D&D Knowledge Management Tool - 9098

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ABSTRACT

D&D work is a high priority across the DOE Complex. Subject matter specialists (SMS) associated with the different ALARA (As-Low-As-Reasonably-Achievable) Centers, DOE sites and D&D community have gained extensive knowledge and experience over the years. To prevent the D&D knowledge and expertise from being lost over time, the Department of Energy and the Applied Research Center (ARC) at Florida International University (FIU) proposed to capture and maintain this valuable information in a universally available and easily usable system. The web-based D&D Knowledge Management Information Tool (KM-IT) is being developed to preserve the D&D information generated and collected by the D&D Community.

INTRODUCTION

The D&D KM-IT is a web-based knowledge management information tool custom-built for the D&D user community by the Applied Research Center (ARC) at Florida International University (FIU) in collaboration with the Department of Energy, the Energy Facility Contractors Group (EFCOG), and the ALARA Centers at the Hanford and Savannah River Sites.

D&D KM-IT will serve as centralized repository and will provide common interface for all D&D related activities. The main purpose of this process is to improve efficiency by reducing the need to rediscover the knowledge and to promote reuse of the existing knowledge. D&DKM-IT is a community driven system. It will facilitate in gathering, analyzing, storing and sharing knowledge and information within the D&D community.

D&D KM-IT has the ability to define, store, categorize, index and link digital information corresponding to D&D problem areas. The system has the capability for users search for and subscribes to relevant content and present the content with sufficient flexibility to render it meaningful and applicable across multiple contexts of use.

Too frequently, people in one part of the D&D community "reinvent the wheel" or fail to solve problems quickly or in an optimum fashion because, while the knowledge they need may exist elsewhere, it is not known or accessible to them. This knowledge management tool will help to enhance collaboration and knowledge sharing while building upon the D&D knowledge base within the EM's D&D community. As the generational cycle of the D&D cleanup progresses into the future the knowledge pool and its best practices for D&D applications will expand.

D&D KM-IT will promote knowledge innovation where new knowledge will be created and converted into valuable goods and services. This tool will provide an environment where creativity and learning will flourish and knowledge will be encapsulated in a form that can be applied.

D&D KM-IT will get the right content to the right people at the right time and in the right form. It will use the World Wide Web as the primary source for content in addition to information entered by the subject matter specialist and D&D community.

In this paper, FIU ARC will present various modules of the D&D KM-IT that are designed to capture information from D&D community and build the knowledge base for future use. Figure 1 shows the high level components of D&D KM-IT.
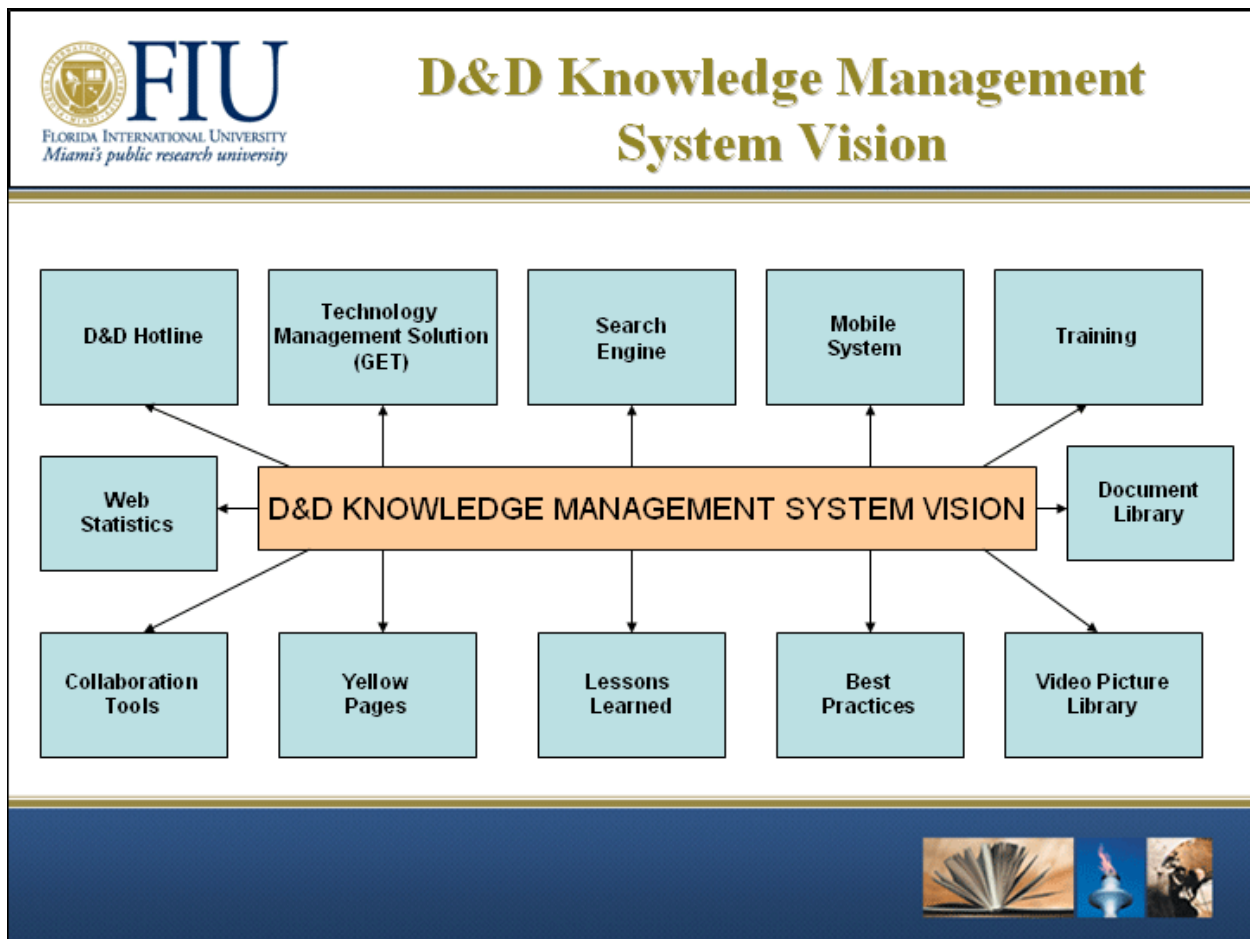

Figure 1 D&D Knowledge Management Components

MATERIALS AND METHODS

The requirement from DOE Headquarters was to develop a repository and a dynamic system that will make excellent use of the knowledge that exists within the D&D community by allowing D&D project managers around the DOE complex to share innovative ideas, lessons learned, past experiences, and practices.

D&D KM-IT will be developed and deployed in multiple phases, providing solutions to the D&D problems, sharing best practices, yellow pages, customized web searching, technology solutions etc. It will evolve as a centralized high-end knowledge repository where D&D scientists and engineers can search for information related to their field of expertise.

Underlying system and information technologies will provide shared conceptualization to describe people, process and content. They will provide a semantic framework from which information can be harvested, modeled, published, retrieved, used and shared. The next generation of information technologies will be used to create, manage and extract value from their knowledge assets and to integrate these technologies to create a complete approach to the knowledge life cycle.

As there was no off-the-shelf computer application or integrated solution available for building the D&D knowledge base, ARC is building an approach that will service the DOE complex with a, high performance, n-tier web-based system for capturing the information from the DOE sites/faculties, ALARA centers and D&D community as a whole.

This system is being built using Microsoft.net framework, SQL server 2005, Crystal Report and SQL server reporting services. Visual Studio 2005, Dream Weaver and Photoshop were also used as development tools to construct the system.

RESULTS AND DISCUSSION

D&D Knowledge Management Information Tool can be accessed from web address www.dndkm.org. The system home page is shown in Figure 2. It provides the interface that connects to various components of D&D KM-IT

Figure 2 D&D KM-IT Home Page

D&D knowledge Management is the overall strategy, approach or philosophy followed to build the D&D KM-IT which the information tool integrating knowledge management in the D&D area. Following are some of the components or modules of D&D KM-IT that are successfully developed and deployed.

- **D&D Hotline**
- **Technology Management**
- **D&D Yellow Pages**

D&D Hotline will provide the framework where registered users post problems over the web in any of the supported functional groups (i.e. Deactivation & Decommissioning) and functional category (i.e. characterization, decontamination, dismantlement, size reduction, worker's health & safety, etc). Once the problem is submitted to the SMS assigned to the specific technology area, it will be reviewed / analyzed by the assigned SMS. The SMS can provide multiple suggested solutions to the posted problem based on knowledge, experience, and any electronic/physical information repository available. Once the solution is developed, the **proposed** solution(s) to the problem will be submitted to a content coordinator for review and publication. The content coordinator will review the content of problem and all the solutions provided for the problem. If the content coordinator rejects the problem and solution, it will revert back to the SMS with the content coordinator's comments. The SMS will review the comments and make the necessary changes to the solution and again submit it for the content coordinator's approval. Once approved by the content coordinator, the problem, along with all of its solutions, will be published in the D&D KM-IT and will be available for viewing by all users. The complete workflow detailed above will be managed by the D&D Hotline system. Main features of the D&D Hotline are shown in Figure 3.
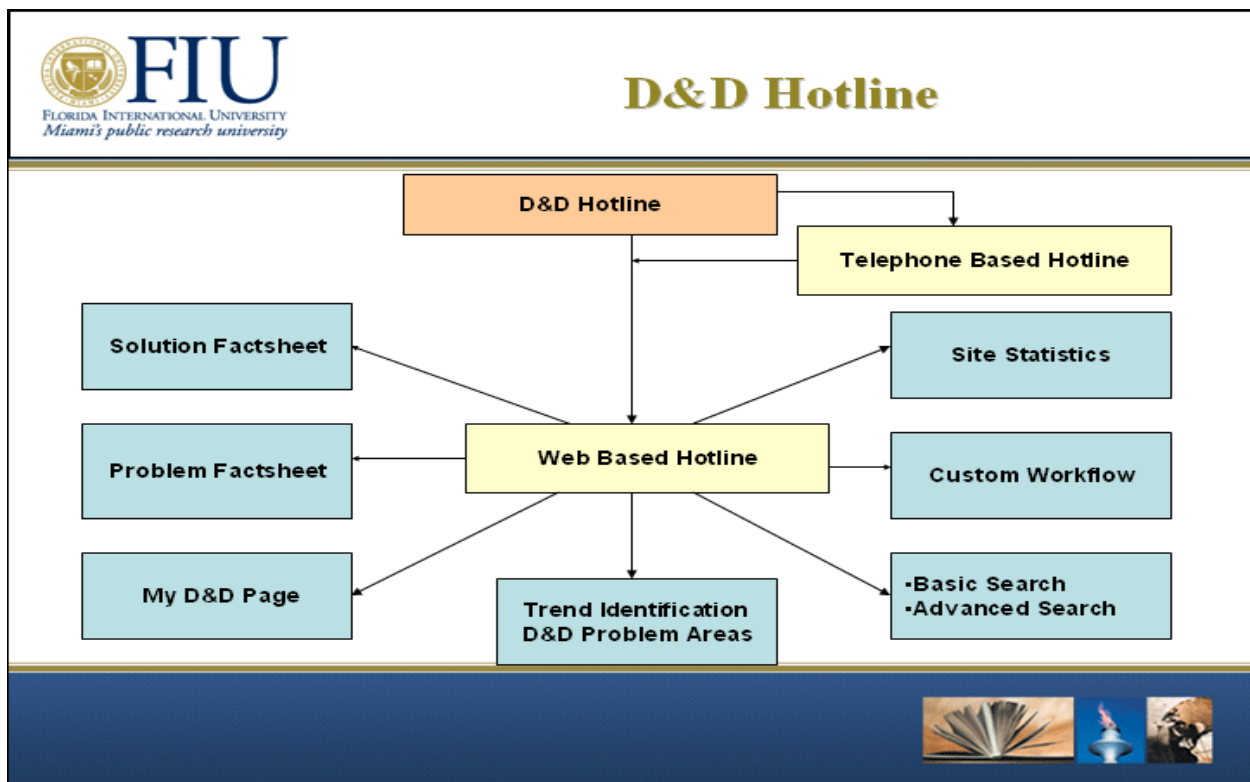
Figure 3 D&D Hotline

D&D Technology Management maintains and enhances technology and demonstration information repository to provide the D&D community with easy access to up-to-date information on technologies used in the deactivation and decommissioning of facilities. It facilitates collaboration on technology development, improvement, and deployment by providing a vehicle for information and experience exchange between developers, manufacturers, vendors, and users of technologies.

Project managers will have a comprehensive, easily accessible source of information on technologies that are beneficial to their remediation projects. Technology users will be able to share information and lessons learned which can significantly improve work methods and result in savings in cost and time. Main features of the D&D Technology Management solution are shown in Figure 4.
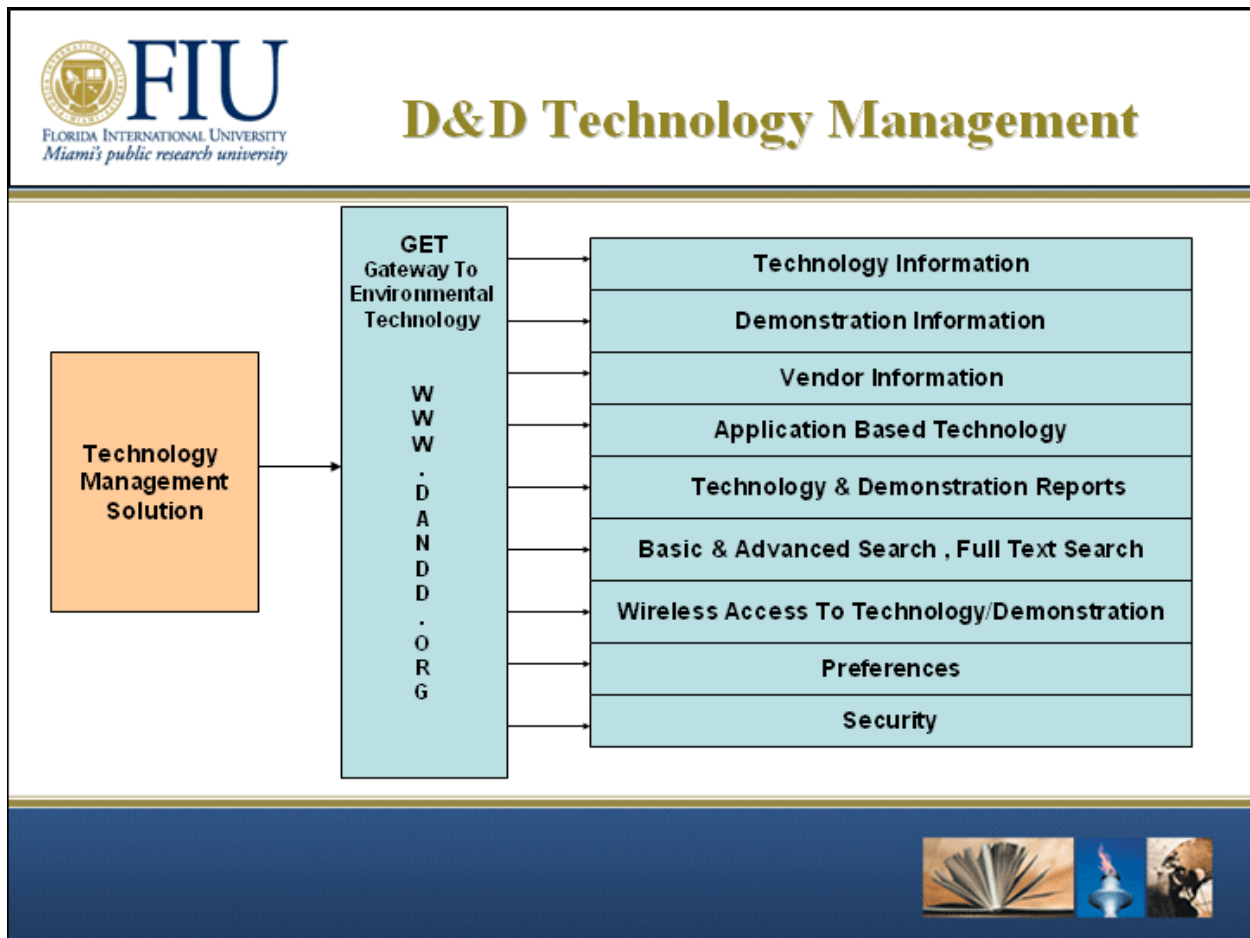

Figure 4 D&D Technology Management

D&D Yellow Pages provides a directory of D&D experts around the DOE Complex containing their contact information and technical area (areas) of expertise. System allows experts to register with yellow pages directory. They can choose to become subject matter specialists in the selected areas. D&D community can access the expert information through this module.

CONCLUSION

D&D KM-IT will provide single point access to all D&D related activities through its knowledge base. It is envisioned to be a community driven system. D&D KM-IT will make D&D knowledge available to the people who need it at the time they need it and in a readily usable format. It will use the World Wide Web as the primary source for content in addition to information collected from subject matter specialists and D&D community. It will bring information in real time through web based custom search process and its dynamic knowledge repository.

Future D&D KM-IT developments include D&D web crawler- dynamic customized D&D search engine; Vendor management-contact information of D&D technologies vendors, D&D mobile system-D&D KM-IT information on wireless devices; lessons learned, D&D best practices, video/picture library, document library, collaboration tools, etc.