

## **D&D Knowledge Management Information Tool – 2012 - 12106**

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### **ABSTRACT**

Deactivation and decommissioning (D&D) work is a high priority activity across the Department of Energy (DOE) complex. Subject matter specialists (SMS) associated with the different ALARA (As-Low-As-Reasonably-Achievable) Centers, DOE sites, Energy Facility Contractors Group (EFCOG) and the D&D community have gained extensive knowledge and experience over the years in the cleanup of the legacy waste from the Manhattan Project. To prevent the D&D knowledge and expertise from being lost over time from the evolving and aging workforce, DOE 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.

### **INTRODUCTION**

The D&D Knowledge Management Information Tool (KM-IT) is a web-based 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 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. D&D KM-IT is a community driven system. 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 2011-2012 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, 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](http://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.

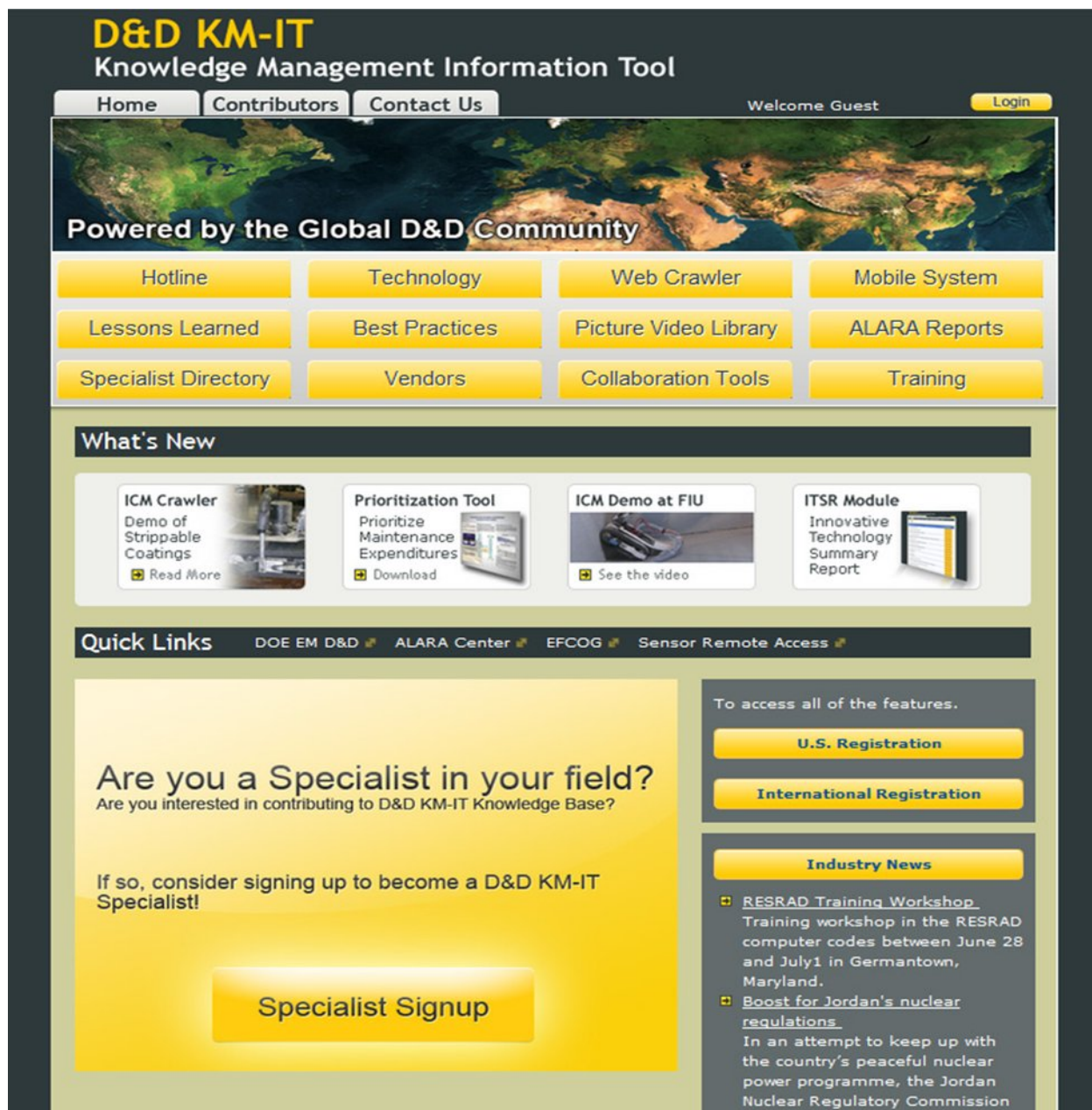


Fig. 1. D&D KM-IT website home page – A new look.

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 2011-2012:

- Vendor Module
- Collaboration Tools
- Training
- Mobile System

## VENDOR MODULE

The vendor module provides a directory of commercial D&D vendors as shown in Figure 2. The vendor module captures all of the vendor related information, including vendor name, address, phone, fax, email, website and areas of expertise. Vendor information is monitored and maintained by FIU. DOE Fellows, the FIU students participating in the DOE/FIU Science and Technology Workforce Development Program, research available commercial vendors that provide D&D related products and services and publish that information onto the D&D KM-IT.

**Knowledge Management Information Tool**

Home Contributors Contact Us Welcome Guest Login

**Vendors** Search Help

The vendor module provides a directory of commercial D&D vendors. Vendor management captures all the vendor related information, including vendor name, address, phone, fax, email, website and areas of expertise. Vendor information will be monitored and maintained by FIU.

The user may search for vendors using a basic text string search. The basic search allows the user to input a simple word or phrase (e.g., full or partial vendor name or area of expertise) to return the applicable vendors.

**DISCLAIMER**

The information provided in the vendor module is a sampling of the commercial vendors who provide D&D related technologies, supplies, and services, and, thus, is not intended to be a comprehensive directory of all D&D vendors in the marketplace. Vendors included in the vendor module may offer additional products and services and users are encouraged to contact the vendor directly for more information. In addition, the data provided is for informational purposes only and does not constitute an endorsement of any particular product, service, or vendor by FIU or the United States government (see full disclaimer here). [See Full Disclaimer](#)

**Search Vendors** **Adobe PDF Reader** **Support**

Start searching our Vendors database. [Start Your Search Now](#)

The documents used on this website are available as PDF documents. Need Adobe Reader? Click on the Adobe Icon to download.

**Technical Support** [Please contact our technical team](#) for questions regarding system features, access, functionality and more.

Share / Save

Fig. 2. Vendor module home page.

The user may search for vendors using a basic text string search with the **Search By Keyword** option. The **Search by Keyword** option allows the user to input a simple word or phrase (e.g., full or partial vendor name or area of expertise) to return the matching vendors.

The **Search by Category** option allows the user to search by an area of expertise. When a user selects the **Search by Category** option, a drop-down list of available expertise areas appears. The user can select the area of expertise and display all of the vendors from the selected area.

In addition, a **Show All Vendors** link is provided on the search page to display all of the vendors from the vendor database.

All three options (Search by Keyword, Search by Category and Show All Vendors) display a summary list of vendors with an option to view the complete details of the selected vendor.

## **COLLABORATION TOOLS**

The main objective of the collaboration tools is to provide a platform to allow the D&D community to collaborate with one another. The collaboration tools are a collection of various conversational means over the web. Collaboration tools includes news, event calendars, links, message boards, FAQs, etc. The various information tools will facilitate the exchange of information within the D&D community where the primary purpose of the interaction is to share the knowledge and the events occurring at the D&D sites. These tools can be expanded based on the community's needs. Users will be able to post events and other news on the site which will be published after administrative approval. Figures 3 illustrates the collaboration tools home page.

### **News & Alerts**

This module will inform the users of up-to-date news about the people, conferences, and papers and other events that affect the D&D community. The latest news can be found in the news section of the collaboration tools as well as on the D&D KM-IT home page. Keeping track of the latest news keeps the D&D community in touch with what's happening in the community on a real-time basis. News will be monitored and administered by the collaboration tool administrators. They will maintain, refresh and update the news on a timely basis.

### **Announcements**

Announcements will be collected from various sources, including contributions from the D&D community, articles pulled from news reporting elements (e.g. industrial journals) or any other reliable source. Timely, important and specific messages which can notify the members about new projects, schedules and software upgrades that affect the D&D community are posted under the system announcements. Notifications or declarations by individuals of the D&D community are posted here after a formal approval process. These announcements provide strategies and advice about knowledge management to the D&D community. These efforts can help individuals and groups to share valuable organizational insights, reduce redundant work, and avoid re-inventing the wheel. They also help the organization to adapt to the changing environments and markets. The announcements can range over many D&D related topics such as D&D related discussions, professional training opportunities and D&D project management.

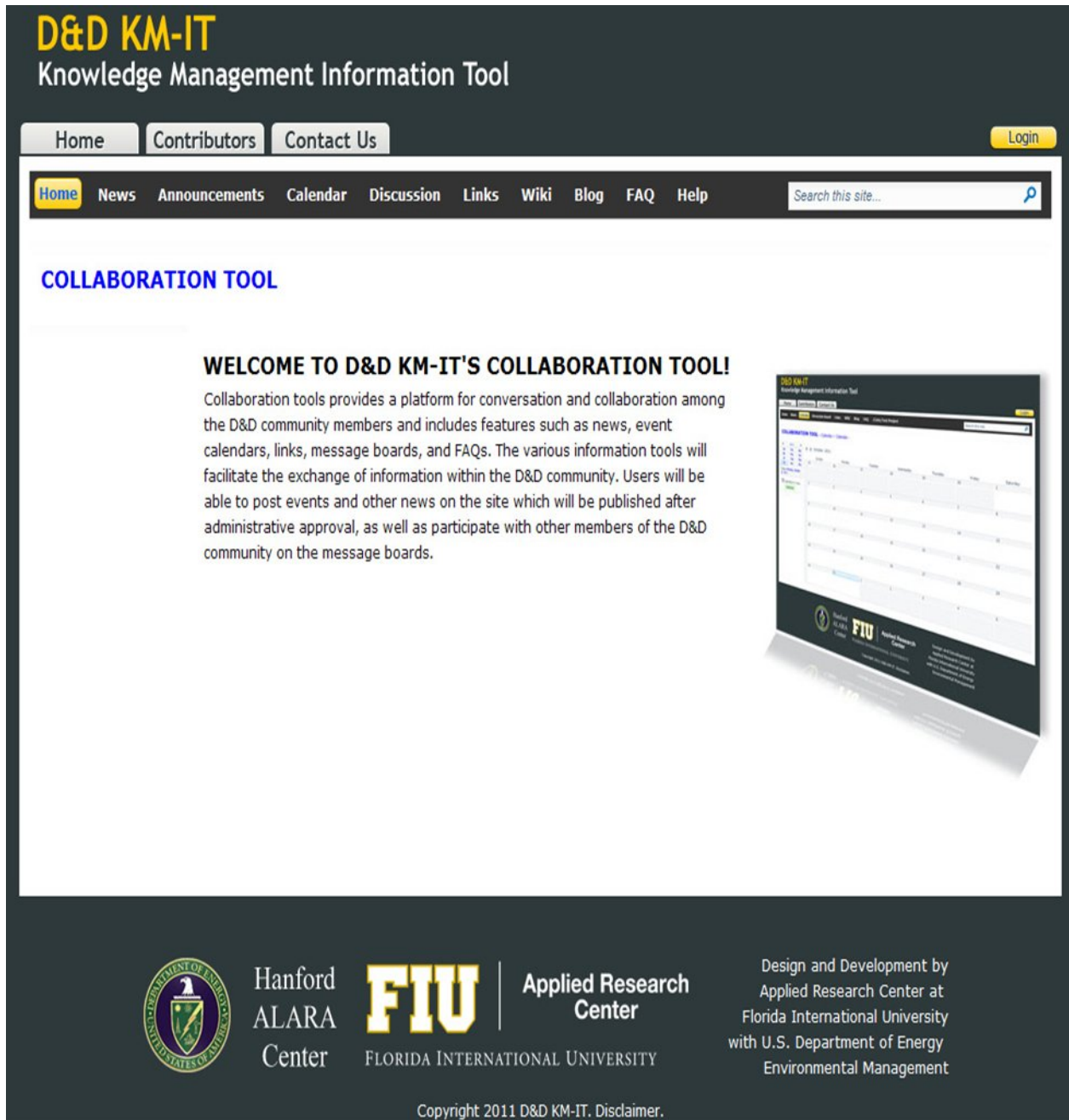


Fig. 3. Collaboration Tools home page.

### Links to D&D Related Websites

Links between websites are a fundamental part of the web. The objective of a link is to provide the user with easy access to relevant information contained in another page. Links to D&D related websites are provided in the system which will minimize the effort required by the users to search for the information over the internet. This will help to increase network connectivity between internal and external individuals. Instead of browsing the internet to find the information

related to D&D, the links module will make it easier for users to find the information they are seeking. Links will be continuously monitored by DOE Fellows on a regular basis at FIU to ensure that active links are maintained.

### **Forum/Message Board**

An internet forum or message board is an online discussion site. The forums will host discussions among the members of the D&D community and will serve as a showcase where people can exchange valuable information about D&D related topics. These forums will be monitored by D&D KM-IT moderators who are responsible for the conceptual and technical maintenance of the forum. The moderators are users of the forum who are granted access to the posts and threads of all members for the purpose of moderating the discussion and also keeping the forum relevant and free of unrelated content (e.g., spam). The administrator manages technical details required for running the forum. As such, they may promote members to moderators, manage rules, create sections and sub-sections as well as perform any database operations. The forum will include a list of rules detailing the guidelines and main aims of running the forum. For example, the forums will concentrate on the topics and discussions related to the main areas of D&D. The forum moderators will guide the discussions, as needed, to abide by the rules for the forum, and keep content relevant and useful.

### **Frequently Asked Questions (FAQs)**

The term FAQs refers to frequently asked questions and the answers to these questions. This module will help the users of the system to quickly find the answers to the most common questions in the areas of characterization, decontamination, dismantlement and material disposition. It will also have a list of general questions related to the D&D KM-IT, its various modules, features and processes. If the user is new and is not sure of the D&D KM-IT process, then he/she can refer to the appropriate FAQ section. General questions will be based on the registration process, who can register, how to post their questions to the hotline, pre-registration policies, copyrights, etc. The FAQ will also provide general information on the D&D KM-IT system (e.g., definitions, descriptions, or perspective of the system). The FAQs will provide a chance to learn more about the system and users can extend their knowledge about the system and learn how to use D&D KM-IT efficiently.

### **Calendar**

It will be important to keep track of all of the events of the D&D community. The calendar option will help users to highlight main activities, mark main events, create invitations and keep reminders for a particular date. It also will have a search tool which can bring up the events for a specific day. Calendars will manage the D&D KM-IT schedules, time and activities so that events do not overlap and will help in planning the activities. D&D community members will have the ability to post their events through this module. All proposed events will go through the formal approval process before they are published over the D&D KM-IT. Users will be able to publish important events, making it possible to share them with the entire D&D community network. This enables members to not only announce the event but to discuss it as well. Users will have access to an aggregated calendar showing all the D&D related events and activities in the entire network.

### **Wikis/Blogs**

A wiki is a web page that can be modified by D&D community users using a web browser over the internet. Wikis will permit communication and collaboration within the D&D community. Wikis

will grow because the D&D community can add material/information to the site which can be viewed/edited by others in a responsible way.

A blog is a web-based application in which information is published on a regular basis and displayed in reverse chronological order (most recent first). Blogs use a conversational style of writing and are focused on specific areas of interest. This feature will allow the D&D community to maintain their blog on the D&D KM-IT. They will be able to provide news or commentary on particular subjects like characterization or decommissioning, etc.

The D&D KM-IT features will be listed on YouTube with different videos or pictures to share the information with the community. An effort will also be made to integrate features of social networking sites like FaceBook and Twitter into D&D KM-IT.

## **TRAINING MODULE**

D&D KM-IT is developed in coordination with the ALARA centers that are responsible for providing training and support to the D&D community. The ALARA centers provide training in different D&D areas with the help of documents, videos and photographs. They will take advantage of web-based features to reach large numbers in the D&D community with their training related needs in dismantlement, decontamination, characterization and other functional areas.

The D&D KM-IT training module will offer the ability for the ALARA centers to post and share training packets of information to help better facilitate knowledge sharing and enhance D&D operational performance. In addition to the basic training required, today there is a need to continue training beyond initial qualifications, to maintain, upgrade and update skills throughout one's career. The D&D related field requires this sort of training for professional development.

Figure 4 shows the training module home page with content navigation tabs for documents, videos, outline, classroom training, certification and help.



The screenshot shows the 'D&D KM-IT Knowledge Management Information Tool' website. The header includes navigation tabs for 'Home', 'Contributors', and 'Contact Us', along with a 'Welcome Guest' message and a 'Login' button. A secondary navigation bar highlights 'Training' and includes links for 'Documents', 'Videos', 'Outline', 'Classroom', 'Certification', and 'Help'. The main content area features a paragraph describing the Training module and a 3D-style image of a computer monitor displaying the website's interface. Below this, there are three columns: 'Search Training Repository' with a 'Start Your Search Now' button, 'Adobe PDF Reader' with a download icon and text explaining document availability, and 'Support' with a link to the technical team and social media sharing options. The footer contains logos for the Department of Energy, Hanford ALARA Center, FIU (Florida International University), and Applied Research Center, along with design credits and a copyright notice.

Fig. 4. Training module home page.

## 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 will provide access to important features of the system through wireless devices. The D&D community users can access the hotline, technology information, specialist directory, lessons learned titles, news/alerts, announcements, event calendars, and vendor information on their wireless devices. This list can be expanded based on the additional modules or features added to the D&D KM-IT system. Figure 5 illustrates the mobile systems.

### **Specialist Directory Lite**

The Specialist Directory Lite is a mobile D&D application which is the scaled down version of the web based specialist directory module. It will allow the users to find a D&D community member through the search criteria by entering his/her name or the area of expertise in the search blocks which returns matching results based on the keyword. Once the user clicks on view details, the system will display the person's contact information.

### **Vendor Lite**

The Vendor Lite is a mobile D&D application which is the scaled down version of the web based Vendor module. It will allow the users to find a D&D technology/service provider through the search criteria by entering vendor name in the search block or by selecting the area of expertise which returns matching results based on the keyword or the area of expertise. Once the user clicks on view details, the system will display the vendor's contact information.

## **CONCLUSION**

D&D KM-IT provides single point 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 developing a document library, providing D&D information access on mobile devices for the Technology module and Hotline, and coordinating multiple subject matter specialists to support the Hotline. 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.