D&D Knowledge Management Information Tool – 2014 - 14190

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ABSTRACT

The Knowledge Management Information Tool (KM-IT) is a web-based system developed to maintain and preserve the Department of Energy's (DOE's) D&D knowledge base. The system was developed by Florida International University's Applied Research Center (FIU ARC) with the support of the D&D community, including the DOE Office of Environmental Management, and with the active collaboration and support of the DOE's Energy Facility Contractors Group (EFCOG). The KM-IT system is a D&D community driven system tailored to serve the technical issues faced by the D&D workforce across the DOE Complex.

This KM-IT web-based interactive system is operational and available for use at www.dndkm.org. The application has a fresher appearance and more intuitive navigation. D&D KM-IT is currently composed of the following modules: Web Crawler, Hotline, Technology, Document Library, Specialist Directory, Lessons Learned, Best Practices, Video/Picture Library, Vendors, Training, Collaboration Tools, and Industry News. The Web Crawler dynamically searches through the D&D KM-IT repository as well as the web and displays search results based on the search criteria. The Hotline allows registered users to post questions/problems related to D&D and to receive solutions from a subject-matter specialist. The Technology module serves as a repository of D&D technologies and contains technology/ demonstration fact sheets and vendor information. D&D community members can add Lessons Learned, Best Practices, and Pictures/Videos to the D&D KM-IT repository, after a formal approval process. The Vendor module provides a directory of commercial vendors who provide D&D related technologies, supplies, and services. D&D KM-IT makes excellent use of the knowledge that exists within the D&D community by allowing D&D project managers around the DOE complex to collaborate by sharing innovative ideas, past experiences, and practices and by maintaining a directory of subject matter specialists. The mobile version of the KM-IT can be accessed from m.dndkm.org and currently has four active modules: Vendor, Technology, Picture and Specialist Directory.

Knowledge management (KM) is the practice or process responsible for gathering, analyzing, storing and sharing insights, experiences, knowledge, and information within an organization or community. The main focus of KM-IT for the D&D community is to enhance safety through improved efficiencies (e.g., by reducing the need to rediscover the knowledge and experience gained over time and to promote the reuse of the existing knowledge). KM-IT serves as a centralized information repository and a common interface for D&D related activities. It facilitates the gathering, analysis, storage and sharing of knowledge and information within the D&D community.

The KM-IT system is continuously updated and enhanced by incorporating feedback from the D&D community, DOE, and EFCOG. This year, developments include mobile access for

Hotline, Community Contribution and Popular Technologies. The overall objective is to develop a high-end sophisticated and secured system that will serve as a single large knowledge base for all of the D&D activities across the DOE complex.

INTRODUCTION

D&D KM-IT serves as a centralized repository and provides a 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. It facilitates the sharing of knowledge within the D&D community by gathering, analyzing, storing and displaying D&D related information.

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 ability to allow users to search for and subscribe to relevant content and presents 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 helps 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 promotes knowledge innovation where new knowledge will be created and converted into valuable goods and services. This tool provides an environment where creativity and learning will flourish and knowledge will be encapsulated in a form that can be applied.

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

In this paper, FIU ARC will present the various new modules added to D&D KM-IT in fiscal year 2013-2014 that are designed to capture information from the D&D community and build the knowledge base for future use.

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 is being developed and deployed in multiple phases, providing solutions to the D&D problems, sharing best practices, a specialist directory of D&D experts, customized web searching, technology solutions, etc. It is a centralized high-end knowledge repository where D&D scientists and engineers can search for information related to their field of expertise.

The underlying system and information technologies provide a shared conceptualization to describe people, processes and content. They provide a semantic framework from which information can be harvested, modeled, published, retrieved, used and shared. The next generation of information technologies is being 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 has built an approach that is servicing the DOE complex with a high performance, n-tier web-based system for capturing the information from the DOE sites/facilities, former ALARA centers, EFCOG and the D&D community as a whole.

This system was built using Microsoft.net framework®, SQL server 2005®, 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 KM-IT can be accessed from the web at www.dndkm.org. The system home page, shown in Figure 1, provides the interface to connect to the various components of D&D KM-IT. The D&D KM-IT home page was completely redesigned and given a fresh look to address the needs of U.S. and international D&D community members.

D&D knowledge management is the overall strategy, approach or philosophy followed to build the D&D KM-IT, which is the information tool integrating knowledge management in the D&D area. The following are the new components or modules of D&D KM-IT that were successfully developed and deployed in fiscal year 2013--2014:

- Community Content Contribution Process
- Hotline Mobile System
- Popular Technologies

Community Content Contribution Process

To further community awareness to knowledge management, a community contribution module has been added to the KM-IT in the hopes of fostering greater community contributions in the area of D&D. The content displayed includes short, precise and quickly readable highlights about how to begin contributing to the information contained in each module. This component lists all the features of KM-IT with short descriptions, links to each module's help page, and informs the user on uploading or adding content to the KM-IT's various modules. Community Content Contribution is integrated with the homepage of KM-IT. This provides users with readily accessible information on how they can participate in the knowledge management goals of the D&D KM-IT.
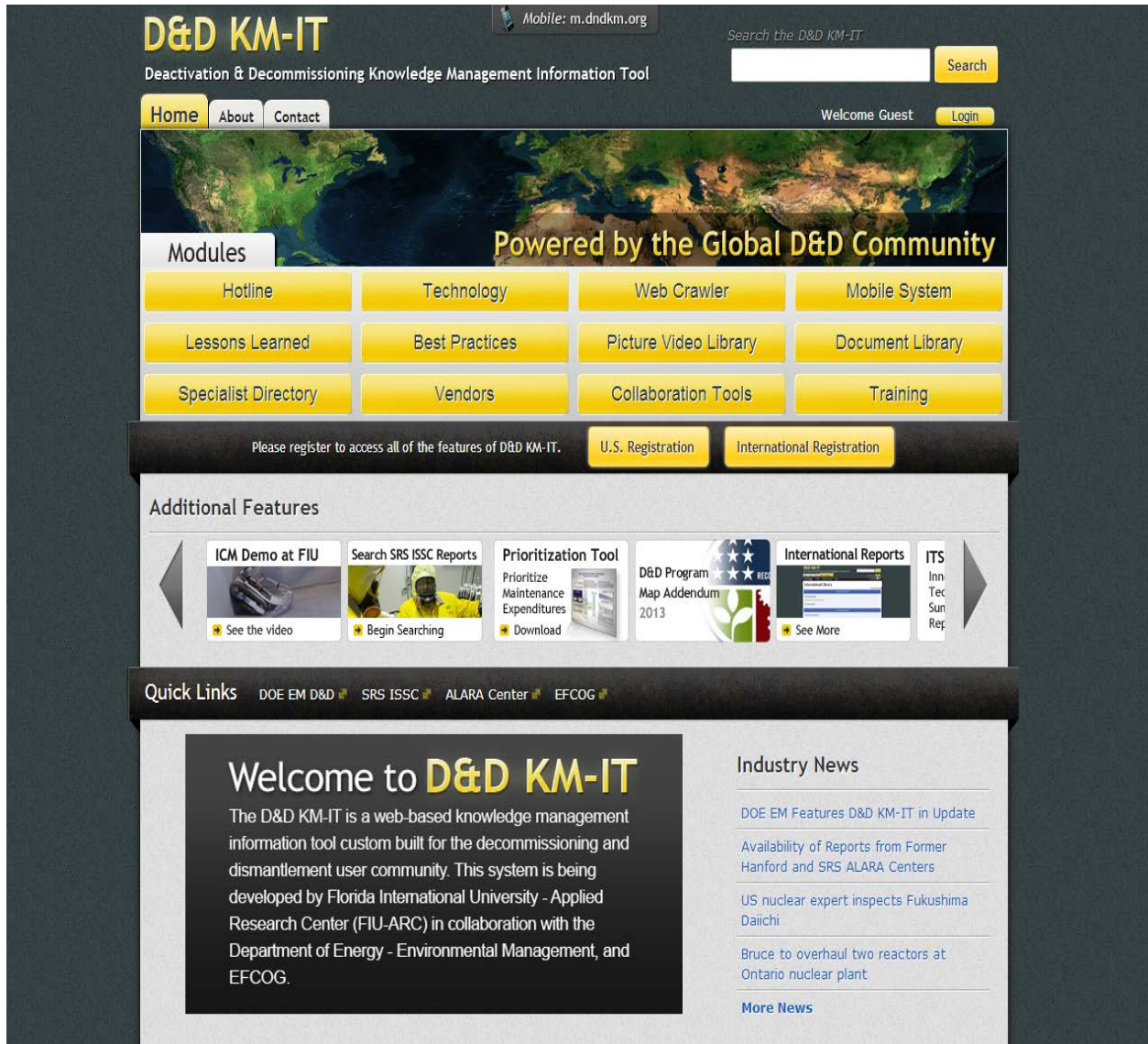
Fig. 1. D&D KM-IT home page

Hotline Mobile System

In the past, access systems in telecommunications or computer networks were mainly based on fixed wired access, making the device immobile. The introduction of wireless access technologies allowed a higher degree of mobility. This enabled users to communicate or to transfer data independent of their current location or their movement. A second important aspect was the removal of cumbersome cables from the network system on the client side. Wireless access focuses on bi-directional connections between the user's wireless device and a counterpart on the network side.

The mobile system for D&D KM-IT provides access to important features of the system through wireless devices. Hotline for mobile devices provides the framework where users can search

through the posted problems published over the web and look for a problem and solution title and description in any of the supported functional categories (e.g., characterization, decontamination, dismantlement, size reduction, worker health & safety, etc.). FIU ARC has developed Hotline mobile applications targeting currently popular mobile devices like iPhone, Blackberry, Android and Windows along with tablets like iPad from Apple and Surface from Microsoft. The mobile home page and search results are shown in Figure 2.
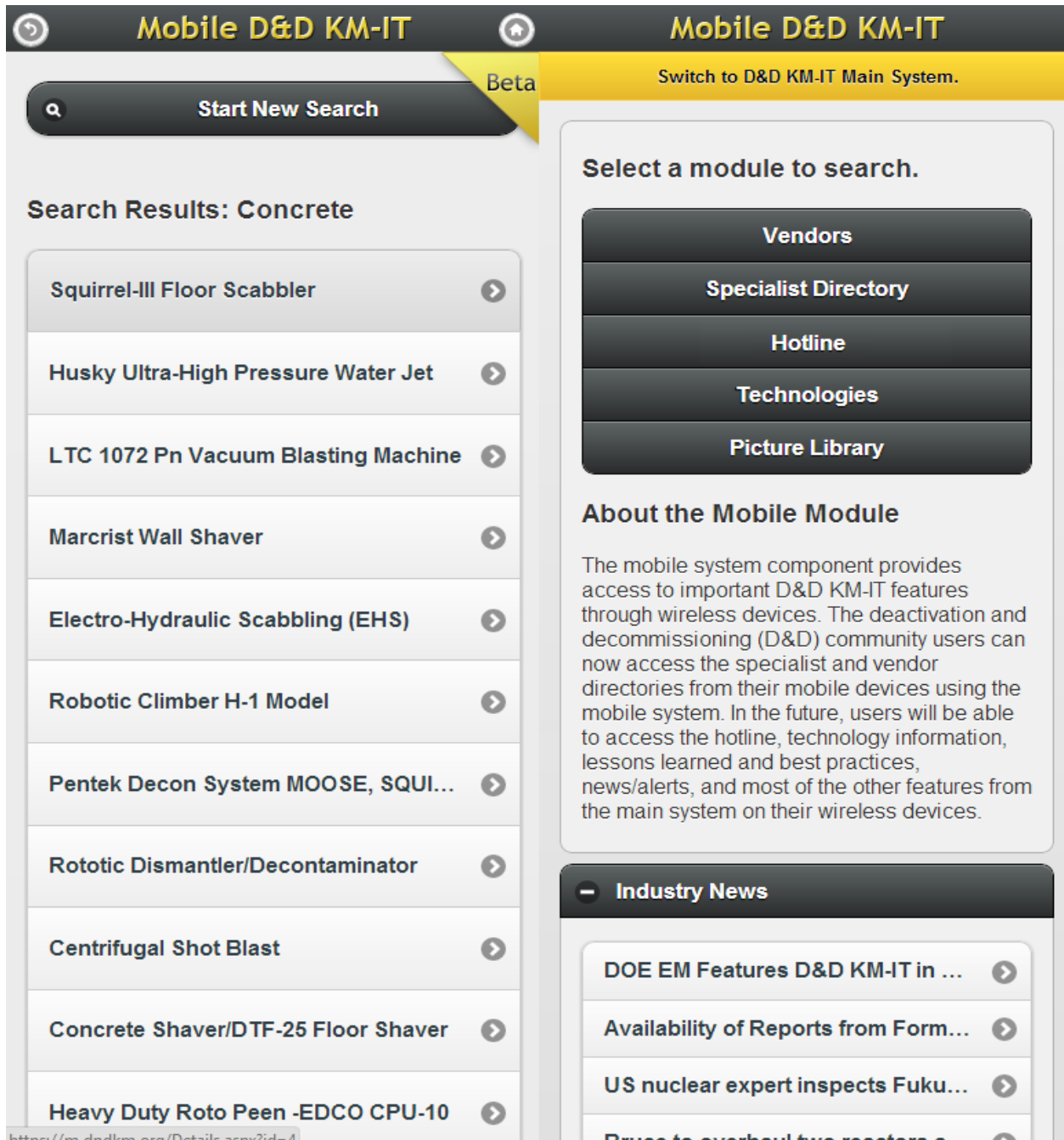
Fig. 2. Hotline mobile system

Popular Technologies

Google Analytics is used to study the user behavior and the keywords being used to search the technologies. The technologies which are most popular or the keywords that are most frequently used are identified and displayed on the technology search page. Page views are recorded by the KM-IT system and utilized to provide further user retention. The most viewed content, relevant to the content being viewed, is displayed under the "Popular Technologies" section so that users have additional navigation options on detail or content pages. Figure 3 shows Popular Technologies on the technology search page.

Fig. 3. Popular technologies

CONCLUSION

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

Future developments include publishing content in various modules of KM-IT like Hotline, Technology, D&D dictionary, Document Library; providing D&D information access on mobile devices for desktop modules. The goal is to deploy a high-end sophisticated and secured system to serve as a single large knowledge base for all the D&D activities. The system consolidates a large amount of information available on the web and presents it to users in the simplest way possible.

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