

Knowledge Management System for Higher Education : Design of KM EduSoft

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Abstract — Recent development in Information and Communication Technology (ICT) helps faculty to create and share educational contents through web-based knowledge sharing system. The integration of ICT in higher education involves the consideration of three important dimensions of innovation such as changes in students' role, changes in lecturers' role and changes in working mechanism of Higher Education Institutions (HEI). The aim of Knowledge Management (KM) is to create, share, store and apply knowledge effectively in the organization. To ensure success in higher education, there is a need to identify the knowledge that each component contributes to the system and to develop appropriate methodology using KM concept with the support of ICT, so that available knowledge are exploited to achieve goals and vision of Higher Education Institutions. The proposed KmEduSoft system is the dynamic web content knowledge portal designed to fill a perceived gap for knowledge sharing and accessibility in the organization. The tacit and explicit knowledge of the registered users are made codified and accumulated as knowledge repository. The various documents are uploaded by registered faculty members and can be shared and captured among other faculty members and students in the HEI. This develops an effective knowledge sharing culture for the benefits of faculty and student communities in higher education. This paper will help to develop a knowledge sharing tool to improve teaching-learning process effectively using concept of Knowledge Management with the help of ICT in Higher Education Institution.

Keywords — Knowledge, Knowledge Management, Information and Communication Technology, Higher Education Institution, Knowledge Sharing, Web Portal

I. INTRODUCTION

Due to globalization and increased competition along with a number of development trends like virtualization and digitalization, today's education system is rapidly changing and demanding. Higher Educational Institutions (HEIs) are made up of a number of components consisting of teaching faculty, students, administrative staff and researchers. In HEIs knowledge is inherently managed through teachers and researchers who create and disseminate knowledge. The educational institution is considered as service industry where it provides knowledge to the students through the expertise of academic staffs. The main objective of HEI is to ensure that knowledge is shared among teaching faculty, researchers and students. The system demands greater level of communication among faculty members and students to have optimum use of

resources. Hence there is a need to apply Knowledge Management (KM) process for knowledge acquisition, knowledge storage and knowledge sharing purpose in HEIs. By keeping this in mind, a web portal is designed to satisfy the need of students and faculty members in the domain of HEIs. The paper describes about web portal, literature review, software specification, features of KM EduSoft and concluded by giving future direction to make this portal as a knowledge management tool for HEIs.

II. ABOUT WEB PORTAL

Web portal is a single, integrated, ubiquitous and useful access to information, applications and people (IBM Global Education Industry, 2000). The aim of knowledge portal is to provide views onto domain specific information on the World Wide Web and facilitate their users to find relevant domain specific information [7]. It is an important part of IT infrastructure of HEIs, which seek to integrate the vast intellectual resources within a central virtual space that is easily accessible via a web interface. Portals facilitate a dynamic exchange of knowledge, data and information. It facilitate easy accessibility to both explicit and tacit knowledge of experts and helps for SECI process for knowledge creation, knowledge storage and knowledge sharing purpose in HEIs. Since it is made available to communities of practice, people are not constrained by geographic barriers for sharing and disseminating new knowledge. Portal provide two way communication channel among transmitter and receiver and hence move beyond the one-sided information exchange found in traditional websites. Web portal allows to combine the KM practices and e-learning together for developing an effective knowledge-sharing platform between teachers and students.

III. RELATED WORK

M., Almstrum (2001) in the paper explored about content based web based learning environment design which consist of basic information, content delivery and provision of question papers and example. Here a learning process is one-way knowledge transmission from the contents to the learner. It involves learners accepting and memorizing the facts given in the web pages and recalling the materials learned whenever required [5].

Pickett, R.A et. al.(2002) in the paper ‘Building Portals for Higher Education, New Directions for Institutional Research’, has provided the concept of Learning Content Management System in order to create an effective learning experience by using Ontologies and Semantic web technology[7].

S. Rajlakshmi (2009) has provided importance and need of web portal in higher education. Paper considers the aspect of need of social network, communication blogs , discussion forums and benefits of portal solution in higher education [8] .

A. Nitya Rani et.al.(2011) , has developed web based learning environment to offer a practical tool for instructors and learners to use the knowledge for teaching and learning by using knowledge mining [1].

Nur Razia Mohd Suradi et. al. (2011) has attempted to design K-Portal in Fiit, Unisel by using Open Source tools such as

JOOMLA, PHP Programming language and MySQL to increase efficiency and productivity of faculty members and to encourage knowledge sharing culture among the academic staff [6].

IV. SOFTWARE SPECIFICATION

While designing the portal, there is a need to consider selection of software, database and allocation of resources. Table No. 1 shows comparative study of programming language, database, web server and FTP support.

The comparison between open source that are available in the market is studied. After considering the difference, the following software specifications are selected:

Table 1: Web Content Management System Comparison (Austin, 2010)

	Prog. Language	Database	Web Server	FTP Support	UTF-8 Support
Joomla	PHP	MySQL	Apache	Provided as a free add-on	Limited support available
Drupal	PHP	MySQL, PostgreSQL	Apache, IIS	Limited FTP support	Available
Mambo	PHP	MySQL	Apache, IIS, any PHP-enabled web server	Not available	Available
Open CMS	Java 1.4	MySQL, PostgreSQL, Oracle, MSSQL	Tomcat, Apache	Not available	Available
PHP Nuke	PHP	MySQL, PostgreSQL, mSQL, Interbase, Sybase	Apache, IIS	Not available	Not provided
Plone	Python	Zope	Apache, IIS, Zope	Available	Available
TYPO3	PHP	MySQL, PostgreSQL, Oracle, MSSQL	Apache, IIS	Available	Available
WordPress	PHP	MySQL	Apache, mod rewrite	Available as a free add-on	Available
Xoops	PHP	MySQL	Apache, IIS	Available	Limited support available

1. PHP 5.5 : PHP is a general-purpose server-side scripting language designed for Web development to produce dynamic Web pages. The code is interpreted by a Web server with a PHP processor module which generates the resulting Web page. PHP can be deployed on most Web servers and also as a standalone shell on almost every operating system and platform free of charge.
2. Apache server : XAMP Tool with Apache server.
3. MYSQL: Relational Databases Management System (RDBMS) is used to create database tables and data. MySQL is very fast, reliable and easy to use and its connectivity, speed and security make it highly suitable for accessing database.
4. Template : Template is used as web based publishing feature to create web content.
5. HTML5: HTML5 is used to create interactive websites by embedding graphics on the web page.

6. dbEdusoft : Database designed to hold all forms and reports.

V. FEATURES OF KMEDUSOFT :

KmEduSoft is knowledge repository created for students, faculty members and administrative staff and promotes knowledge flow among the stakeholders in HEIs. It allows knowledge to be applied across time and space and enhance the speed of knowledge integration and application by codifying and automating organizational routines. The knowledge in the knowledge base ensures the availability of knowledge quickly and efficiently and disseminated to the different stakeholders. A centralized approach towards storage of knowledge provides opportunity for collaborative work environment which leads to better services. Codification approach is used to allow many people to search and retrieve codified knowledge and can be used easily.

Characteristic features of KMEdusoft :

- Ease of knowledge dissemination, knowledge storage and knowledge sharing within the academia in higher learning institution.
- Easy identification of sources of knowledge, which enable students, faculty, administrative staff to access your institution's resources anytime from any connected device.
- Centralized repository system where students, faculty members and administrative staff interact with the system.
- Mapping of knowledge into tacit and explicit form as per the need arises.
- Electronic Publishing System where faculty can post lesson plans, course work and research content .
- Maintains history of sessions.
- Application is run completely on the server side ensuring a high level of security and minimal load on the client system and web browser which causes immediate updating.

5.1 System Architecture :

Three-Tier architecture concept is used while designing KMEdusoft.

- View Layer : It is the web portal design with which user interacts.
- Middle Layer : It lies between database and view layer with PHP functionalities..
- Database Layer : It consist of database access with the help of Apache server.

VI. COMPONENTS OF SYSTEM DESIGNED :

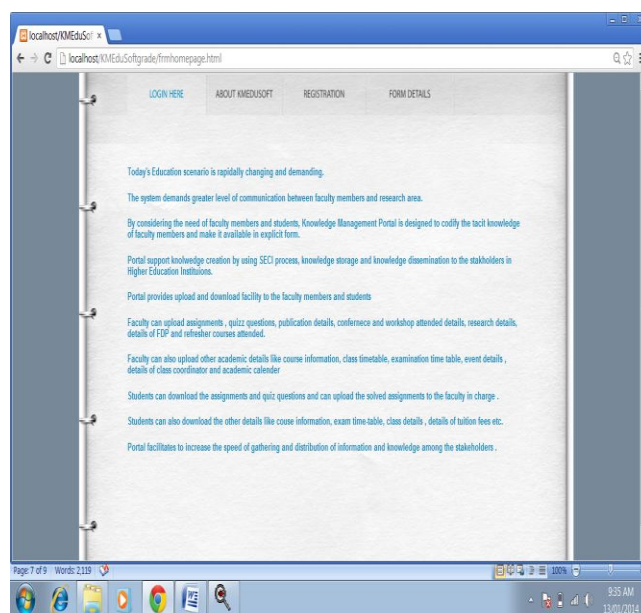
- Registration : Teaching faculty and students must be registered before using the system. Faculty can register as teaching faculty or subject expert.
- Login Window : The login window requests a valid user name and password to be able to gain access into the software. Only registered users can access the system by entering their login name and password which is maintained by Administrator.
- Upload Facility : Teaching Faculty can upload assignments and quiz questions of related subject. They can also upload publication details, conference details, workshop and seminar attended details, details of books publication and major and minor research details. Other academic details like course details , class time-table, examination time-table, details of class coordinators , event details , academic calendar is also uploaded.
- Download facility : Students can download assignment and quiz questions. They can also download other academic details as per the need . Faculty can also download research details available on portal and can make use of tacit knowledge of other faculty converted into explicit form for the creation of new knowledge.
- Upload Facility by students : Students can upload solved assignments and quiz to the subject in charge.

Faculty can keep track of details of online assignments and quiz submitted so that online evaluation is possible.

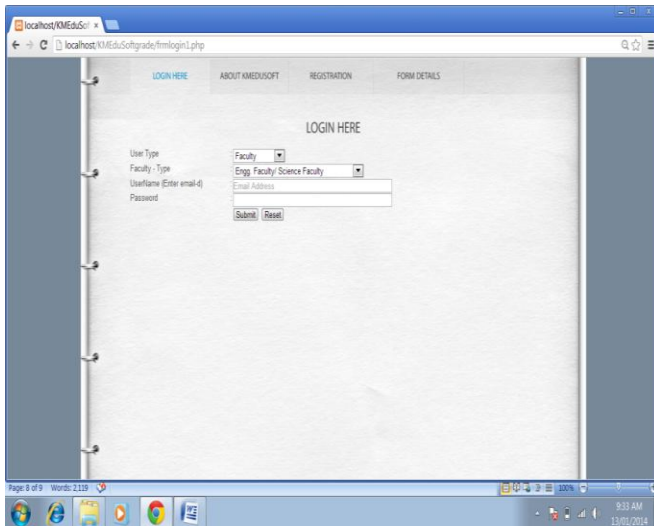
- Administration Message Broadcasting : Administrators can broadcast and send common message to all students and faculty members.
- The uploaded material send by faculty members and students will be made stayed on the portal database until administrator takes action to delete it.

VII. CONCLUSION

Knowledge Management using ICT expand new web-based offerings and work to utilize the cost effective use of technology to meet more enrolment . Web portal provide an environment where institutions cross state and national borders to meet needs of students anytime/ anywhere. Web portal provides an effective resource sharing of knowledge between faculty members and students . It provides needed information to the students to improve their academic performance and excellence. It is hoped that portal designed will increase the efficiency and productivity of the faculty by eliminating manual and offline knowledge sharing and provide access to updated information for better knowledge sharing culture.

VIII. SCREENSHOTS OF KMEDUSOFT PORTAL:**I. Home page for Km EduSoft**

II. Login Page :



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