CHAPTER 5

DESIGN OF KNOWLEDGE PORTAL

It is essential for the Higher Educational institutions and Universities to have a Knowledge Portal consisting of the available explicit and implicit knowledge. Most of the educational institutions will have explicit knowledge in the form of books and journals in the library. Institutions may not have a store of implicit knowledge. The explicit knowledge available in the Universities alone will not enable them to serve the students better. It is important to have a collection of implicit knowledge from the sources related to institutions, in order to frame knowledge management systems effectively. In this research the author aims to create a knowledge portal, which will have the entire available implicit and explicit knowledge inside the educational institution. From this knowledge portal, many knowledge management systems can be derived, so that the institution can succeed in an improved teaching-learning process and attain an effective knowledge transfer to the students. The knowledge portal created can be made available to everyone who needs solutions, or wants to share his knowledge.

Pickett and Harmre (2002), stated that a portal is a gateway to resources in accessible networks, such as the Internet or intranet. Thus, a site may include many web pages or even a simple web page, which presents users a static view of the available resources and information. Using web-based technologies, knowledge portals are an emerging approach for providing a single point of access to various information sources and applications. Today’s portal systems allow combining different portal components, the so-called portlets, side by side on a single portal webpage (Wege 2002). Heila Pienaar (2003) defines a Web portal as a Web site that
aggregates an array of content and provides a variety of services, including search engines, directories, news, e-mail and chat rooms. In order to support the academics’ personal knowledge management in an integrated manner the academic portal must have the following characteristics:

- The type of portal is a combination of a vertical portal (vortal) and a corporate or enterprise information portal.
- High levels of functionality and integration are needed – a seamless interface. This must include advanced personalization and customisation capabilities.
- The portal must support both the teaching and research roles of academics.

Portals are an enabling technology for knowledge management. They provide users with a consolidated interface that allows accessing various types of structured and semi-structured information. From the point of view of Knowledge Management, their success depends not only on their ability to provide information and knowledge depending on the user’s tasks in business processes (exploitation of knowledge), but also on their ability to support unstructured, creative and learning-oriented actions of knowledge work (exploration of knowledge) (Haedrich et al 2005). Web portals are a general knowledge management system that provides the facility for organizations or companies to share, create, exchange and reuse knowledge. Portals support knowledge management processes. Generally, a portal is defined as a web site with a highlighted feature: it provides quick access to services and personalized information (Marjan et al 2010).

The design of a knowledge portal for institutions involves the following steps:

- Knowledge extraction from sources
- Content management,

Submission and document indexing
- Information refinement
- Information storage and retrieval,
  Search and analysis support
  Keyword Suggester
  Meta-searcher
- Knowledge dissemination

The design of knowledge portal is shown in Figure 5.1.
5.1 KNOWLEDGE EXTRACTION FROM SOURCES

Knowledge is continually being created in any group, corporation or organization, since the very interaction among people generates knowledge. The creation of new knowledge will not be possible without creativity and innovation. The process of creating new knowledge is the most difficult to manage. Once new knowledge is created, it will be necessary to capture it, so that it can be utilized. Knowledge can be captured in various ways, F. A. Uriarte, Jr. (2008). Sources of explicit and implicit knowledge were identified. Explicit knowledge from the explicit sources can easily be captured, since it will be in a readily available format. There is no need of specific extraction methods to extract this knowledge. Implicit knowledge can be extracted from various sources using different methodologies. The extraction of knowledge from sources has been discussed earlier in chapter 4.

5.2 CONTENT MANAGEMENT

Content management is a very important step in designing the knowledge portal, which involves the creation of an information database. Information can be contributed in many ways. It can be submitted into the database via a prescribed form or it can be contributed through web pages, emails, shared public folders and shared network directories. Content management involves making a decision on the acceptable means of adding content into the database, and access to subsequently update or delete information in the database.

The knowledge collected from different sources, like the students, faculties, and persons from the corporate sectors will not be in an organized manner; it needs to be organized. Also, all the collected information or knowledge will not be of much use to be added to the database. Only useful knowledge should be added. This process is involved in content management.
In the content selection process, experienced teaching staff, administrative persons, psychologists, persons from corporate sectors and society, and students are involved. They form a panel and hold discussions to select the content to be posted in the knowledge portal.

5.2.1 Submission and Document Indexing

Information can be collected from the available data storage systems and can be captured automatically by preparing structured reports. The submission of information or knowledge can be designed in a way that the users do not face any obstructions. The process of submitting information or knowledge can be part of an organization’s day-to-day processes. The Document Indexer is responsible for tokenizing each document into words, and recording the relationships between the words and the documents (i.e., indexing). Various information retrieval techniques, such as stemming and stop-word removal, can be applied as necessary. The resulting searchable index is then stored into a database for document retrieval and further analysis (Michael Chau et al 2006).

The contents are tagged as data and stored in the database for easy retrieval of information. Indexing can be done using the XML.

The XML allows users to do the following:

- Bring multiple files together to form compound documents.
- Identify where illustrations are to be incorporated into text files, and the format used to encode each illustration.
- Provide processing control information to supporting programs, such as document validators and browsers.
- Add editorial comments to a file.
The XML was not designed to be a standardized way of coding text. In fact, it is impossible to devise a single coding scheme that would suit all languages and all applications. Instead, the XML is a formal language that can be used to pass information about the component parts of a document to another computer system. The XML is flexible enough to describe any logical text structure, whether it be a form, memo, letter, report, book, encyclopedia, dictionary, or database (Bryan 1997). Information and data can be retrieved by generating a keyword index from the organization’s file system.

5.3 INFORMATION REFINEMENT

Information stored in the database will not be in a refined form. It must be refined, so that the user can get the exact information or knowledge required; otherwise, irrelevant or unwanted information will be added to the required information. Knowledge refinement can be obtained by sharing knowledge. Once the knowledge is shared, it gets refined and enriched. Knowledge can be shared among the faculty members, students and others related with the institutions during meetings, seminars, workshops etc. During seminars and meetings everyone shares his ideas and views about a particular topic. This particular topic gets enriched. Likewise, discussions on different topics result in the refinement and enrichment of knowledge. Attending seminars and workshops outside the institution enhances knowledge sharing and enrichment of knowledge. To facilitate knowledge sharing, several methods can be adopted.

5.4 INFORMATION STORAGE AND RETRIEVAL

In order to retrieve knowledge, it should be stored. Information or knowledge to be stored should have proper indexing for easy retrieval. Knowledge can be stored in files and folders, databases etc. Based on the usage, knowledge can be stored in different locations. Important details can
be stored in files and folders with protection. Knowledge which can be shared may be displayed on websites. Communication messages can be stored in e-mail locations. The results of the students can be stored in databases.

5.4.1 Search and Analysis Support

Once the knowledge is stored in the repository, it should be accessible for users. Without an access facility, the knowledge repository cannot be used by the user. In order to access the repository search and analysis, support is provided. It is a web-based user interface with the Keyword suggester and the Meta-searcher.

5.4.2 Keyword Suggester

The keyword suggester is a web based script that instantly generates a list of keywords related to a main word. The Keyword Suggester is designed to help users to refine their search queries by suggesting the relevant keywords based on the co-occurrence analysis. In the keyword suggester, whenever a user asks for the keyword suggestion, the phrases that co-occur most frequently with the search query terms will be suggested to the user.

5.4.3 Meta-searcher

The Meta-searcher is designed to help users search queries, forwarding them to various databases and search engines, and combining the search results. The Meta-searcher collects documents from different data sources. It submits a search request to each data source through the HTTP protocol, and extracts the search results from the returned pages. Meta-search engines merge the search results from the various data sources into a single list.
Screen-shot of a prototype knowledge portal is shown in Figure 5.2.

Figure 5.2 Screen-shot of a prototype Knowledge Portal

5.5 KNOWLEDGE DISSEMINATION

Once the knowledge stored in the repositories is retrieved by the user, it is transferred as implicit in to the minds of the user. If this knowledge is not disseminated, knowledge development is limited. In order to develop knowledge, it should be effectively disseminated. The users can participate in conferences and seminars, so that the knowledge can be transformed into explicit. Publications, presentations, websites and libraries are the most obvious forms of the dissemination of knowledge. Participation in external networks, establishing partnerships with other organizations, and creation of knowledge centers are also effective means to disseminate knowledge (Uriarte 2008).