DESIGNING USER ROLES AND CONTENT SHARING WORKFLOW FOR WEB CONTENT MANAGEMENT SYSTEM IN HIGHER EDUCATION

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This work is dedicated to my beloved parents, father “THAIR MOHAMMED AMIN”, mother “RUNAK ABDALRAHIM”, brothers, and sisters for their resilience in insisting to educate me amidst the absolute poverty in which they raised me.

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ABSTRACT

Web content management system has significant roles in higher education for content sharing among students, and promotes higher education to a higher level of study. The main idea of this thesis was to design a user roles, and content sharing workflow for web content management system in higher education. The current web content management system was used in most of a university in the world, but the existing CMS did not fully support the requirement of a university community such as students, staff and alumni. Most of university communities have a different kind of user's categories like a prospective students, current students and alumni students, and they need tools for doing content sharing, and user management among them. For that reason, this research has designed user roles and content sharing workflows specify for prospective students, current students, and alumni students in university environment. This prototype has been designed and developed to support the content sharing among prospective students, current students, and alumni students, and user management among them, which is based on time. For evaluation the researcher toke 33 students of Faculty of Civil Engineering for user performance test, and prepare the questionnaire based on (Functionality, Usefulness, and User Satisfaction).

ABSTRAK

Web sistem pengurusan kandungan mempunyai peranan penting dalam pendidikan tinggi untuk perkongsian kandungan dikalangan pelajar, dan menggalakkan pendidikan tinggi ke tahap pembelajaran yang lebih tinggi. Idea utama tesis ini ialah untuk mereka bentuk peranan pengguna, dan perkongsian kandungan aliran kerja untuk web sistem pengurusan kandungan dalam pendidikan tinggi. Empat objektif telah digariskan. Web system pengurusan kandungan semasa telah digunakan dalam kebanyakan university di dunia, tetapi CMS yang sedia ada tidak menyokong sepenuhnya keperluan komuniti university seperti pelajar, kaki tangan dan alumni. Kebanyakan komuniti university ada berbagai jenis kategori pengguna seperti bakal pelajar, pelajar semasa dan pelajar alumni, dan mereka memerlukan alat untuk melakukan perkongsian kandungan, dan pengurusan pengguna di kalangan mereka. Oleh sebab itu, kajian ini telah mereka bentuk peranan pengguna dan perkongsian kandungan aliran kerja terutamanya untuk bakal pelajar, pelajar semasa dan pelajar alumni dalam persekitaran university. Prototaip ini telah direka dan dibangunkan untuk menyokong perkongsian kandungan dikalangan bakal pelajar, pelajar semasa dan pelajar alumni, dan juga pengurusan pengguna dikalangan mereka, berdasarkan masa. Untuk tujuan penilaian, penyelidik telah mengambil 33 pelajar dari Fakulti Kejuruteraan Awam untuk ujian prestasi pengguna, dan menyediakan selidik berdasarkan kepada (Fungsi, Kegunaan, and Kepuasan Pengguna).

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LIST OF ABBREVIATIONS

CMS	Content management system
WCMS	Web content management system
ECM	Enterprise Content Management
PDM	product data management
UML	Unified modeling language
KS	Knowledge sharing
HTML	Hyper Text Markup Language
PHP	Hypertext Preprocessor
ASP	Active Server Pages
ASP.Net	Active Server Pages.Net
HTTP	Hypertext Transfer Protocol
SQL	Structured Query Language

CHAPTER 1

INTRODUCTION

1.1 Overview

Web Content Management Systems (WCMS) consist of applications used to create, manage, store and deploy content on the Web, including text, graphics, video or audio, and application code. Web Content Management Systems are often a part of Enterprise Content Management (ECM) (Sadique and Vasundhara, 2012).

Web has an important role in higher education. Nowadays a lot of activates in higher education is grown through the web, as all the facilities can be used or worked in the website. As a result of this, web technology has become a significant and very quick growth tool for web development. When a system for higher education is created, the student must be focused because the student is an important factor in higher education.

Every university website typically has a section for each of its department. This section contains information on that department such as its research projects, faculty information, and courses. This information is usually normal in nature and does not change often. In this scenario, the department provides the desired information to the website administrators and they create the website section for the department as per the instructions. Any subsequent changes or additions to the website will involve making a request for the same to the website administrators. This severely restricts the flexibility and usability of the website for the department and its faculty (Joshi, 2011).

Several organizations until now are not familiar with a content management system technology, every website and intranet use content management system like a facility tool to success. Hundreds of content management systems and dozens of open source tools because content management system grows very fast and challenges the customary rules of business markets. The number of new product launches by old and new companies somehow still manages to stay ahead of the ongoing consolidation (Sadique and Vasundhara, 2012).

File, image, picture, video etc. are the forms of digital content items. An increasing number of content is produced these days by non-professional users as compared in the past when content was greatly generated by professionals. There are six phases in a digital content life cycle: create, update, publish, translate, archive and retrieve. For instance, content is formed by one or more users, which is then updated by other users. Content is accepted for publication after some updates. Creating, publishing, and updating are some of the features in content, and enable the content to be shared among different areas and different users. A chief problem in higher education is content sharing, and numerous investigations concentrate on this subject, because sharing among students or staff promotes higher education to a higher level of study.

An engineering document is the vehicle to communicate both structured and unstructured information. They can be specifications, procedures, drawings, data sheets, calculations, geophysical data, analytical results, correspondence, contractual commitment or financial projections. Engineering documents flow within and across company boundaries fuelling business processes that deliver large-scale programs of work. Typically, programs of work transition through phases such as Investigation, Engineering, Procurement, Construction, Operation and Maintenance.

Content Management System is also used for higher education and for managing content in web higher education. This research will propose a new user roles and content sharing workflow for web content management system in higher education for civil engineering students consisting of prospective students, current students and alumni students.

1.2 Problem Background

Quality, cost and time are main factors for a growing content management system and delays in publishing, mistaken or out of data content are popular problems that happen in the web. Organizations can benefit a content management system like tool for alleviation pressures on staff and infrastructure associated with web environment (Karlsson and Gennäs, 2005).

Nowadays the information is increasing very quickly; hence this increase has affected the way which it is publicized, accessed and submitted. Emphasis has shifted from viewing of information, to efficient, retrieval and monitoring of selective changes to information content (Jyoti Jacob, et al. 2005).

This change has been reflected greatly in digital document management situations in recent years. Since Electronic Document Management (EDM) systems were introduced in the 1990s (as a new generation of systems to manage digital documents), it has evolved into two distinguishable divisions: simple EDM systems, and Content Management (CM) systems (Shaofeng Liu, 2007).

Another feature was almost "inherited" due to the evolution of CMS from document management systems. The standard feature of CM-systems these days is its ability to store different versions of documents and assets. This allows the systems to display older pages, keep up with the changes on them and to form an archive of old documents. This is important as well because in a large number of countries, publishers are required by law to store copies of published contents. Even though CMS are largely used to publish content on websites these days, they are, in actuality provide the possibilities to publish content cross-media (Husain, 2012).

Knowledge sharing is a very important aspect in organizations because every employee or worker in organizations need knowledge and information, he/she can get this knowledge from another employee or worker inside the organization. For this reason, knowledge sharing is sustainable and a valuable technique among employees or

workers. For example, many organizations have a personal folder in which they manage and keep needed codified knowledge (textual documents) in categories (Liu, et al. 2007).

Till now, without a close examination of the specific needs, there is no one who can precisely tell which web content management system is ideal for an institution. However, there are seven critical characteristics that any web content management vendor should provide given as follows (Flexibility, Scalability, Priced to fit, Quick implementation, Browser-based, Multi-user functionality, and Easy-to-use) (Husain, 2011).

1.3 Problem Statement

Nowadays people as well as all organizations are more dependent on the website for every task. As the number of websites increases, problems also increase because all organizations need web tools to manage and facilitate the work. Also, a university is one of the organizations that need web tools to facilitate students' work, as web presence become less of a novelty. As traffic in the site increases, we begin to realize the depth and breadth of information we have available to provide (powel and gill, 2003).

One of the important factors in content management system is product data management (PDM) but open source CMS is usually criticized for the lack of application in the manufacturing field (Yen, et al. 2008).

Documents are a big problem in the web existing today because of its processes like searching, sharing, and writing descriptions about a picture. The speed of the time searching depends on how the content objects in a document are organized; also, engineers involved in the design process have been found to spend as much as twenty to thirty percent of their time searching to access design information (Lowe, 2002).

Most universities have problems about content sharing among students and automatically user management in real time. Some problems occur in University Technology Malaysia when the students want to apply or come to Malaysia like prospective students, students intending to register in the university or register for subjects like current students. On the other hand, alumni students have problems communicating with other students when they are back to their own countries; and they need the system to find a job or publish an article after they graduate from the university. Diverse tools for interactions and content sharing are used among the students of University Technology Malaysia, but the present tools don't fully sustain the user management which results in students still experiencing issues with content sharing and user management. For example, if after class, a student wants to get an answer from other students or has a problem in research; he/she will not be able to get the answer because currently, the university doesn't have the tools for content sharing and user management among students; and students require the tools to locate other students who have the same field like themselves.

For these purposes and for solving these problems in higher education, in this research the researcher try to design and develop a prototype system to support the university for solving the content sharing problems among students including (Prospective, Current and Alumni), and user management among them. Another aspect for this research is demonstrating the user rule in this system and the current system. In the current system the user has one role like (Administrator, editor, publisher or creator), but in this system the user has all permeation in the system. The administrator of this system has authorizations to change the user state and extend the time of study for the student if the user asked for it. This research will explain knowledge sharing and knowledge management in higher education. The researcher uses the web content management system like a tool for solving the problems inside the university. As a conclusion, This project made an effort to answer the main question: how can the researcher design and develop new user roles and content sharing workflow for content management system in higher education, and how engineering students consisting of prospective students, current students and alumni students use content and how content sharing can be done among them.

1.4 Research Aim

The main aim of this research is to design and develop a new user roles and content sharing workflow for web content management system in higher education.

1.5 Objectives

1. To investigation user roles and content sharing workflow for web content management system in higher education.
2. To designing user roles and content sharing workflow for web content management system in higher education.
3. To develop user roles and content sharing workflow for web content management system in higher education.
4. To evaluate the proposed workflow in user roles and content sharing to measure the effectiveness of the workflow.

1.6 Scopes

The scopes of this study are:

1. Mapping prospective students, current (postgraduate) students, and Alumni student's user roles in web content management system.
2. Content sharing document based on Engineering Document management. In this project we focus at UTM civil engineering students like a case study.

The faculty of Civil engineering in UTM contains different fields like (Highway, Structure, Hydrology, Geotechnical, Construction Management, and Environmental). When a student comes to UTM like a prospective student to the faculty of civil

engineering, they have problems and are confused about choosing the right field in this faculty because there are different fields to choose from and they must make a decision about that, and this decision is very hard without any help. Current students and Alumni students also have problems in this faculty (it will be explained in detail later). For these reasons, we chose the faculty of civil engineering in UTM as a case study.

3. Web content management system to modify content including (text, graphics, video or audio) in web, particular text and for improving communication among users.
4. Using unified modeling language UML to design knowledge sharing among students of Civil Engineering.
5. Select ArgoUML tool to design prototype system.

1.7 Research Contribution

The following are research contribution:

1. Identify and illustrate the user role in Content Management System including (Administrator, Editor, Author, and Reviewer).
2. Proposed new user roles for Web Content Management System in higher education environment, by mapping prospective students, current (postgraduate) students, and Alumni student's user roles in web content management system.
3. Develop a prototype of content management system to visualization the proposed user roles.
4. Evaluate the proposed user roles are appropriate with content management system in higher education.

1.8 Thesis Organization

The organization of the thesis is as follows:

1. Chapter 1 contents the introduction about content management system, and web content management system. On the other hand the researcher discussed problem background, problem statement, research objectives, research scopes and contribution.
2. Chapter 2 provides an extremely literature review of the study area, content management system, problems in this WCMS for higher education, current user roles in WCMS, and current model for WCMS.
3. Chapter 3 provides research methodology flow used in this research. This has been done by provide the general framework of the research represented via several stages.
4. Chapter 4 explained modeling the prototype system, and design data flow, use case diagram, and database design for the prototype.
5. Chapter 5 contains the implementation and data analysis for the proposed prototype system. For the implementation in this thesis the researcher used the several tools such as (Asp.Net, java scripts, Xml, Database, and Html).on the other hand in this chapter explain about the data collection by the (questionnaire and task) for the prototype and analysis data has been done by the (SPSS) program.
6. Chapter 6 presents the discussion and conclusion of this research, and explained how the researcher achieved all objective in this research.

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