Analysis & Comparative study of LAMP CMS

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Abstarct:

Content is king of any business and organization. For small and medium enterprise face many difficulties to manage digital content and website. A content management system, often abbreviated as **CMS**, is software that helps users create, manage, and modify digital content on a website without the need for specialized technical knowledge. In this work we explain how to manage LAMP CMS & how to select best and most popular open source LAMP based CMS namely Joomla, Wordpress, Drupal, Magento, PrestaShop, SquareSpace, Wix, Typo3. Through a qualitative comparative analysis, visual aspect, ease of use, advantage and drawback.

Keywords: LAMP, web content management system, open source CMS,

1. Introduction

Content is becoming one of the most important ways to businesses interact with their customers. Content is king of any business and organization. Yet, 42% of companies indicated they don't have the right technology to manage their content. For small and medium enterprise face many difficulties to manage digital content and website. A content management system, often abbreviated as **CMS**, is software that helps users create, manage, and modify digital content on a website without the need for specialized technical knowledge. As a tool, WCMS are booming, being very helpful for beginners in web development or for small business managers, because websites can easily be implemented at a relative low cost.

The Internet is more alive than ever: the number of websites on the Internet has already exceeded one billion [1], the number of Internet users has achieved almost four billion, and the penetration rate is more than 51.7%.

A large number of web-sites are built using PHP and MySQL on the Linux platform with Apache as the web server. This combination is known as the LAMP architecture. Apache, PHP and MySQL are also available on the Windows platform giving rise to combinations like WAMP (Windows, Apache, MySQL, PHP) and WIMP

(where the IIS webserver is used instead of Apache). In this paper we present the results we obtained while investigating some performance issues related to MySQL and PHP and an application built with this architecture.

The open source WCMS also called second generation WCMS, are platform often based on PHP(PHP Hypertext Preprocessor) and usually fed by communities of users contribute novel solution and new functionalities. Open source LAMP based WCMS have several advantage and disadvantage. Due to the key position that WCMS occupy in today's internet. We have chosen best WCMS in terms of popularity ease of use, and performance.

A CMS has a flexible, modular framework that separates the content of a web site (the text, images, and other content) from the framework of linking the pages together and controlling how the pages appear. In most cases, this is done to make a site easier to maintain than would be the case if it was built exclusively out of flat HTML pages.

A CMS can be easily administrated and moderated at several levels from an Administration Panel, allowing flexibility of access to make different types of materials available to selected members of an online community, to the whole community, or to the wider world. Registration of members is necessary if different permissions and levels of access are assigned to different types of member, and if registered members of the site upload material direct or submit material for publication to moderators who give approval and publish on the web site. This gives complete control of compliance with the organisation's policy for published material. In addition, the work-load relating to publication of material and overall maintenance of the website can be spread among many members, rather than having only one webspinner, securing frequent updates of content and reducing individual workload, so making likelihood of member participation greater. The initial user registration and redistribution of passwords and access can be carried out automatically by user requests, while assignment to user groups is made manually by the site administrators or moderators.

2. Related Work

LAMP is a very popular and easy to use architecture. In WCMS market many successful and best open source WCMS are available like Joomla, Wordpress, Magento etc. we compare and discuss most suitable WCMS for different type of work.

3. Types of content management system

Component Content Management System

This CMS manages repetitive content across different documents, frequently revised, and translated into various languages. Content is stored in reusable building blocks that can be easily matched and mixed to create documents.

Web Content Management System

This content management system helps to create and maintain a web page without any need for highly technical skills. It uses templates that form the structure of the website. The editor or author can add images, content, and videos into the templates that are then published onto the site.

Document Management System

It allows for efficient storing and tracking of documents in digital format, to allow these files to be changed and maintained by multiple users at one time. It helps businesses to store and manage MS word and PDFs with ease.

Digital Asset Management System

This CMS is used to manage media files such as videos, photos and other multimedia and graphical content. This software can be used to manage large sets of media while managing a huge list of metadata on each of these assets to make it super easy to find media that meets certain criteria.

Custom CMS

A custom CMS is an application tailored to specific business needs related to creating, storing, organising and publishing digital content.

Custom content management system may include the following components:

- Document management,
- Records management (documents for legal purposes),
- Digital asset management (audio, video, graphic content),
- Web content management

Each CMS initiative should start with an intentional, thoughtful and an agreed-upon set of requirements so you can easily determine which type is best for your needs.

4. LAMP

LAMP (**L**inux, **A**pache, **M**ySQL, **P**HP/**P**erl/**P**ython) is an acronym denoting one of the most common solution stacks for many of the web's most popular applications. However, LAMP now refers to a generic software stack model and its components are largely interchangeable.[1]


Each letter in the acronym stands for one of its four open-source building blocks:

- **L**inux for the operating system
- **A**pache as HTTP web Server
- **M**ySQL for the relational database management system
- **P**HP, Perl, or Python programming language

The components of the LAMP stack are present in the software repositories of most Linux distributions.[2] LAMP is suitable for building dynamic web sites and web applications.

Developers that use these tools with a Windows operating system instead of Linux are said to be using *WAMP*, with a Macintosh system *MAMP*, and with a Solaris system *SAMP*.
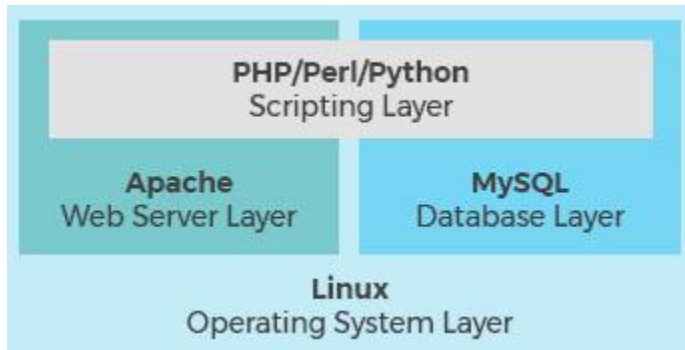
The response time of WAMP (window, Apache, MySQL, PHP), LAMP(Linux, Apache, MySQL, PHP) architecture is almost equal, WIMP(window, IIS, MySQL, PHP) is trailing substantially.[10]

The modularity of a LAMP stack may vary. Still, this particular software combination has become popular because it is sufficient to host a wide variety of website frameworks, such as *Joomla*, *Drupal*, and *WordPress*

LAMP Architecture

LAMP has classic layered architecture, with Linux at the lowest level. The next layer is Apache and MySQL, followed by PHP.

Although PHP is at the top or presentation layer, the PHP component sits inside Apache.
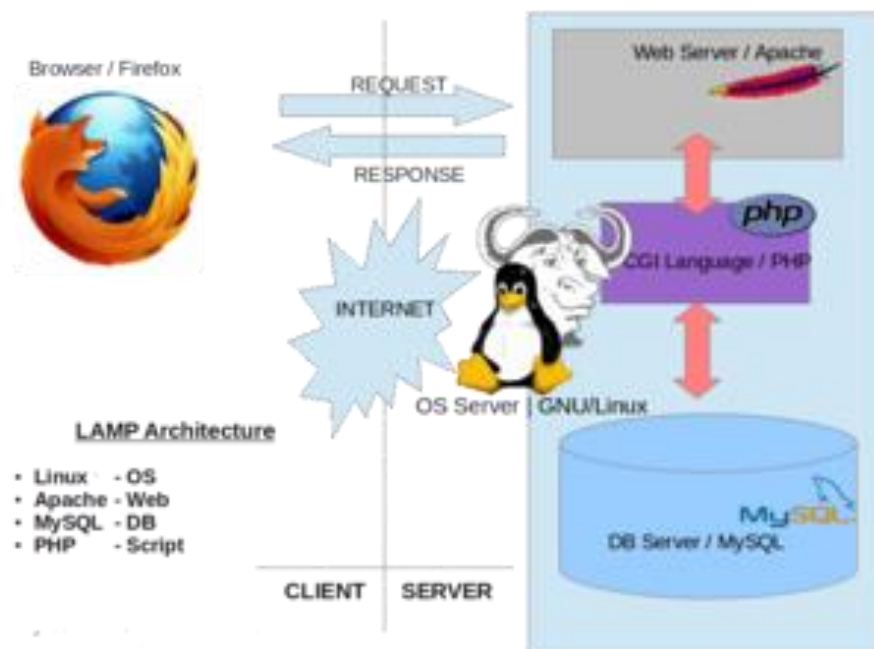
The LAMP stack order of execution shows how the elements interoperate. The process starts when the Apache web server receives requests for web pages from a user's browser. If the request is for a PHP file, Apache passes the request to PHP, which loads the file and executes the code contained in the file. PHP also communicates with MySQL to fetch any data referenced in the code.

PHP then uses the code in the file and the data from the database to create the HTML that browsers require to display web pages. The LAMP stack is efficient at handling not only static web pages but also dynamic pages where the content may change each time it is loaded depending on the date, time, user identity and other factors.

After running the file code, PHP then passes the resulting data back to the Apache web server to send to the browser. It can also store this new data in MySQL. And of course, all of these operations are enabled by the Linux operating system running at the base of the stack.

Advantages of LAMP

LAMP has the following advantages, such as:

1. The LAMP stack consists of four components, all of which are examples of *Free* and *Open-Source Software (FOSS)*. As they are free and available for download, it attracts the attention of many users who wish to avoid paying large sums of money when developing their website.
2. Because it is FOSS, the source code of the software is shared and available for people to make changes and improvements, enhancing its overall performance.
3. The LAMP stack has proven to be a secure and stable platform thanks to its vast community that contributes when any problems arise.
4. We can easily customize the stack and interchange the components with other open-source software to suit the needs.

LAMP Stack Alternatives

There are several variants of the four stack model as well. These variants use alternative software, replacing one or more of the standard components.

Open-source alternatives are:

- **LEMP**(Linux, NGINX, MySQL/MariaDB, PHP/Perl/Python)

- **LAPP**(Linux, Apache, PostgreSQL, PHP)

- **LEAP**(Linux, Eucalyptus, AppScale, Python)

- **LLMP**(Linux, Lighttpd, MySQL/MariaDB, PHP/Perl/Python)

While non-open source alternatives include:

- **WAMP**(Windows, Apache, MySQL/MariaDB, PHP/Perl/Python)

- **WIMP**(Windows, Internet Information Services, MySQL/MariaDB, PHP/Perl/Python)

- **MAMP**(Mac OS x, Apache, MySQL/MariaDB, PHP/Perl/Python)

Different types of content management systems

When choosing a **content management system (CMS)** for your business, it helps to understand the differences between the various types, their features and functions, and pricing models.

Types and examples of content management systems

There are three broad types of CMS software: open source, proprietary and Software-as-a-Service CMS, including cloud-based solutions.

Open source CMS

The open-source WCMS, also called second-generation WCMS, are platforms often based on PHP (PHP Hypertext Preprocessor) and usually fed by communities of users who contribute novel solutions and new and new functionalities. The basic WCMS structure has the following parts:

(i)   The files of the content manager;

(ii)   A hosting provider to store the files of the content manager; and

(iii)   A linked database, e.g., MySQL (My Structured Query Language), to store website information. A WCMS provides an administration or development area called the back-end, where articles, functionalities, or any other aspect can be added, deleted, or modified. On the other hand, the visible part of a website, i.e., what a visitor sees, is called the front end.

You can download open source CMS software at **no initial cost**. These types of content management systems are created and developed with user community environment, where third party developers improve the original product. You can easily install add-ons and improve its functionality. Sometimes you will have to pay for add-ons, templates another adaptation. However, with open source CMS you may have to pay for:

- Technical help during installation and set up
- Customization to extend the software beyond the core offering
- Compatible templates, add-ons and plug-in (although free versions may be available)
- Staff training
- Support, including regularly updating the software

Examples of the most widely used open source CMS platforms include:

WordPress: Wordpress is our number one choice for the best CMS platform. It cover 42% of all websites on the internet. It originally designed for blogging, but now it's used by all sorts of websites/online stores.

One key feature of WordPress is its great Search Engine Optimization (SEO) positioning. The reason for this is that WordPress has many plug-in to improve a quick inclusion in search engines, compared with other WCMS.

Pros

➢ WordPress offers you the flexibility and freedom to build any kind of website (online store, auction site, membership site, etc).

➢ It does not require any technical skills or coding knowledge. The WordPress block editor makes it really easy to create great looking pages on your site.

➢ You have complete freedom to make money online from your website in any way you want.

➢ There are thousands of WordPress themes and plugins available, both paid and free. These let you add all sorts of useful extras to your site, like contact forms, photo galleries, and much more.

➢ WordPress is really well designed for search engine optimization (SEO). It's easy to create SEO-friendly URLs, categories, and tags for your posts. You can also choose from plenty of SEO plugins to help you do more.

➢ There's a huge and supportive community around WordPress, as it's an open source CMS. You can join groups like the WPBeginner Engage Facebook group to get help with any problems you run into.

➢ WordPress offers a lot of extensibility which is what makes it an ideal CMS platform for both beginners and developers alike.

➢ WordPress lets you download all your content in XML format, making it easy to move to a different system in the future if you choose to do so.

Cons

➢ You'll need to set up your hosting and domain name, and you'll be responsible for managing things like security and backups.

➢ Because WordPress offers so many options and so much flexibility, it can sometimes feel a little daunting when you're getting started. This is why many beginners use drag & drop page builder plugins for WordPress.

Joomla :   Joomla is another popular free open source CMS platform that comes with lots of different templates and extension.

It was released in2005. However it's really an ideal CMS platform for developers and experienced website creators, so it's not much a good option for beginner.

Joomla! is one of the most popular WCMS for creating dynamic websites. Joomla! is compatible with MySQL, SQL Server, and PostgreSQL databases. One of the key features of Joomla! is that it offers the widest range of functionalities, such as picture galleries, forums, chats, blogs, news, etc

Pros

➢ Joomla gives you lots of flexibility and plenty of options. It's a good choice if you're building something complicated or bespoke.

➢ Although Joomla is particularly useful for developers, you can still use it even if you don't want to ever touch a line of code. It's easy to edit your content.

➢ Like WordPress, Joomla is open source, and there's lots of community support available if you get stuck.

➢ You can use Joomla to run an e-commerce store as there are extensions available for this.

Cons

➢ Even Joomla fans will admit it can be pretty complex. Depending on what you want to do with it, you may well need to hire a developer to help out.

➢ There aren't that many options for additional extensions. If you're used to a CMS like WordPress, which has thousands of available themes and plugins that extend the core functionality, you might be disappointed by Joomla.

➢ There can be some compatibility issues if you have a lot of different extensions and modules installed.

Drupal: Drupal is another open source CMS platform. It is a good options for developer. It's especially good if you're aiming to build a high customized site that needs to handle a lot of data.

Drupal is also aimed at creating dynamic websites. It presents high compatibility with different databases. Security, fast loading, and a wide variety of user roles are the main Drupal features; as an example of the last characteristic, Drupal allows us to limit access of a specific user such that they are only able to modify the properties of a certain functionality, and even to modify only particular parameters of that functionality.

Pros:

➢ It's easy to add content on Drupal. The custom content types are flexible and offer plenty of options.

➢ There are lots of different modules available that you can add to your site (these work like WordPress plugins).

➢ Support is available via community support options similar to other popular platforms like Joomla and WordPress

➢ User management is easy, with a built-in system where you can create new roles and specify their permissions.

Cons:

➢ With Drupal, it can be tricky to figure out how to change the appearance of your site or add extras. It's definitely not as beginner-friendly as WordPress.

➢ Most Drupal websites have a heavily customized theme created by a developer, which can be very expensive.

Comparison between Wordpress, Joomla & Drupal

WordPress offers many extensions to insert a specific functionality, but it does not have the wide range of functionalities that Joomla! has. Additionally, WordPress includes the option to add integrated extensions to the management environment. Lastly, Drupal is the most complex WCMS in terms of extending its capabilities, because a specific functionality can have dependencies from different libraries or functions, making this extension process long and tedious. The same applies to the functionality range, where Joomla! and WordPress have a large number of functions to extend the website. In contrast, this option is more limited with a Drupal implementation. Repositories are very important for updating WCMS, implementing new functionalities, and improving the existing ones. These repositories can be distributed, which is the case of Joomla! and WordPress, or centralized, such as in the case of Drupal. The largest user communities belong to Joomla! and WordPress, and hence they have a very active user community and excellent documentation. On the other hand, the Drupal user community is limited, because it is more complex to implement and manage, having, as a result, a limited documentation compared to the others. In contrast, Drupal's complexity allows a higher diversity of user roles, which is an advantage compared to Joomla! and WordPress.

Magento (e-commerce)   : Magento is a powerful open source eCommerce plateform from the huge software company adobe. There's a free version you can download and install on your own hosting account, called Magento Open Source.

If you prefer, then you can pay for Magento Commerce. This comes with full support, and is hosted for you, but it's very expensive.

Pros

➢ Magento is highly customizable, with lots of third-party extensions available that you can use to add extra features.

➢ With Magento, you can handle *lots* of products and customers. It lets your business grow easily, without your site slowing down. (You'll likely need to upgrade your hosting plan, though.)

➢ There are some really big name brands using Magento, including Nike, Ford, and Coca Cola.

➢ You can connect different payment gateways to Magento. It also comes with certain options, like PayPal, cash on delivery, and bank transfer already built-in.

Cons

➢ If you're just starting out in eCommerce, Magento might seem overwhelming.

➢ It can be tricky to find good developers for Magento projects, and it can be very expensive to hire them.

➢ The support available can vary, particularly if you're using Magento Open Source and relying on online forums for help.

PrestaShop (e-commerce) : PrestaShop is an open source eCommerce CMS platform. you host it youself, so you can install it on any web host that support it.

Pros

➢ There's a large PrestaShop community. This includes an official forum where tips and tutorials are shared, plus lots of other groups.

➢ You won't have to pay extra as your shop grows (unless you need to upgrade your hosting plan).

➢ There are loads of PrestaShop modules, so you can add new features easily.

➢ It doesn't cost much to get started with PrestaShop, especially if you're on a cheap shared hosting plan.

Cons

- ➢ PrestaShop can have quite a steep learning curve to begin with.

- ➢ There are plenty of themes (designs) available from PrestaShop, but a lot of these aren't very good. You may have to spend a long time looking through them to find something that'll work for your online store.

Squarespace: You may have heard people refer to Squarespace as a 'web app', a 'website builder', 'web platform' or other terminology, but in a nutshell, it's a tool that allows you to build and manage websites through a web browser. To be more specific, Squarespace is a flexible, easy, hosted content management system (CMS).

Pros

- ➢ **Flexible:** Unlike some website-building tools, Squarespace allows you to upscale or downscale your site with new features, control the layout of your pages on a page-by-page basis, or even switch your entire site to a completely different design - at any time, without needing to install any extras. You can also export your Squarespace website to another system, should you find that it's just not quite right for you.

- ➢ **Easy:** Squarespace is really easy to use. It may not be the absolute simplest website builder, but I firmly believe it's one of the best products of its type. I have been working with similar products for the last 20 years, and I think Squarespace offers the perfect combination of power, ease of use, and stunning design. My clients love it.

- ➢ **Hosted:** Squarespace is a 'cloud' service, so you don't need to download or install any software, and you don't need to buy separate web hosting. You pay a subscription fee to Squarespace, and that covers your hosting as well as your access to the content management system, and you can rest assured that the Squarespace team will run regular maintenance and upgrades for you behind the scenes, without you needing to do anything. The good news is that a Squarespace subscription costs about the same as regular web hosting.

Wix : Wix is a popular CMS platform, though it has some limitation. We often get readers asking how to switch from wix to wordpress that's because every smart business owner knows that wordpress is definitely better than wix.

Pros

➢ Wix's drag and drop interface makes it really easy to create pages that look just how you want. You can select any part of your page and start editing it.

➢ There are lots of pre-made templates you can choose from in Wix. These are fully responsive, so they look great on mobiles and computers.

➢ You can add lots of apps to your site from the Wix App Market. These work like WordPress's plugins to give your site new features.

Cons

➢ Once you've chosen a template on Wix, you can't change to a different one. This could mean that you get stuck with a layout that's not quite right for your site.

➢ You can't run an eCommerce store on Wix unless you upgrade to a paid plan, and even then, you can only accept payments using PayPal or Authorize.net.

➢ Wix doesn't allow you to easily download your data and export it. You can download your blog posts (though not your images) to move them, but if you have any pages on your site, you'll need to copy and paste these manually. We have full instructions on how to move your Wix site to WordPress.

➢ If you're using the free plan, you'll have a Wix-branded domain name and ads on your site. The ads make money for Wix, not you.

TYPO3 : Typo3 is a free, open source CMS platform that has been around even longer than blogger. It has originally released in 1988. It's an enterprise CMS, which means it's useful for internet sites as well as websites.

There are a number of extension available for TYPO3 that extra functionality, too.

Pros

➢ TYPO3 can handle really large websites, including ones that have multiple websites in different languages. It's a good option for large international companies.

➢ Because it's open-source, TYPO3 can be extended however you want, if you're willing to hire a developer to work for you.

➢ You can easily modify the access rights of different individuals and groups who work on your site.

➢ There are over 6,000 extensions and applications that you can add to your TYPO3 site to include new features.

Cons

➢ There aren't all that many themes available, so you'll likely have to hire someone to create one for you.

➢ You'll need a pretty high degree of technical expertise to get TYPO3 up and running, and to maintain it.

Comparison Table for Open Source CMS

CMS	Ease of Use	Beginner Friendly	Operating System	Plugins or Extensions	eCommerce
WordPress	Easy	Yes	Cross-Platform	55,271	Only with Extension
Joomla	Moderate	No	Cross-Platform	10,000+	Only with Extension
Drupal	Moderate	No	Cross-Platform	43,731	Only with Extension
Magento	Moderate	No	Cross-Platform	5324	eCommerce
PrestaShop	Easy	Yes	Cross-Platform	3,000+	eCommerce
OpenCart	Easy	Yes	Cross-Platform	13,000+	eCommerce

Comparison Table for Open Source CMS by TemplateToaster Blog

You can install and manage open source CMS on a web server. While most solutions work out of the box, countless customisations are available to meet the different business needs, such as plugins for e-commerce websites, tools to help you optimise content for search engines or customise your design themes and layouts.

Proprietary CMS

Proprietary content management system comes with an initial license fee, and in some cases, there are annual charges for user support and updates. This type of CMS can be easily tailored to suit the user requirements.

This CMS can be bit expensive, with additional costs. So it is important to be clear on what is actually covered by the license, and what all you will have to pay in the future.

Proprietary or commercial CMS software is built and managed by a single company. Using such CMS generally involves:

- buying a licence fee to use the software

- paying monthly or annual charges for updates or support

You may also need to pay additional costs for customisation and upgrades, as well as for training and ongoing technical or user support.

Examples of popular CMS solutions include:

- Kentico

- Microsoft SharePoint

- IBM Enterprise Content Management

- Pulse CMS

- Sitecore

- Shopify

You can usually customise proprietary CMS with built-in functionalities, although this may come at an additional cost. If possible, look for a CMS solution that meets all of your requirements out of the box. If you are implementing a proprietary CMS with an existing website or back-end system, be aware that this may require extensive development work.

If you're looking for a CMS for a brand new website, it is best to choose a solution that has all the **important features and functions** to meet your current and future business needs.

Software as a Service (SaaS) CMS

SaaS CMS solutions commonly include web content management software, web hosting, and technical support with a single supplier. These are virtual solutions hosted in the cloud and based on a subscription model, usually on a per-user or per-site basis. The pricing usually includes:

- amount of data transfer (i.e. bandwidth to and from your site)

- storage for your content and data

- ongoing support

There are two types of cloud content management systems:

- **'Fully cloud' CMS** often comes as part of a package or service. Typically, these are proprietary systems under the supplier's control, so it isn't always possible to customise or alter their functionality to suit your needs.

- **'Partial cloud' CMS** is located on your own cloud web-server. It provides for greater flexibility since you can modify the functionality, either with add-on modules or by altering the source code or with some add-on modules. This content management system will work for small to medium sized companies that can work efficiently with technical expertise and ongoing support.

Cloud CMS offers some significant benefits to small and medium-sized businesses. For example:

- costs are generally low - small set-up fee usually covers a basic implementation

- SaaS supplier deals with upgrades, maintenance and technical issues

- the software is accessible from any computer, laptop or mobile with an internet connection

- updates to software and features are available in real-time

- packages are easily scalable - you can add more sites or users as your needs change

See more on **cloud computing** or find tips to help you **choose the best CMS for your business**.

NOTES

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