Open Source Content Management Software : A Comparative Analysis

Kaushal K Giri **Kirti R Nirgude**

Abstract

There are many web-authoring software like FrontPage, Dreamweaver, etc which have been used to develop and maintain the websites. But gradually, it became difficult to maintain and update the websites because of their very dynamic nature and a variety of file formats. Content Management Systems (CMS) evolved as an alternative to such web-authoring tools. There are many CMS Like Joomla, Drupal, Mambo, Pligg, Plone, Post Nuke, Tweak, Zope etc., but this paper deals with a comparative analysis between Joomla and Drupal. The goal of this comparative study is to find the better CMS of the two according to various selected criteria. The criteria includes installation, platform support, browser support, modules and extensions, documentation, support, user management, multimedia integration, content creation and searching.

Keywords: Content Management Systems, Dreamweaver, Drupal, FrontPage, Joomla

1. Introduction

In modern information society, there is now sea change in information generation, distribution and access. Emergence of Internet and development in ICT affect every aspect of human life but in recent years finding information from the web is becoming more and more complex. Today we are living in the information age. Information on the web is growing tremendously, and searching on the Internet today can be compared to dragging a net across the surface of the ocean. The Internet's explosion created a new set of problems for site administrators. Producing and managing content was becoming increasingly difficult. A system was needed to manage, create, and distribute various forms of content. The Content Management System was created. Most CMS's are built on the LAMP (Linux Apache MySQL PHP) stack and are FOSS (Free Open Source Software.) Every CMS now uses downloadable add-ons known as modules or extensions. Modules enable the community and other third parties to expand the capability beyond the original intent. There are many CMS Like Joomla, Drupal, Mambo, SilverStripe, but this paper deals with a comparative study between Joomla and Drupal.

2. Open Source Software

OSS can be defined as computer software for which the human-readable source code is made available under a copyright license (or arrangement such as the public domain) that meets the Open Source Definition. This permits users to use, change, and improve the software, and to redistribute it in modified or unmodified form. It is very often developed in a public, collaborative manner.

3. Content Management

In simple terms, content management can be defined as a process of creating, collecting, organizing, categorizing and structuring information resources of any type or format so that they can be saved, retrieved, published, updated and re-purposed in any way desirable (Yu, Holly, 2004).

A Content Management System (CMS) is a computer application that enables users to manage content in an orderly fashion. Content can include a variety of file types such as text, images, and media, which a CMS helps to create, edit, store and publish. The benefit of using a CMS, especially for website creation, is that it does not require an extensive knowledge of coding. The CMS provides a bridge between the seasoned coder and the weekend blogger; in the sense that, both can maintain the site to their desired control, even though both have different levels of technical knowledge. After the arrival of Web 2.0

technologies, many tools are there in the seen, which are more flexible and easier than the traditional tools. The new technologies include Content Management Systems (CMS), Blogs, Wikis, and RSS etc. There are many Content Management Software's used like Joomla, Drupal, Bitweaver, Mambo, Pligg, Plone, Post Nuke, Tweak, Zope etc.

4. Existing Approaches

Since their inception around 2000, many evolved into more powerful systems. Initially they managed certain sections of a website. Drupal originated in 2000, on the other hand, Joomla is a relative newcomer. Joomla started in 2005 as Mambo fork. Drupal and Joomla both provides general means of control while allowing the user to customize different aspects of the system. Joomla and Drupal are not the only choices—1000's of different systems exist. Potential users most choose between a free or proprietary system. Some purchases systems, while others pay to create a custom one. Users are trending to open source platforms. Open source systems are usually more expandable than their proprietary counterparts. Drupal won the award for best overall CMS in 2007. Joomla won the award for best PHP CMS. They exemplify a modern CMS in terms of functionality and expandability, as well as being a benchmark for newcomers.

As it is in a process of development, currently both the software Joomla and Drupal has been installed on a local server, for evaluation purpose. After evaluation the comparative analysis was taken under. Later on, after achieving a state of maturity it will be moved to a fully functional server accessible over the Internet.

5. Evaluation Criteria

Drupal and Joomla will be evaluated on the following criteria:

- **Installation**: The installer will be evaluate on effectiveness, user interface and result.
- **Platform Support**: Each systems platforms requirements will be compared
- **Browser Support**: Does the system support the necessary browsers?
- **Modules & Extensions**: Ease of module management and quantity of available modules will be compared.

- **Documentation**: Documentation resources will be evaluated, specifically API, theme, and the availability of handbooks.
- **Support**: The level of community support and professional support availability will be contrasted.
- **User Management**: Are customization of permissions allowed? How much of an effort does it take to create and organize users?
- **Multimedia Management**: The ability to upload pictures and videos, and the difficulty level will be compared.
- **Content Creation**: The ease and control over content created by the user is considered.
- **Searching:** Is the search quick? Are the results relevant?

6. Comparative Analysis

6.1 Installation

Joomla and Drupal provide graphical installation scripts. The algorithm is:

1. Upload the files to the web server.
2. Set the correct permissions on the install files.
3. Run the installer script.
4. Delete the installation files.
5. Log into the administration panel and configure the rest of the site.

- **Joomla :** Joomla's installer is large and complex. Installer quality is very high, and has a professional fit and finish, while being easy to navigate. All options are presented on the screen, but the amount of options may be overwhelming. The script prompts the user to input the site URL, administrator email, MySQL account details, and a few other basic settings. Once the installer has the required information, it creates the tables. It offers a choice to populate the database with the default values, or migrate from a previous site or version. Joomla commits file system modifications through a FTP layer to enable advanced manipulations not available in PHP. If the FTP layer cannot be configured, the installer will fail and the user must complete a manual installation. While testing the installer, the FTP layer configuration failed and a manual installation had to be completed.. The manual installation was easy, but may not be simple enough for users without technical knowledge of the LAMP stack. In the test case, manual installation was quicker than using the installation script. Step one creates the database using the included SQL files. Next, edit the configuration file to reflect the database connection details and administration panel password. During test case, the manual installation successfully configured the FTP layer without error. After editing the configuration file, log into the administration panel and continue setting up the system.

- **Drupal :** Drupal's installer is precise and straightforward. The steps are similar to Joomla's steps. First the installer verifies permissions. The user is prompted for database connection details, then general website information such as administrator email, site URL, and administration account details. After necessary information, the installer finishes and the user is prompted to delete the installation directory. Drupal's installation is much more simple and faster than Joomla's. In the test case, the installer only took 5 minutes, much faster than manual installation required by Joomla. Overall, Drupal's installation experience is much easier. It has a better installation experience. The installer was faster and less complicated than Joomla's. Joomla's installer does not give any meaningful information about the failure, which made troubleshooting difficult. Error was most

likely related to the host system. Joomla's installer feels overly complicated when compared to Drupal's. Drupal accomplished the task faster and easier.

6.2 Platform Support

Each CMS is designed for a Linux platform. Apache is the preferred web server. The manuals state that each system is tested on Apache. Apache can be deployed on either Windows or Linux. Both are written in PHP. Each requires 4.3+, but recommend 5.2+. This should not create a problem for pre-existing installations as most have migrated to 4.3+. Database support varies between the two. Joomla's technical requirements state only MySQL is supported. Joomla does not support MySQL 6.x. Drupal supports MySQL versions above 4.1. Drupal also supports

PostgreSQL version 7. Drupal does not support any other databases, but Oracle and MSSQL support is in development for a later release. Drupal's moves to support these other databases give it an edge in enterprise situations.

The following table summarizes all requirements:

Platform Requirements

Table - 1

	Apache*		ISS		PHP		MySQL		Postgre SQL	
	Rec.	Req.	Rec	Req.	Rec.	Req.	Rec.	Req.	Rec.	Req.
Joomla	2.x	1.3	7	6	5.2+	4.3.1	4.1.x**	3.2.3		
Drupal	2.x	1.3	6/7	5	5.2+	4.3.5	4.1/5.0	4.4	7.4+	

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.

6.3 Browser Support

Browser support plays a fundamental role in any web based CMS. The most used browsers are FireFox and Internet Explorer.

Table-2

	Internet	Explorer	Firefox	Safari	Opera	Camino
Joomla	6+	1.5+				
Drupal	6+	2+	1+	7+	1+	

6.4 Modules & Extensions

♦ **Joomla :** Joomla offers three installation types. The administrator can upload the downloaded package, enter the URL, or install from a local directory on the web server. Depending on the package, the install may need extra steps. Once installed, the module is configured through the extensions section of the administration panel. The administration panel also provides a friendly interface to remove modules.

♦ **Drupal :** Drupal offers one installation method. First, upload the files to the web server. Second, follow any included directions before moving to the administration panel. Next, log into the administration panel, enable the module and save the configuration. If updating to a new version of a pre-installed module, run update.php to refresh the system. Afterwards, the administrator can configure the module through the appropriate section in the administration panel. Modules can be removed much easier.

Installing modules needs a simple process. Joomla succeeds and Drupal does not.

6.5 Documentation

♦ **Joomla :** The documentation is in two separate places on the main website. One is a wiki and the

other is a standard web page. The main website (http://api.joomla.org) keeps auto generated documentation in packages. Joomla is broken down into packages. The core package is Joomla-Framework. Selecting a package displays a tree hierarchy of classes and files. Method specifications and brief description are given for each entry.

Joomla does provide a handbook for beginners. The document covers system administration, basics of changing templates, how to install new extensions, and search engine optimization. The document is on the wiki, but is complete unlike other sections. A large and complete FAQ is also present in the wiki. The handbook is more complete than the theme or API reference, but does not provide easy access to useful information.

♦· **Drupal :** The main page provides a useful component hierarchy and links to other sections. The break down enables readers to choose the exact type of documentation. Drupal also provides a developer handbook. The handbook is comprehensive and easy to navigate. It contains topics such as coding standards, Drupal's APIs, automated testing, best practices, and setting up a development environment.

Drupal provides many handbooks. There is a "Getting Started" handbook that describes the basics. The handbook gives a general overview of core modules and how to accomplish common tasks.

♦ **Summary :** Joomla's website is plagued by navigation and organization issues. If finding the documentation wasn't enough, finding usable documentation is a whole different task.

Drupal is much different. Navigation issues are not present and information is presented in a clear and concise format. Drupal also provides handbooks for different users. The documentation portal has a consistent and accessible user interface making it easier to use compared to Joomla's combination of wiki and regular pages. Drupal's documentation are complete and accessible compared to Joomla's. Drupal's documentation makes it quicker and easier to find needed information for completing tasks.

6. 6 Support

♦ **Joomla :** Joomla follows the community support model. Registration is free to anyone. Many knowledgeable members who donate time answering questions and posting tutorials. Forums cannot provide real time feedback. Free clients are available for all platforms.

The community model does not provide enough support for some users. There are companies that offer professional Joomla support. OpenSourceSupportDesk.com offers service contracts or single ticket purchases. Many different forms of support are available. Community support handles most issues. If the issue requires immediate professional support, it can be purchased.

♦ **Drupal :** Drupal also follows the community model. Professional support is available as well. Acquia offers Drupal support in a variety of plans based on number of servers, sites, or single issue packages. Other companies exist as well.

♦ **Summary :** Drupal and Joomla have very similar support systems. New users to the community model may have a hard time adjusting, but find it is worth it. Many knowledgeable users donate time to helping other members.

6.7 User Management

User management within a CMS is very important. It is the centralized area where administrators control users and permissions. User management should be an easy process, but enable complex

settings as needed.

♦ **Joomla :** Joomla has a friendly user interface allowing administrators to manage users, and also allows the visitors to create their own accounts without an administrator's approval. If the need is for a simple user management tool, Joomla performs well. There are predefined groups that are available upon user creation. The groups are split into two categories, public front-end and public back-end.

Within these two groups, there are the predefined groups with set permissions. The public front-end group is created for users of the site, and the public back-end is created for managers and administrators.

♦ **Drupal :** Drupal has a less user-friendly interface, which is completely text, based. Although it is less users friendly, it is not complicated to access and browse. Drupal offers a thorough user management tool with predefined groups, as well as the option to create custom groups. The ability to create custom groups gives the administrator more control over the users and permissions. Drupal enables the administrator to control every permission of a user, which includes:

- administer blocks
- use PHP for block visibility
- access comments
- administer comments
- post comments
- post comments without approval
- administer filters
- administer menu
- access content
- administer content types
- administer nodes
- create page content
- create story content
- delete any page content
- delete any story content
- delete own page content
- delete own story content
- change own username
- delete revisions
- edit any page content
- edit any story content
- edit own page content
- edit own story content
- revert revisions
- view revisions
- access administration pages
- access site reports
- administer actions
- administer files
- administer site configuration
- select different theme
- administer taxonomy
- access user profiles
- administer permissions
- administer users

♦ **Summary :** User management is an integral important part of CMS, which requires an easy interface, while maintains an advanced set of management tools. User management should have a user-friendly interface, ease of use, as well as the complexity of advanced settings. Joomla falls short compared to Drupal. Joomla's interface is simple, easy, and more elegant; however, the tools offered are limited. Joomla may be more desirable for beginners; however, Drupal is well suited for beginners to advanced users. Joomla does not offer enough tools to edit the groups and permissions. Although Joomla's interface is more user friendly, Drupal's interface doesn't fall too short. The user interface of Drupal is still easy to access and navigate. Drupal is the better candidate when comparing user management tools.

6.8 Multimedia Integration

Multimedia integration is a very popular feature

among the users. Users demand easy picture and video uploads. The CMS should permit the ability to upload pictures and videos of any file type.

♦ **Joomla :** The multimedia integration is limited. Only pictures are allowed to be uploaded. Joomla allows the ability to insert an image, or upload an image of up to 10 MB. Joomla does not allow any video uploads. The interface to insert or upload a picture is easy. There is an insert image button, which requires one click and allows the user to insert an image directly using an URL, or by browsing the local computer and uploading. The interface allows the user to also create a new directory as needed on the spot. Both image and video embedding is permitted, however, requires HTML coding.

♦ **Drupal :** The multimedia integration feature is much undeveloped. Video integration is not allowed. Image integration is allowed. The user is limited to uploading 1 MB for each image. The image is not displayed as an image object, but rather as an attachment. Embedding an image object would require the user to use extra HTML coding. Video embedding also requires the need of html coding. Uploading an image is easy, however, is displayed as an attachment.

♦ **Summary :** Joomla proved to have a better developed multimedia integration tool. Although Joomla has more features than Drupal, the two are undeveloped. Both Joomla and Drupal do not have video integration, however, Joomla has a better image integration. Direct imaging is available in Joomla, but not in Drupal. Drupal requires some knowledge of HTML in order to embed an image. Joomla is also capable of an image upload of up to 10 MB. Although Joomla and Drupal doesn't allow direct video uploads, there are third party modules that allow video uploads. Modules and extensions may be downloaded from the Joomla or Drupal websites. Both Joomla and Drupal needs more development in multimedia integration, but Joomla proves to have a better developed multimedia integration compared to Drupal.

6.9 Content Creation

Content creation is an extremely important aspect in a CMS, simply because that is what the system hinges on; content. Key features that the system must provide for the user must be the ease of creating content and the ability for the user to have complete control over the content, in terms of where the content will be shown/stored on the page, what type of format it will be and what can be included within the content. The system must be accommodating for different forms of content.

♦ **Joomla :** Within its interface, Joomla has a specified content management section where the content can be created and edited. Initially, the administrator can only create 'articles' (i.e. content). But within these articles, text, pictures, video and music can be added in for more expansive multimedia integration. In order to manage these articles, Joomla has an 'article manager' which handles all the article contents in an easy to view table containing the article's. When creating a new article, Joomla provides the necessary editing tools within one creation page. In this page, the title, section, publishes and category settings can be configured firstly. A text-editing box is also provided for placing the content in the article, this feature also has graphical buttons to select any editing options on the content. Lastly, the page has a few

final sections that deal with the more detailed information of the content, this includes: parameters and metadata information. Once everything is set, the page allows the user to preview the content and if the user is satisfied all that is needed is for the content to be saved by simply clicking the save button located on the page. After it is saved, the article is automatically added onto the

system and wherever the user specified for the content to be published.

♦ **Drupal :** The content creation in Drupal is a bit similar. However, it takes the concept of articles and divides it into two categories: Page and Story. A page entry is used for content that does not change within the site and no comments are expected to be added on to it. A story entry is used in a blog-like format. It is usually a piece of information in which visitor feedback is welcome. Thus, it enables comments to be added on in response to the information the administrator has posted. Creating this content is quite simple. During construction, the structure of the page and story are shown in two fields (title, body) in which the administrator fills in. After this is complete, the boxes are then followed by configuration settings (input format, revision information, comment settings, file attachments, authoring information and publishing options) in the form of drop-down check boxes. Once all categories are satisfied the user has the ability to preview the work, after which, the page/ story is saved and the content is immediately uploaded onto the site. There is also a content management section, which holds all the content operations to edit and define the settings for all or specific content on the site. Like Joomla, when editing content, it is placed within a table for easy viewing. However, in Drupal, pull-down menus are utilized to configure the content.

♦ **Summary :** Both CMSs provide an easy and simple way to create content. The real difference falls under the basic user interface. For example, the text-editing window in Joomla includes many built in editing tools to format text, add images, and many other things. Drupal only provides a blank window and a few settings to adjust later on, expecting the user to know a little more about web coding. Joomla's content creation is a little easier due to the nicer interface, but Drupal provides the user more control and expects a stronger creation of content.

6.10 Searching

♦ **Joomla :** In order to search in Joomla, the function must first be enabled in the module manager section. When enabling, there are many areas given to configure the search function, such as the details of it, what menus it will be located in, and the parameters of how the search module will look on the site. Once it is configured, the search module can be used to search for anything within the site. Its response time is quick but it is also very picky.

♦ **Drupal :** Drupal's search function also had to be enabled for use. All that is needed is to enter into the modules sections and enable the search. No other work is needed for the system as it updates itself to include the feature. After the search is enabled, the search form must be changed within the block section, since the search feature is initially set to not be visible. The search function itself is quick and returns relevant searches.

♦ **Summary :** Both Joomla's and Drupal's search functions are alike. There is no big difference between the two. The only exception

being is the added feature of a filter/search located in the administrative section in Joomla. This helps to find articles and modules quickly within a huge list; drastically cutting the time to manually scroll through the list.

7. Conclusion

Joomla and Drupal have many things in common. Support and browser support essentially equal. Each CMS share similar support channels. Joomla does not deliver proper documentation. The lack of proper documentation will increase software development cost. Content producers may have a hard time learning the system. Users who like to understand low and high level function will appreciate Drupal's documentation portal. The portal leaps and bounds in front Joomla's. Joomla does gain points for having better module management.

Drupal and Joomla both provide general tools to manage content. Joomla's are complicated. A fresh Joomla installer presents a clutter site. This can confuse users who are unsure of what they want. Drupal starts with the absolute minimum and the user adds what they needs. For example, on a fresh Joomla install to add new content managers, the administrator must create a user and assign them to the proper group. On Drupal, the administrator must create a group with posting permissions then add a user. Drupal provides an empty canvas where the user is open to paint their own image of ideal system. Joomla can be overbearing to users who do not understand all the options.

Not only does Drupal offer better administrative tools, it also offers better use management tools. Drupals interface remains simple and easy, although not as elegant as Joomla's, and delivers the necessary tools to ensure efficient user management. Joomla offers an elegant and even simpler navigation than Drupal; however, does not contain the advanced user management tools if needed. Drupal offers the ability to create new groups, and set custom permissions, while Joomla only allows the selection of predefined groups.

On the other hand, when comparing multimedia integration between the two CMS, there is no major difference. Although Joomla proves to be better, the two CMS are still undeveloped in video integration. Both offer the ability to upload images, but Joomla had the better image integration.

For content creation, Joomla and Drupal provide a simple and quick approach to add content to one's site. Joomla provides easier access and control but the architecture may not be well stabilized. Drupal does require more work, but it makes sure that the content is without bugs.

Drupal proves to be the better CMS. Although Drupal fails to deliver in some categories, it delivers what administrators and users need in the more important categories. Drupal offers a faster and simpler installer than Joomla, better documentation, and better user management tools.

References

1. **Content Management** Available at http://www.contentmanager.eu.com/cms.htm (Accessed on14 /12/08)
2. **Content Management** Available at http://en.wikipedia.org/wiki/Content_management_system (Accessed on 14/12/08)
3. **Drupal** Available at http://drupal.org/ (Accessed on 16/12/08)

4. **Drupal Demo** Available at http://drupal.org/node/2955 Accessed on 16/12/08)

5. **Joomla** Available at http://www.joomla.org/ (Accessed on 15/12/08)

6. **Joomla** download Available at http://sourceforge.net/projects/joomla/ (Accessed on 29/06/08)

7. **Joomla** Available at http://en.wikipedia.org/wiki/Joomla! (Accessed on 15/12/08)

8. **Joomla** Demo Available at http://demo.joomla.org/ (Accessed on (116/12/08)

About Authors

Mr. Kaushal K Giri, Student, Documentation Research and Training Centre (DRTC), Indian Statistical Institute (ISI),bangalore. Karnataka
E-mail :kaushalgiri@drtc.isibang.ac.in

Ms. Kirti R Nirgude, Library Officer, Library & Information Centre in Tata Consultancy Services Ltd. Mumbai.
E-mail: kirti.nirgude@tcs.com