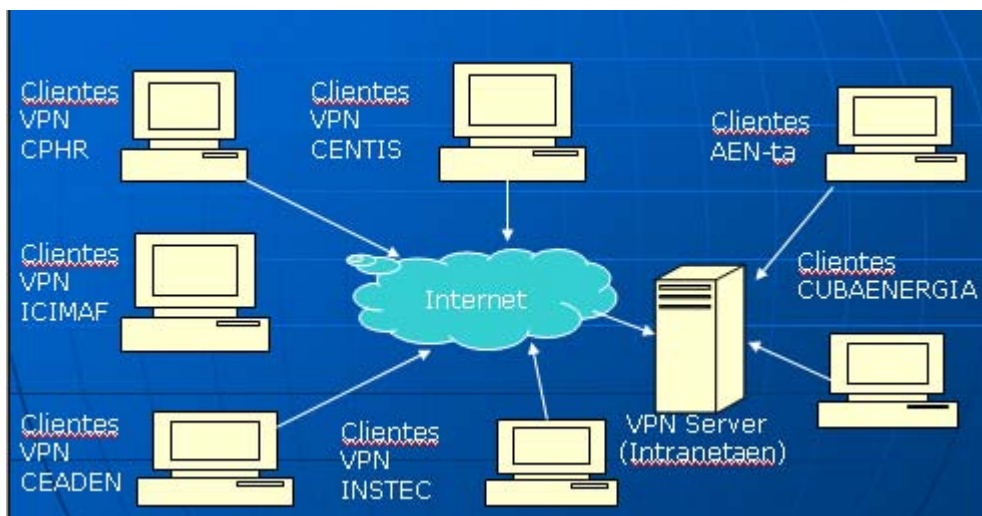


Fig. 1. AEN&TA's Virtual Private Network.

The executive intranet site of the AEN&TA, in continuously development, has seven dynamic applications developed over Web technology and focused to management the information relative to: organization, corporative documentation, projects, human resources, economic results, international collaboration and INIS Data Base.

2.2 AEN&TA's portal

The AEN&TA has, also, a portal (<http://www.aenta.cu>) (Fig. 2) as corporative image in Internet, which was created as part of the project denominated "Development of the Web site of the AEN" (5).



Fig. 2. AEN&TA's Web site

Through this portal the AEN&TA announces information relative to: mission and purposes of the agency, Nuclear Ramal Program and applied projects so as its main results, institutional directory, services and products, etc. Each organization belonging to the agency must develop and support his own Web site linked to the AEN&TA's Web site.

This portal is considered as the image in Internet of the nuclear sectorial node belonging to the network of the Cuban Energy National System (6) and is also linked from the REDENERG portal (<http://www.energia.cu>) of this network.

2.3 Web system for learning to distance of the human resources belonging energetic sector in Cuba

With the purpose to guarantee the continued capacitation of the human resources, independently of its territorial allocation and available time, was developed the Web system called LaEscuela (7) (Fig. 3) as part of the project "Implementation of a system for learning to distance" (8), allowing the socialization of the generated and acquired knowledge through of the process of use and application of nuclear energy with peaceful purposes, so as others technologies. This platform can be accessed by all institutions belonging to AEN&TA through Internet.

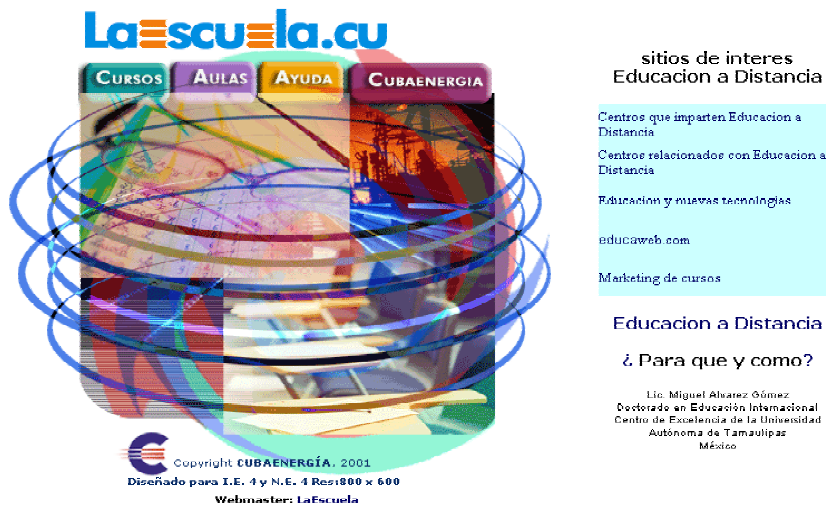


Fig. 3. LaEscuela Web site for learning to distance

2.4 Introduction of datawarehousing process for all institutions on corporate levels

As is known, the creation, exploitation and support of the datawarehouse enterprise constitute the state of art on the use of the TIC as support of the information management process. So, the strategy for implementation of the process of the knowledge management designed in CUBAENERGIA predisposed the introduction of the datawarehousing process in this organization through of the project denominated “Development and implementation of a methodology to discover knowledge in corporative database as support to the organizational making decision process” (9). It constitutes the first step to introduction of datawarehousing process for all institutions belonging to AEN&TA on corporate levels and also will allow managing great volume of information derived of the application of the nuclear technologies in several social and economic contexts, inclosed the information derivated of the Cuban Nuclear Ramal Program.

The get results of this project were: the Web site called Red del Conocimiento with the main purpose to allow the creation of an organizational culture about knowledge management and the datawarehouse enterprise (Fig. 4), which required the modellation of the facts: Sales, Purchases and Human Resources. The latest fact included the management of the Human Resources by competences and by time.



Fig. 3. Entry point to CUBAENERGIA's datawarehouse enterprise

2.5 A methodology to evaluate the impact of applied projects of Nuclear Ramal Program

The Cuban Nuclear Ramal Program constitutes an important tool to introduce of nuclear technologies in the socioeconomic life in Cuba. An adequate management of it requires: the quantification of the results, the organization of its available information in electronic format to make easy the access to them and the diffusion between the interested public, so as the generalization of the results, which is considered as the implementation of the necessary actions to diffuse them and its application in other organizations. This process allows elevating the impact of the got results and guarantees the ownership of the program.

The got results behind the evaluation *ex-post* impact of the first convocation of the Nuclear Ramal Program were presented in the article "Evaluation of the results of the first Nuclear Ramal Program" (10). The used method is based in the hierarchical analysis of the purposes of the program. In each level were setting the similar elements with impact in high levels. At each element is associate a weight according to its importance. The Saaty's method was used to weight and the weights are calculated according to the predominance of each element compared two to two. The assignation of the predominances of the each aspect to consider so as the evaluation of the contribution of each project at the indicator of successful of the results was based over the judgements of the experts according to the analysis and the systematization of the recompiled information.

2.6 Management of the information of nuclear profile

A catalogue (11) has been developed to compile the scientific and technical publications of nuclear profile available in cuban nuclear institutions, according to like methodology proposed by institutions as BIREME to develop OPAC. To create and support its Unified Database was selected the WINISIS system and to process the information were assumed the INIS's Reference Manuals. To recover the bibliographic records of the database was coded a conversion program of the automatized information using the CD/ISIS utilities. An interface was developed with WWISIS to consult information by the users. Additionally was elaborated a proceeding to make up-to-date the information.

The review Nucleus, referenced in the database INIS and with arbitration, establishes an space for diffusion by cuban researchers, specialists and technicians of the jobs produced with

scientific rigor about topics relatives to the nuclear energetic, several applications of nuclear technical, nuclear safety, radiological protection, safeguards and no proliferation, nuclear energy and public information, etc.

2.7 Technology watching system for all the scientific and technical activities linked to the use and application of the peaceful use of nuclear energy

The technology watching as organized, selected and permanent form to get information from the exterior of the organizations, to analyze and to convert it in knowledge to support the making decision process with lesser risk possible, is considered by AEN&TA as an important element and complementary of its strategy to introduce the knowledge management process in its institutions. So, actually is executed the project denominated "Technology watching system for the information and knowledge management in the use and application of energy" (12), with the main purpose to implement a service to watch and to analyze the world tendencies relatives to the use and application of the peaceful use of nuclear energy.

The technology watching system in developing is based on the information and knowledge contained in the databases of INIS, WIPO and RRIAN and will support a service composed by three steps: consult of information in the databases cited and other source information, processing and analysis of the information, confection and deliver of the final report. The final product is delivered in hard copy and CD-ROM.

The celebration of events like the Workshop of the applied scientific-technical information, the National Workshop of Knowledge Management in Energy and the National Seminar of Information on Energy, with an important and a decisive support of the OIEA, coordinated by CUBAENERGIA has allowed to create spaces for discussion on these topics and to share the experiences of the institutions in the implementation of processes of information and knowledge management, starting from the design and implementation of own strategies.

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