

Joomla, Drupal and WordPress - A Statistical Comparison of Open Source CMS

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Abstract— In the present time open source content management system (CMS) has gained a big market. Lots of varieties are available based on functionality and platform. As no CMS is best for everyone but when content management principles are concerned, two to three CMS names like Joomla, Drupal and WordPress stick in mind. These CMSs perform well in their preferred conditions. But if anyone wants informative types of website and doesn't require much functionality the question arises that out of these three CMSs which is to be preferred. As there are lot of surveys has been carried out in this area, we have tried to prove statistically by comparing their page performance criteria that which CMS is to be preferred. For doing the same we have created same pages in three CMSs to evaluate their page performance. To evaluate the page performance of these CMSs the pages had been hosted on local as well as live server. By requesting this page from client side different values of page performance criteria were recorded like page load time (PLT), page size (PS), number of request, number of CSS and JS files etc. while comparing all these parameters we could come to conclusion that which CMS should be used under what conditions.

Keywords—Open Source; Comparision; Drupal; Joomla; Prerformance; WordPress.

I. INTRODUCTION

There are many definitions of "Content Management System" as there are many Web CMS vendors and analysts. But one universal definition of Content Management System is: "A system that lets you apply management principles to content." [1] Generally all CMSs fulfill common task of content like create, edit, publish. But above mention CMS are providing good user support, security, more plug-ins, documentation etc than others. In this paper we want to prove out of this which CMS is preferable for getting better performance. For doing the same we have created a page in all CMS to take statistics of different page criteria. We have taken statistics of a page with only textual information, page with single object and then with multiple objects like calendar, watch, and image gallery to check which CMS handle load better and give faster response. To develop page with above mention objects we have to use third party plug-ins for different CMS. The CMS and plug-ins information are described in below table.

TABLE I. CMS AND PLUGINS DETAIL

CMS	Version	Calendar Plug-ins	Clock Plug-ins	Gallery Plug-ins
Joomla	1.6.4	Minicalendar	Jmtimenow	Simplespotlight
Drupal	6	Calendar Block	Timeblock	Cycle Plugin
WordPress	3.1.3	In Built	Local Time Clock	Js Banner Rotate

We have used above plug-ins for calendar, clock and image gallery in all CMS. WordPress has calendar plug-in in built except that we have to use third party plug-ins for all objects.

II. JOOMLA

Joomla is one of the most powerful Open Source Content Management Systems. It is used to create highly interactive multi-language Web sites in no time like online communities, media, portals, blogs and E-commerce applications. With Joomla you can customize your site as you wish. In many cases Bloggers select WordPress as blogging platform. This is a natural choice, but you can also blog with Joomla. Templates are used to set page. You can add additional functionality using add-ons. You can do anything with your site by hiring a developer and enjoy the freedom. Joomla is an award-winning CMS. [2,8].

A. Core Features

- User Management
- Media Manager
- Banner Management
- Contact Management
- Polls
- Search
- Web Link Management
- Content Management
- Syndication and Newsfeed Management
- Template Management
- Integrated Help System
- Powerful Extensibility[3]

Below “Fig. 1” shows page in Joomla with some textual information and objects like calander, clock, and image gallery. We have created same page with same object in Drupal and WordPress CMS.

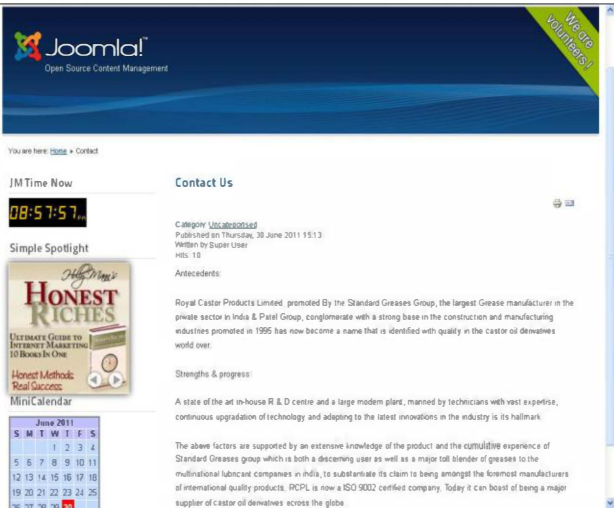


Figure 1. Joomla CMS page with text and other objects.

III. DRUPAL

Drupal is an open source platform for building robust, flexible websites. Drupal is a CMS which allows user to update their web pages without technical knowledge and ensure that it fits your organization's workflow. Drupal is a dynamic platform that will grow as your need expands. Drupal can be installed in multiple languages, allowing both administrators and users to view a site in their own language. You can customize Drupal according to your content, user and features of organization that make shine in front of others. You do not have to relying on vendors, Drupal have large developer community which provides support, security, testing, documentation for your web site. Whenever you hear about next big enhancement in web design, Drupal is always there. Drupal community member makes Drupal better and better. [4, 9]

A. Core Features

- Administer
- Build
- Collaborate
- Connect
- Create
- Design & Display
- Extend
- Organize & Find[5]

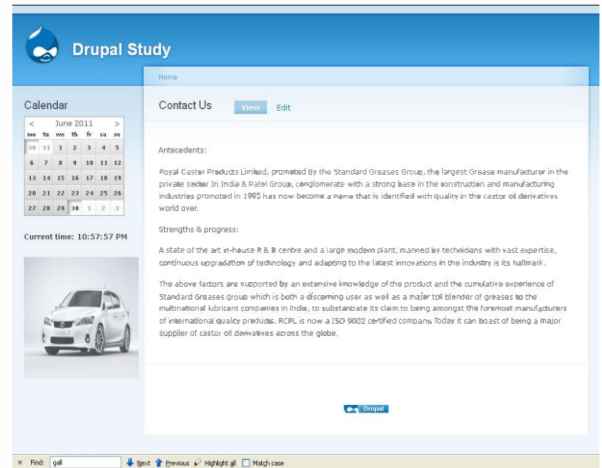


Figure 2. Drupal CMS page with text and other objects

IV. WORDPRESS

WordPress is initially designed as a blogging platform, in the last several years WordPress has changed itself as a useful content management system. One of the main advantages of WordPress is the large number of plug-ins released by independent developers. In fact, every aspect of web site regarding the creation, organization and search engine optimization can be now handled with the use of WordPress plug-ins. Actually these plug-ins are add-ons and improve the functionality of the user interface. With lots of WordPress plug-ins available it becomes popular in the public. Lots of people confused in selecting plug-ins to simplify a particular task. For them, there is a large WordPress community ready to advice how to use them with WordPress content management system.[6,10]

A. Core Features

- Custom Taxonomies
- No rebuilding
- Custom Post Types
- WordPress Themes
- Cross-blog communication tools
- Spam protection
- Full user registration
- Password Protected Posts
- Easy Importing
- XML-RPC interface
- Workflow
- Intelligent text formatting
- Menu management[7,11]

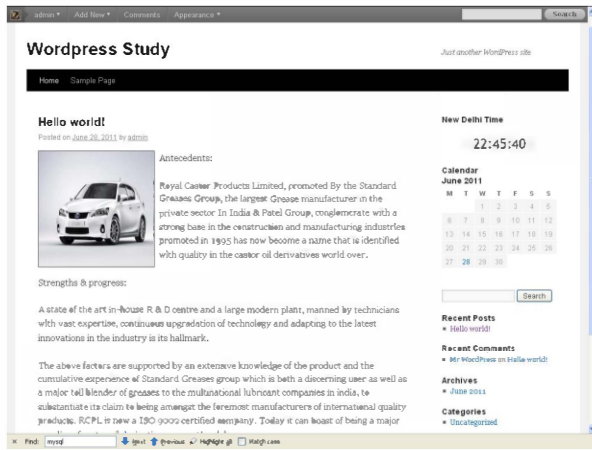


Figure 3. WordPress CMS page with text and other objects.

V. CASE STUDIES

After developing a same page in all CMSs as mentioned above, we went for statistics of page performance criteria from local as well as live server. Therefore, two case studies have been taken here.

A. Local Server

As mentioned above we had created same page with same kind of objects in all CMSs. Then we have hosted those pages in local server. The following table shows configuration of the server.

TABLE II. SERVER CONFIGURATION

Operating System	Windows XP
Hardware Configuration	
Processor	Core 2 Duo
RAM	2 GB
Hard Disk	320 GB Hard Disk
Motherboard	Intel Motherboard
Server	Apache Server 2.2.19
Front End	PHP 5.0
Back End	My SQL 5.0 Server

Following are the parameters measured for page performance.

- Page Load Time: in Mile Second (M.S).
- Page Size: Total Size of the page in Kilo Byte (K.B).
- Total Request: Number of request send to the server to load the page.
- Total cascading style sheet (CSS) files: Number of CSS files used by CMS to make a page.
- Total java script (JS) files: Number of JS files used by CMS to make a page.

- PLT after caching: when page load first time some of its content store in cache memory so when we load that page again only rest of the data which is not in cache will load from the server so it decrease load time.
- PS after caching: As system cache used to decrease the PLT it also reduces PS as mention above.

From the below Table III it is seen that except PLT, Joomla has higher values compare to Drupal and WordPress. By comparing normal PS and PS after caches, it is seen that Joomla caches 45.9 K.B of data in memory when page gets loaded for second time. In the same way if we compare normal PLT with PLT after cache, Joomla reduces 219 MS. When PS comes in picture Drupal has smallest PS compared to others. It does not use any JS file even. As it takes very less time in page load, it gives faster response to the request. WordPress takes too much time, i.e. almost 4 times higher then Joomla and 7 times higher then Drupal in PLT. But it also stores good amount of data in cache memory as well as it reduces PLT up to 3198 MS. Therefore, from the below table it is clearly seen that Drupal is giving its best for the site having textual information.

TABLE III. PAGE PARAMETER WITH ONLY TEXT

CMS	PLT	PS	Total Requests	Total CSS Files	Total JS Files	PLT After Caching	PS After Caching
Joomla	935 ms	515.9 KB	26	8	6	716 ms	470 KB
Drupal	520 ms	52 KB	18	7	0	382 ms	32.9 KB
Wordpress	3660ms	99.3 KB	11	2	3	462 ms	30.9 KB

Below Table IV shows parameter value comparison of the page with textual information and calendar object. If Joomla is compared with text as well as one object, joomla's PLT is seen increased by 75 M.S While in the case of Drupal it's PLT is increased by 247 M.S, but in case of PS it is seen that Joomla's PS is slightly increased around 4 K.B, on the other hand Drupals' PS is double. The size of the WordPress remains almost the same. When we talk about total request Drupal take 150% more request compared to previous one. Data in Table IV show that Joomla and Wordpress handle load better than Drupal. In other sense it can be said that Drupal's calendar plug-ins consume more size compared to others.

TABLE IV. PAGE PARAMETER WITH TEXT AND CALENDAR OBJECT

CMS	PLT	PS	Total Requests	Total CSS Files	Total JS Files	PLT After Caching	PS After Caching
Joomla	1010 ms	519.7 KB	27	8	6	729 ms	475 KB
Drupal	767 ms	110 KB	31	8	3	440 ms	79.4 KB
Wordpress	3210 ms	100.6 KB	11	2	3	479 ms	30.9 KB

Below Table V shows page performance criteria having text and objects like calendar, clock, and image gallery which is shown in "Fig. 1", "Fig. 2" and "Fig. 3" respectively. After giving comparative load to page when measured it is seen that Joomla was having 165 M.S. differences compared to only text

information. Drupal's page time increased dramatically having countable difference of 2523 M.S. while considering PLT as main criteria, Joomla won the battle. WordPress PS has just increased by 87 K.B compared to Joomla and Drupal which increased more than 140 K.B. WordPress caches more amount of data in memory compared to other two. It also cuts down its PLT more than half a time after caching data. Drupal has deducted 2468 M.S in the next PLT after cache it means that it works faster after caching. Even if Joomla's PS is three time higher than others its PLT is 3 time lower than others, it interprets that Joomla handle load better and is performing well with local server.

TABLE V. PAGE PARAMETER WITH TEXT AND MULTIPLE OBJECTS

CMS	PLT	PS	Total Reque sts	Total CSS Files	Tota l JS Files	PLT After Cachi ng	PS After Cachi ng
Joomla	1100 ms	682.2 KB	44	8	9	816 ms	623 KB
Drupal	3290 ms	195.5 KB	36	8	5	822 ms	136.2 KB
Wordpr ess	4870 ms	186.6 KB	20	3	7	2280 ms	100.6 KB

B. Live Server

In this case the CMS pages were hosted on a live server and requested from the client machine. Here all page performance criteria were taken in to consideration again. Normally all page performance criteria depend upon server configuration, client configuration and speed of the internet connection. Values of page criteria can be varied according to Client and server configuration. This case gives a better idea that which CMS gives better performance under same internet speed and which CMS handle load better. Configuration of client and server has given below.

- Server Configuration
 1. Operating System: Linux
 2. Architecture: x86_64
 3. Kernel Version: 2.6.18-238.12.1.el5
 4. Disk Space: Unlimited
- Client Configuration
 1. OS - Win XP
 2. RAM - 1 GB
 3. Internet Connection - Broadband 2 MB
 4. Processor - Dual Core
 5. Hard Disk - 320 GB

1) *PLT Comparison:* P.L.T is an important parameter for comparing page performance. It can be seen from the below “Fig. 4”, that with only textual information Joomla and Drupal takes almost same time in page load. But if these CMSs are compared with WordPress, it is seen that WordPress takes 1.9 second less time in page load. Even if the load in page is increased by adding objects, WordPress took very less time compared to others. From below data it is very clear that WordPress is performing well with textual information

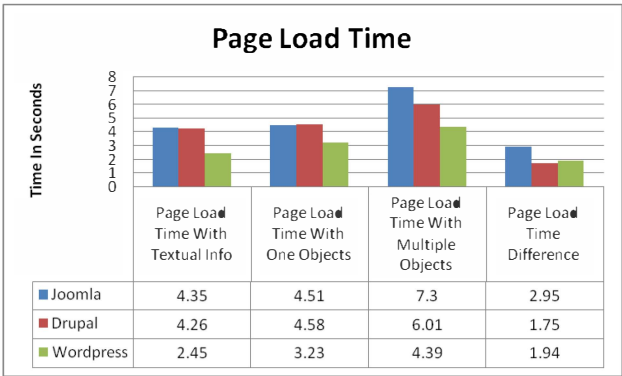


Figure 4. PLT of different CMS.

2) *PS Comparison:* PS has a direct effect on PLT. It is seen that when we talk about textual information, the size of Joomla is almost 10 times bigger than Drupal and WordPress is almost double than Drupal. If the effect of calendar plug-ins on PS of all CMS is compared, Joomla and WordPress plug-ins have very less effect on PS. In the case of Drupal its size is double. If we look at the last parameter PS difference whose value is taken after deduction of PS with textual information from pagesize of multiple objects, WordPress have very less effect on size compare to Joomla and Drupal. Drupal are performing well with textual information as it consume very less size.

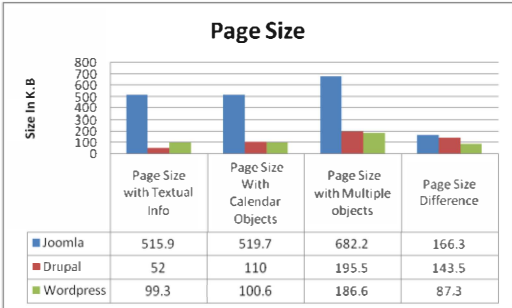


Figure5. PS of different CMS

3) *Request Comparison:* To load a page number of request has been send to the server from client machine. Request has direct connection with PLT; it means that less number of requests, less PLT. Joomla uses 2.5 times more while Drupal uses 1.5 times more request than Wordpress as can be seen from the below “Fig. 6”. Due to very less number of requests WordPress takes very less time in page load.

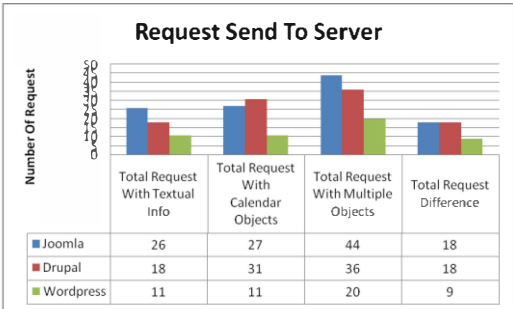


Figure 6. Numbers of request send to server.

4) *JavaScript Comparison:* When any CMS creates a page it uses some JS files and some CSS files. As numbers of JS files and C.S.S files are increased, page takes more time in page load. If we talk about page with only textual information, Drupal is not using a single JS file compared to WordPress uses 3 and Joomla uses 6. As number of objects increased number of JS files may be increased.



Figure 7. Numbers of java script used to create page.

5) *C.S.S File Comparison:* From below “Fig 8” it is seen that WordPress uses very less number of C.S.S files compared to others. Joomla uses same number of C.S.S file in textual information and with multiple objects.

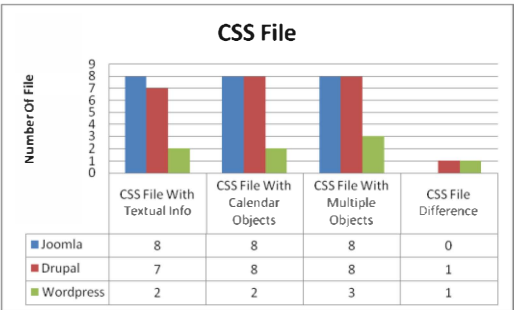


Figure 8. Numbers CSS files are used

6) *PLT after Caching:* When any page gets loaded from server to client machine, the client machine stores some data on its site so when that page gets loaded again it takes less time in loading compared to first time load. In case of textual information Joomla and Drupal takes 1.10 seconds less time than the earlier one while WordPress only reduces 0.32 seconds in PLT. It seems that it caches less data in memory.

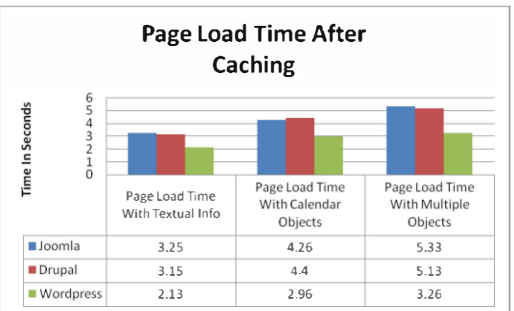


Figure 9. PLT after caching data in memory

7) *PS After Caching:* If CMS caches more amount of data in memory it directly reduces PS. If your PS is reduced it takes less time in page load. Below “Fig 10” shows significant result of PS for different CMS after caching.

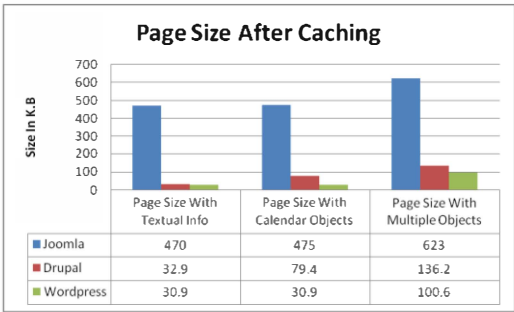


Figure 10. PS after caching some data in memory

8) *Reduction in PLT:* After inserting all objects with text in page for all CMS, caching was optimized and derived significant time reduced in PLT. Below “Fig 11” shows clearly that Joomla caches more amount of data in memory and that is why it reduces 1.97 seconds in PLT. WordPress come second with 1.13 seconds while Drupal secured last position compare to other two.

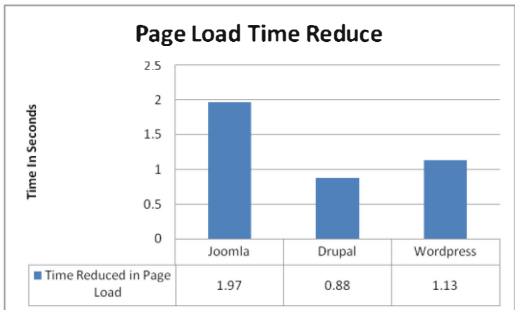


Figure 11. Number of seconds' reduced in page load.

9) *Amount Of Data Stored in cache:* We have taken one more statistics in which we have analyzed which CMS store more data in cache. After full load we have optimize that Joomla and Drupal almost caches 59 K.B data in memory and WordPress caches 86.6 K.B data in memory. Even if Joomla and Drupal caches same amount of data Joomla reduces more than twice amount of seconds than Drupal. Though WordPress caches more amount of data it cannot have significant effect in the reduction of PLT.

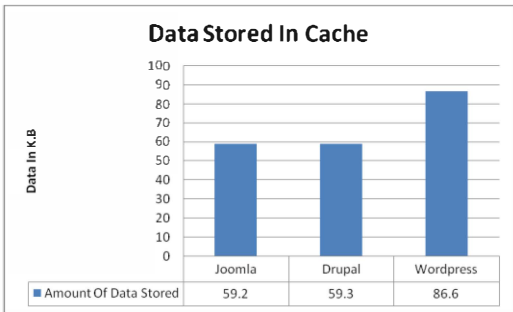


Figure 12. Amount of data stored in cache by different CMS.

VI. CONCLUSION

This paper is written after analyses of the performance of Joomla, Drupal and WordPress in the same condition. Two separate experiments were carried out for above mention CMSs and tried to see that out of these CMSs which performs well under local server as well as live server. From the result of case 1 it is concluded that if anybody wants informative website, Drupal is the best choice as it consumes very less PS as well as load time. If a person wants intranet site with multiple objects and needs faster response in this case Joomla should be his/her first choice as it handles the load better. As WordPress caches more amount of data in cache memory so in some cases it might be useful to speed up your task. By looking on the result of case 2 it can be said that we have some controversial result compared to case 1 but as everyone normally want their site performance for live server we take this result more seriously. In this case WordPress has makes it ground in lots of parameters like PLT, number of request send to server, number C.S.S files used, amount of data stored in cache. From the figure 4, 6,8,9,10,12 we conclude that WordPress has shown its performance and proved it best in most of all areas. In live server even Joomla caches less amount of data in memory it reduces significant time in page load therefore it can be said that Joomla performs faster than others after caching. At last from all above result it is concluded that for informative and intranet site Drupal is better, for intranet with multiple functionality site Joomla is better and for live site none than the others WordPress is the best.

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