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Advanced System Analysis and Design

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Publishing web contents using Joomla!

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ABSTRACT

Joomla! is a content management system (CMS), which enables end users to construct Websites, it is a powerful open source software application freely available to everyone.

Joomla! is built using most widely used web technologies such as PHP and MySQL. Its technical design identifies that, although there are great benefits of a pre-packaged CMS to build a website, each site is different and there is no single approach for development.

The purpose is to make software application as easy to extend as possible, along with rich and reliable core feature set. It can be extended in many ways, including with custom templates, pre-built extensions and by customizing the core programs.

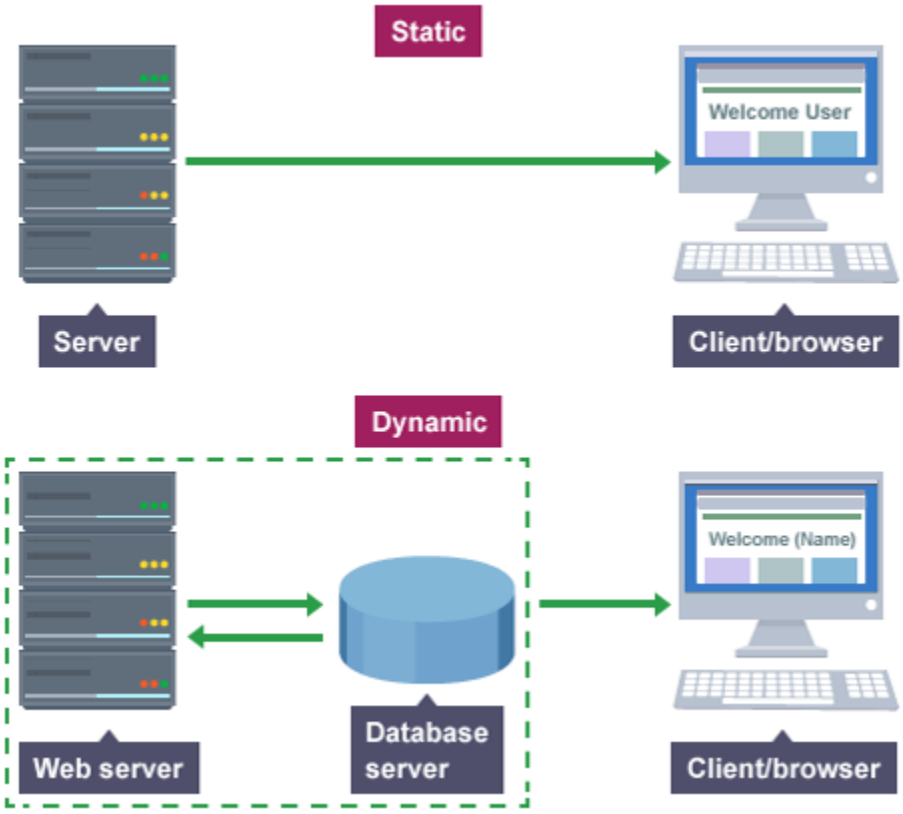
CONTENTS

INTRODUCTION

Joomla! is a great Content Management System with great of flexibility and with an easy-to-use user interface that many people get intimidated about when they implement available options and configurations. This document is meant to serve as a guide to Joomla's basic features, architecture, working and understandings.

There are two ways of creating a website:

For Layout, HTML, CSS, and JavaScript can be used for styling and basic scripting. For Interaction with database and server-side PHP, SQL can be used.



On a **static** website, only data is displayed, and we cannot modify the content. e.g. Username as shown in above diagram. On the other hand, only layout is constant in dynamic web applications and rest of the data is loaded from an information source or from a database. Database languages would greatly increase application's efficiency and speed. However, the same result can be achieved via static xml or json files instead of using database.

Web developers must develop separate web pages on their local machines. By, using an File Transfer Protocol(FTP) program, a developer can migrate those files to web server, which later becomes available through a website. In case of any changes, they must repeat the same process again.

The use of Server Side Includes(SSI) shortens the number of pages that needs to be updated because a site's menu which is contained by an Include can be reused and updated in the entire site.

For a web developer, Content Management System is an excellent addition to his toolbox. Once the website is launched, it needs to be updated whenever there is a change in content or new content is added.

CONTENT MANAGEMENT SYSTEM

Content Management System(CMS) can be defined as a software application which allows its users to manage content, website information and internet / intranet application. Every piece of content on website is tracked by the system. Content can be anything, a simple text, document, music, videos etc. Using a Content Management System, any person who does not have any technical skill or knowledge can easily build a website.

Purpose

The purpose of this document is to analyze and display an exhaustive understanding of Joomla!, the content management tool. This document will present the features and purpose of the information system, expected working, use cases as well as limitations of the system and comparison to other similar platforms.

System Overview

Joomla! is a content management system also known as CMS. It allows users with no technical background to create and edit a website easily. A CMS is different from how a website is created using Dreamweaver or similar other programs in past.

While creating a site with programs like Dreamweaver one needs to have basic knowledge of HTML to create or edit each page using computer software, upload those page files to website with FTP software. With Joomla! there's no need to understand HTML. Through a web-based interface a user can login and edit the website. No knowledge of HTML and no upload of files is required. An integrated database is used to store the content of the website rather than in different files. The built-in Joomla! code handles all these details masking it from the visitor's side. A Joomla! site won't look any different than any other website when someone visits a Joomla! site. The Joomla! website gets its content from the database and uses the Joomla! template to control how that page's content.

The Joomla! CMS is designed to maintain the layouts, the site content programming code, all separate that making the system flexible. User can change a part without impacting other parts. for example, one can easily change the look of site by switching to a different template while

the content remains the same. It was started in 2005 as a fork of an early CMS called Mambo. It rapidly became more popular than Mambo application. After that, it has gone through number of software iterations where new features and capabilities have been added with each iteration. Frequent updates show that the Joomla! technicians are staying on the latest technology of web applications. In fact, the mobile features of the new 3.0 version make Joomla! one of the friendliest content management systems.

The Joomla! CMS is free whereas the similar content management systems would cost somewhere between 7,000 and $25,000. As the websites can be created much faster using Joomla! compared to traditional websites, development costs are usually less.

Applications

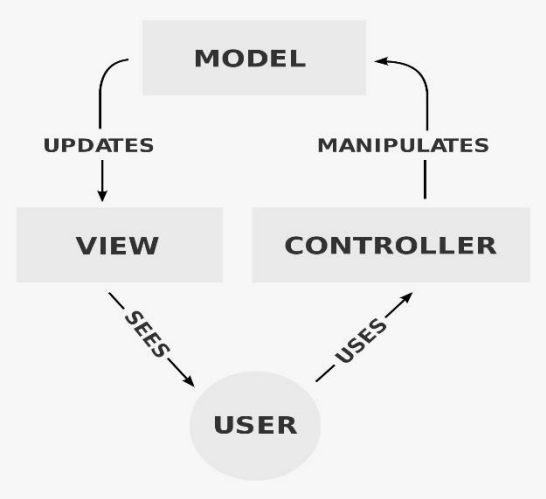
- The system has following applications to power Web sites of all shapes and sizes.
- Online newspapers, magazines and publications.
- Organizational and Non-profit Web sites.
- Corporate portals or web sites.
- Company intranets and extranets.
- Online reservations.
- Government software applications.
- Family or Personal homepages.
- Small business Websites.
- Community-based portals.

Joomla! System Objectives

- To provide all the users with an Open Source Content management system which is secure and of high-quality.
- To identify themselves as a socially responsible content management system.
- Become a stronger community by building trust among all the users.
- To be able to convey straightforwardly on all levels of the group about the system.
- To be able to develop a project without much help.

ARCHITECTURE

'Joomla! is a Model-View-Controller(MVC)' web application that can be used to develop modular software applications. The diagram below shows the architecture of Joomla!.



The architecture of Joomla! contains following layers:

Database: Database is consisting of user specific data. It can be stored and manipulated in a required pattern. It stores the user information, content and many more required data pertaining to the web site. It is used to store the admin information Joomla! site management. The database layer helps ensures flexibility and platform compatibility for extension to great extent.

Modules: In Joomla! different modules are managed and organized by the module manager. It can be used to render the pages in Joomla!. It is also used to display the new data from the component. New data can be dynamically fetched from database. It displays the new content and images based on user specific data when module is linked to Joomla! components.

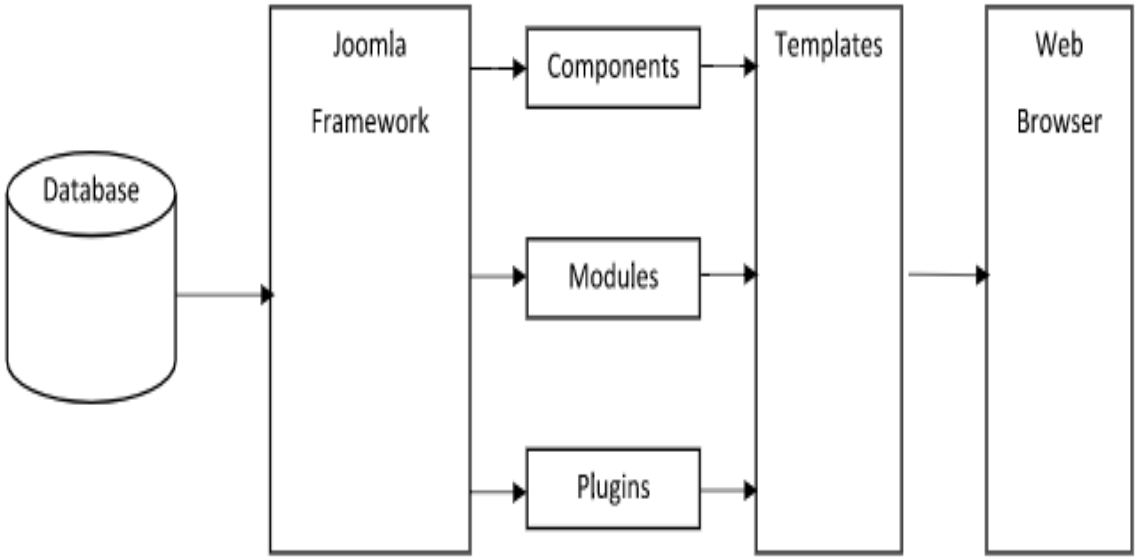
Joomla! Framework: Framework can be defined as a collection of open source software components. It helps to have pre-built components for web site development. It is developed for more flexibility. It also breaks the framework into multiple coherent modular packages each contributing to the new functionality. Joomla! package has many features that facilitates faster development. These packages help for development.

Plugin: This is a Joomla! extension. To extend the features, it very flexible and powerful framework. It is consisting of programming codes that is used to execute the event trigger. It is commonly used to format the module output when a page is built. The plugin function that helps build more interactive web site associated with an event are executed in specific sequence when an event occurs.

Templates: It helps to design and determines the aesthetic features of Joomla! website. It consists of two parts 1. Front-end and 2. Back-end. The Front-end template is used to show

contents to the users. Whereas the Back-end template with database connectivity is used to manage various functionalities by the administrator. Templates are easy to build, and they can be used to customize web site by providing flexibility to great extent.

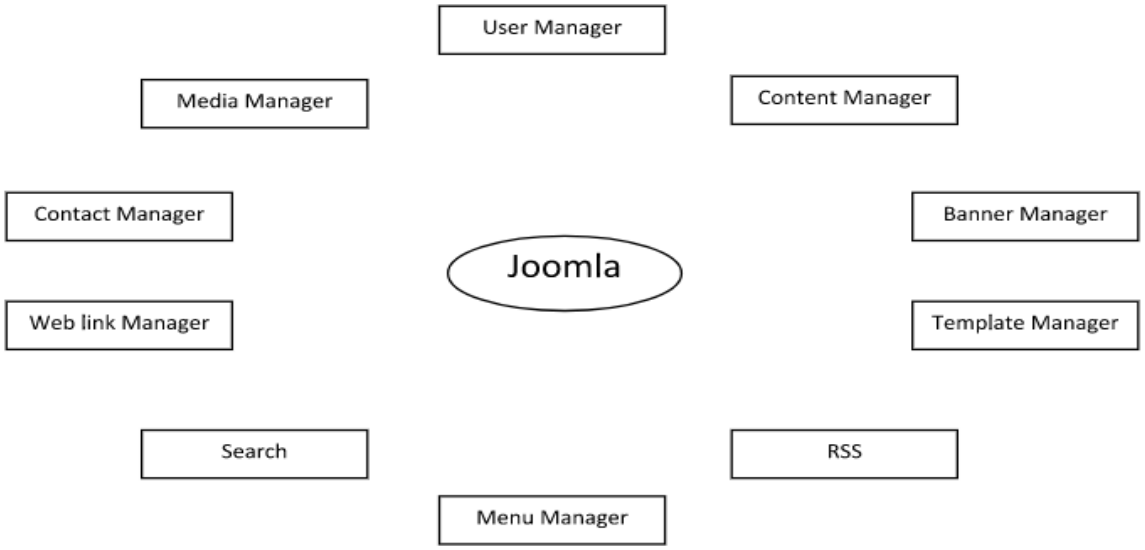
Joomla Architecture



Components: There are two types of components. 1. Administrator and 2. Site. Whenever a page gets loaded in the browser, corresponding component will be called to draw to the page body. Each of the component has great flexibility to get worked with other modules. The Administrator part handles different specifications pertaining to the component. The front-end web site part helps in rendering the pages when request.

Web Browser: This is the first point where the user interacts with system. There are multiple browsers that helps user to launch website. It delivers the web pages from web server. The styling content will be handled by CSS and jQuery. It uses markup language such as HTML for communications.

FEATURES



Joomla! has its own powerful built-in features.

- **User Manager**: It is basically used to add, delete and update the user information loaded with the system. There are about 9 different user groups in Joomla! with different set of privileges. User authentication is also managed by the user manager.

- **Banner Manager:** It is used to add or edit the banners displayed on the website. The banners in a website are basically use for advertising purposes, to notify users about some important activities happening and to attract the users that can be converted into any monetary value later. Even the click rate can be calculated using the banners and clients can also create any campaigns through the website.

- **Media Manager:** Any website built will have lot of images and other video files embedded in them. There is a need for some manager that will organize and segregate them into different folders so that uploading and managing them wouldn't be strenuous. All those tasks are taken care by the media manager. It will even separate the files based on the file types. It is available in the articles section of the Joomla! Interface.

- **Contact Manager**: It allows managing the contact information of various users of Joomla! system. Users can be categorized into different types. We can create as many contact forms as we want and can even add any miscellaneous information through images.

- **Search:** A good search facility is necessary for a good websites functionality. It allows users to search any content that is posted on the website with ease. Joomla! used different search techniques to make the appropriate content pop up first. Based on the search queries it is possible for the website owner to streamline their content.

- **Menu Manager:** It allows users to create various menus and menu items. There are different styling options available for menus and menu items making the website more interactive. Menu Manger is responsible for the creation of automatic breadcrumbs that will help user to move around he website with ease.

- **Template Manager:** It manages the front-end design part on the website. They can be implemented without changing the content structure. Template manager provides a facility to edit the existing templates imported from the Joomla! Website.

- **Content Manager and Versioning**: It allows the end user to manage the content on his/her website using WYSIWYG editor in a simpler way. The user doesn't even need to have knowledge on coding and layouts. Content manger will make sure that the entire website contents like images, contacts, articles are organized in proper folders thus making it easy for the content retrieval. Content versioning will make sure that we keep track of previous versions of the content put onto the website.

- **RSS:** It helps site contents and RSS files to be automatically updated. It is important for the clients to make sure that the websites user are well notified with the trending news and about any important updates.

- **Web Link Manager**: The link resource is provided which aids in establishing connections between components and can be sorted into categories.

USE CASE DIAGRAM

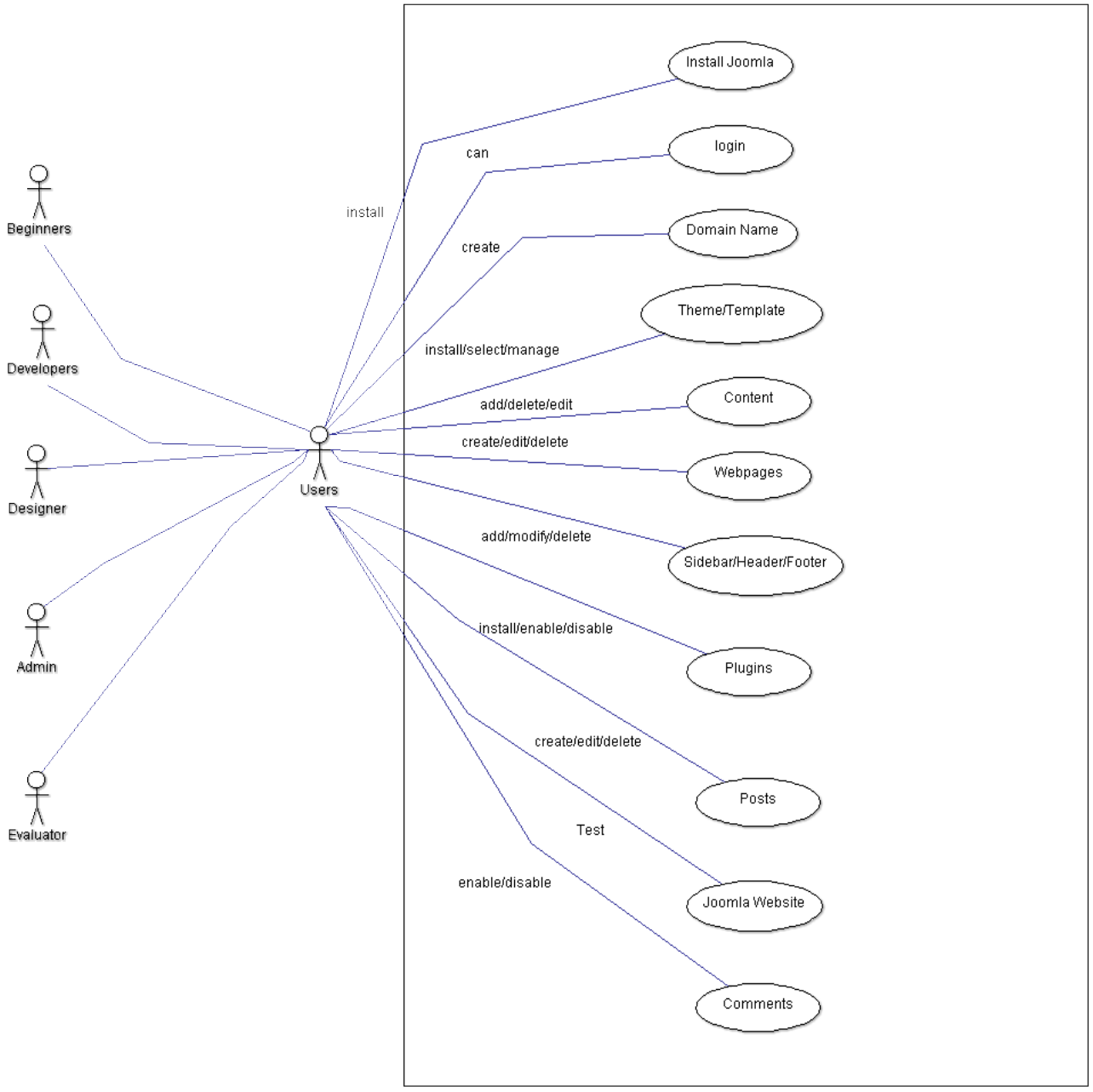
Use Case Diagrams are used to portray the set of activities performed by an individual actor or in collaboration with the other actors. Use case diagram of Joomla! system mainly consists of 5 actors which are described as below.

There are 5 different stakeholders of the system Joomla!:

- Beginners
- Developers
- Designer
- Admin
- Evaluator

The above 5 are considered as the users and the common functionalities associated with them are

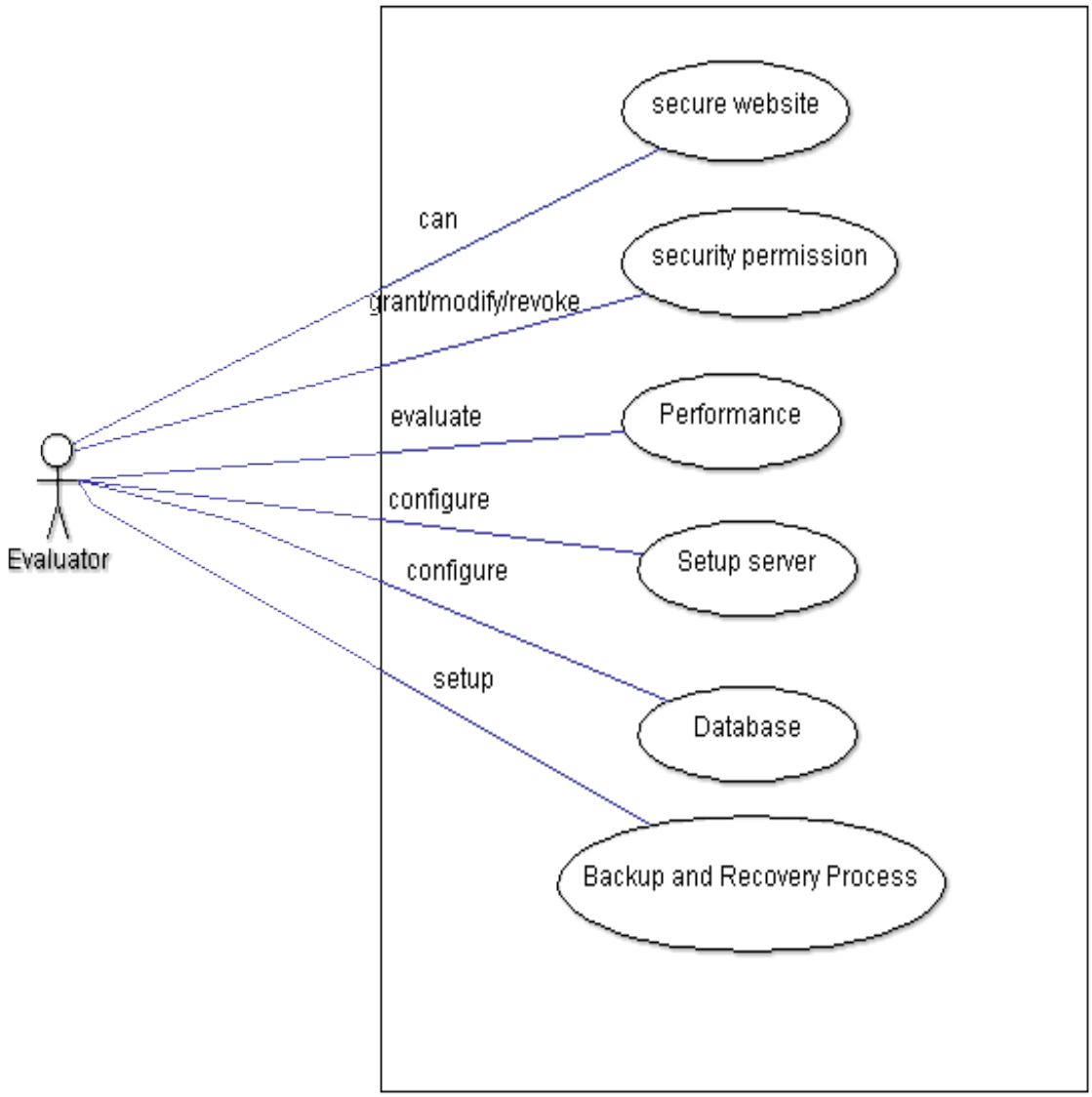
- They can install Joomla! Software
- They can login to the system
- They can create a domain name
- They can install, select, manage themes and templates
- They can add, delete and edit the content created using Joomla!
- They can create, modify and delete the webpages
- They can add, modify and delete the header, footer and sidebar of any webpages
- They can install, enable and disable plugins
- They can add, modify or delete the posts
- They can enable or disable the comments



Specific functionalities related to the stakeholders are as follows

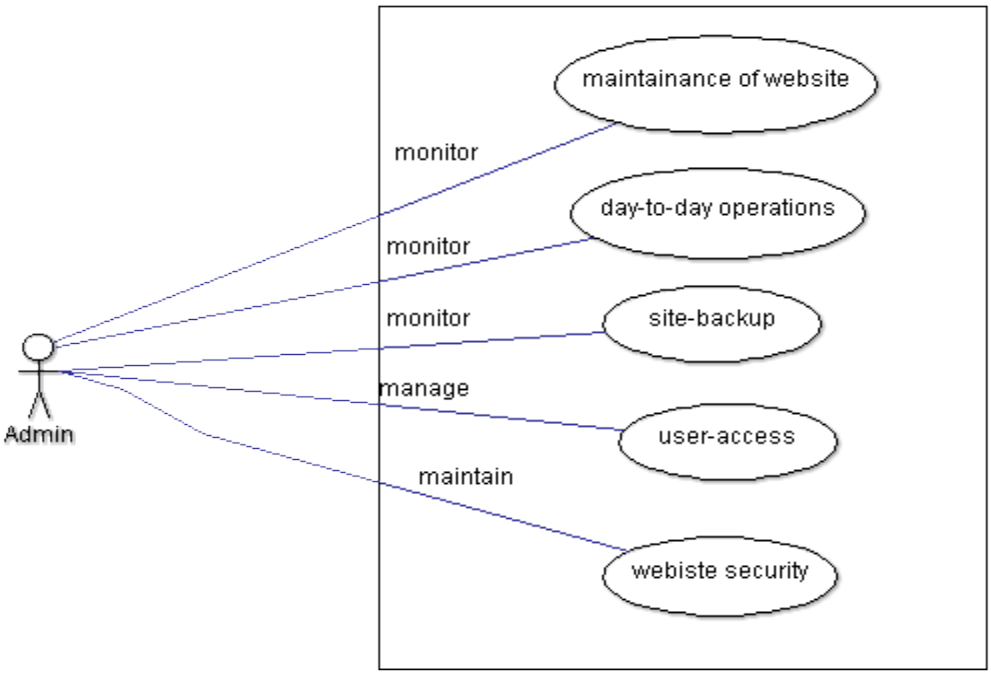
Evaluator:

- Can make sure that the website is secure
- Can grant, modify and revoke the security permissions
- Can evaluate the websites performance
- Can configure the setup server
- Can configure the database
- Can setup backup and recovery procedures



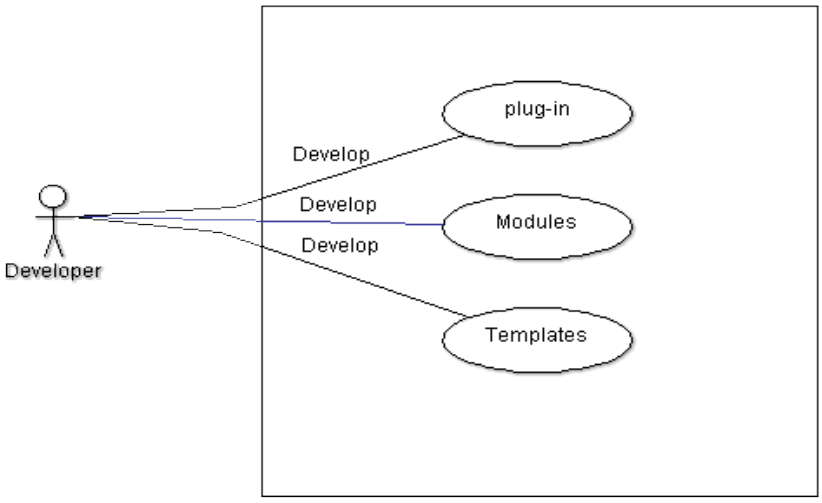
Admin:

- Can monitor the websites maintenance
- Can monitor the day-to-day operations
- Can monitor the websites backup activities
- Can manage the user access to the website
- Can maintain the websites security activities



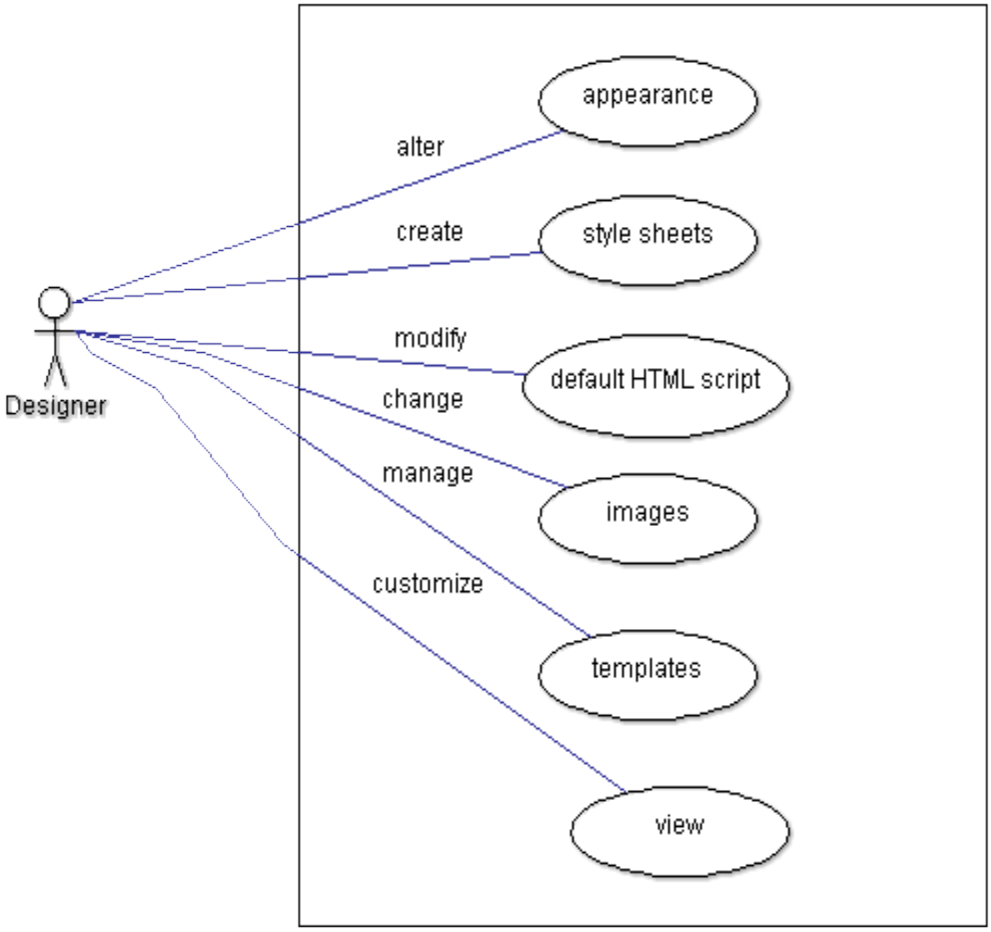
Developer:

- Can develop the plugins
- Can develop any new modules
- Can develop various templates



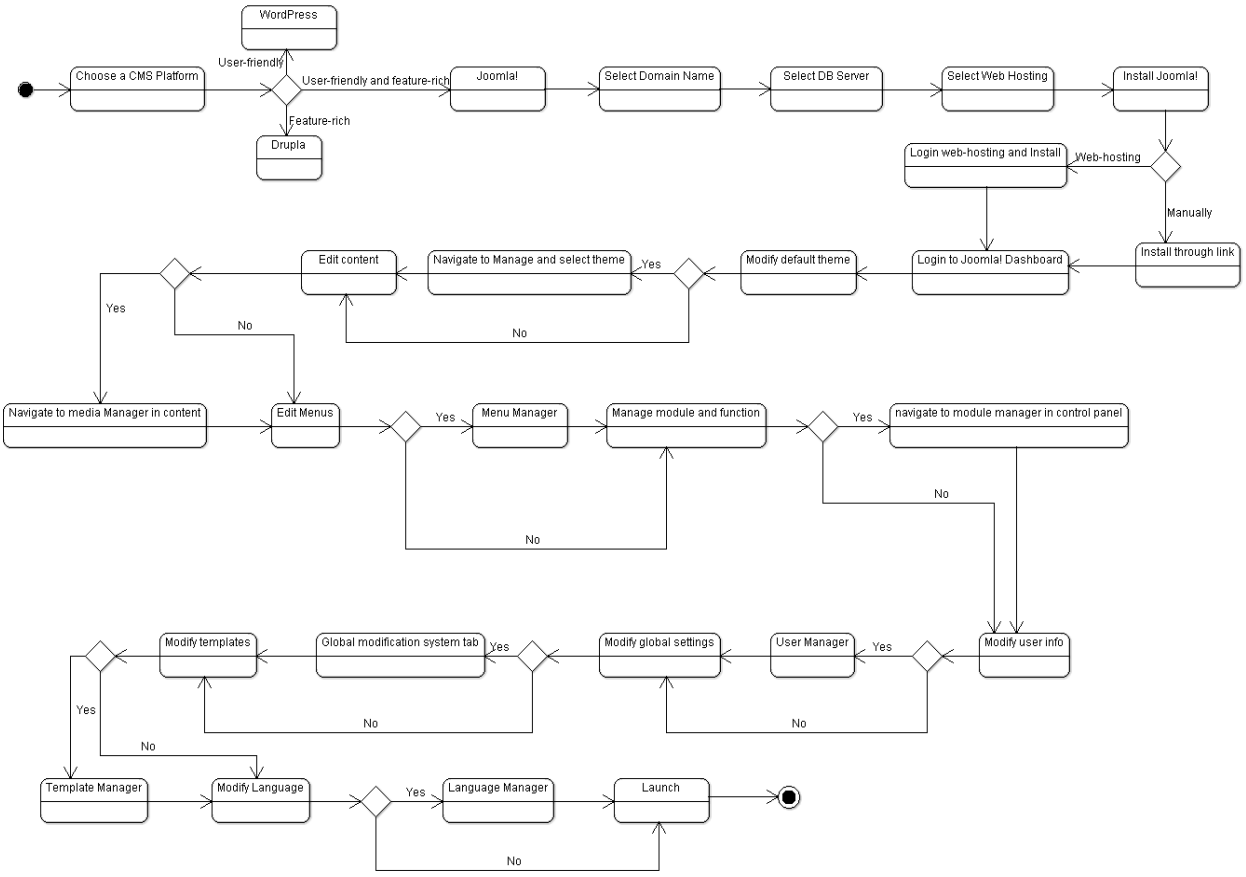
Designer:

- Can alter the Websites appearance
- Can create different stylesheets
- Can modify the default HTML scripts
- Can change the images
- Can manage the templates design
- Can customize the websites view



STATE CHART DIAGRAM

A state chart diagram is a pictorial representation of the states that an object can attain as well as the transitions between those states in the Unified Modeling Language.



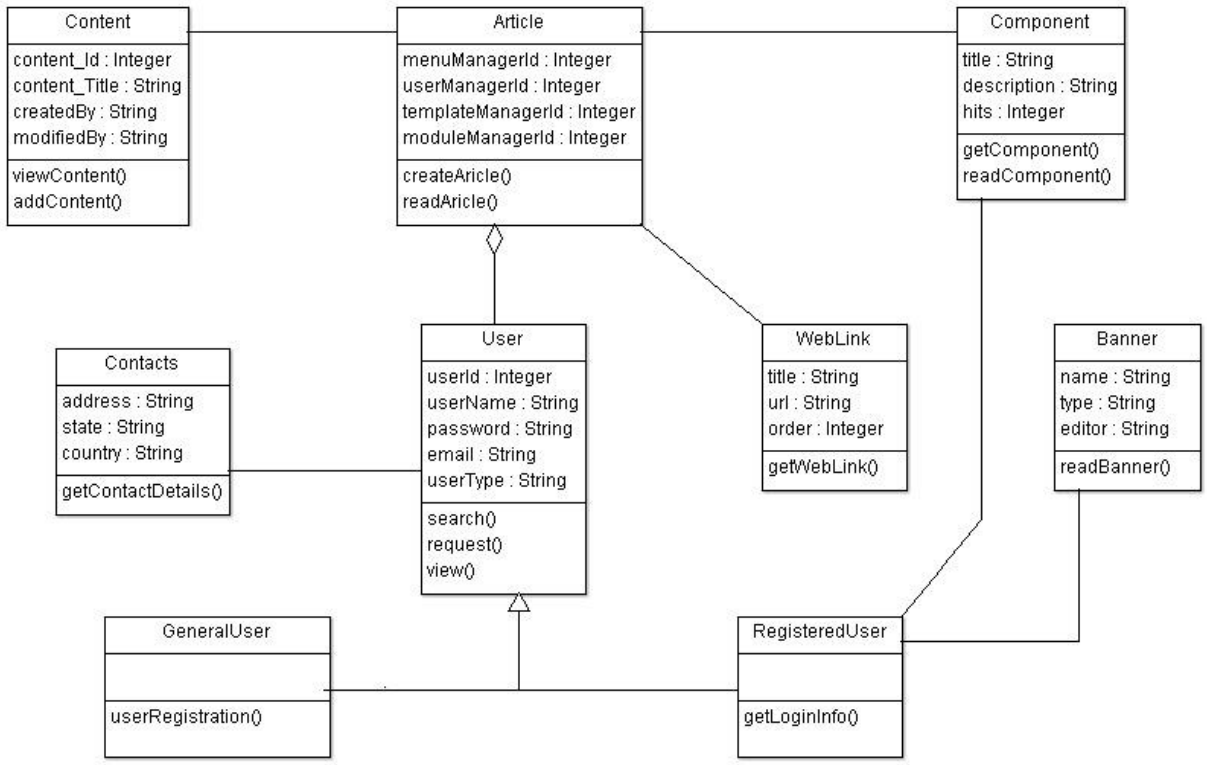
Series of events involved in the system for creating content using Joomla! are as follows:

1. Choose a CMS Platform: Among various Content Management systems available choose the correct CMS for the website.
   - If user wants user-friendly CMS, go for Content Management Systems like WordPress
   - If user wants feature-rich CMS, go for Content Management Systems like Drupal
   - If user wants to balance between user friendliness and feature-rich CMS go for Joomla!
2. Select Joomla! as content management system to build websites.
3. Select a domain name for website.
4. Select the web hosting platform.
5. Install Joomla!

- If user wants to download through hosting platform, login to web hosting platform and install
- User can also Manually install Joomla! through link

6. After installing, login to Joomla! dashboard.
7. User can modify the default theme.
   - If yes, navigate to manage tab and select theme.
   - If no, continue to next step.
8. User can edit content.
   - If yes, navigate to manage content tab and edit.
   - If no, continue to next step.
9. User can edit menu.
   - If yes, navigate to menu manager.
   - If no, continue to next step.
10. User can manage module and function.
    - If yes, navigate to module manager in control panel.
    - If no, continue to next step.
11. User can modify user info.
    - If yes, user can navigate to User manager.
    - If no, continue to next step.
12. User can modify global settings.
    - If yes, navigate to global modification systems tab.
    - If no, continue to next step.
13. User can modify templates.
    - If yes, navigate to template manager.
    - If no, continue to next step.
14. User can modify Language.
    - If yes, navigate to language manager.
    - If no, continue to next step.
15. Launch the website.
16. Designing a website using Joomla!, a CMS completed.

CLASS DIAGRAM



The attributes, methods and relationships among various classes of system is as follows:

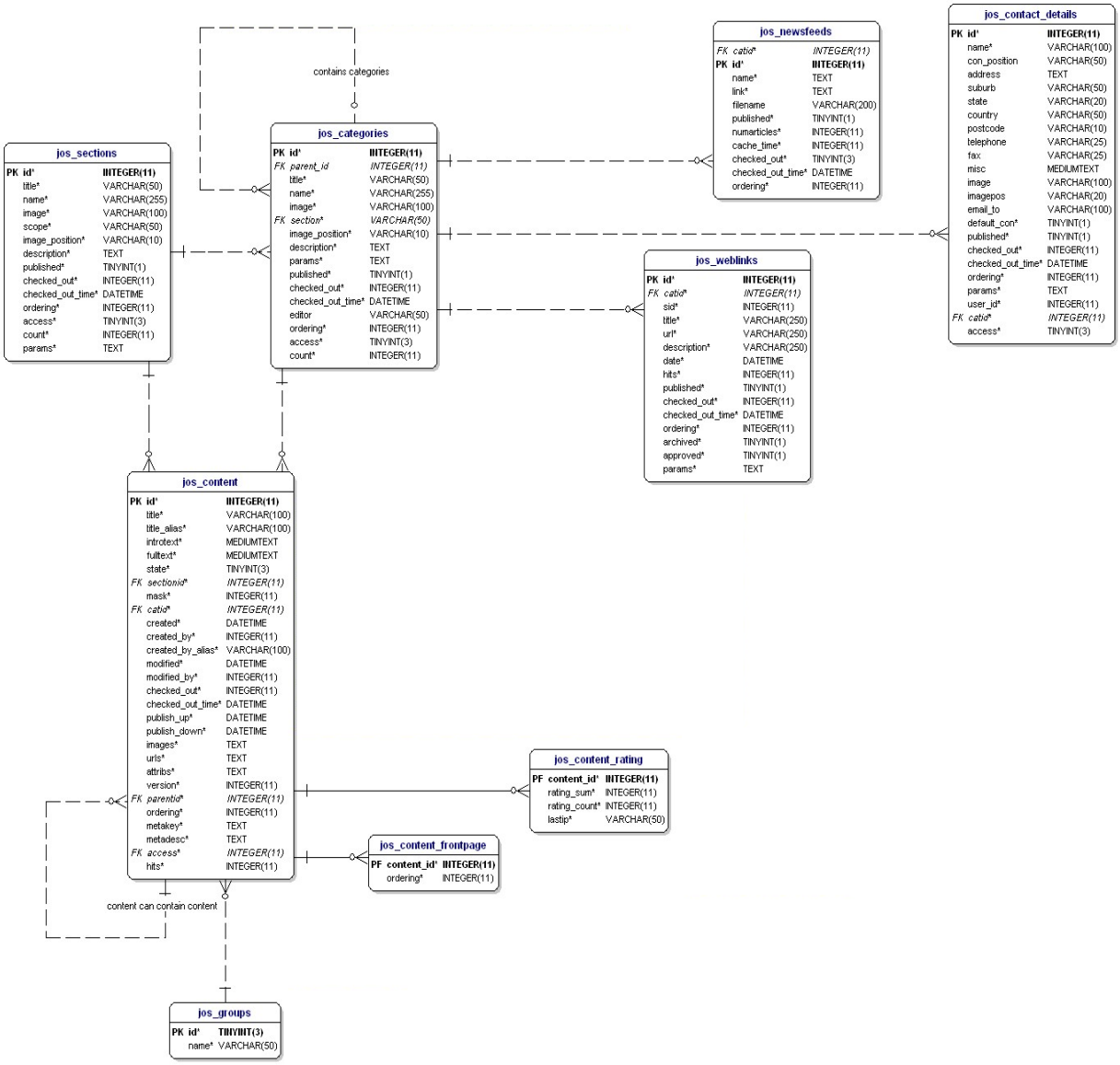
Class Name	Attributes	Operations
User	1. userID : Integer 2. userName : String 3. password : String 4. email : String 5. userType: String	1. search() 2. request() 3. view()
GeneralUser		userRegistration(userID : Integer, password : String) : String
RegisteredUser		1. addSchedule() : String 2. modifySchedule() : String 3. deleteSchedule() : String
Banner	1. name: String 2 type: String 3. editor: String	1.readBanner(name: String , type: String) : String
Component	1. Title : String	1.getComponent() : String

	2. Description : String 3. hits : Integer	2.readComponent() : String
Article	1. menuManagerID : Integer 2. userManagerID : Integer 3.templateManagerID: Integer 4. moduleManagerID: Integer	1. createArticle() 2.readArticle()
weblink	1.title: String 2.URL: String 3.order: Integer	1. getWebLink()
Contacts	1.address : String 2.state: String 3.country: String	1.getContactDetails()
Content	1.content_id : Integer 2.content_title : String 3.createdBy: String 4.midifiedBy : String	1.viewContent() 2.addContent()

The association among these cl**asses** are as follows:

1. ***User and GeneralUser:*** General User is a user who has not yet registered to the system and in general relation with the user.
2. ***User and RegisteredUser:*** Registered User is a User who has registered for the system.
3. ***RegisteredUser and Banner:*** Registered User can create banners.
4. ***RegisteredUser and Component:*** Registered User can create new components.
5. ***RegisteredUser and Article:*** Registered user can create articles.
6. ***RegisteredUser and Content:*** Registered User can create content.
7. ***User and Contacts:*** User can view and edit his contact information.
8. ***User and Article:*** User can create articles.

ER DIAGRAM


contains categories
jos_sections
PK id* INTEGER(11)
title* VARCHAR(50)
name* VARCHAR(255)
image* VARCHAR(100)
scope* VARCHAR(50)
image_position* VARCHAR(10)
description* TEXT
published* TINYINT(1)
checked_out* INTEGER(11)
checked_out_time* DATETIME
ordering* INTEGER(11)
access* TINYINT(3)
count* INTEGER(11)
params* TEXT
jos_categories
PK id* INTEGER(11)
FK parent_id INTEGER(11)
title* VARCHAR(50)
name* VARCHAR(255)
image* VARCHAR(100)
FK section* VARCHAR(50)
image_position* VARCHAR(10)
description* TEXT
params* TEXT
published* TINYINT(1)
checked_out* INTEGER(11)
checked_out_time* DATETIME
editor VARCHAR(50)
ordering* INTEGER(11)
access* TINYINT(3)
count* INTEGER(11)
jos_newsfeeds
FK catid* INTEGER(11)
PK id* INTEGER(11)
name* TEXT
link* TEXT
filename VARCHAR(200)
published* TINYINT(1)
numarticles* INTEGER(11)
cache_time* INTEGER(11)
checked_out* TINYINT(3)
checked_out_time* DATETIME
ordering* INTEGER(11)
jos_contact_details
PK id* INTEGER(11)
name* VARCHAR(100)
con_position VARCHAR(50)
address TEXT
suburb VARCHAR(50)
state VARCHAR(20)
country VARCHAR(50)
postcode VARCHAR(10)
telephone VARCHAR(25)
fax VARCHAR(25)
misc MEDIUMTEXT
image VARCHAR(100)
imagepos VARCHAR(20)
email_to VARCHAR(100)
default_con* TINYINT(1)
published* TINYINT(1)
checked_out* INTEGER(11)
checked_out_time* DATETIME
ordering* INTEGER(11)
params* TEXT
user_id* INTEGER(11)
FK catid* INTEGER(11)
access* TINYINT(3)
jos_weblinks
PK id* INTEGER(11)
FK catid* INTEGER(11)
sid* INTEGER(11)
title* VARCHAR(250)
url* VARCHAR(250)
description* VARCHAR(250)
date* DATETIME
hits* INTEGER(11)
published* TINYINT(1)
checked_out* INTEGER(11)
checked_out_time* DATETIME
ordering* INTEGER(11)
archived* TINYINT(1)
approved* TINYINT(1)
params* TEXT
jos_content
PK id* INTEGER(11)
title* VARCHAR(100)
title_alias* VARCHAR(100)
introtext* MEDIUMTEXT
fulltext* MEDIUMTEXT
state* TINYINT(3)
FK sectionid* INTEGER(11)
mask* INTEGER(11)
FK catid* INTEGER(11)
created* DATETIME
created_by* INTEGER(11)
created_by_alias* VARCHAR(100)
modified* DATETIME
modified_by* INTEGER(11)
checked_out* INTEGER(11)
checked_out_time* DATETIME
publish_up* DATETIME
publish_down* DATETIME
images* TEXT
urls* TEXT
attribs* TEXT
version* INTEGER(11)
FK parentid* INTEGER(11)
ordering* INTEGER(11)
metakey* TEXT
metadesc* TEXT
FK access* INTEGER(11)
hits* INTEGER(11)
jos_content_rating
PF content_id* INTEGER(11)
rating_sum* INTEGER(11)
rating_count* INTEGER(11)
lastip* VARCHAR(50)
jos_content_frontpage
PF content_id* INTEGER(11)
ordering* INTEGER(11)
content can contain content
jos_groups
PK id* TINYINT(3)
name* VARCHAR(50)

ADVANTAGES

- “Joomla! an open source Content Management System.”
- It is very easy to install and set up, even if the user is novice to technology.
- Its easy to use functionality enables a web designer or developer to quickly build sites for their clients.
- Just by following few instructions, clients can manage their sites on their own without much issues.
- As Joomla! uses WYSIWYG editor (What You See Is What You Get), it is very easy to edit the content using Joomla!
- The safety of data content is well taken care of and the system allows only authorized users to change the content.
- Joomla! is compatible with almost all the browsers.
- The built-in templates that are offered by Joomla! are very easy to use.
- Media files can be can be transferred effortlessly to the article editor tool.
- Menu creation tool is very easy to understand and implement.

DISADVANTAGES

- There might be few compatibility issues with few modules, extensions and plugins.
- Few plugins and modules might not be available for free in Joomla!
- If the user wants to create a new layout, development might be difficult.
- Joomla! is not a Search Engine Optimization(SEO) friendly system.
- Sometimes the websites created through Joomla! might find it difficult to run.

CAPABILITIES

Several resources are present that helps user to get a high-level overview of the overall functionalities of Joomla!

Web sites running Joomla!

Joomla! is amongst the top three world's popular and best feature rich CMS (Content Management System) and approximately is the backbone of 2.7% of the major 1,000,000 Websites that are in existence. The sites that are run on Joomla! is showcased on Joomla! Community Showcase. Those which are showcased only represent a small fraction of Joomla! backed sites worldwide.

Extensions

One of the important feature of Joomla’s platform is the ease by design principle that the platform is envisioned to be with in tandem with its strong core functionality which can be enhanced further by installing optional Extensions. This feature is a major forte of Joomla!

Many extensions have been created and made available by a third-party developer which is very active. Many extensions are being added regularly.

Community

Joomla! community is huge community where the developer community is just one part of the former. There are approximately half million registered users who are active in many Joomla! forums. There is an addition of 150 new users to the forum every day. These forums are very responsive and quick, with over thousands of posts per day, and they provide a high level of free support to Joomla! users and who's reward is only recognition. This support is given voluntarily and is free by other community members.

Support

The quality of support available is an essential question when gauging how a software package works. In tandem to the essential support forums, Joomla! has a large community of highly capable Website professionals and a collection of consulting organizations who use Joomla!'s platform to build and maintain wide varieties of Websites.

PLATFORM COMPARISON

While WordPress has captured market share of 23% of all websites created on the internet, it's not the only open source content management system in the market. There are already other alternative feature software like Joomla! and Drupal. Though the above three platforms have a lot in common, they still have their own advantages and disadvantages.

Common features:

- Joomla!, WordPress and Drupal are all free and open source software written primarily in PHP and licensed under General Public License (GPL).
- All the above platforms support the most common MySQL as their database management system. Joomla! and Drupal support other database management systems while WordPress solely supports only MySQL.

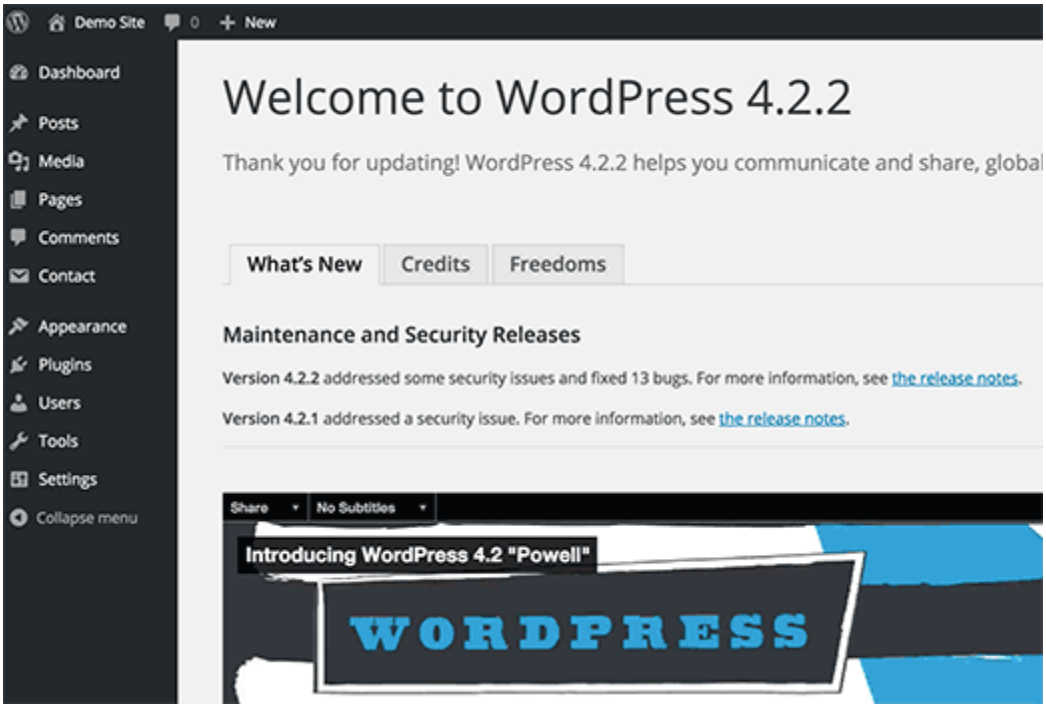
- All the above three platforms use themes and templates for visual aesthetics of sites, and provide plugins, modules and extensions for enhancing features.
- As the above platforms are open source software, they are all community-driven projects.
- Whilst there are a lot of similarities, in many aspects they are diverse. They have dissimilar policies on vision, what constitutes the core software, directions on handling modules and templates, dealing with security, etc. These alterations make a huge impact on users, and how they build their websites.

1. Ease of Use and Beginner Friendliness

Vast number of people who are creating their websites aren't web developers, designers, or programmers. They are average users with almost no coding or HTML knowledge, who just want to build a website. For many users, it is important that the website should be easy to use.

WordPress

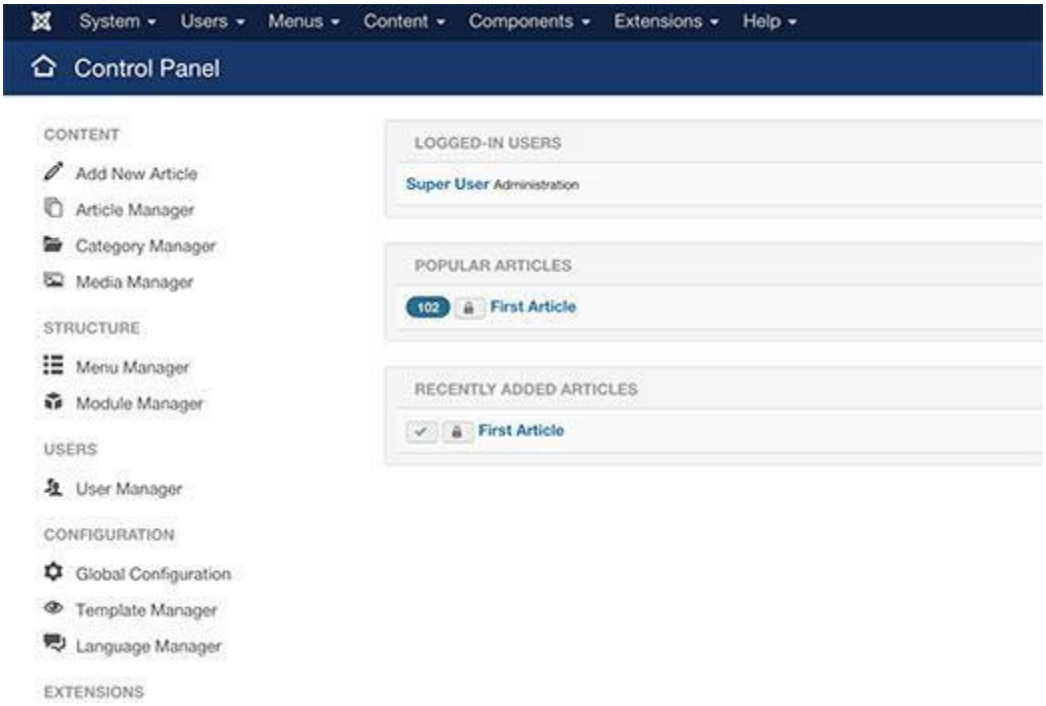
WordPress comes with a well-known five-minute install. Thus, making it easy for a new user to start a WordPress blog within minutes, not hours.



The user experience after installation of WordPress is way better than Joomla! or Drupal. The end consumer gets a simple clean-cut user interface along with menus to create pages, posts or start tailoring appearances and themes.

Joomla!

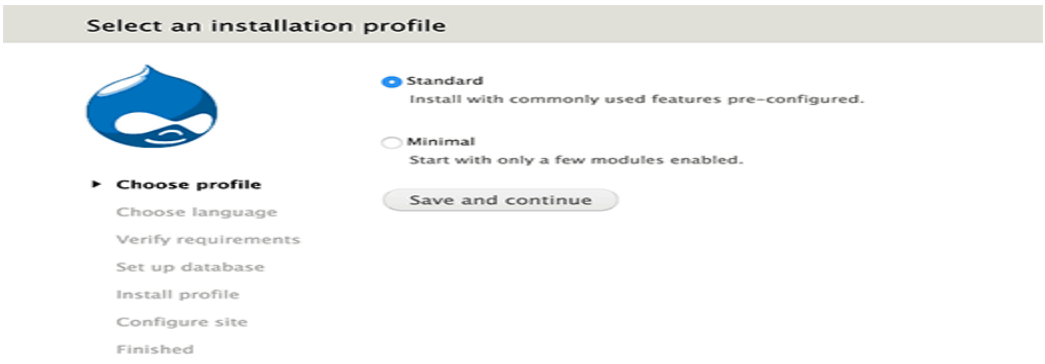
It is little difficult to install Joomla! compared to WordPress. but it has very similar steps. Similar to WordPress, many hosting providers provide one click install packages for Joomla! too.



Post installing, the user lands on a control panel that is not as straight forward and simple when compared to platform such as WordPress. There are plethora of menus to click on to tailor your site. The primary reason is that Joomla! is a lot more powerful than WordPress, but is intimidating for a beginner.

Drupal

Installing Drupal is similar to both Joomla! and WordPress. Simply download and upload the package and then run the installation file.



Drupal, like the other platforms also offers various distributions. These distributions are pre-packaged Drupal bundles with modules and configurations to create specific kind of websites.

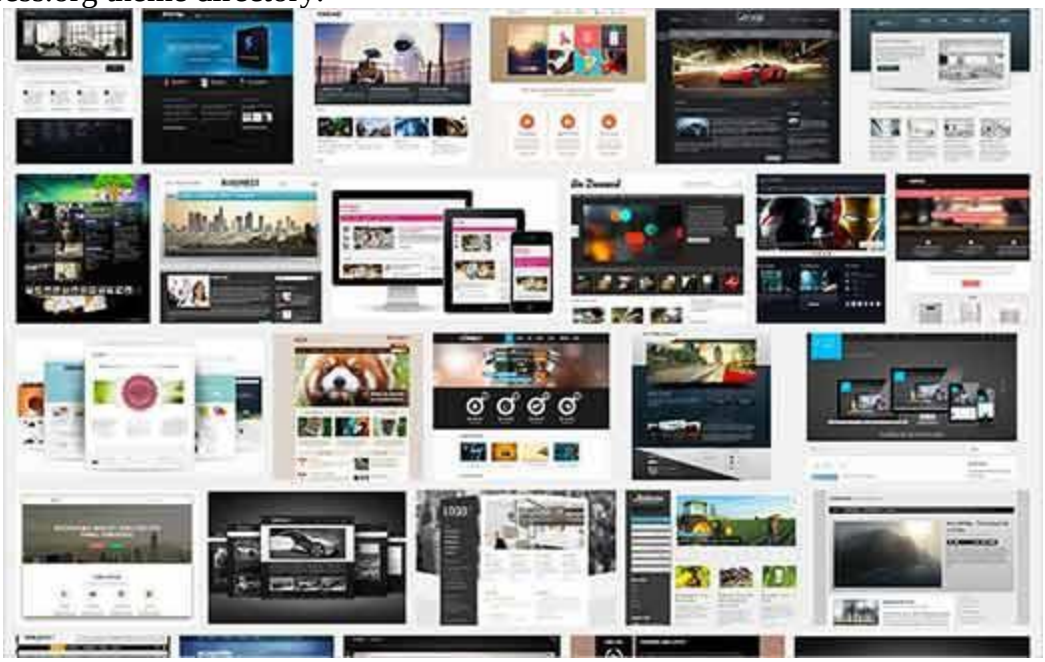
When compared to WordPress and Joomla! the post installation experience for novices is a tad complex. Users find it difficult to figure out how to change aesthetics and content navigation menus on their site.

2. Themes and Addons

All three platforms above are amongst the popular Content Management System, which comes with themes, plugins and modules primarily to extend the features and appearance of the software.

WordPress

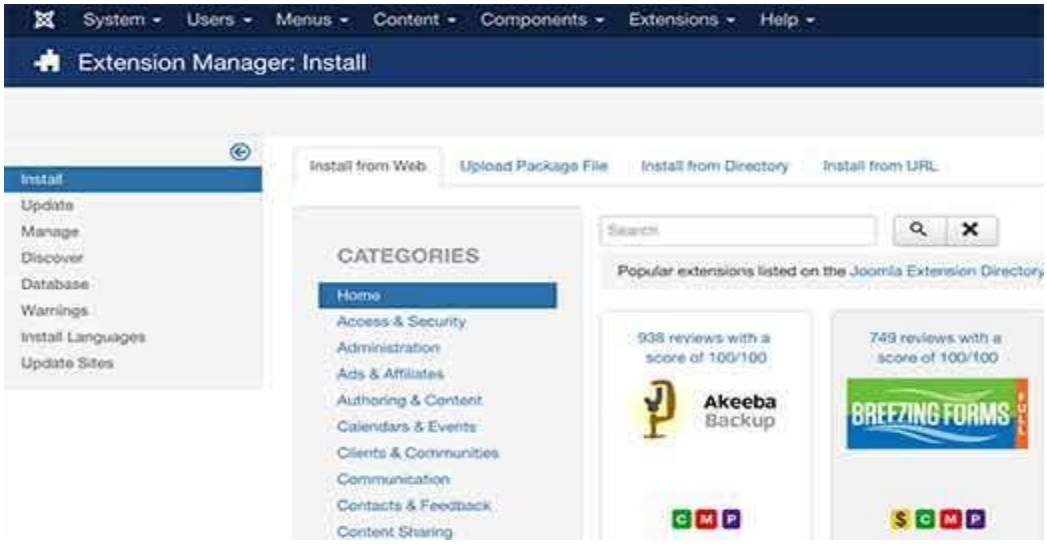
WordPress comes with a few default themes pre-installed allowing customers to modify their site's appearance by applying themes. At any point user can navigate to appearance page and click on the add new button to install free themes from plethora of options present in the official WordPress.org theme directory.



There are many more premium WordPress themes apart from the available free themes, which are developed by third party theme stores like StudioPress, Themify, or ThemeLab. These premium themes available inherit with premium support options.
The real prowess of WordPress lies within the plugins. Amongst the 38,000 WordPress plugins available for free in official WordPress plugin directory, User can also get support provided by plugin developers by buying premium plugins.

Joomla!

Joomla! has templates and extensions just like its counterpart, WordPress. There are several extensions available to do just about anything varying from managing email to creating an ecommerce website.

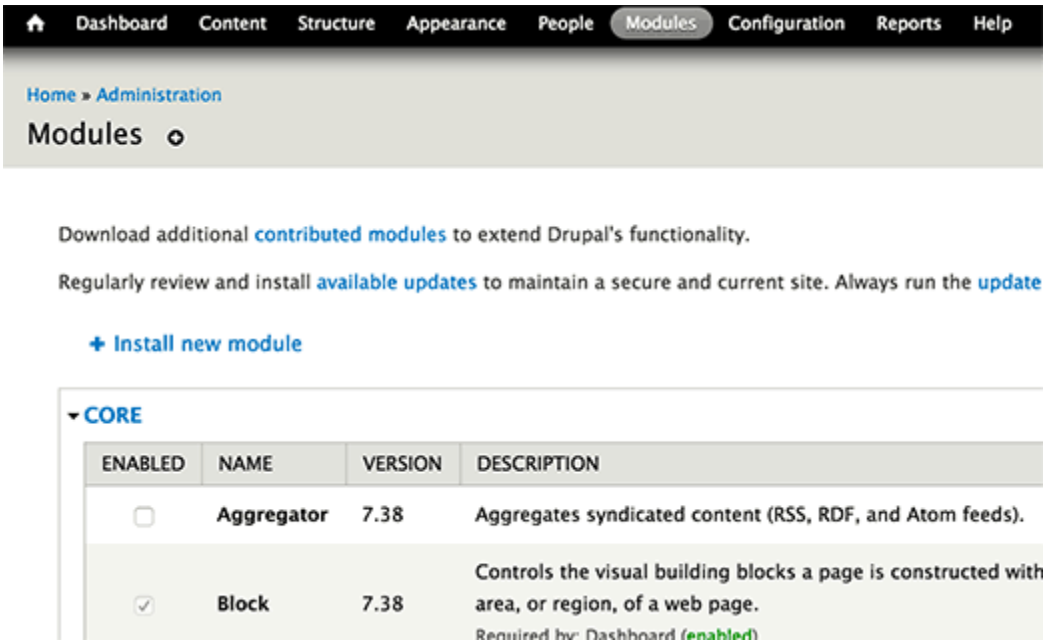


The magnitude of these templates and extensions for Joomla! when compared is not as high as WordPress. Thereby making exploration of the perfect template and the perfect extensions a bit difficult.

Joomla! lacks a feature which allows users to search and install extensions or templates from the administration panel by default. But as a work around, an extension is available which allows users to add install extensions feature from web feature. Whereas for templates, users would still have to manually search templates and then add its URL in order to install them.

Drupal

Drupal has the same issue, similar to Joomla! with respect to the availability of themes and modules. Consumers would have to leave their site and search for the theme or module they want like to add, thereafter identify the project's zip file URL and post which they can enter the URL in the Modules or Themes page to install them.



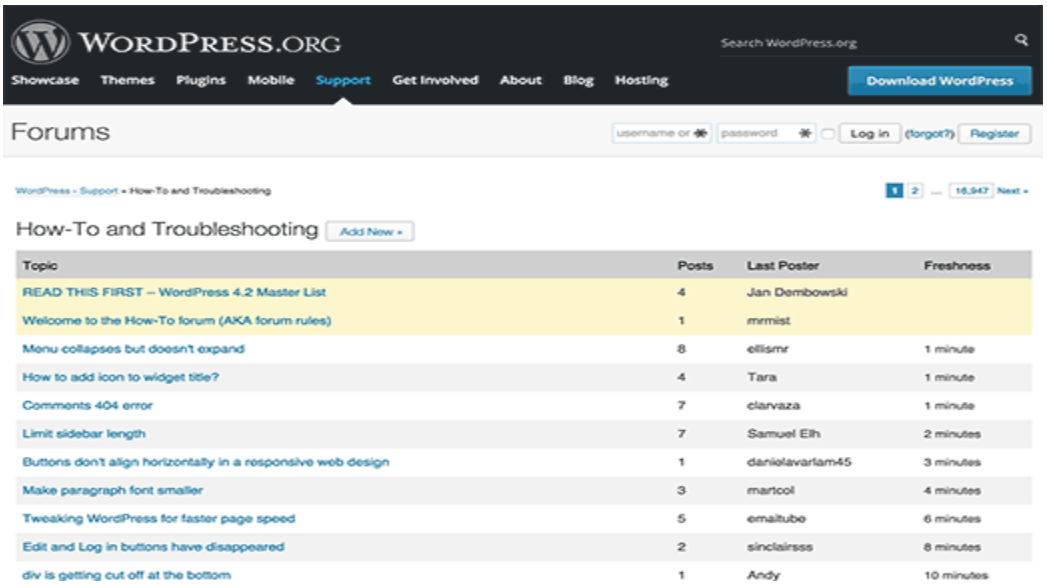
Modules for Joomla! available do just about anything and novel ones are constantly added. Still, the large magnitude of modules are lacking when compared to WordPress.

3. Support Options

There are bound to be some hurdles when you are exploring a new software. Availability of help and support options is crucial, especially for novice users.

WordPress

WordPress has a huge user community. Users can find help and support for WordPress on their official support forums, Slack channels, documentations, handbooks, codex, Stack Exchange, and practically every web design and development forums on the internet.



There are numerous ways to get free WordPress support and search them. Websites like WPBeginner, containing hundreds of tutorials, video tutorials, and articles exists providing to beginner level WordPress users. There also exists paid support for WordPress in tandem with the free support options.

Due to huge popularity and adoption of WordPress, finding developers for WordPress is easy and affordable for small-medium businesses and individuals. There are also platforms where you could hire WordPress experts from around the globe to at very reasonable price to quickly resolve a problem. Platforms like Upwork, Fiverr, and elance are some examples of such.

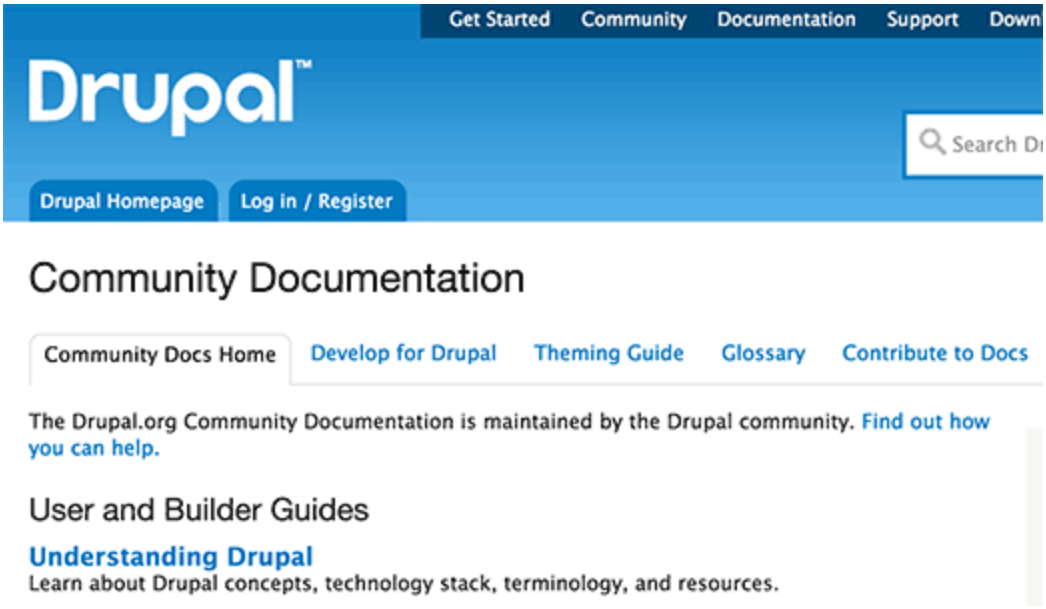
Joomla!

Like WordPress, Joomla! also possess a large helpful user community Extensive documentation a valuable resource for beginners is present on the Joomla! website. For more exhaustive and interactive support options, users can join mailing lists, forums, IRC chatrooms, etc.

There are third party resources in tandem with the community forums such as paid training, and development agencies that provides aid. Employing a developer or expert for Joomla! development, troubleshooting or assistance can cost way more than WordPress as finding affordable expert help is quite difficult for Joomla! unlike WordPress.

Drupal

Drupal platform is known for its highly proactive community of users and fans. Just like WordPress and Joomla! you will find all the community support options for Drupal. There are good resources for getting free help, extensive design and usage documentation, support forums, mailing lists, vast number of user groups, irc chatrooms are few of them.



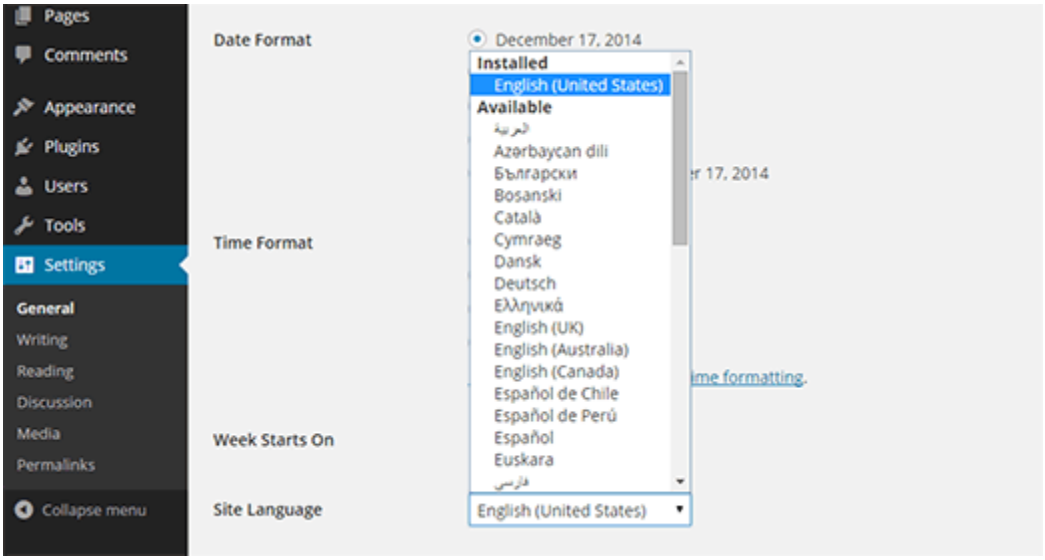
4. Localization & Multi-Lingual Support

Many websites that are developed every day are of many different languages (both English and Non-English sites). The need for a good content management system that can support many different languages.

WordPress

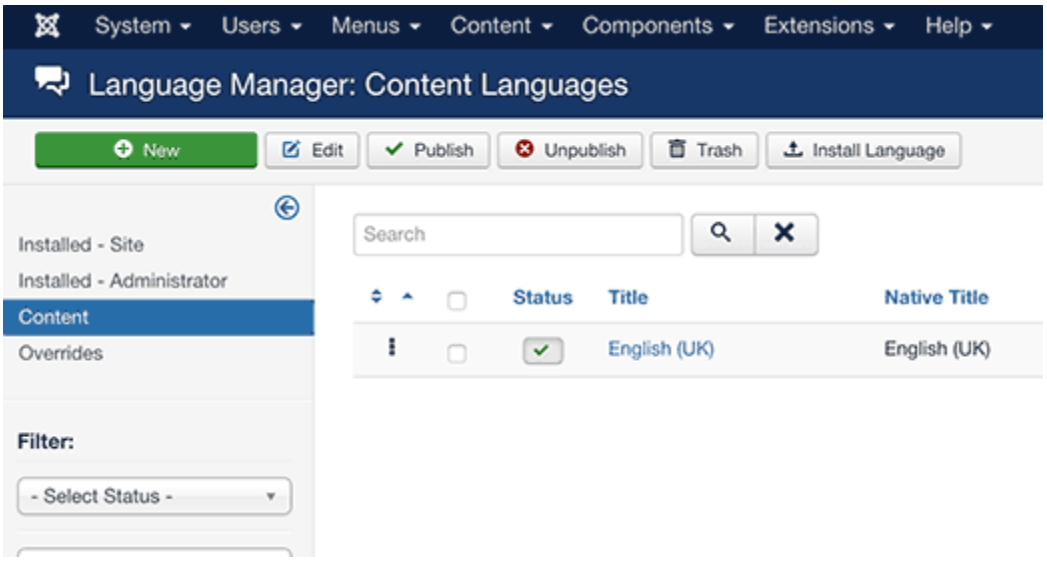
WordPress is the most famous content management system that is supporting the multilingual feature with 53 languages. It's just that the user must download a plugin from the admin area in the WordPress website. User can even develop a plugin of his own with the language that he/she want and integrate it with their website. WordPress even has many inbuilt plugins and themes available in various languages.

Developers in WordPress are working with people to translate the plugins and packages they have built into different languages.



Joomla!

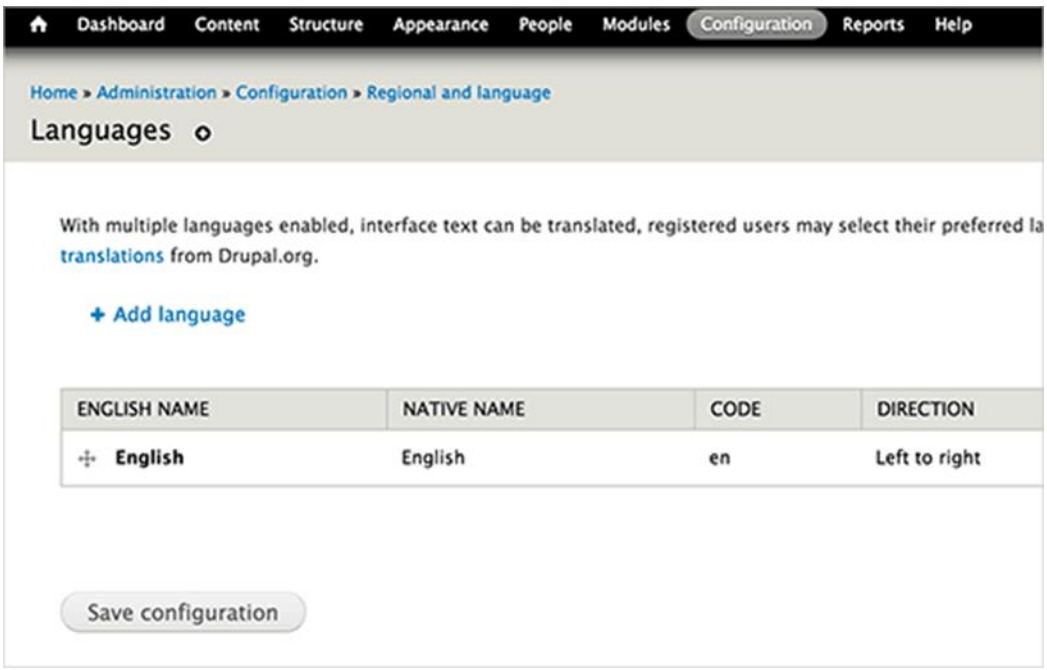
Joomla! has a feature of developing a website with multiple languages without adding any extensions. It's just that the user must change the content language in the language manager tab. The user can just start creating webpages with the language he chose. Even admin has a facility to manage the languages using the admin interface that is available in the admin area.



Drupal

Drupal comes with built-in support to handle different sites. User should turn on the locale and content translation modules. After that you can add site and admin interface languages from Drupal's configuration section.

Even Drupal is not an exception in providing multilingual support for the websites built through their system. In Drupal we must enable the translation modules: content and locale. Then in the configuration section of the Drupal system we can add admin and interface languages.



5. Security

Anything put over the internet is prone to security threats. Therefore, it is important to choose a content management that can ensure the security for our website.

WordPress

Websites are the most common things that are prone to security threats and WordPress being the number one CMS platform for website development is not an exception for that. Websites built on WordPress are very secure to some extent and are less prone to vulnerabilities. Whenever a new security patch is released, there is an automatic mechanism included in all the websites built through WordPress such that these websites will get automatically updated with the security patch.

There is a two-factor authentication in WordPress with automated backups to ensure further security. For any new updates in WordPress themes and plugins, user authentication is required thereby ensuring security and making the website free from vulnerability.

Joomla!

Following the best practices as WordPress then it is possible to build safe and secure website through Joomla!. It also provides the same level of security as WordPress. Whenever the end user raises concerns regarding any security threats, then Joomla! system is equipped with an automatic issue tracker to handle them and provides a security patch in less time. But it is the end user who should decide if he/she must install them or not.

Drupal

Since Drupal is not as popular as Joomla! or WordPress it is uncommon that we will get to hear about any security issues or vulnerabilities. Any security issues are considered very seriously in Drupal and they provide the patch as soon as any vulnerability is reported.

SOFTWARE REQUIREMENTS

Software	Recommended	Minimum	More information
PHP	5.6 or 7.0 +	5.3.10	https://secure.php.net
Supported Databases:			
MySQL	5.5.3 +	5.1	https://www.mysql.com
SQL Server	10.50.1600.1 +	10.50.1600.1	https://www.microsoft.com/sql
PostgreSQL	9.1 +	8.3.18	https://www.postgresql.org/
Supported Web Servers:			
Apache	2.4 +	2.0	https://www.apache.org
Nginx	1.8 +	1.0	https://www.nginx.com/resources/wiki/
Microsoft IIS	7	7	https://www.iis.net

SCOPE FOR IMPROVEMENT & RECOMMENDATION

1. Joomla! is not supporting latest Bootstrap version (4.0), most popular HTML, CSS, and JS framework for developing responsive, projects on the web.
2. Lack of End User Support: It takes lot of steps to enroll a new user and not enough help screens are available making the user onboarding process difficult.
3. Updated tools for testing. Currently Joomla! uses JFactory. They could use more efficient testing tools.
4. Duplication of class names in the frontend and backend of components.
5. Create feedback and issue tracker system so that the user can provide feedback and report bugs. This will lead to finding more bugs through the user community there by reducing the burden on development team to release a stable version.
6. Integration of store for plugins, extensions and themes into the software. By this we can eliminate the arduous task of user searching the URL and adding it manually. This also solves compatibility issues with plugins and extensions.
7. Emphasis on development of more plugins and extensions to match the one's offered by market leaders like WordPress thereby giving users to use readymade packages and increasing efficiency.
8. We tried creating articles in a sample website using Joomla! as part of exploring the system and its functionality. We found an issue while trying to display articles. First, we downloaded 100 articles. We requested for display of 2 articles and it worked fine. When we requested for display of 0 articles, it took a long time as it was loading all the 100 articles even though it is not required, and we were unable to next operation fast.

CONCLUSION

The need for creating a website is ever been raising in this information era. Therefore, the demand for fully fledged content Management system is on rise which caters a novice user to a technical expert.

Drupal, Joomla! and WordPress are all fantastic content management systems. Compared to WordPress, Drupal and Joomla! have many in-built features.

After studying the system, we found out that though the feature-rich Joomla! is not as user friendly when compared to industry leader such as WordPress, there is a lot of scope for improvement.

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