

Open Source Content Management System for content development: a comparative study

D. P. Tripathi

Assistant Librarian

Biju Patnaik Central Library

NIT Rourkela

dptnitrkl@gmail.com

Designing dynamic and static web pages have been possible with many good software like Frontpage, Dreamweaver etc. but gradually it became difficult for web developers to design pages due to dynamic nature of these software and different file formats. But evolution of open source content management system such as Joomla, Drupal, Wordpress, Plone, DotNetNuke etc. have been found as an alternative to this. This paper deals with comparative study between Joomla and Drupal. The basic objective of this paper is to find out the best content management system for content development based on selected criteria which includes installation, platform support, browser support, documentation, community support, modules, extensions, user management, usage, design, performance, scalability etc.

Keywords: Content Management System, Joomla, Drupal

Introduction:

There has been tremendous change in information generation, distribution and access in the present information society which has affected most of the human's life, the same way, there has been affect and growth in Information on the web also which has made the searching more complex. Due to Information explosion, a new set of problem has arrived for the administrator who produces and manages the content. So, a system which can allow to manage, create and distribute various forms of content was needed, thus CMS was created.

Joomla and Drupal are two most popular open-source content management systems to design powerful and dynamic websites. Both have similarity in nature such as open licenses, strong community support for further development, LAMP-based (Linux, Apache, MySQL, PHP) hosting architecture & environments. Joomla and Drupal, both are also flexible and able to deliver content management functionality with ease.

Organizations as well as service providers such as library looking for a content management system to develop a website always keep them on top choices due to its system's value, efficiency and capabilities. Though, there are many similarities between Joomla and Drupal even then differences in implementation processes, methods of development, support requirements and specific feature implementation costs can make one or the other more suitable for specific purpose of an organization or library.

This paper describes about the differences between Joomla and Drupal for the content development and involvement of costs. This information is provided for web developers, library professionals, IT department heads etc. who are facing the difficulties while choosing the choice between Joomla and Drupal. Reading this paper, one should be in better position to understand the differences between these two CMS.

Content Management System:

A system which is used to manage the content is called as Content Management System which consists of two elements: the **Content Management Application (CMA)** and the **Content Delivery Application (CDA)**. The element of **Content Management Application** allows the web developer or author (who may not be familiar with **Hypertext Markup Language (HTML)**) to manage the creation, modification, and removal of content from a web site without having the expertise of HTML or web designing. The element of **Content Delivery Application** uses and compiles that information to update the web site.

An individual can use a template as well as wizard and other tools to create or modify web content with its web publishing feature. Documents including electronic and scanned paper can be formatted into HTML or PDF using format management feature for the website. The content can also be updated to new version using revision control feature. Content Management Systems have additional features such as indexing, searching and retrieval. A Content Management System indexes all data available on the site. Individual can then search for data using keywords, which the CMS system retrieves.

A Content Management System consists of different subsystems that interact with each other:-

- Collection
- Management
- Publishing

Need of Content Management Systems

Content Management System is the fastest way to create content and update the website. It gives freedom to create new pages in one click, and inactive unused pages, without worrying about disturbance in the design. A website holder need not to pay every time he wants to modify the content of his website. It also saves money and time.

A powerful content management system has the following advantages.

- CMS is generally web-based and it can be accessed over network system through browser.
- CMS allows to add, change and remove the text, images, and videos.
- CMS allows to edit the page titles, descriptions and URLs.
- CMS allows to create or delete the new category or page in the website.
- CMS allows to edit the tag.
- CMS also allows to change the text of the navigation bar.

A CMS keeps websites well organized, increases the data security, and reduces the site maintenance costs. Several open source content management systems such as Joomla, Drupal, Wordpress, Plone, DotNetNuke etc. are available that may be of much use while designing a website.

Joomla:

Joomla is an award winning open source content management system which is written in PHP scripting language and uses MySQL database for the backend. Joomla is gaining more popularity among users due to ease of usability and extensibility. More than 5000 extensions and modules enhances the functionality of the core Joomla package. The important feature is that it can be installed and run on different operating systems such as Linux, Windows or Macintosh and can be distributed under General Public License (GPL) means it is free to use.

Model-View-Controller (MVC) design pattern is mainly responsible for advanced component of Joomla. It 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 language internationalization. Database which is used in Joomla can be utilized for dynamic

formatting. Look and feel of Joomla can be customized using templates which are composed of XHTML block and in line tagged element. The whole system consists of two types of pages: **Categories and Articles.**

Joomla File Structure

At the time of installation of Joomla, some of the important file will be created either on the local machine or on the server. The example is given below showing how each folder has all the important documentation structured and organized.

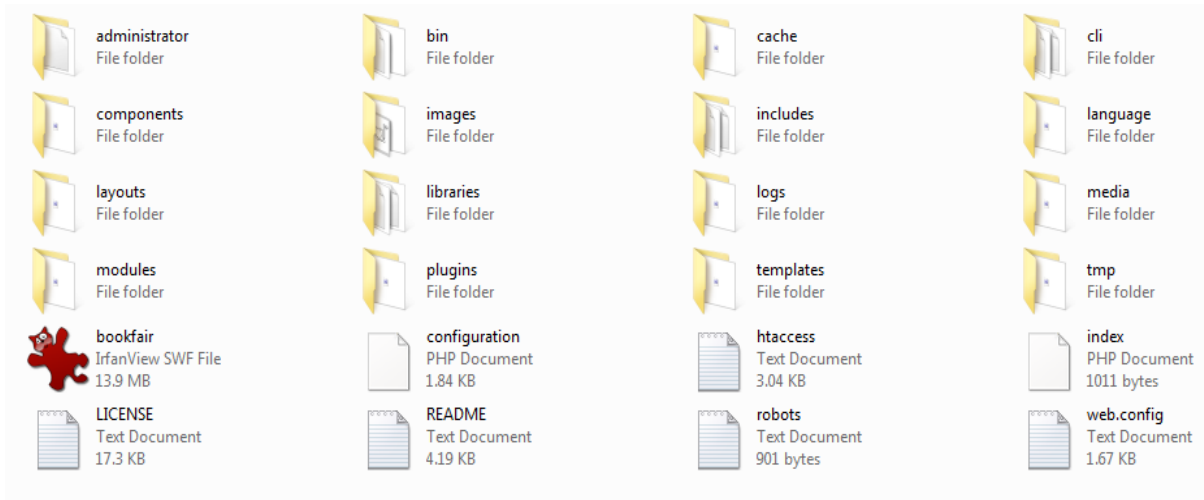


Fig-1: Joomla File Structure.

DRUPAL

Drupal is also an open source content management system which is written in PHP and uses MySQL or PostgreSQL. It can be installed on different operating system such as Linux, Windows or Macintosh. Drupal is distributed under General Public License and is free to download. The Drupal's architecture has been designed in such a way that the three different layers work independently and correlate with each other to give the final output. These three layers are the content which generate the website.

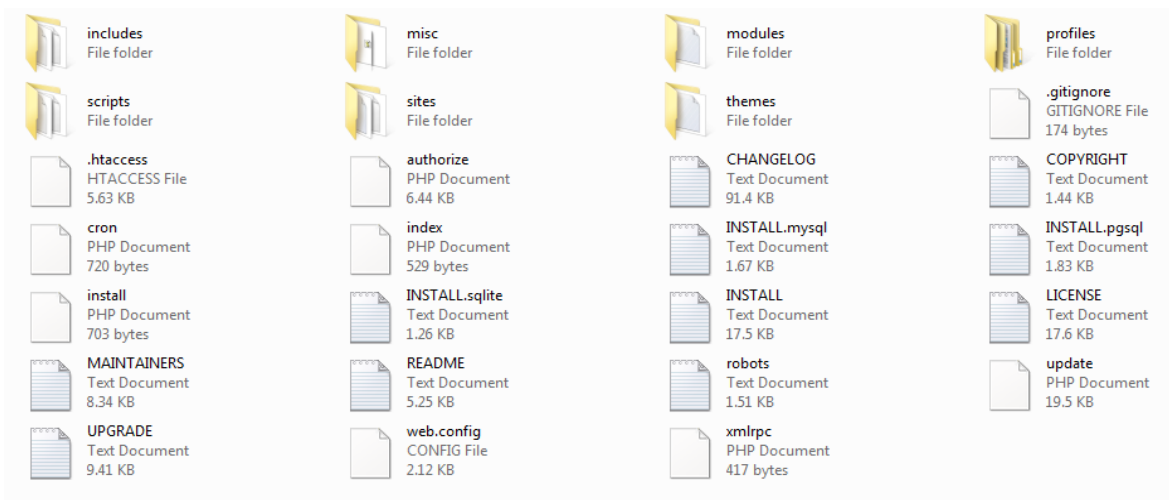


Fig-2: Drupal File Structure

Methodology to compare:

Internal and external variables have been the biggest challenges in comparison of two full-featured content management system. These variables are mainly responsible for implementation processes and real cost involved in implementation. In addition, one system may be better suited than the other to handle a particular requirement of the website, even though both are capable of supporting it.

When we compare two content management systems, it requires a deep familiarity with both platforms and experience with multiple deployments with special requirements. It is also important to understand that how a particular CMS can fit into the context of a project and can go a long ways toward effectively managing integration costs, support and ongoing maintenance.

Both Joomla and Drupal have developed several versions in past few years. Comparison about capabilities and details of two content management systems relate to the most recent, stable, long-term-support releases i.e. Drupal 7 and Joomla 3, respectively. Both Joomla and Drupal are very easy to learn and deploy.

Setup and Configuration of Hosting Environment:

A number of tasks involve to create the environment for web hosting which includes selection of hardware and system configuration, operating system and installation of software on webserver and configuration & network setup.

Joomla runs well on any properly configured system with Apache and PHP.

Drupal runs well on properly configured server same as Joomla.

Environment setup and configuration costs for hosting Joomla or Drupal locally or on web server are effectively the same. However, for large-scale websites that require load balancing across servers, as well as projects that must support multi-site capabilities, **Drupal may require less time for server planning, setup and deployment.**

Installation of CMS and Configuration:

Installation process for both Joomla and Drupal is almost same. The process involves uploading files to your server (hosting environment), create database for the CMS then visit URL at the install location (localhost or web address) and walk through a series of step by step configuration. Once the installation is complete, a default version of the CMS is available at the install location, and from there, it can be further configured, customized and populated with content.

Joomla installation is straightforward and nearly all steps take place within Joomla's step-by-step installation process. After successful installation, it provides a default version of both the front end and back end sides of Joomla. In addition, Joomla also provides options to work with demo content as part of the installation process, which provides freedom for implementers to works easily with example site.

Drupal installation is also straightforward but it requires minor server-side manipulation of file permissions and file names (in case of installation through control panel) and then the process is very similar to a Joomla installation. Initial Drupal configuration settings are

implemented via control panels and include things like front page designation, cache settings and basic site information.

Process of base installation of the content management system is similar between Joomla and Drupal and the time required for installation is essentially the same for both.

Content Types and Structures

The construction of well-organized website with rich content provides a versatile and stable platform for growth of website content. Implementation of content types and structures includes setting out the nature of the content the site is to display, as well as creating the hierarchical structures used to organize and display that content.

Joomla includes several core types of content which includes Articles, Contacts, Banners, Newsfeeds and Weblinks. Each of Joomla's core content types contains capabilities and settings supporting that specific type of use, and they are all available as soon as Joomla is installed. It uses a nested category hierarchy for organizing its content as default method. A single content item can stay at any level of Joomla category tree. Joomla can have unlimited number of categories and articles.

Using specific set of tools, site structure are planned and built in Drupal. The site designed with Drupal requires expertise and can support very high versatility, many different use cases, and extremely complex site.

Joomla is considered less expensive and much faster to implement structured site content. Most of the sites designed with Joomla employ its general-purpose article content type as the main method for containing web page content to keep things organized using the default categories/subcategories. Whereas Drupal websites require implementers to plan and create content types first before meaningful content build-out can begin. This process requires enough time for specialized content items and complex website. **In general Drupal requires 50% more time than the time required in Joomla for site structure construction.**

Site Design and Layout

Both Joomla and Drupal have some common characteristics and contain systems for managing the layout of site elements, as well as implementing completely custom web designs with the help of HTML and pre-defined layouts.

Joomla has pre-defined structure and it uses 'Template' to control site design and layout. It includes two front-end templates for users and two back-end templates for administrative area at the time of installation. Joomla administrator control the template selection through template manager at the back end of Joomla.

Drupal uses "Themes" to customize a website's design and layout through conventions and processes focused around discrete sets of files in a Drupal installation. By default, Drupal ships with four in-built Themes, any of which can be extended or customized by spawning off a copy, registering the copy within Drupal under a new system name, and then adjusting CSS files and template files (named with *.tpl.php file name extensions in Drupal). A top-level *.info file declares the Theme within Drupal; references CSS, JavaScript and other files used within the Theme; and defines page layout areas, which Drupal calls "**Regions.**"

Both **Joomla and Drupal** include highly capable systems for managing site design and layout. Joomla has in-built capabilities and standards which makes it easier and faster to implement website designs. Based on the design and capability requirements, Drupal may take up to 50 percent more time than Joomla to implement a web design and layout.

Site Navigation

Any website designed with content management system, navigation consists of menus or individual menus. Both Joomla and Drupal are benefited from third party developers who provides additional plug-in and modules that can change and improve the appearance and behavior of menu.

Joomla's Menu Manager allows administrator to add, edit and delete menus as well as control the items within a particular menu. While creating a new menu item, selection of the type of content such as article, contacts, Weblinks etc. is compulsory and based on this menu is created. After defining destination type of content, additional parameters for the particular menu in order to display further options to target content. In Joomla, menus are associated with module which is positioned as per template structure which can be rearranged and moved from one menu to another anytime.

Drupal manages the menus through its Menu Module which allows developer to add, edit and delete the menu on the site. In order to contain a link pointing toward internal link site content, the defined menus must be linked with the particular content type of targeted page.

Both Joomla and Drupal has mature system for building menu and configuring menu items. Drupal may take slightly longer time to implement menu but the time expense is still nominal for both of them.

Editorial Tools

A good content management system's editorial tools is mainly responsible for enabling content formatting.

Joomla includes many tools for formatting and managing content at the time of installation. It ships with WYSIWYG editor with rich content editing options. Using control panel which is associated with content items, expiry of content can also be set. Through 'Media Manager' file uploading and storage is maintained.

Drupal does not ship with WYSIWYG editor which is a common complaint. By default, It uses plain text area for drafting and changing the content.

By default, Joomla includes more in-built editorial tools and controls than Drupal, including a native WYSIWYG editor, scheduling controls and interfaces for managing the presence of content item elements. For primary content formatting needs, Joomla offers more tools and options by default.

Rich Media Support

Rich media consists of flash, audio, video, image galleries or other non-text elements within web page content. Both Joomla and Drupal support rich media display through the installation and configuration of additional third party software.

Joomla can support rich media display through the installation and configuration of third-party extension software.

Drupal requires additional software in order to manage rich media display. The Drupal administrator manages rich media support by adding rich media fields, configuring different options. Few good Drupal Modules supports publication and management of rich media content.

Both Joomla and Drupal require third- party extension software to support the easy display and publication of rich media elements.

Joomla has more flexibility and it provides tools to manage the rich media content at fast rate whereas Drupal requires additional tools to manage the same. As a result, **enabling rich media support in Drupal tends to take more development time than in Joomla.**

SEO Support

Search engine optimization (SEO) is the process of configuring website structure and elements to best synchronize with the methods that search engines like Google to evaluate, index and rank content. Both Joomla and Drupal include significant support for SEO features, however, each implements them in very different ways.

Joomla's native support for SEO is extensive, and it can be further expanded with the installation of third-party software.

Drupal's SEO support can be significant, and it requires planning and implementation by the Drupal developer.

By default, Joomla has more rich and easy-to-implement SEO features than Drupal. Drupal requires significant configuration and site-specific development to enable SEO throughout a site, especially for high-quality SEF URLs.

Social Media Features

Social Media such as Facebook, Twitter, and LinkedIn etc. are playing major role for marketing of the successful web site. The third party extensions are available for implementing social media features on both Joomla and Drupal sites, the costs are essentially the same.

Site Membership Features

Both Joomla and Drupal have inbuilt access and permissions control to allow site administrators, content developers and other authorized users to log into the webpage and edit the content, configuration settings and add extra features.

Joomla ships with several in-built features to support site administration and membership options. At the time of installation, a single super user account is enabled for Administrator (back end) and End User (Front end users).

Drupal installs with two types of user “**Roles**” available to the system: an anonymous (or public) user role, and an authenticated user role, used to enable Drupal administrative login.

Both Joomla and Drupal install by default with extensive capabilities for site administrators to log in and conduct site build out. **By default, Joomla offers more site membership features than Drupal.**

Tuning & Testing of Performance

Any website is benefited from good performance which includes dynamic web pages, CSS, media assets and quick delivery to the browser.

Joomla provides site wide caching control accessible through its back end whereas Drupal provides system-wide caching settings and controls, including the ability to enable site-wide caching, dump the site-wide cache, and aggregate CSS and JavaScript files to result in fewer server calls.

Joomla's site-wide caching controls are well-balanced, easy to implement and effective: **In general, it takes less time to configure site-wide caching for Joomla than it does for Drupal.**

Deployment of Website

To launch a new website, it involves moving files and the database from development server to the live server. Once a website is functional and running, there is complexity in implementation of new updates.

Joomla provides control panel settings which allows the administrator to keep the website in offline mode in order to update the changes. A user having privileges of administrator can login during off-line mode and interact with the content in order to update the website.

Drupal provides a maintenance mode setting that allows administrators to temporarily take a site offline and display a custom message to site visitors. When in Maintenance Mode, only the top-level super administrator account has login access to the Drupal site in order to conduct updates and make other changes.

Both Joomla and Drupal sites follow the same process and have the same general costs for launching a website. Both also offer similar features for taking a site offline while updates are implemented, although **Joomla lets multiple authorized users log in while a site is in offline mode, whereas Drupal limits this to the super administrator.**

Platform Support

Every content management system is designed for a Linux platform in which Apache is preferred webserver. It can be deployed on either Windows or Linux, both are written in PHP. Database support varies between the two. Joomla and Drupal both supports MySQL versions above 4.1. Drupal also supports PostgreSQL version 7 and above. For both Joomla and Drupal, LAMP (Linux Apache MySQL PHP) is the target environment. Since Joomla and Drupal share very similar requirements, database support plays large part in the decision.

Community Support:

Joomla has strong community support for which registration is free. Anyone can register and get the benefit of community support. A group of people working on Joomla answer the question and provide the tutorials as ready reference. There are also companies who provide professional community support by taking some nominal charges.

Drupal also has strong community support and it also offers professional community support by charging some nominal fee. Acquia offers Drupal support in a variety of plans based on number of servers, sites, or single issue packages.

Drupal and Joomla have very similarity in support systems.

Comparative Table

Attributes	Joomla	Drupal
Setup and Configuration of Hosting Environment	It requires time to plan.	It requires less time for server planning.
Installation of CMS and Configuration	Straightforward	Requires server side manipulation
Content Types and Structure	Excellent	Requires 50% more time than Joomla.
Site Design and Layout	Highly capable	Highly capable
Site Navigation	Mature system for building menu	Requires longer time to implement menus
Editorial Tools	Includes more in-built editorial tool	It has less no. of tool than Joomla.
Rich Media Support	More flexible	Requires additional tool to manage
SEO Support	Rich SEO feature	Requires significant configuration
Social Media Features	Excellent	Excellent
Site Membership Features	Has more site membership feature	Limited
Tuning & Testing of Performance	Requires less time to configure site-wide caching	Requires more time for caching
Deployment of Website	Multiple users are authorized to login during offline mode	Limited to super administrator
Platform Support	Supports Windows & Linux	Supports Windows & Linux
Community Support	Strong community support	Strong community support

Conclusion:

Hopefully by reading this article, one will be able to understand the basic differences between Joomla and Drupal. However, based on difference resources and study, it is found that Drupal is the first choice for web developer for complex and complicated site. But, at the same time, Joomla is considered good for simple site. But in my opinion, neither Drupal nor Joomla can be considered appropriate software. While designing the website, we are not only supposed to design the site simply but look into other options available into content management systems and as per our requirement, one should select the appropriate content management system for content creation.

References:

1. http://en.wikipedia.org/wiki/Content_management_system (accessed on 01.03.2015)
2. <http://www.prototaph.com/protoblog/86-joomla-vs-drupal-a-comprehensive-comparison> (accessed on 02.03.2015)

3. <https://www.drupal.org/> (accessed on 02.03.2015)
4. K. K. Giri and K. R. Nirgude, Open Source Content Management Software: a comparative analysis, 7th International CALIBER, 2009, pp. 184-193.
5. <http://cmsreport.com/articles/drupal-and-joomla-comparison-for-2013-5092>
6. <https://www.butterfly.com.au/thinking/blog/entry/joomla-vs-drupal-a-technical-comparison-of-the-best-open-source-cms>