Evaluation of Content Management Software with Comparison among Joomla, Wordpress and Drupal

SudipBhattacharjee
Guest Faculty, Department of Library and Information Science,
Assam University, Silchar-788 011
E-mail: sudipbht12@gmail.com

Abstract: In the age of web 2.0, large numbers of website are driven by Content Management System (CMS). CMS is a software program that not only maintaining web sites, but also inherently carry variable information about a site structure and content model. It manages textual and multimedia content faster and easier. In this information age, the demands of Open Content Management Software are continuously increases with growing popularity. This software are now in a position to offer an alternative to commercial products. There are several Content Management Software available now a day's based on various functionalities. In information technology literature, most discussions of content management focus on managing comprehensive web sites and/or web collaboration tools. Till now, no standards were officially published for what a CMS should be and what the critical requirements a CMS should address. This paper discusses about evaluation criteria to choose right Open Source Content Management Software and a comparative study among those content management software such as Joomla, Wordpress and Drupal. This study also attempts to analyze each Content Management Software on the basis of their various usages, performance, graphical flexibility, structural flexibility, search engine optimization, security, etc.

Keyword: Content Management System (CMS), Joomla, Wordpress, Drupal.

1. Introduction:

With the advent of the Internet, we now live in such a society which brings new essence to mankind. The introduction of Web 2.0/ Web 3.0 has been a tremendous innovation in the web community. Since the last decade, when most web sites were developed to publish static information, they have evolved steadily and ubiquitously to serve dynamic and complex web content and business functions. With the growing popularity of web sites and web applications, the web aligned with e-business models started to emerge, which relies on server-side programs executing business logics hosted on application servers to generate the dynamic HTML as per each user request (Ravi et al., 2009). Moreover, in response to the increasing amount of content to be managed and its scatteredness throughout organizations have resulted in the growing popularity of content management products (Grahlmann et al., 2010). To provide organizations with and their marketing communications department in particular the flexibility to publish dynamic and personalized content on the web, a specific type of content management product software evolved called web content management system (*WCMS*). A WCMS is product software which can be tailored and customized by means of configuration and will lead to a CMS-based web application (Souer et al., 2007). Most dynamic web sites utilize some sort of WCMS to support the organization with their online business because it allows them to create web initiatives in a time- and resource-efficient waybased on standardized components.

2. Content Management System:
A content management system is software that is used to support the creating, updating, publishing, translating and retiring the digital information. It allows editors from various

website to easily share and content technology. Rosenfeld and Morville (2002, p. 221) say that "Content analysis is a defining component of the bottom-up approach to architecture, involving careful review of the documents and objects that actually exist. What's in the site may not match the visions articulated by the strategy team and the opinion leaders. You'll need to identify and address these gaps between top-down vision and bottom-up reality."A CMS is a fairly new concept. No standards were officially published for what a CMS should be and what the critical requirements a CMS should address. In information technology literature, most discussions of content management focus on managing comprehensive web sites and/or web collaboration tools. The exact definition of "content management" tends to be ambiguous due to the phrase having different meanings across various subject disciplines. Boiko defines content management as a process of collecting, managing and publishing content (Boiko, 2002, p. 67). Acknowledge management company states that CMSs are a key way of managing and delivering business knowledge.

3. Classifying user generated content:

One of the challenges for dealing with increased amounts of user generated content is classification. Traditionally content is classified through a taxonomy, which ensures that related content can be located together. Managing taxonomy is more difficult when the content is produced minute by minute throughout the world, in multiple languages, using varied media, to different quality levels, by a huge, diverse population. One accepted way of classifying this content is to pass the responsibility for classification over to a community, along with the responsibility for creating and maintaining the content. The community then decides where the content belongs, normally through ''tagging''. Here, rather than using a taxonomy, a folksonomy is generated (Mathes, 2004; Gruber, 2007). Once content has been classified by collective tagging, a variety of semantic information can be deduced from this metadata.

One application of tags is creating a tag cloud; a simple visualization of the most frequently used tags (Godwin-Jones, 2006). If the content on a website is continually tagged with a certain subject, we can assume that the site concerns the subject and present the tag more visibly. While a variety of studies have evaluated the creation and use of tag clouds from a usability perspective (Rivadeneira et al., 2007;Halvey and Keane, 2007), this paper addresses how to improve the accuracy of a cloud. To effectively create a tag cloud, first the community needs to have effectively tagged the content and for that a willing community is needed. Secondly a collection of content is necessary as it is not possible to create a tag cloud based on individual items of content (such as a single photo, or a single article of text). In the following section we examine how to automatically generate an effective cloud, based on individual pieces of text without the need of a folksonomy, by applying natural language processing techniques.

4. Need of Content Management System

Content Management System can help to:
   ➢ Create and Publish content in a standard format without needing to know HTML or other languages;
   ➢ Co-ordinate the work of teams of authors and editors (e.g by ensuring that only one person is editing any individual content item at one time);

> ➤ Control the branding and quality of content (e.g. by ensuring that the correct style sheets are applied, and that changes to the content are approved before they are published);
> ➤ Reuse the same content item in multiple different sites and formats.

5. Software Selection:

The first step in open Source CMS selection was to find a systematic tool which analyses open source CMS packages. CMS Matrix provides facility to compare the features in over 1200 CMS packages. But, evaluating open source CMS packages is a most difficult task. The few firms that concentrate on open source applications may or may not include trend analysis. Those that do often produce reports that is expensive for many. For example, the 2007 CMS Watch Web Content Management System report ranges from $975 to $2975, depending on licensing options. Although Gartner, Forrester, and IDC offer reports within the same price ranges, if commercial vendors are positively reviewed, they are more likely to purchase the rights to publish those reports on the web. Although the intent of these companies is to use these reports to attract potential customers, researchers interested in open source can exploit this free source of information to obtain trend analysis data that is standard in these reports.

It facilitates to discuss, rate, and compare the various CMSs available in the market today. Comparison is based on the data provided by the vendors who develop CMS. It provides statistics like which CMS got most clicks, most views and most compares. It also provides information such as most recently updated CMS, best rated and worst rated CMS by users. On the basis of CMS Matrix, surveys and reviews of industry reports like Info World's Best of Open Source Software (BOSSIES), the Packet Open Source Content Management System awards and water and stone "20II open source CMS market share report" following CMS are selected for the evaluation, which are Wordpress, Drupal and Joomla. These three packages are widely considered "best-of-breed" in the open source community. Additionally, because this document focuses on web site management, the CMS packages selected are those that have been categorized as WCM software or have a significant WCM component. These packages have then been evaluated to determine which type of website it best serves.

The following tests were then applied to this software:
   a) Software must provide basic WCM capability including the ability to publish pages, connect to or function as a portal, and perform web administration, and maintain user accounts.
   b) Software must have an active user base, as is evidenced by the presence of forums and/or mailing lists as well as user groups and/or conferences. Activity must have been detected in these forums or lists within the past 14 days.
   c) Software must have demonstrated evidence of product development within the past year. This includes major or minor releases, patches, or testing.
   d) Software demonstrates that there are plans for future upgrades or releases.

6. Example of Some CMS Software

6.1. Wordpress
WordPress started in 2003 with a single bit of code to enhance the typography of everyday writing and with fewer users than you can count on your fingers and toes. Since then it has grown to be the largest self-hosted blogging tool in the world, used on millions of sites and

seen by tens of millions of people every day. Everything can be seen in it, from the documentation to the code itself, was created by and for the community. WordPress is an Open Source project, which means there are hundreds of people all over the world working on it. (More than most commercial platforms.) It is also free to use it for anything from home page to a Fortune 500 web site without paying anyone a license fee and a number of other important freedoms. (https://wordpress.org/about/). WordPress was born out of a desire for an elegant, well-architecture personal publishing system built on PHP and MySQL and licensed under the GPL. It is the official successor of b2/cafelog. WordPress is modern software, but its roots and development go back to 2001. It is a mature and stable product.(http://codex.wordpress.org/History). In addition, over 60 millions websites are using WordPress which shows just how popular it is.

6.2.Joomla:

Joomla is a class of Open Source CMSs written in PHP scripting language and uses MySQL database for the backend. Compared to Drupal, Joomla is fairly new and is gaining popularity among users because of many aspects, including ease of usability and extensibility. There are around 4500extensions and modules available to enhance the functionalityof the core Joomla package. Joomla can be installed and run on Linux, Windows or Macintosh OS. It is distributed underGPL and is free to use. Advanced components of Joomla 1.5are built using Model-View-Controller (MVC) design pattern. The standard release of Joomla contains the basic features such as blogs, RSS feeds, caching, search functionality, printable versions of pages, create and manage menus, administer the system and support for languageinternationalization. Joomla keeps content in its database toprovide dynamic formatting. Web pages can be presented inunique format preferred by different visitors and differentcomputers as they are not static files. Joomla templates arecomposed of XHTML block and in line tagged element. Thetheme manager interacts with data collectors and Menumanager in particular pattern.

6.3.Drupal:

Drupal is an Open Source CMS written in PHP and usesMySQL, PostgreSQL or MS SQL for database. Drupal can besetup on Linux, Windows or Macintosh OS. It is distributedunder GPL ("GNU General Public License") and is free todownload.The architecture of Drupal is designed in such a way that thethree different layers work independently and correlate witheach other to give the final output. These three layers are thecontent which forms the website, the application algorithmthat organizes this content for presentation, and therepresentation layer which is incorporated by the Drupaltheme system. The webpage that comes to a viewer's browsergoes through a sequential process in which Drupal modulestake all the relevant content from the databases and then thetheme gets ready for the final presentation. Unlike Joomla,Drupal's architecture does not follow the design pattern ofMVC but instead follows the Presentation-Abstraction-Control (PAC) (http://www.w3schools.com/js/).

7. Evaluation Criteria While Choosing Content Management System (CMS):

❖ **Defined needs and goals:** While choosing CMS, define needs and goals. There are lots of CMSs available for specific need like Moodle-CMS for E-Learningfor social networking, Drupal- for library services, Joomla CMS with Mosets - for real estate. Search the CMS which is suitable to achieve the defined goals and requirements.

❖ **Software License:** The license under which open-source software is offered plays vital role. It is important to check the license of the CMS which is being considering, particularly if one is going to modify the software and plan to redistribute it.

❖ **Ease of Hosting and Installation:** Content Management System requires services of web host. Web host is a company that provides and maintains servers which host the CMS. It also connects the website to internet safely and securely. Selected CMS should be easy to install on sheared web hosts. Wordpress, Joomla and Drupal can easily be installed on shared web hosts.

❖ **Ease of setup:** If one wants to design a simple website which contains less than 50 pages or simple in structure, technical skills are not needed. For setting up simple site all four CMS provides many pre-packaged themes. One can choose the suitable theme that works for organization and install it into the CMS. They also allow to easily setup the webpages and navigation scheme. For setting up complex sites technical skill is required. One has to learn the system to understand advanced features, administration tools, navigation system. All three systems provide sufficient documentation which includes published books. Wordpress, Joomla are relatively easy to learn. Drupal provides many options, settings and screens for more flexibility. Before using these options one can see the reviews and ratings on the site drupalrnodules.com. Plone is most difficult among all four CMS. The system provides complex set of options and settings which requires expertise in CMS system.

❖ **Ease of use: Content Editor:** CMS should provide easy tools for updating the text and images. All three CMS are easy to use. It only requires bit training for non-technical staff members to update pages. Wordpress, Joomla provide friendly support while Drupal provides add-on module for page editing.

❖ **Ease of use: Site Administrator:** Site administrator has to manage the users who can edit and create new contents. He has to address security issues and fix bugs. Also it is important to take back-up of site regularly. Wordpress make site management easy by providing upgrades and tools to manage users and contents. DrupalandJoomla require administrator to have technical skill to install new upgrades.

❖ **Graphical Flexibility:** Graphical design is important factor as it provides look to website. One can easily prepare theme by using knowledge of HTML/ CSS. Having graphical flexibility in CMS one can enhance the look by using different templates, images, flash etc. Graphical flexibility allows extremely granular control over look and layout. All three systems provide great graphical flexibility.

❖ **Accessibility and Search Engine Optimization:** The term Website accessibility refers to making a website accessible to all internet users, regardless of what browsing technology they're using. Website should appear prominently after providing the desirable keywords to the search engines is known as Search Engine Optimization or SEO. To achieve both CMS use common conventions like using tag "Hi" to denote top level header. Joomla perform well in case of SEO while Drupal and wordpress provides less robust functionality.

❖ **Structural Flexibility:** It is the feature which allows the display contents on website in different formats. For example one can display list of college events on event page and just library event in the library section. Using structural flexibility one can manage lists or directories of unusual types of content. Drupal is structurally flexible. It permits to create site structure and one can decide content location on web page. Joomla is less flexible and provides three level hierarchy: sections, categories and articles, Wordpress is the weakest CMS in structural flexibility.

❖ **User Roles and Workflow:** If only a few people are going to manage contents on website then specific functionality to manage user roles is not needed. But in the case

of complex content having hierarchical flow which is handled by multiple people, a CMS which assigns users permission to add, edit or publish data can be useful. Site manager can specify the particular role and set the permissions to that role. Drupal provides modules which allow node wise permission. Wordpress and Joomla are weaker and restricted to few user types.

- ❖ **Community/Web 2.0 Functionality:** Content Management systems offers different Web 2.0 features in which one can upload, share the articles, images, videos. One can comment on the topic, publish their blog or subscribes the site content through RSS feed. More advanced features includes community building, discussion forums, social networking features like one can create own profile and then link to the people from same profession. Drupal has a strong and active community features. It offers profiles, blogs and comments and various add-ons. Wordprss has blogging and comment features. It also provides add-ons to create social networking sites. Joomlais relatively weaker in this area and offer fewer community features.

- ❖ **Extending & Integrating:** This feature provides facility to extend the CMS by programming custom add-ons for unusual needs. All three CMS facilitates users to program custom add-ons. Drupal, Joomla and Wordpress use PHP coding language for add-ons. Many organizations want to integrate their CMS with other organizational systems like organizations database, accounting system etc. A CMS that integrates already existing database is the ideal option. All threeCMS offer robust data integration support.

- ❖ **Security :** Websites can suffer from different attacks of hackers, malwares, denial of service etc. The ideal CMS is one which has fewer vulnerabilities and it should remove the vulnerabilities in shortest period of time. In case of security, Drupal and Joomla have more vulnerabilities but it is possible to recover the system easily and remove it. Wordpress has the most reported vulnerabilities.

- ❖ **Support/Community Strength:** An active and knowledgeable community plays vital role in open source software. By posting the problem to the site one can judge the community on the basis of quality of responses. All three CMS have strong and active community with lots of support from forums and IRC. Also paid support of developers is available for all three systems.

Based on these parameters a comparative table has been given as follows:

Table 1: Comparison chart

CMS Evaluation	Wordpress	Joomla	Drupal
Flexible	Best	Less	Best
Powerful	Best	Best	Best
Theme choices	Less	Best	Good
Quality of free plugins	Less	Ok	Best
SEO- capability	Good	Good	Best
Content management capability	Good	Best	Good
Flexible	Best	Less	Best
Ease of Hosting and Installation	Best	Best	Best
Ease of setup	Best	Good	Good
Ease of use: Content Editors	Best	Good	Good
Ease of use: Site administrator	Best	Good	Good
Graphical Flexibility	Best	Best	Best
Accessibility and Search Engine	Good	Best	Ok

Optimization			
Structural Flexibility	Good	Good	Best
User Roles and Workflow	Ok	Best	Good
Community/ Web 2.0 Functionality	Best	Good	Best
Extending and Integrating	Best	Best	Best
Security	Ok	Good	Good
Support/ Community Strength	Best	Best	Best

8. Conclusion:

Organization can use open source CMS to manage their contents effectively and efficiently with the features like personalization and web administrative functions. While choosing best suitable open source CMS for the organization one has to study it in detail. Analysis of various features of open source CMS can often enhance decision making. A stable, cost-effective, flexible CMS which fulfills the organizational needs is an ideal choice. Open-source CMS facilitate user to control overall content management solution. It provides freedom to program custom modules according to the needs. For basic site which contains few pages and less number of users, wordpress and Joomla are the best options. They are useful for blogs and forum sites. Drupal and is suitable for complex site with more number of pages and multi-contributors.

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