Content Management Systems Software: A Solution for Dynamic and Cost Effective Library Portal - The Case Study of IIT Bombay

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Abstract

The World Wide Web is a huge repository of information, and continues to grow at a rapid pace, constantly being augmented and maintained by millions of people. The library professional has progressed immensely in the last decade, and acquired the common skills to use the Internet and other technology to collect organize and disseminate the knowledge, but still creation and maintenance of an interactive library website required technical expertise, money and time. The maintenance of library website in a traditional way also creates problems for library staff with little technical expertise. The chosen readymade JOOMLA (CMS) Open Source Software to create an interactive web 2.0 compliant information portal of Central Library http://www.library.iitb.ac.in Indian Institute of Technology Bombay.

Keywords: Library Portal, Content Management System-Joomla, Web Designing - Tools and Techniques

1. Introduction

Indian Institute of Technology Bombay is a world class institution of higher learning and research in engineering, science and technology. The Central Library, one of the largest libraries in engineering and technology and play a vital role in generation, assimilation, and dissemination of knowledge, has an excellent collection of over 4,00,000 volumes comprising of text books, reference books, standards, patents, reprints, pamphlets, bound volumes of journals, technical reports, theses, dissertations and multimedia materials etc., online access 24 X 7 on institute-wide network for more than 10,000 e-journals, e-databases, standards and ETD etc. Central Library has its web site since 1997 which initially provided access to the OPAC, an in house software and database of all library books.

We are in the information age and in this age, in order to be efficient, it is vital for us to store and retrieve information in the most convenient way. Hosting a website is one of the ways in which information can be organized. A basic website can be developed using HTML (Hyper Text Markup Language). It can be made feature-rich and powerful by using the server side scripting languages such as PHP (Hypertext pre-processor), ASP (Active Server Pages) or JSP (Java Server Pages) or can be enhanced by using client side scripting tools such as Java Script. While developing a website one has to have knowledge about web servers and web browsers, programming languages and CSS etc.

There are tools available to help to create using WYSIWYG (What-You-See-Is-What-You-Get) editors such as Adobe Dream weaver, Flash, Front Pages. These are useful to rapidly develop web pages, although they required the programmer has knowledge of HTML and other web-

programming languages. On the other hand there are online website builders such as Tripod, Yahoo, and Google which allows a novice user to build a website. However, these packages are limited in their applications and features.

Hence creation and maintenance of a dynamic and interactive website from scratch requires one to undergo the tedious steps makes an enormous challenges before information professionals and library authorities, it needs money and professional manpower expertise compared to traditional web sites.

The Open Source CMS software is feasible in terms of functionality (RSS feed, Blogs, Discussion forum, Wiki, News flash, Site search and Polls etc) cost and maintenance i.e. to add, change and delete content the novice users (who have no web-programming skills) can build the dynamic web site.

2. Open Source Content Management System (CMS)

The concept of open source software (OSS) was invented in order to provide software users with more rights than proprietary (or commercial) software does that everyone is allowed to use, copy, or distribute, unmodified or with modifications, for free or for money, but always together with the source code.

Content management systems support the Content Creation, Management, Publishing and Presentation information. This information, also referred to as content, may be in the form of text-documents, pictures, or videos. The most commonly used type of content management systems are web content management systems (WCMSs) which are used for creating and administrating websites and content to be published on the World Wide Web. The WCMSs cover complete lifecycle of a website's pages, from providing tools to create the content, through to publishing, and finally to archiving.

3. Basic Characteristics of CMS

Web content management systems have the following basic characteristics:

- **Strict separation of content from design**

  CMS apply the key principle of separating content from design. Page designs are stored in templates while the content is stored in a central repository. When a user requests a web page, a standard HTML page is created dynamically by inserting content into the corresponding template. The resultant web page may include content from multiple sources. As a traditional websites which consist of static HTML pages including page content and design.

- **Component Management**

  Another basic characteristic of CMS is the existence of a component database (also known as content component database) where the content is stored. Prior to being stored

in the component database, the individual components (texts, pictures, videos, etc.) are enriched with additional information (metadata) which facilitates their classification and their retrieval.

- **Workflow management**

The third major feature of CMS is workflow management. CMS typically allow the definition and control of workflow. These workflow capabilities enable the co-ordination of collaborative Web-based work, such as the collaborative creation and management of a website.

4. Functionality and Fundamental Principles

The functionality of content management systems can be subdivided into four main areas: content creation, content management, publishing, and presentation.

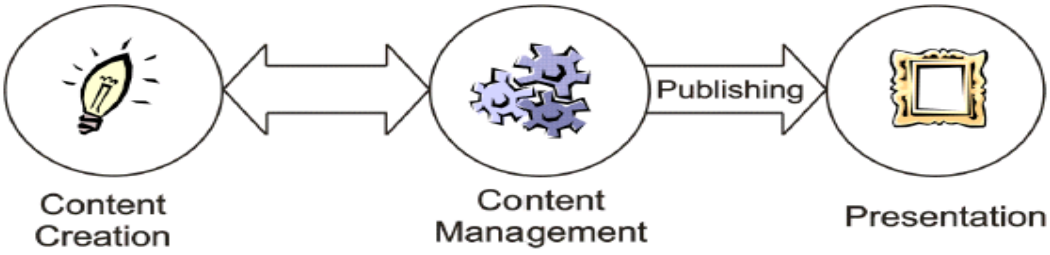

Figure 1: Basic functionality of a CMS

- **Content creation**

Content creation, also known as (content) authoring and content contribution, refers to the activities by which content is generated and entered manually by authors (content creators) into the content management system. CMS typically provide a Web-based, easy-to-use authoring environment, which enables authors to enter content conveniently by using a web browser and other integrated tools such as WYSIWYG editors.

- **Content management**

After the content is created, it is stored in a central repository (e.g. XML files or a component database) along with supplementary information (metadata). This repository constitutes the core of a content management system and enables content manipulation and content management. Content management comprises a range of useful features such as content reuse, versioning of content and online administration. Apart from that, content management

comprises workflow management the workflow capabilities of content management systems allow the participation of more people in the workflow.

- **Content publishing**

Information stored in the repository is distributed or delivery to users this stage is called publishing. Web content management systems comprise so-called publishing engines which generate web pages from the content stored in the repository and publish them (by the use of style sheets and templates) to users. They are also capable of publishing the content in a variety of formats such as HTML and PDF. Finally, content management systems support personalization.

- **Content presentation**

The functional area of presentation is concerned with the standardized appearance of a website. The published pages must meet certain standards in order to be of value to the users.

5. CMS Integrated Modules/Applications

Content management systems normally offer a wide range of integrated, ready-to-use applications or features which are either available directly after installation of the CMS, or can be added to the system at a later point (e.g. as freely available open source modules).

Some of the most common integrated applications/features are:

- **Tools for asynchronous communication**: Most typical are email / webmail, blogs, and message boards.
- **Tools for synchronous communication:** Similarly, a CMS may provide facilities for synchronous communication such as a chat- and whiteboard application.
- **Groupware functionality**: Some content management systems offer groupware (collaborative software) functionality that enables people to work together while located remotely from each other.
- **Search engine**: The CMS creates indexes for the content it manages (by using metadata), thus enabling the search.
- **File upload and download**: A CMS normally provides an integrated tool or that enables users to upload or download files, in their personal user areas.
- **Contact management**: CMS is an integrated contact management application which makes it possible for users to manage their contacts conveniently.
- **Calendar:** A built-in calendar application that allows users to plan and track events, possibly supporting multiple views.

- **Task management**: A further feature that some content management systems provide is task management.
- **Online help**: Some content management systems support users by means of context-sensitive online help functionality which is built into the system.
- **FAQ management:** Most major content management systems include FAQ management capabilities.
- **Spell checker**: A number of content management systems include spell checker functionality
- **Clipboard**: The CMS may provide a built-in clipboard system that allows authors (content creators) to cut and paste content from one area of the site to another.
- **Trash**: Some content management systems support administrators and authors in recovering content that has previously been removed from the website by means of a trash system.
- **Wiki functionality**: Wiki is used to designate functionality (or an application) that allows users to add content to a system which can be edited by any other system user.
- **Photo gallery application**: The CMS might also be equipped with an integrated photo gallery application for displaying images stored in the system.
- **Guest book**: (Electronic) Guest books enable website visitors to leave their name and comments voluntarily.
- **Newsletters**: CMS users may also be offered the possibility of subscribing to email lists maintained by the system and receiving online newsletters (via email) on various topics they are interested in.
- **Polls and surveys**: CMS functionality is provided by integrated tools for conducting polls and survey.
- **RSS:** 'Really Simple Syndication' is an alternative means of accessing the vast amount of information that now exists on the World Wide Web.
- **Support for multiple languages**: The CMS may also provide support for multiple languages.
- **Support for multiple platforms**: Most content management systems can be installed and operated on different hardware and software platforms
- **Interoperability**: Due to the increasing heterogeneity of IT systems provide appropriate interfaces and mechanisms which are based on open or industry standards such as SOAP, RMI, DCOM, and CORBA are often supported.

- **Extensibility:** Content management systems are written in a variety of programming or scripting languages such as C++, Java, PHP, Perl, and Python. The language a CMS is written in, can often be used to extend the existing CMS functionality by means of own source code or by modifying it.

6. Open Source CMS Software

1.	Acidcat ASP CMS	http://www.acidcat.com/acidcat
2.	Adaptive Website Framework	http://www.awf-cms.org
3.	AngelineCMS	http://angelinecms.com/index.php/
4.	Apache Lenya	http://lenya.apache.org
5.	Ariadne	http://www.ariadne-cms.org
6.	ASP Content Management	http://ww.aspcontentmanagement.com
7.	Back-End CMS	http://www.back-end.org
8.	Bitflux	http://www.bitflux.ch/english
9.	BolinOS	http://www.bolinos.com/com
10.	Bricolage	http://www.bricolage.cc
11.	CMS Made Simple	http://www.cmsmadesimple.org
12.	CMSimple	http://www.cmsimple.dk
13.	Cofax	http://www.cofax.org
14.	Contenido	http://www.contenido.org/opensourcecms/en
15.	Contentor	http://www.contentor.net
16.	CPS(Collaborative Portal Server)	http://www.cps-project.org
17.	Dragonfly CMS	http://www.cpgnuke.com
18.	Drupal	http://drupal.org
19.	e107	http://www.e107.org
20.	Easy Publisher	http://easypublisher.com
21.	Exponent	http://www.exponentcms.org
22.	eZ publish	http://ez.no/products/ez_publish_cms
23.	ezContents	http://www.ezcontents.org/ezContents2x
24.	imCMS	http://www.imcms.net/1015
25.	Joomla	http://www.joomla.org
26.	Kumera	http://www.cyber4.org/kumera/index.html
27.	Magnolia	http://www.magnolia.info
28.	Mambo	http://www.mamboserver.com
29.	MD-Pro	http://www.maxdev.com
30.	Metadot Portal Server	http://www.metadot.com
31.	Midgard CMS	http://www.midgard-project.org

32.	MMBase	http://www.mmbase.org
33.	OpenACS	http://openacs.org
34.	OpenCms	http://www.opencms.org
35.	OpenPHPNuke	http://www.openphpnuke.com
36.	PHP-Fusion	http://www.php-fusion.co.uk
37.	phpWebSite	http://phpwebsite.appstate.edu
38.	phpWebThings	http://phpwebthings.org
39.	Plone	http://plone.org
40.	Poociboo	http://poociboo.mendrik.de
41.	PortalMagic	http://www.portalmagic.cl/
42.	PostNuke	http://www.postnuke.com
43.	Silva	http://www.infrae.com/products/silva
44.	Sitellite	http://sitellite.org
45.	Syntax CMS	http://www.syntaxcms.org
46.	Tiki (aka TikiWiki)	http://tikiwiki.org
47.	TYPO3	http://typo3.org
48.	WebGUI	http://www.plainblack.com/webgui
49.	Xaraya	http://www.xaraya.com
50.	Xoops	http://www.xoops.org

List of some selected Open Source Web Content Management Systems (Web sites Accessed on 14.01.2008)

7. Use of JOOMLA CMS at Central library, IIT Bombay

There are so many CMS software are available and it is very difficult task to select from the above list. CMS use various programming and technology such as PHP, ASP, PERL, Python and Java. Databases supporting are MYSQL, PGSQL and Oracle with Windows or Linux. Most popular content management systems developed on PHP-MYSQL-Windows /Linux platform.

Joomla is regarded as one of the most user friendly tools and has won several awards including the Packt Publishing Open Source CMS Award in 2006. Design and layout are configured with extensible hypertext markup language (XHTML) and cascading style sheet (CSS). Hundred of free templates for Joomla exist, which are able to edited and configured to user's own look and feel.

While Joomla is packed with features, its greatest quality that it is extremely extensible and there are so many add-on modules are available, Easy installations, supporting required software's are already available in Linux, Easy customization etc., due I have chosen Joomla CMS for Central Library, Web Portal.

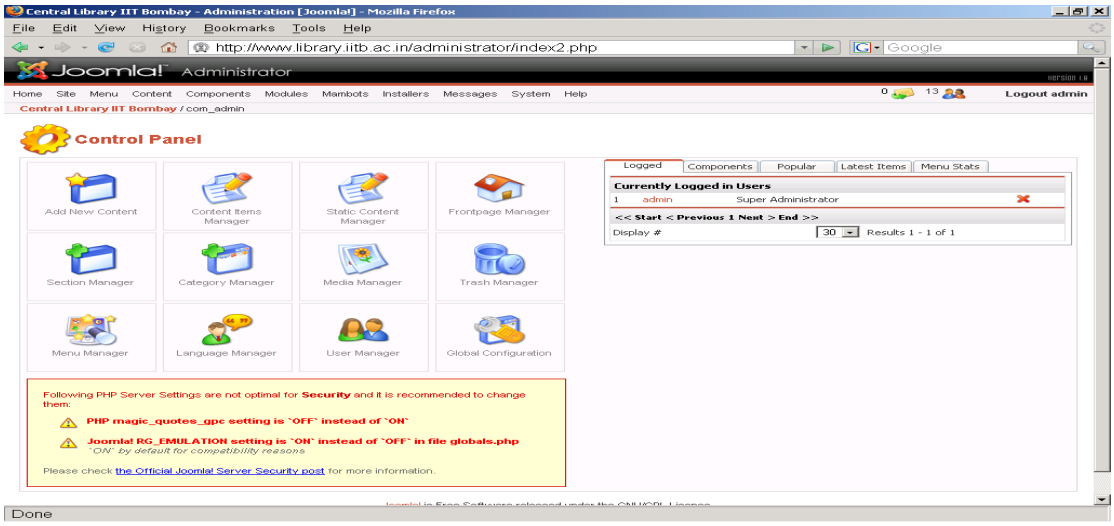

Fig. 2 JOOMLA Administrator Interface

Joomla Administrator interface where you can create content, manage content & publish Content:

- Add new Content
- Content Item Manager
- Static content Manager
- Front page Manager
- Section Manager
- Category Manager
- Media Manager
- Menu Manager
- Language Manager
- User Manager
- Global Configuration

8. **Features of Central Library Web Portal** (http://www.library.iitb.ac.in)

The Central Library portal of IIT Bombay is one of the best examples of Content management system which providing information about its activities, functions, resources and services and brings together all its resources and services on a single platform for convenience of its users.

The Web portal comprises of 160 contents Pages; 350 MB Disc Space, over 6500 content links to important e-resources and direct links to e-journals subscribed by the Library & trough INDEST consortium. The library portal enables the following modules.

- News Flash
- Quick links
- News Scroll
- Random Image
- RSS
- Contact
- Polls
- Search etc.

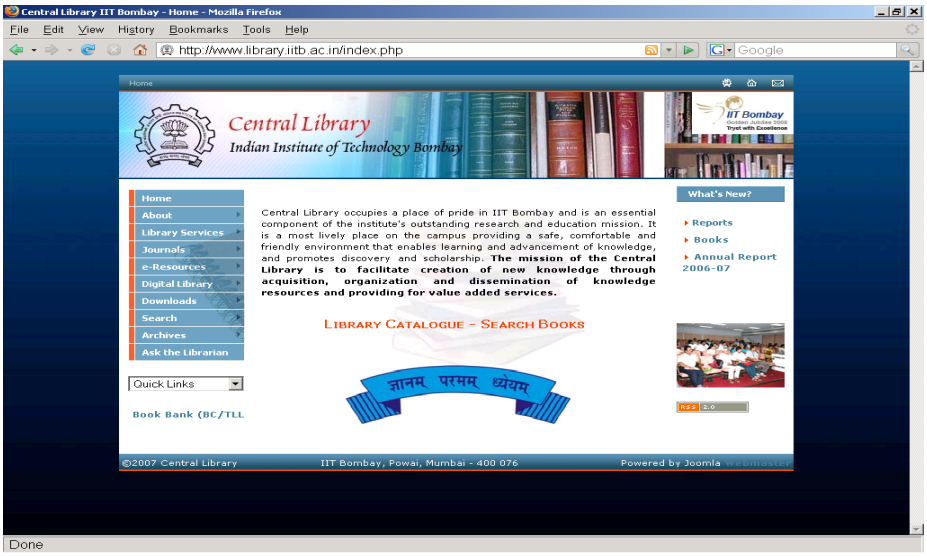

Fig. 3 Web Portal of Central Library, IIT Bombay

The library portal has eight main components of contents and it provides factual information:

1. About- The staff (Our Team) Collection Organization, FAQs and Library holidays & hours.
2. Library Services- Book Bank, Circulation, Inter-Library Loan ,Membership, Reference Service, Photocopying, Users Awareness
3. Journals - Current Journals, Library Holdings, Union Catalogue
4. IT Infrastructure - e- Books ,e- Databases ,e-Journals (A-Z) ,e-Journals (Publisher Wise), Multimedia Library
5. Digital library -Institutional Repository DSpace, ETD Submission (Intranet), ETD Search , INDEST
6. Download- Membership Form, Book Suggestion Form ,Know Your Library
7. Search - Search Book Search (OPAC), Advanced Book Search, User Details, Book Claim.

8. Archive- Annual report ,List of Additions ,Workshop Report
9. Contact – Ask the Librarian

9. Conclusion

The growing popularity of Open Source CMS software can be examined by the numerous advantages it offers Low cost, Conformity with open standards, Cross-platform support/ Portability, Interoperability, Large number of available products etc. The CMS are not free from disadvantages require initial investment on technical help and dedicated server and CMS is effective in an environment where regular update of website content. The JOOMLA having lot of features and facilities without any programming language, html languages and other software's knowledge the library professional can build a Library Portal and CMS also cost effective and save the time for maintenance the library portal.

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