Design and Development of Website with CMS: A Case Study of Library Website of Indian Institute of Technology Jammu

*Rajan Kumar#   **** Vanita Khanchandani**

* Library Assistant, Indian Institute of Technology Jammu; Email: rajankumar8285@gmail.com
** Assistant Librarian (SS), Indian Institute of Technology Delhi; E-mail: vanita@library.iitd.ac.in
# Corresponding author.

Abstract

Library website is the mirror of an institution. It is the best way of expressing what an organization believes by reflecting the organization's mission and vision to its users. This paper describes the live project towards the design & development of a new user-centered, IIT Jammu website using the content management system "WordPress." The main objective of developing this pilot project is to study and explore the features of the academic library website as well as experience of the flexibility and agility of open source Content Management Software. Since it is the newly established institute library and day by day student strengths are increasing, designing the website will help the patron to find the desired information without wasting time for searching the information at the different platforms.

1. Introduction

Lancaster expressed about a paperless society several decades ago. In today's electronic era, or we can say the emergence of Information and Communication Technology (ICT) in the field of Libraries and Information centers, it has brought a tremendous change by converting the physical presence of the library to virtual reality. As online technology plays an important role in the educational process, so the need for higher education institutions is to have a reliable, effective, and attractive tool for communication which is websites. The Higher Education Institutions (HEIs) play an important role in the development of society, while higher education institution's websites have different and many roles to fill. Websites are being used as a key medium of communication to the outside world.

In the digital era, library users are becoming more technology savvy due to the availability of the Internet and other smart devices. They need the right information from the right source with a very short span of time as they are very much busy. It brings up two important issues for the LIS Professionals: Information seeking behavior of different types of users for library resources and the importance of user awareness towards the library resources. Timeliness and accuracy are also important for the user's point of view. One of the important tools in achieving these things is to create the library website so that users can at least understand, what are the resources and services provided by the library, and users directly find the desired information without wasting time for searching the information at the different platform.

The Library website plays an important and powerful role in increasing awareness among the users about the services and activities of libraries and information resources centers. The

most creative and challenging work is to develop a library website and making it up-to-date regularly; it requires sound knowledge and professionalism of library personnel on web designing along with performing their daily library activities. The vision, mission, and values of any library could become successful if it satisfies the user's need at the optimum level. To be updated in the present-day context, libraries need to go beyond their physical boundaries and working hours, need to potentially expand library services and facilities to users located remotely so that they can access the information from anywhere, anytime. The libraries' websites as a means to provide access to information e-resources, online catalogs, news, events, and creative workshop, besides providing information about library collection, services, and facilities. However, only having a website will not attract much of their users; they need to create such websites that are user friendly where users can easily retrieve the desired information.

In most of the Institutions, the library website was maintained by a third-party or the competent authority of the computer center. The website may be the library's domain or placed within the institution/community website, but as there is a constant need for regularly updating the website and also the size of the content is increasing day by day. With such changes, the structure and nature of the library and side by side of the LIS profession have also changed dynamically. Now in the present situation, the LIS professionals are playing all-around multimodal roles to satisfy the different requirements of the end-users.

A website is an effective tool for any organization to disseminate its mission and vision to its user or the world. Earlier, we used to build up a static website that was difficult to update, modify, or make any changes. All these difficulties show the way to capitalize dynamic website. A Content Management System (CMS) helps any novice to make, modify, publish and update the content of the webpage without having much technical expertise. Present-day, Library, and Information Science Professionals have many options to take advantage of using various open-source CMS. WordPress is one of them, for developing their website. Most of the world communities are using CMS to manage the content of their website.

2. About Central Library, Indian Institute of Technology Jammu

The Central Library of IIT Jammu is an integral part of the Institute's academic and research work. As an Informational hub of the Institute, Library provides great learning and insight with optimum ambiance for study and learning on all institute working days. The Central Library was established in August 2016 along with the establishment of the premier Institute of this country with an emphasis development of Text collection required for the curriculum. It moved to the transit campus of the Institute in 2018. At present, it is located at the center of the transit campus. The library is fully automated with the open-source library management software Koha that supports all its in-house operations. The library has a CCTV surveillance system for the safety of library materials and also it is centrally air-conditioned. The main building of Central Library will be constructed in the next two years which will be the focal point of all the IIT Jammu fraternity.

Central Library provides information resources through the implementation of collection development policy as a result, balanced collection of Books and E-Journals are procured. At present, the Library has a collection of over 3,000+ books, which includes textbooks, reference books, and English language and Literature covering the areas of academic and research interest of the Institute. It has around 550 students. The Institute library has access to over 6,600 + full-text electronic journals/proceedings/standards and over three

databases/bibliographic databases from several publishers through the direct subscription. These resources and databases are ACM Digital Library, ACS, ACI Journals Online, AIP, APS, ASCE, ASME, IEEE IEL online, JSTOR, RSC Gold, SAGE-EMS Collection, Science Direct, Springer Link, SIAM, MathSciNet and SciFinder Scholar. The details and links to these electronic journals are available through the Library webpage. In addition to this, Library is also providing a Remote access facility to all faculty and research scholars to access the subscribed e-resources from off-campus locations through the Knimbus platform. The library is also providing the Academic writing tools facility to its user, which are Grammarly and URKUND (Plagiarism detection software).

The library is already procured a number of E-Resources and also in the process to enhance the online e-resources collection for the coming years. The library is the Institutional member of the National Digital Library sponsored by MHRD and coordinated by IIT Kharagpur. In addition, the library is also the member of eShodhSindhu Consortium for Higher Education Electronic Resources, formed by MHRD and based on the recommendation of an Expert Committee (Merging three consortia initiatives, namely UGC-INFONET Digital Library Consortium, NLIST, and INDEST-AICTE Consortium).

3. CMS AND WordPress

A content management system or CMS is a software that facilitates creating, editing, organizing, updating, and publishing the content of the website. The main objectives of CMS are to control the publication of extremely complex workflows through their information lifecycle: through create/discover, Archive/Retire, Secure/Encrypt, Retain/Hold/Dispose and Monitor and access. It is free open source software that keeps track of every piece of information of our website; it is the same as the Library that keeps the track of every book and its location. These open-source CMS software are created and managed by the group of community of developers and they allowed anyone to contribute the development of software. It can be installed/download without any cost only some basic skills are needed. There are large numbers of open source content management software are available online for publishing, editing and modifying the content of the website; such as WordPress, Joomla, Drupal, ModX etc.

WordPress is a Content Management System that enables us to create, modify, update and publish our content on the web. It is mostly used for web publishing. It can also be used to manage content on an intranet. WordPress permits users to have full control over the files, documents, as well as the design and display of the contents. This is the beauty of WordPress that we can publish the web content on the web without knowing a basic line of code. The benefit of a great content management system is to enable any user to edit, publish and modify their content without any technical expertise.

WordPress is being used in all sorts of creative ways. We have seen WordPress being used to power small business websites, blogs, large university library websites, portfolios, real estate property listing site, an internal communication system for companies, web directories, movie databases, application infrastructure base, arcade sites, and anything else we can think of.

In the earlier days, an average user or a small company had to rely on static HTML sites because they could not afford a content management system which would cost hundreds of thousands of dollars. That problem is now solved. WordPress is open source and free for anyone to use.

4. Advantage of using Content Management System (CMS) in Libraries

Content Management System of any libraries can make the services easier for non-IT persons. It can be used in libraries to:
- Design and develop a dynamic, dedicated, and interactive library website.
- Manage digital content in various formats like text, image, audio, video, etc.
- Increase user participation in library activities and services.
- Provide anywhere and anytime access to library resources through remote access.
- Provide library 2.0 services like blogs, RSS feeds, social networking, etc.
- Library authority can develop shared content for the library. Users can also participate in this process.
- Provide intuitive navigation, comprehensive site search, and integrated services as much as possible.
- Easy storage and retrieval or access of data.

5. Software requirements for designing the Library website using WordPress

To run WordPress, they recommend our host supports:
- *Operating system: Cross-platform (Windows, Linux, etc.)*
- *Web Server: XAMPP (XAMPP Apache + MariaDB + PHP + Perl)*
- *CMS:WordPress*
- *SSL Certificate (Secure Socket Layer): A valid security certificate is required for HTTPs*
- *PHP version 7.3 or greater*
- *MySQL version 5.6 or greater OR MariaDB version 10.0 or greater*
- *HTTPS support*
- *Browser Supports: Firefox, Google Chrome, IE*

6. Guidelines for designing a user centered Library Website

a. Whenever update something, always mentioned the last date of update.
b. Copyright statement.
c. Provide the status when a something is in progress (an 'under construction' or coming soon).
d. Include a section as news and announcement and update the latest announcement.
e. Provide an instruction where the content is not for public as internet or intranet.

7. Guidelines for Creating and Maintenance Website web documents

Mc Clements and Becker in their article 'Writing Web page Standards' have produced concise standards and guidelines for creation and maintenance of website web documents. Their standards consist of three parts: content, design, and technical concerns.
- Use a style sheet to define style of webpages.
- Use small graphics to identify the documents.
- Short home page.
- Always provide and updated link to the documents.
- Avoid 'monster' graphics.
- Provide navigational tools for users.
- Provide the whole site map of the website.
- Use less text in menus or lists.

> ➢ Use extensible markup language that is readable by future maintainers of the website.
>
> ➢ Check the finished document with a variety of browsers, both textual and graphic.

8. Procedure for the development of the dynamic library website using WordPress

The following steps were used for the development of a dynamic library website and making it live:

1. First, download the XAMPP and Install in your PC (https://www.apachefriends.org/download.html) XAMPP: X-Cross Platform, A-Apace, M-MariaDB, P=PHP, P-PERL
2. Download the WordPress .taz.gz file from the official website of WordPress (https://wordpress.org/download/)
3. Extract the zip file of WordPress and copy the extracted file to the C Drive as C:\xampp\htdocs
4. Open XAMPP control panel and start both the module Apache and MySQL
5. Open phpMyAdmin and it directs to the graphical user interface of MySQL, where we create a database name "WordPress."
6. In PHPMyAdmin interface after creating databases select hostname as "Localhost" (For hosting MySQL databases) create user name as "root" & password as "   ". Grant all privileges to the created user "library" of the database.
7. Open the web browser and type http://localhost/wordpress/wp-login and login; we will get the administration screen that provides access to the control features of our WordPress installation. Through the admin interface, we have the privilege to add/edit/delete articles, modules, menus, submenus, templates, components, banners, plug-ins, etc.
8. Now install the downloaded theme (Smartline Lite) to the WordPress by selecting Add New in the Appearance Screen, then Themes, the WordPress Theme system is a way to "skin" our WordPress site. A WordPress Theme is a collection of files that work together to produce a graphical interface with an underlying unifying design for a website. These files are called template files. A Theme modifies the way the site is displayed, without modifying the underlying software. Themes may include customized template files, image files (*.jpg, *.png, .gif), style sheets (.css), custom Pages, as well as any necessary code files (*.php).
9. Now create the Menu and Sub Menu, Pages in WordPress as the content can be organized using Menus. It allows us to create a navigation menu of pages, categories, custom links, tags, etc. that are presented to our visitors. A custom menu WordPress Widget allows the display of a custom menu in the sidebar or other widgetized areas in the Theme. We can make a sample format of our website, which is as below, and accordingly, we will create all the pages. Shown in the table:

Table 1: Sample format of website

Header					
Home	**About**	**Resources**	**Services**	**Useful links**	**Contact**
Left Menu	**Content Page**				**Search Box**
					Sidebar (widget)
Paragraph 1	**Paragraph 2**				**Paragraph 3**

10. Now create post category and Tags in WordPress through Add new post option. While we are writing those Posts, we can also create new Categories and new Tags. In addition, any Media (pictures, video, recordings, files) can be uploaded and inserted into the Posts.

11. To make the website more attractive and functional we must add-on some extra features. One of the methods is to install Plugins; it allows us to add new features to our website that don't come standard with the default installation. The core of WordPress is designed to be lean and lightweight, to maximize flexibility and minimize code bloat. Plugins offer custom functions and features so that each user can tailor their site to their specific needs. e.g. TinyMCE-advanced, hit-counter-max.2.0, vertically-scroll-RSS-feed, featured-posts-slideshow etc.

12. Add header image to the website as the header or banner plays an important role in order to disseminate the information about the website.

13. Add the content to the created web pages as we have created Menus, and Submenus and it should contain the relevant information as per our requirement. It may contain textual information, images, videos, tables, paragraphs, and so many other things.

14. Backup and Restore of databases are very important as the WordPress database contains every post, every comment, and every link we have on our blog. If our database gets erased or corrupted, we stand to lose everything we have written. There are many reasons why this could happen, and not all are things we can control. With a proper backup of our WordPress database and files, we can quickly restore things back to normal.
    ➢ There are many methods to take the Backup of the databases one of the most popular is phpMyAdmin which is as follows:
       a) Click on Databases in our phpMyAdmin panel.
       b) We may have several databases. Click the one that holds our WordPress data, the database we created when we installed WordPress.
       c) Click Export.
       d) Click Go. The data will now be saved into our computer.
    ➢ Using phpMyAdmin we can restore our database from backup, steps as follows:
       a) Login to phpMyAdmin.
       b) Click "Databases" and select the database that we will be importing our data into.
       c) We will then see either a list of tables already inside that database or a screen that says no tables exist.
       d) Across the top of the screen will be a row of tabs. Click the Import tab.
       e) On the next screen will be a location of the text file box, and next to that a button named Browse.
       f) Click Browse. Locate the backup file stored on our computer.
       g) Make sure SQL is selected in the Format drop-down menu.
       h) Click the Go button.

One of the important things that we should take care i.e. *Back up our database regularly, and always before an upgrade.*

15. The time required to complete this library website was around 3 months (i.e., October to December 2019)

16. The following screenshots were from the process of WordPress Installation finally developed the Central Library website of IIT Jammu. Figure 1 and 2.

Figure 1: Customizing the Library Website (Library, IIT Jammu)

Figure 2: Home page of the website Library, IIT Jammu

9. Salient features of IIT Jammu Library Website

The Library website of IIT Jammu is one of the best example of Content Management System, which provides information about its collections, services, activities, resources, and announcements and brings together all its various services, resources on a single platform for so that users can access the same. The Salient features of the library website that provides factual information is depicted in the table 2 given below:

Table 2: Salient features of IIT Jammu Library Website

Menu	Sub-Menus	Brief Description of Contents/Links
Home Page	----------	Displays main/ header menu, right side menu, digital library menu, tab menu, Trail Access, New Arrival books under latest updates, Research supports tools, quick links to the Institute website and Web OPAC, etc.
About us	About Library	Provides brief view of library, its vision and mission.
	Library Rules	Provides information on library rules and regulations.
	Library Hours	Provides information about library timings and holidays.
	Library Collection	Provides information on library collection details.
	Our Team	Presents library staff details and their responsibilities.
	Library Floor plan & Layout	Describe the library floor plan and layout details.
Sections	Textbook section	Provides information about the textbook section
Services	Membership	Provides information on library membership provision, loan period, and loan privileges.
	Circulation Service	Provides services like the issue, return, renewal, and reservation of books to the users.
	Reprography Service	Provides photocopy services to the user.
	Inter-Library Loan Service	Provides the articles to the user through ILL
Journals	Print Journals	Provides the details of print subscribed journals
E-Resources	Full text	Provide the details of subscribed full-text e-resources with direct link and the list of the journals
	E-Database	Provide the details of the subscribed database
	Standard	Provide the details of subscribed Standard
	E-Books	Provide the details of subscribed E-Books along with the respective publisher website
	NDL@IITKGP	Provide the registration link of National Digital Library
	E-Resources Guidelines	Provide the guidelines for fair use of subscribed e-resources at IIT Jammu
Web OPAC	OPAC	Provide a link of Online Public Access Catalogue (OPAC)
Downloads	Book recommendation form	Provide a link to download this form
	List of Approved vendors	Provide the list of approved vendors who supply the book to the library.
Contact us	-------	Provide the contact details of the library.

10. Conclusions

Libraries and information centers are always deals with information science and have a direct contact with their user community who are living both campus and off campus. Without a user-centric website, a digital library can't be imagined in India. User-centric website may attract new patrons of the library and some may help to retain existing user. In order to meet the requirements of the user, libraries should design and develop a dynamic, dedicated and interactive library website using content management system software like "WordPress" or any other CMS software, as library website plays a pivotal role for the user in this digital India.

The concept of librarianship in HEIs had been changing day by day. Many peoples believe that the role of librarians is decreasing day, but the fact it is becoming more important provided you are keeping the same pace with the emerging trends and technologies in this field. There is a transformation in the need of library users and due to ICT; there is a change in the resources, services, and products of libraries. The library services and its facilities had crossed the boundaries of the four walls like the virtual library. In today's scenario of digitalization, the librarian should try to extend the facilities to the users apart from his location at any time. Marketing of the library services and products is perhaps the most important for increasing the usage to justify the ROI (Return on Investment). The librarian will have to be more proactive in this area. He must understand the information-seeking behavior of the users. For optimum use of resources, the librarian must develop a mechanism for their user so that it provides the desired information directly to them rather wait for them to visit to the library. Libraries should provide web-based services and facilities to their users and it is the role of the librarians to act as an Information scientist and disseminate the information successfully. It's the right time to "think globally and act locally" and to be architect NOT the victim of the Change due to the impact of ICT on Library Services, Resources and Products.

Previously Librarian or LIS Professional has to depend upon IT peoples to make a Library Website or to make and manage the table of the content of the Library on the web. With the emergence of the Open Source Content Management Systems, Library professionals need not to depend on IT professionals. By using open-source CMS, Library professionals independently create, manage command, maintain and upload the contents and also take back up their own content easily and effectively in any database format with free of cost.

References:

1. About IIT Jammu. (n.d.). Retrieved November 16, 2019, from https://iitjammu.ac.in/about-iitjammu
2. Alam, Md. Nurul & Maity, Goutam (2016). Developing a Website with Content Management System (CMS): A case study of Department Of Library and Information Science (DLIS), Jadavpur University. *Knowledge Librarian, 3* (1), 124-130. Retrieved November 5, 2019, from http://www.klibjlis.com/3.1.17.pdf
3. Amin, J. and Navik, V. (2013, March). *Creating Library Website using Joomla: A Case Study on IIM Ahmedabad Library Website*. 9th International CALIBER-2013, Gandhinagar (Gujarat). Retrieved November 15, 2019, from http://ir.inflibnet.ac.in/handle/1944/1781

4. CMS Usage Distribution in the Top 1 Million Sites. (n.d.). Retrieved November 25, 2019, from https://trends.builtwith.com/cms

5. Dhamdhere, Sangeeta N. (2012, February). *Library Website: A Mirror of the Library. 57th All India Library Conference- ILAKSIL*, from https://www.researchgate.net/publication/325425994_Library_Portal_A_Mirror_of_the_Library

6. Hosting Requirements for WordPress. (2018, March 28). Retrieved November, 2019, from https://wordpress.org/about/requirements/

7. Islam, I., Md., Shariful, I, Md. & Sagorika, S. (2011, February). *Content Management System (CMS): Application of Joomla to website development in Libraries and Information Centers.* Paper presented at International Seminar "Vision 2021: the role of libraries for building digital Bangladesh". Retrieved Jan. 1, 2017, from http://nazmul81.weebly.com/uploads/1/9/1/2/1912061/cms_nazmul.pdf

8. Jadhav, Mahendra N. (2006, February). *Content Management Systems Software: A Solution for Dynamic and Cost Effective Library Portal - The Case Study of IIT Bombay.* 6th International CALIBER-2008, University of Allahabad, Allahabad. Retrieved November 15, 2019, from:
http://ir.inflibnet.ac.in/bitstream/1944/1267/1/32.pdf

9. Kishore, A. & Seshaiah, O. (n.d.). *Drupal: Developing Library Portal Using Open Source Content Management System.* Retrieved November 10, 2019 from http://www.liscom.org

10. Kuchi, T. (2006). Communicating Mission: An Analysis of Academic Library Web Sites. *Journal of Academic Librarianship, 2*, 148-154.
doi:https://doi.org/10.1016/j.acalib.2005.12.006

11. Pant, A. (2015). Usability Evaluation of an Academic Library Website Experience with the Central Science Library, University of Delhi. *The Electronic Library, 33*(5), 896-915. doi:https://doi.org/10.1108/EL-04-2014-0067

12. Sharma, D. et al. (2009, February). *Web Content Management in Universities Using Joomla!: Freedom All Together.* 7th International CALIBER-2009, Pondicherry University, Puducherry. Retrieved January 1, 2017, from http://www.inflibnet.ac.in/caliber2009/CaliberPDF/31.pdf

13. Static v Dynamic Website Design. (n.d.). Retrieved November 10, 2019, from https://www.spiderwriting.co.uk/static-dynamic.php

■ ■ ■