

Web application development and development trends

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Vložit oficiální zadání diplomové/bakalářské práce

Study and compare open source publishing systems, e.g. Mambo, Typo3, PHP-RS, Nuke and others (comprehensive list including demo installation is placed at <http://www.opensourcecms.com/>). In each system rate these features:

- Administration and user interface
- Users administration - option of registration, access privileges distribution to each system's function
- Document categorization and management
- Document workflow - creation, approval, publication, modification sequence
- Template support - easy creation, possibility to use more templates in one presentation
- Compare available extension components, e.g.:
 - photogallery - compare available components with referential implementation, for instance Zoom Gallery or Gallery.Sourceforge.Net.
 - discussion forums
 - wiki
 - document database
 - calendar - in each component do not forget to explore the support of IETF 2445 standard, important for calendar data synchronization
 - contacts
- Multi-lingual document support
- SW and HW server demands
- User support, user documentation and implementation description for own component development.

I declare that I worked on my thesis individually and quoted the literature I used.

In Zlín, 07. 06. 2005

.....

name

Abstract

In my bachelor thesis I deal with trends in web application and presentations development. It compares and judges the most popular open source CMS (content management system) and it's features as administration/user interface, user administration, document control, template support, multi-lingual support, hardware and software demands, user support, product documentation, own components development etc.

It also deals with extension components as discussion forums, wiki, document database, photo galleries, contacts and calendars.

The object of my work is to help developers to choose an appropriate CMS for their project, to show them potentialities of constituent CMS systems. I examine the Drupal, e107, Exponent, eZ publish, Mambo and Typo3. All these CMS system share these features: they are platform independent, work on PHP and MySQL, do not need the root access to server, can be used in a shared hosting environment and are free of charge. They also seemed at the first sight to have a big support and a lot of useful professional features.

Abstrakt

Ve své bakalářské práci se zabývám trendy vývoje webových aplikací a prezentací. Webové aplikace a prezentace jsou poskytovány službou WWW (World Wide Web), která je jednou ze dvou nejvyužívanějších služeb nabízených světovou sítí Internet.

Tvorba webových stránek byla dříve realizována pomocí psaní zdrojového kódu značkovacího jazyka HTML do textových souborů v editorech. Pro přidání další stránky bylo třeba kopírovat kód pro layout stránky, což značně snižovalo efektivitu při vývoji projektu. Dále zde byla potřeba správy a tvorby obsahu firemního portálu lidmi, kteří neznali HTML, PHP či CSS. Tyto problémy zapříčinily vytvoření CMS systémů (Content Management System – systém pro správu obsahu). Dalším důvodem bylo zjednodušení vývojového procesu, administrace dat v SQL databázi, správa uživatelů a autorizovaný přístup k datům a tím zachování jejich konzistence a v neposlední řadě i workflow.

CMS je kombinací rozsáhle databáze, souborového systému a dalších souvisejících softwarových modulů, které slouží k ukládání a pozdějšímu vyhledání velkého množství dat. [2]

Tato práce porovnává a posuzuje velmi populární open source CMS (systémy správy obsahu) a jejich vlastnosti jako administrační a uživatelské rozhraní, administrace uživatelů, řízení dokumentů, podpora šablon, podpora vícejazyčných dokumentů, hardwarové a softwarové požadavky na server, uživatelská podpora, dokumentace o produktu, možnosti vývoje vlastních komponent a další.

Také se zabývá rozšiřujícími komponentami jako jsou diskusní fóra, wiki, databáze dokumentů, fotogalerie, kontakty a kalendáře.

Cílem mé práce je pomoci vývojářům zvolit vhodné CMS pro jejich projekt, ukázat jim potenciál jednotlivých CMS systémů. Podrobně jsem se zaměřil na systémy Drupal, e107, Exponent, eZ publish, Mambo a Typo3. Všechny tyto CMS systémy sdílí následující rysy: jsou platformě nezávislé, pracují na PHP a MySQL, nepotřebují přístup uživatele

root k instalaci na server, mohou být použity ve sdíleném hostingovém prostředí a jsou k dispozici bezplatně. Dále se na první pohled jeví, že mají velkou dostupnou podporu a velké množství profesionálních funkcionalit.

Jako metodu porovnání jednotlivých systémů jsem zvolil SWOT analýzu, která hodnotí tyto čtyři aspekty – Silné stránky, slabé stránky, příležitosti a hrozby. Poslední dva aspekty byly přizpůsobeny. Příležitosti ve významu vhodné aplikace; a hrozby ve významu nevhodné aplikace.

Je naprosto zřejmé, že použití CMS systémů je více než vhodné v množství různých projektů. Může přispět ke snížení nákladů na e-marketing prostřednictvím vývoje webové prezentace, snížení vývojové doby, obzvláště při pozdějších modifikacích.

V dnešním obchodním světě je velmi důležité, aby firma dokázala pružně a rychle aktualizovat informace o svých produktech a službách na svých stránkách. Typickým kandidátem pro použití CMS systémů jsou projekty, kde se objevují následující problémy:

- webové stránky jsou značně rozsáhlé a často aktualizované
- velmi častá integrace obsahu mezi prezentací a dodavateli, call-centry či dalšími marketingovými kanály
- situace, kdy důvěrné informace jednotlivých sekcí mají různí lidé a není možné tyto sekce měnit bez jejich přispění

Různé CMS systémy umožňují v různých úrovních přidělovat oprávnění k jednotlivým úkonům a způsobům manipulace s daty a strukturou webové prezentace. Tím přispívá ke zvýšenému zabezpečení dat.

Design celé prezentace je centralizován v šabloně. Změnou šablony dochází ke změně všech stránek, narozdíl od dřívější úpravy všech HTML souborů.

CMS usnadňují integraci webové aplikace spolu s dalším software korporace. Dále nabízejí různé rozšiřující funkční moduly, které zvyšují použitelnost a užitkovou hodnotu webové prezentace.

CONTENT

CONTENT	7
FOREWORD.....	9
INTRODUCTION.....	10
I. THEORETICAL PART	12
1 HISTORY OF WWW PAGES DEVELOPMENT	13
1.1 HISTORY AND FUTURE OF INTERNET	13
1.2 HISTORY OF WWW PAGES DEVELOPMENT.....	14
2 FUNCTIONS AND FEATURES OF CMS.....	15
2.1 WHAT IS A CMS ?.....	15
2.2 A TYPICAL CANDIDATE FOR USE OF CMS.....	16
2.3 SIMPLE CONTENT EDITING	16
2.4 ADVANTAGES OF CMS	17
2.5 WORKFLOW IN A CMS	18
2.6 SECURITY AND PERMISSIONS	19
2.7 WEBDAV.....	20
2.8 RSS	20
2.9 USE AND FUNCTION OF CMS IN EAI AND B2B.....	20
2.10 WORKING PROCESS OF A CMS	22
II. PRACTICAL PART	23
3 DRUPAL.....	24
3.1 STRENGTHS	24
3.2 WEAKNESSES	25
3.3 OPPORTUNITIES	25
3.4 THREATS	26
4 E107.....	28
4.1 STRENGTHS	28
4.2 WEAKNESSES	29
4.3 OPPORTUNITIES	29
4.4 THREATS	29
5 EXPONENT	32
5.1 STRENGTHS	32
5.2 WEAKNESSES	32
5.3 OPPORTUNITIES	33
5.4 THREATS	33
6 EZ PUBLISH.....	35
6.1 STRENGTHS	35
6.2 WEAKNESSES	36
6.3 OPPORTUNITIES	36
6.4 THREATS	36
7 MAMBO	38
7.1 STRENGTHS	39
7.2 WEAKNESSES.....	39
7.3 OPPORTUNITIES	40
7.4 THREATS	40

8	TYP03	42
8.1	STRENGTHS	42
8.2	WEAKNESSES	42
8.3	OPPORTUNITIES	43
8.4	THREATS	43
	CONCLUSION.....	45
	USED LITERATURE LIST.....	48
	USED SYMBOLS AND ABBREVIATIONS LIST	49
	IMAGE LIST.....	51
	APPENDIX LIST	52
	APPENDIX 1: NON-TRANSLATED QUOTATIONS	53
	APPENDIX II: FEATURE COMPARISON OF EACH CMS	54

FOREWORD

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I pass one of the biggest thanks on Chanh Ong, because of creating and maintaining the www.opensourceCMS.com

Those quotations, which needed to be translated from Czech to English, have been translated by me, Petr Smětala. Non-translated originals can be found in Appendix I.

INTRODUCTION

This bachelor thesis deals with trends in web application and presentations development with use of a CMS (content management system.)

The goal of this work is to help developers to choose an appropriate CMS for their project, to show them potentialities of constituent CMS systems. I want to help young developers and companies as well to efficiently create web sites at minimal costs. This will make the Internet more accessible, approachable and more useful for the users (web page visitors), including myself as well.

The other objective is to find out if there exists a comprehensive CMS, which will satisfy the need of Tomáš Baťa University in Zlín for its web site.

Features which are considered as necessary are: multiple template support, multi-lingual support, strong document workflow control and supervision, powerful separation of data and design, user permissions administration at more levels.

Other wanted features are product documentation, open source, image resizing, very friendly user interface and plug-ins available.

I examine the most popular open source CMS systems. All these CMS systems are LAMP (Linux, Apache, MySQL, PHP) compatible. This means they share these features: they are platform independent; are based on PHP and MySQL; use the Apache web server. They also do not need the root server access to install, so they can be used in a shared hosting environment (no dedicated servers needed) and are free of charge. They seemed at the first sight to have a big support and a plenty of useful professional features too.

This thesis compares and judges Drupal, e107, Exponent, eZ publish, Mambo, Typo3 and their features as administration/user interface, user administration, document control, template support, multi-lingual support, , hardware and software demands, user support, product documentation, own components development etc. It also deals with extension components as discussion forums, wiki, document database, photo galleries, contacts and calendars.

I use the SWOT analysis method, which means to list four aspects - Strengths, Weaknesses, Opportunities and Threats, but a little bit adapted. Opportunities have the meaning of convenient application and use and Threats means inconvenient application of the particular CMS.

I. THEORETICAL PART

1 HISTORY OF WWW PAGES DEVELOPMENT

1.1 History and future of Internet

The worldwide computer network, nowadays known as the Internet, arose as an experimental large network connecting host computers and terminal servers. It uses the TCP/IP protocol (Transfer Control Protocol / Internet Protocol). The IP is based on the packet switching technique and the datagram service. The TCP uses services of IP, but enhances it with security and reliability services.

Internet is a young multimedia and technology, which originated at the end of the 20th century. But not only young, Internet is also a rapidly growing name. It surrounds us; it has become a natural part of our everyday life. It is being used as a communication, information, business, education or promotion tool. Nowadays it is considered as indispensable. This determines the Internet to have a positive progress in future.

This article explains importance and opportunities of Internet:

The Computer Press publishing awarded the importer Audi ČR „E-company of 2003“ for active and long-term use of on-line marketing, both in B2C communication and B2B via its Internet portal www.audi.cz. „Nearly 90 percent of our customers commonly use Internet in their daily practice, so it is logical that we try to be close-by even by this instrument. Internet as a new medium represents a great potentiality for direct communication and even corresponds with traditional orientation of Audi to progressive technologies.” says David Liška, the head of Audi Division of Import Volkswagen Group. “About progressivism of Internet as a communication instrument gives evidence the access increase: While in 1999 the web site Audi was regularly visited by almost 10 thousands users, nowadays we record even 50 thousands accesses monthly.” [1]

1.2 History of WWW pages development

One of the most used Internet's technologies is the WWW (World Wide Web) which provides the search of information in HTML documents, simply called web pages. Web pages development used to be (and in some cases still is) writing manually an HTML code into a text file. Adding a page meant creating a new file, copying the layout from another page, and then adding the content. If you wanted to add a new item to the menu, or add a banner to every page, you would have to manually change this in every page. Extended search and replace made this easier, but wouldn't work perfectly every time. This process was not very efficient and comfortable.

The next step in progression was SHTML. Now you could place the code for menu in a separate file, and include it server-side every time a page was loaded. In fact, the entire layout could be stored in one file, and you could change the look of the site instantly. This helped, but still lacked the power that was needed.

And there was a need to manage the content by people, which do not know the HTML code. This is the beginning of creating a CMS (content management system). Other purposes were to simplify the development process, to administrate data in an SQL database (or any other), to administrate the users, their permissions and the document workflow.

It is obvious that use of a CMS may be very appropriate in many projects. It can decrease project's costs, development time, especially in further modifications. However there are thousands (maybe tens of thousands) of different CMS systems, with various features, abilities, requirements and demands of user skills and experience. Many of them are free, or under the GNU GPL license. They need a web server and an SQL database to work.

2 FUNCTIONS AND FEATURES OF CMS

2.1 What is a CMS ?

A Content Management System (CMS) is a combination of large database, File System, and other related software modules, which are used to store and later retrieve huge amounts of data. [2]

Users of the CMS can find relevant content from within a database by searching for keywords, authors, date of creation, etc. CMS systems can be used to create information portals, which serve as the backbone of data management. Along with the database handling facilities, the software modules also allows anyone to contribute information to a website via a graphical user interface (GUI). They are usually based on a pre-written template that acts as a platform for each page in the site as those pages are dynamically created.

The CMS systems are different from the databases in the sense that these can index text, audio clips, video clips, or images in a database. [3]

The CMS systems are divided by two different approaches. Some systems are based on horizontal approach and support customers across a large range of industries. Some other systems are based on vertical approach and provide functionality for specialized segments such as engineering. Content management systems are specifically available for local government offices, sports franchises, hospitals and for travel websites as well.

2.2 A typical candidate for use of CMS

In today's world of e-Businesses, content flow is almost as crucial as cash flow. If an enterprise cannot refresh the information about its products on a continuous basis then it will not be able to fulfill the today's Internet based expectations. [3]

If any company wants to increase the content flow without spending lots of money and with less problems then the content management systems are chosen as a way to automate the content gathering and delivery process. CMS is very convenient if your problem is one of those listed below:

- The web site is big and there are frequent updates of content or structure
- Very frequent content integration between the web site and retail outlets, call centers, email newsletters or other channels
- Strong requirement to manage specifications from R&D (Research & Development) to customer support
- Company has customers which also contribute to the site
- One individual has intimate knowledge of the entire site (and others have intimate knowledge over their own sections) so if there is a requirement for changes then it is not possible to change it without the help of a specific individual

2.3 Simple content editing

CMS enables you to establish a consistent look and feel throughout your site, and gives your non-technical content authors the power to publish and update their own content using simple, but powerful, browser-based tools.

There are three basic participants in the web publishing CMS system:

- Content Editors (Decide what content to publish and where)
- Content Publishers (Publish the content on the web)
- Content Authors (Create the content for the web)

CMS can establish defined publishing processes and specific publishing rights to various individuals. By using these facilities, the company can save the time for training, while facilitating more people to publish. It also reduces the daily stream of calls to the IT department for changes to the website. CMS reduces time-to-publish, allowing you to get content published faster. The quicker you get key content published, the more value and emphasis it creates.

2.4 Advantages of CMS

In any Content management system, there are many basic features, which should be present so that the system works efficiently and saves money. The CMS database or the central repository for corporate content must be accessible to a wide range of technical and non-technical individuals.

CMS interface must be easy to use, and its architecture must fit within the framework defined by the IT organization. It should be menu driven so that the pages can be added and linked easily. Creating, designing and deploying the web content should be automated according to the need of the organization. It should reduce the time programmers have to spend on building custom forms for content management. The programmer can spend that time on the front-end of the web site. Other features:

- The user interface design of CMS should be changed using templates. Different templates for different level of users should be present.
- The CMS Management Tool should be present which is used to manage groups, users and rights from a central point. There should be a facility to import groups and users in the domains like Windows or Unix.

- It should be powered by the latest database and Internet technologies and should be used in any operating system on any computer platform.
- CMS should facilitate better content security. It should control who is allowed to publish to the website, and who is allowed to see what content.
- It should eliminate the constant and large volume of updates by redistributing the publishing work among the content authors, who can now publish and update their own content using easy-to-use, browser-based tools.
- It should reduce Web site maintenance time and costs. Most of the maintenance operations should be automatic.
- For the content authors, the facilities like, selecting different types of content from the inbuilt content library, cut & paste from other applications, set publication dates and times for finished pages in advance and have them publish automatically and easy, automatic page indexing and linking should be present.
- Content management system should provide tools for adding and managing content for administrators including Content Owners, Content Editors, Page Owners and Site Administrator.
- The system should be able to scale in terms of performance, integration with other applications and the addition of custom features.
- The system should provide multi user options for controlling the user privileges at multiple levels. The security keys should be provided to restrict the users to work according to their access rights.
- The database model should not be rigid but it should be able to analyze the database structure and build the forms for database tables accordingly.

2.5 Workflow in a CMS

Workflow is the operational aspect of a work procedure through which we can define the following aspects:

- How tasks are structured
- Who performs the tasks

- What their relative order is
- How they are synchronized
- How information flows to support the tasks
- How tasks are being tracked

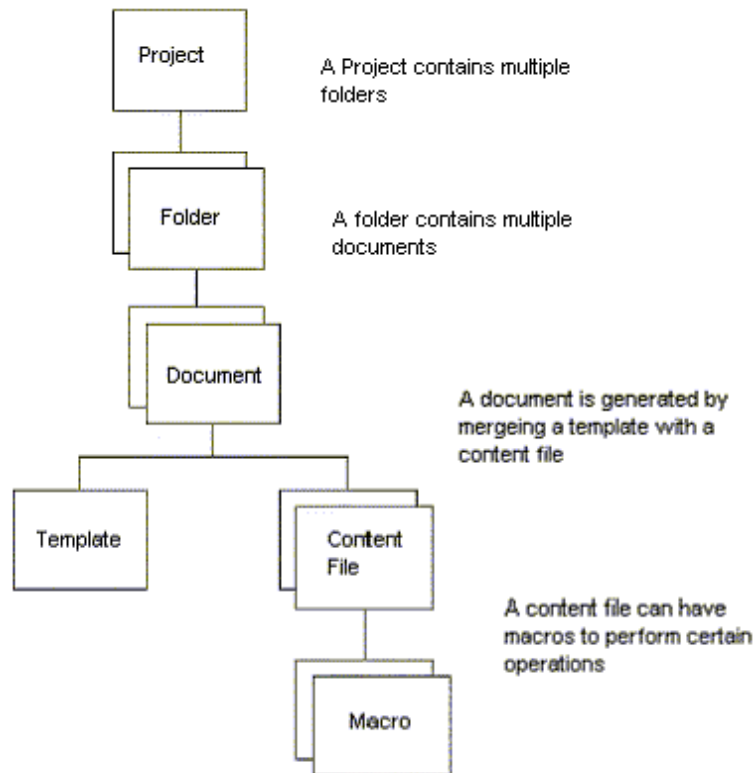


Image 1. Components of a workflow [3]

2.6 Security and permissions

Security is one of the most important features of CMS for most projects. The Audit Trail allows the administrator to find out who did specific changes. Content Approval is a function, which is very convenient for publishing sites. Granular Privileges enable administrators to choose which content can be managed by specific users, publishers or editors. Other important features are Authentication (LDAP, NIS, NTLM, SMB, Kerberos, etc.), Login history, SSL support, Problem Notification, Versioning and Email Verification of registered users.

2.7 WebDAV

WebDAV (Web-based Distributed Authoring and Versioning) is an emerging standard for CMS. It is a set of HTTP protocols, which allow users to edit and manage files on remote web servers. Any WebDAV client can be used to connect to the CMS server and execute the methods provided by WebDAV protocol. The basic authoring capabilities available using the CMS user interface can be accessed using WebDAV. [4]

2.8 RSS

RSS is a short for RDF Site Summary or Rich Site Summary, an XML format for syndicating Web content. A Web site that wants to allow other sites to publish some of its content creates an RSS document and registers the document with an RSS publisher. A user that can read RSS-distributed content can use the content on a different site. Syndicated content includes such data as news feeds, events listings, news stories, headlines, project updates, and excerpts from discussion forums or even corporate information. RSS was originally developed by Netscape. [4]

2.9 Use and function of CMS in EAI and B2B

Just as today's business demands for communication, cooperation between applications and e-commerce continues to grow, so does the volume and variety of needs of information systems integration. Companies must be able to communicate with their partners, increase cooperation between their applications, share information to meet customer's expectations, improve productivity and maintain their competitiveness.

Integration projects involve Electronic Data Interchange (EDI), and Enterprise Application Integration (EAI), as well as e-commerce application integration (eEAI or B2B integration). [5]

Nowadays the EDI is exploring the opportunities of Internet as a communication channel instead of traditional EDI-VAN (EDI Value Added Networks). The communication protocol EDI-INT has been developed by IETF (Internet Engineering Task Force). EDI-INT – especially its AS2 protocol by the HTTP - can decrease the costs for EDI services by eliminating the VAN charges. The W3C consortium belongs between the patrons of EDI-INT. The connection between EDI and Internet opens new possibilities for CMS systems.

At the company level, CMS systems store and manage an organization's electronic document and Web content so that the employee of the company can reuse the information across different applications. The web published content can also be distributed to customers and business partners outside the organization. The core application of the CMS is to manage content during its entire lifecycle i.e. from creation through publishing. The content of the CMS can also be shared by e-commerce and customer relationship management systems (CRM).

2.10 Working process of a CMS

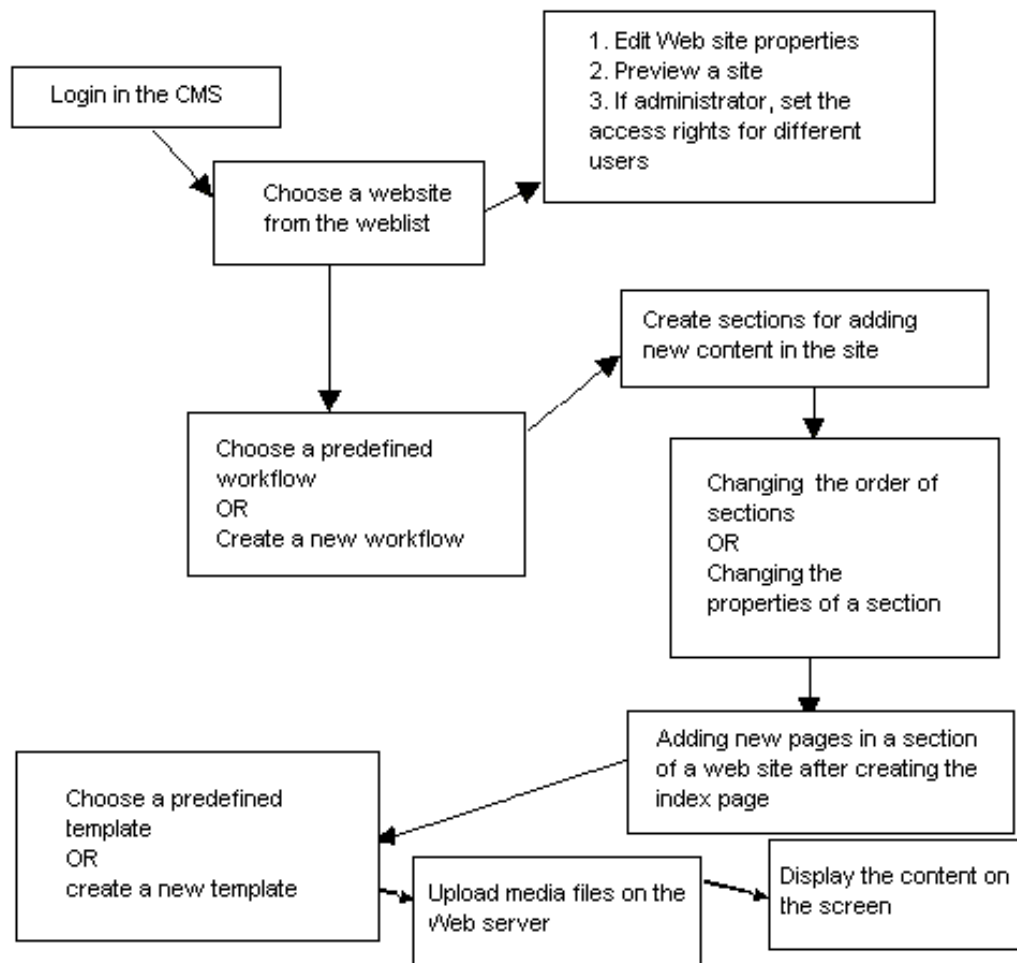


Image 2. Working process of a CMS

II. PRACTICAL PART

3 DRUPAL

Drupal is an open source content management platform, originally based at www.drupal.org. There is no company or author, because Drupal is software licensed under the GPL, and is maintained and developed by a community of thousands of users and developers. Actual released version is 4.6.0.

Rating by users at opensourcecms.com: 4,03 (1 equals poor, 5 means best) at May 10, 2005

3.1 Strengths

- Documentation, handbooks and help
- Lot of modules available, including Image resizing
- News aggregation
- User administration and role based permission system - administrators don't have to setup permissions for each user. Instead, they assign permissions to roles and then group like users into a role group
- Multi-language - Drupal is designed to meet the requirements of an international audience and provides a full framework to create a multi-lingual website, blog, content management system or community application. All text can be translated using a graphical user interface, by importing existing translations, or by integrating with other translation tools such as the GNU gettext [6]
- Workflow, but not very strong
- Document management, but limited
- Metadata functions
- Searching – all content is fully indexed and searchable at all times

- Collaborative book - unique collaborative book feature lets you setup a project or "book" that needs to be written and then authorize other individuals to contribute content.
- FTP support, but limited
- Lots of modules makes it enough professional, but takes time to find and learn them

3.2 Weaknesses

- Only MySQL and PostgreSQL – other SQL DB can be supported by writing a supporting DB backend containing 14 functions and creating a matching scheme
- Templates – Drupal has several themes available, but they are quite the same. To definitely change the view you have to change the PHP code.
- WYSIWYG editor is not integrated but only a module
- No UI levels – same interface for sophisticated and less sophisticated publishers
- Not integrated content scheduling
- No package deployment
- Limited versioning
- Quite difficult to add images and files – upload module and image modules needed
- Lot of functions is not integrated but available only as modules. This makes it more transparent for non-experienced users

3.3 Opportunities

Drupal is a great tool, if you have an experienced PHP programmer in your developing team, also when you don't need to change the layout of the pages. Drupal is suitable for sites, which are focused into text content. But it is possible to add all kinds of content. But it is a bit complicated.

It is very strong in user roles, permissions and authorization, very convenient for web sites with a lot of contributors. It has a lot of tools, which fit for news and articles publishing. It has a document workflow, user permissions, reads statistics, forums, search engine, Collaborative book, good translations, RSS – content syndication, news aggregator etc.

3.4 Threats

It isn't convenient for huge data web sites. There is no database replication, load balancing or static content export.

Drupal isn't strong in projects where is necessary strong templating and layout engine. If you expect less sophisticated users to contribute, a more intuitive CMS would be better.

To create an original, unique and individual layout is more difficult. But it is possible. Some examples follow:



Image 3. www.drupal.org



Image 4. www.bryght.com powered by Drupal



Image 5. www.ourmedia.com powered by Drupal

4 E107

e107 is a CMS created by a group of approximately 10 developers. It is situated at <http://www.e107.org> and other related web sites like <http://www.e107styles.org>, <http://e107themes.org>, <http://e107coders.org>, <http://e107hacks.org>.

e107 has a very active community which is helpful, because there isn't documentation or a tutorial available. The application contains small hints, but it is not a problem. e107 is very intuitive and simple to start with. From not only my point of view this is a very good CMS. I tested the 6.17 version.

Rating by users at opensourcecms.com: 4,22 (1 equals poor, 5 means best) at May 10, 2005

4.1 Strengths

- There is a strong and rich community of users
- Hundreds of themes available
- Easy installation without troubles
- Load balancing
- Lots of features integrated:
 - Only one from this work which has Chat, Guest book, Surveys, Tests/Quizzes, Help desk/Bug reporting, Classifieds and Database reports integrated
 - One of two with integrated Events calendar, Product management, Shopping cart
- Very intuitive and transparent user / admin interface
- Lots of modules available
- Clear, effective and simple programming code
- Small files size (2MB, reduced 0,5MB)

4.2 Weaknesses

- Only MySQL database
- I had fatal bugs with applying a group to a user, probably local problem
- No versioning, no UNDO, no documentation yet
- Inline administration is missing
- No sub-sites support, no workflow engine, no URL rewriting
- No multi-lingual support, no multi-site deployment
- Not very good WYSIWYG editor
- Block layout
- Missing proper support of RSS 2.0

4.3 Opportunities

e107 is a very good, flexible and stable CMS system. It has so many themes that you would not need to know HTML and PHP to make it look as you want. But there is a limitation of formatting the layout.

It is one of the best choices for web portals, which you don't have to adjust so strictly and closely. Very intuitive and simple user interface makes it convenient for a large scale of users.

4.4 Threats

e107 is not prepared for multi-lingual web sites. It isn't very convenient for large web sites and intranet application where a workflow and versioning is very important.



Image 6. Theme „Frame of mind“ for e107

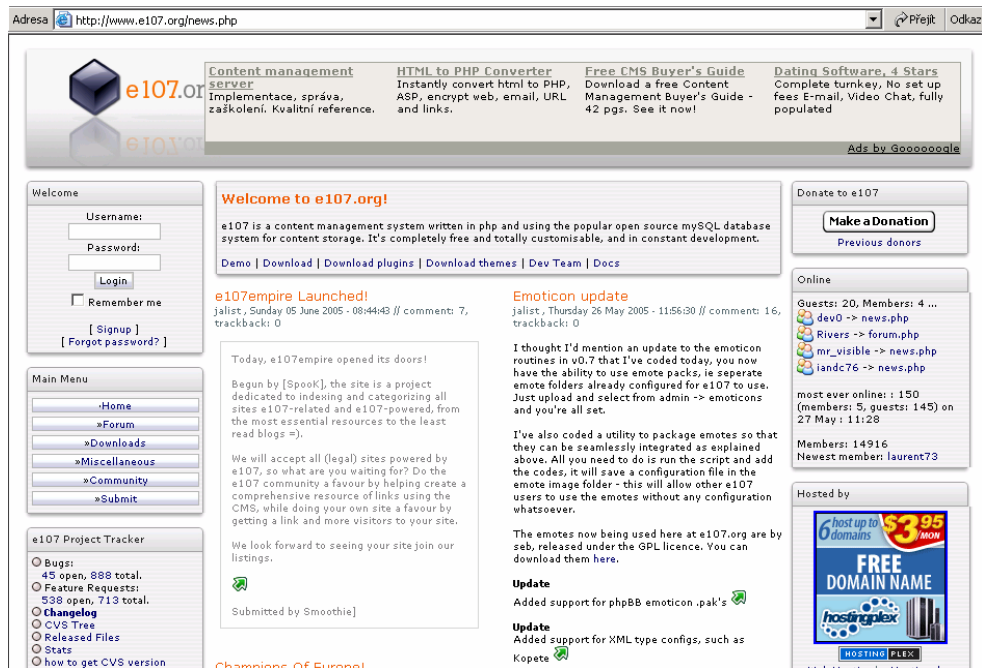


Image 7. www.e107.org

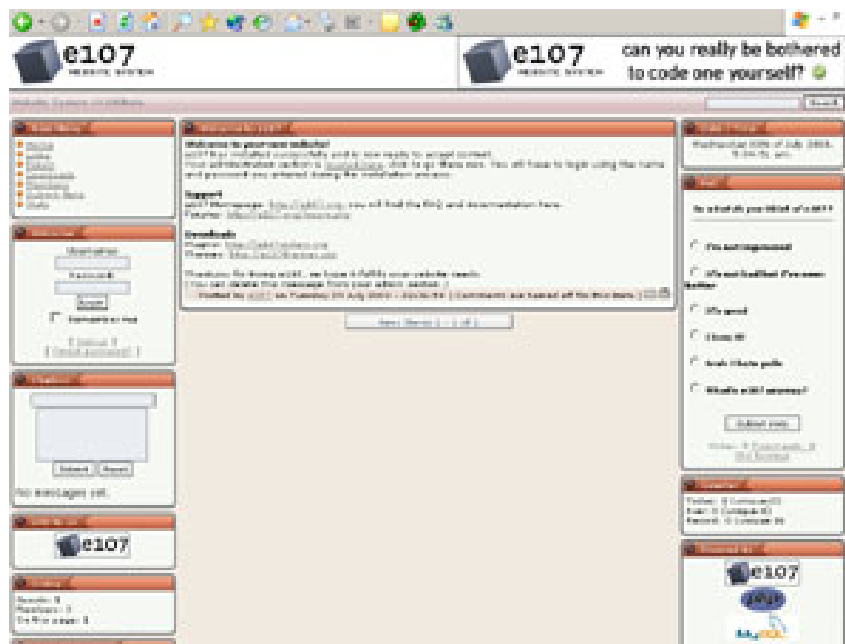


Image 8. Default theme of e107



Image 9. Theme „Physioaqua“ for e107

5 EXPONENT

Exponent CMS is a flagship of OIC Group and has been created by James Hunt, who is now 21 years old. It started as a project of refactoring the Mambo for some clients. But soon they realized it would be easier to create a new CMS that will fit their needs. [8]

Rating by users at opensourcecms.com: 4,22 (1 equals poor, 5 means best) at May 10, 2005

5.1 Strengths

- Installation in less than 1 minute
- Unique - No administration interface. Instead it is integrated into the site. Administration panel is a module, so it can be placed anywhere on the page.
- Very easy to theme, but some function outputs are hard to customize
- Versioning
- Workflow engine
- Content Structure: Very easy to add pages where you want them (unlike Mambo).

5.2 Weaknesses

- Weak documentation and community, no online help, no user conference
- Without Search Engine Friendly URLs
- Uses TABLEs instead of strict DIV tags and CSS – not fully XHTML compliant
- No e-commerce
- Much less features overall
- No UNDO

- No multi-lingual content support
- No caching at all, no performance support

5.3 Opportunities

One of (or exactly) the best for sites, where you do not need a lot of add-ons and modules and where you wish the simplest interface for clients to customize the web site. There's no need to teach anybody anything. Everything is so intuitive that it can't be better.

5.4 Threats

You can have troubles to use this CMS with web sites, where forums, polls, quest books etc. are very important. You have to create your own modules or find free modules to do it. But there are no modules for Exponent, but general modules can be integrated.



Image 10. www.exponentcms.org

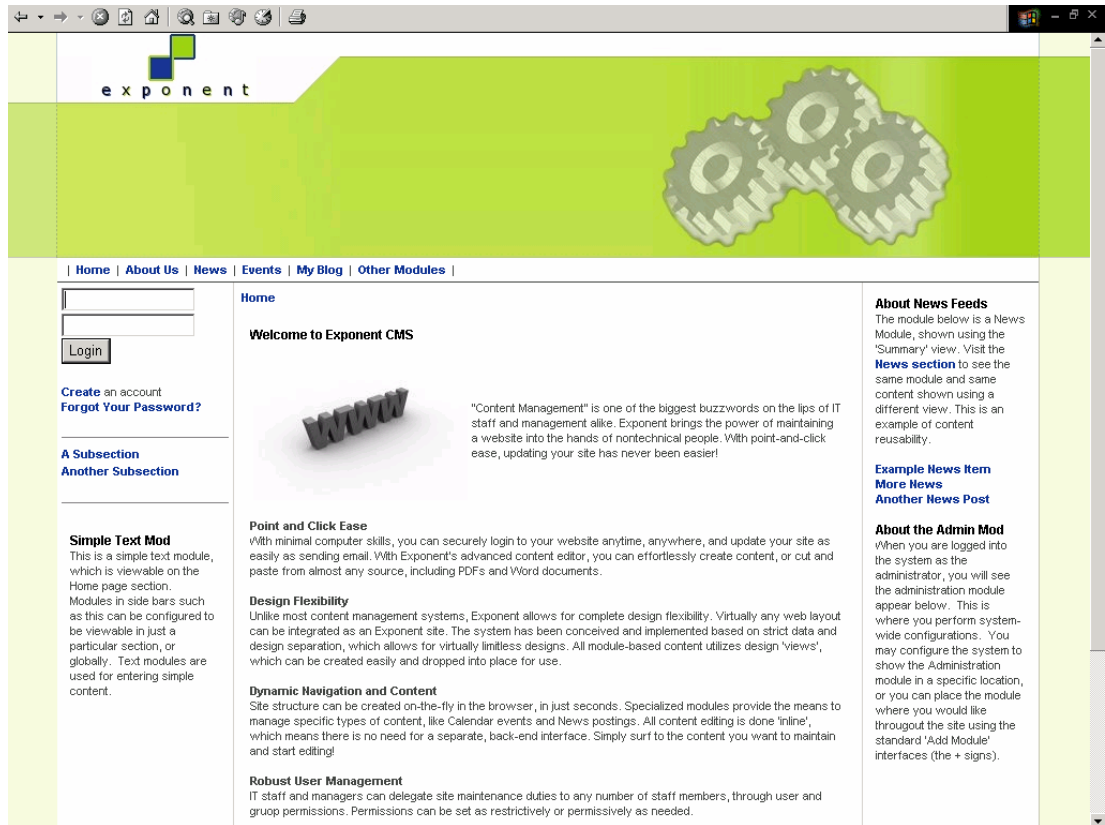


Image 11. Website preview

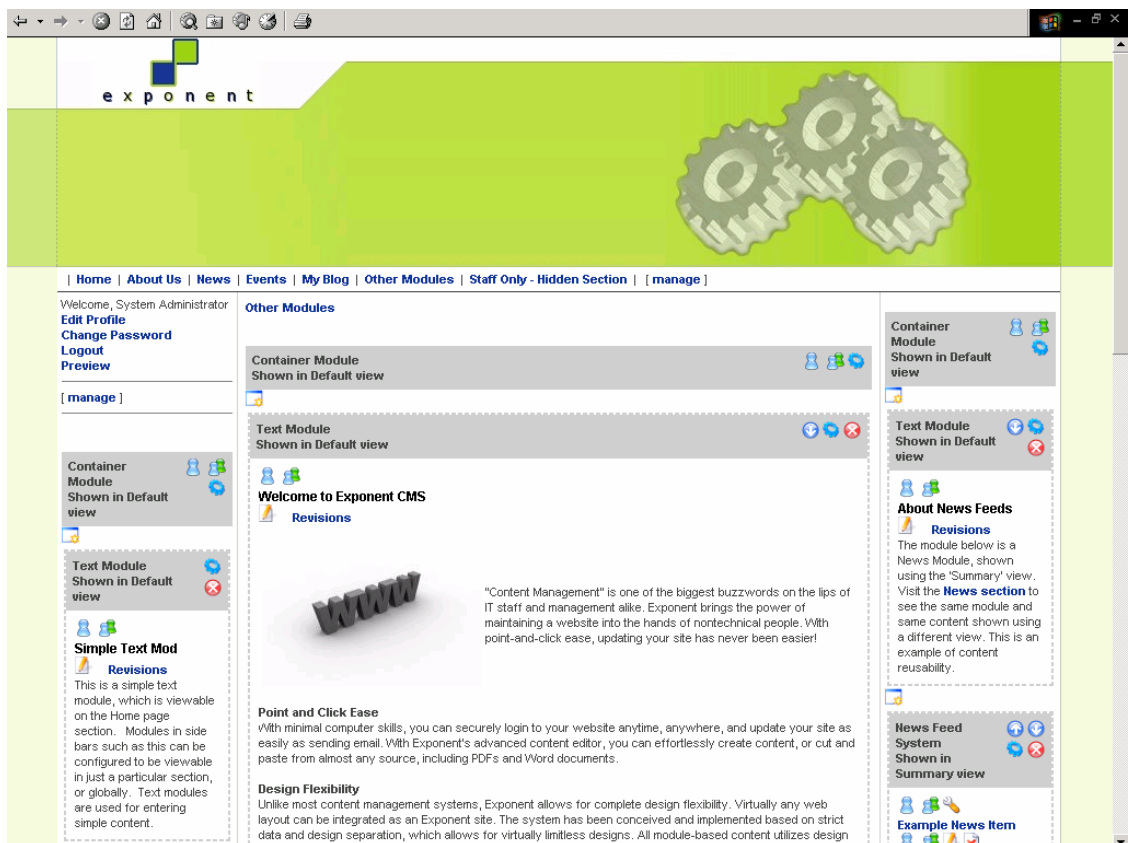


Image 12. Website editing

6 EZ PUBLISH

eZ Publish CMS systems is a product of eZ systems AS. eZ systems was founded in 1999 by three of today's employees. The eZ philosophy of openness and information sharing is still the basic guideline for the company, employees and products. Today the company consists of 40 open-minded and talented experts from 14 different nationalities, with offices in Norway, Ukraine and Germany.

eZ publish is an Open Source Enterprise Content Management System and development framework with functionality for web publishing, intranets, e-commerce and more. [9]

Rating by users at opensourcecms.com: 3,74 (1 equals poor, 5 means best) at May 10, 2005

6.1 Strengths

- Supports MySQL, PostgreSQL, Oracle and MSSQL
- Only one that supports WebDAV
- Most features and modules from all tested CMS systems
- Image resizing
- Content staging
- Menus, submenus
- Trash, Site map
- Performance support – database replication, advanced caching, load balancing, page caching, static content export
- Author permissions
- Workflow engine

6.2 Weaknesses

- Runs only on Windows and Linux, only on Apache web server
- No login history
- No chat module
- No events calendar module
- Not a web-based translation management
- Not an intuitive user / admin interface
- Bad documentation
- Not an install-and-run system
- Installation problems
- Separate database for each site, extra memory in php.ini

6.3 Opportunities

eZ Publish is a professional system, but you have to first understand the way it work, its philosophy. It doesn't seem to me very clear to understand it. It can be compared to Typo3 in some way. Good for medium sized or large companies, which can invest time into learning this system.

6.4 Threats

It isn't the convenient CMS for personal homepages or small webs until you intend to occupy yourself with web designing. This system needs a lot of time. The learning curve is steep.

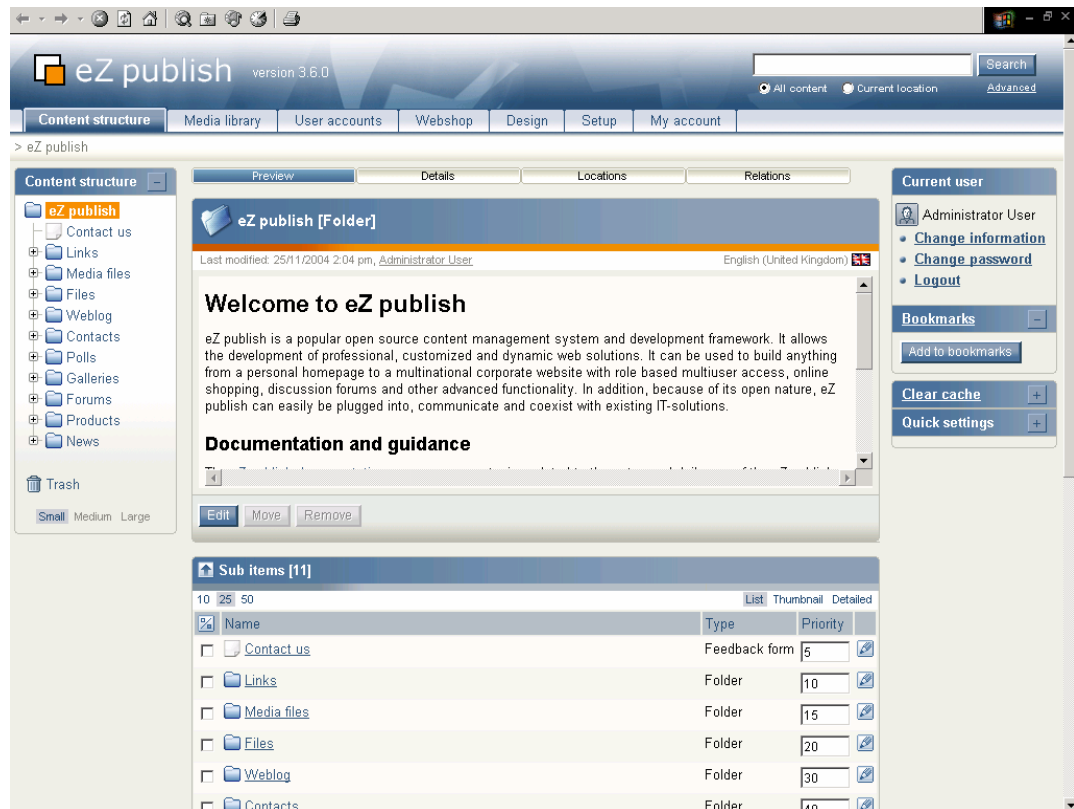


Image 13. eZ Publish administration interface



Image 14. www.ez.no

7 MAMBO

Mambo is a very popular full-featured content management system that can be used for everything from simple websites to complex corporate applications. It is being developed by the Mambo Project Team, which is made up of individuals from the community, which creates the plans and implements the programming that makes the Mambo system.

Mambo is not a typical "portal" solution. While Mambo can be modified or extended to provide this style of site this is not the goal of the project. Mambo is aimed at the more squarely at corporate websites or sites for small to medium businesses, families or personal sites.

The Mambo Development Team focuses on building a solid application framework rather than on add-ons that are typically found in many portal solutions. This keeps the Mambo core extremely lightweight and efficient, thus making it easier for anybody to extend Mambo through custom third party component and modules that directly serve their needs. [10]

Rating by users at opensourcecms.com: 4,42 (1 equals poor, 5 means best) May 10, 2005

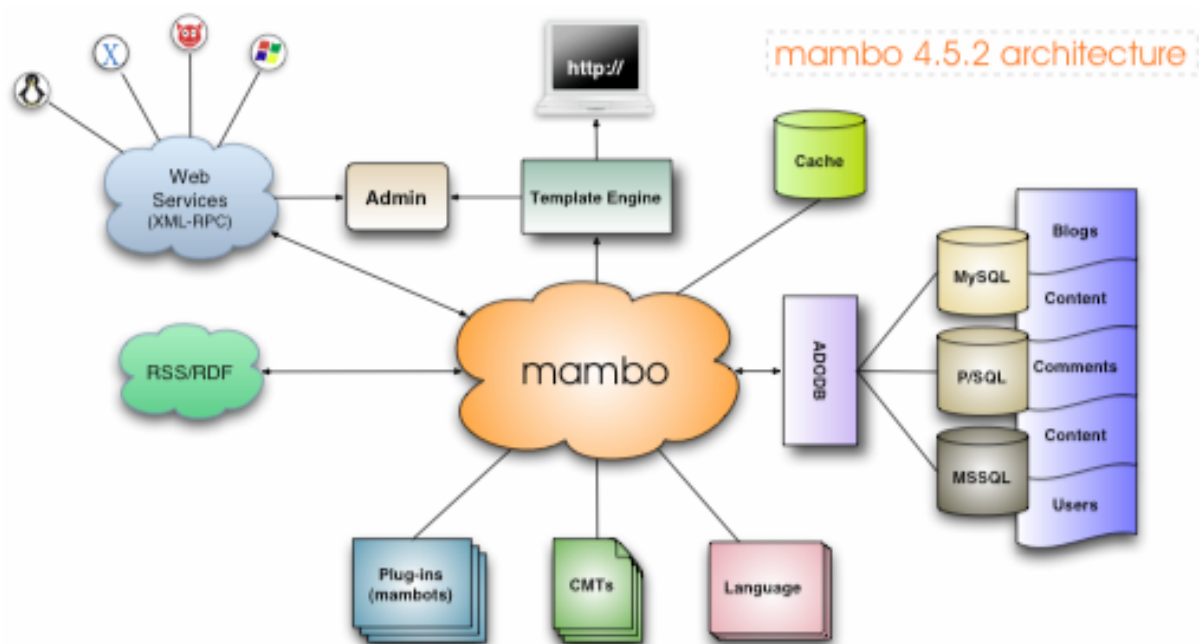


Image 15. Mambo architecture

7.1 Strengths

- Lots of modules available
- Very clean and usable interface
- Undo available
- Great documentation, also about templating
- Huge community and support forums
- Interface translation
- Extensions for MacroMedia DreamWeaver

7.2 Weaknesses

- Only MySQL
- No audit trail, limited content approval, no login history, not SSL compatible
- No sub-sites / roots, no workflow engine, limited content reuse
- Modules and add-ons are provided only by a third party
- Hard to create individual pages, difficult to place them where you want
- Sometimes hard to find something, sometimes installation troubles, lots of directories have to be chmoded to 777, which decreases security
- Not very flexible in meaning of hack or group privileges
- Needs a root and shell access to install
- High frequency of new versions and security releases. But common component such as forum, gallery, etc. are tied to a specific release. By fixing something, you brake something else
- Not fully XHTML compliant – some scripts use TABLEs

7.3 Opportunities

Mambo is a good choice, especially because of great documentation and user-friendly interface. It has many modules, add-ons and templates to download which makes it very powerful and versatile tool, able to do nearly every project. But for some specific project there might be a better tool.

7.4 Threats

Mambo isn't good for newbies and PHP-not-aware developers. It is not so easy to customize. Mambo isn't convenient for projects where you need about 200 different contributors and to limit their permissions strictly and closely. Also it doesn't contain some publishing features like showing the number of reads of an article etc.

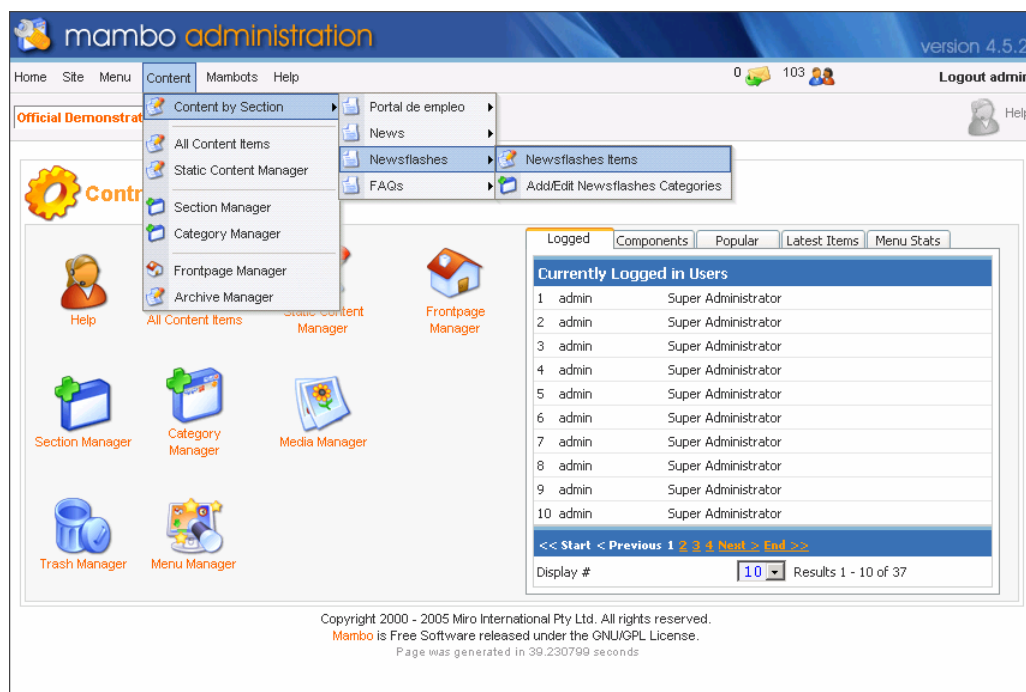


Image 16. Mambo administration interface

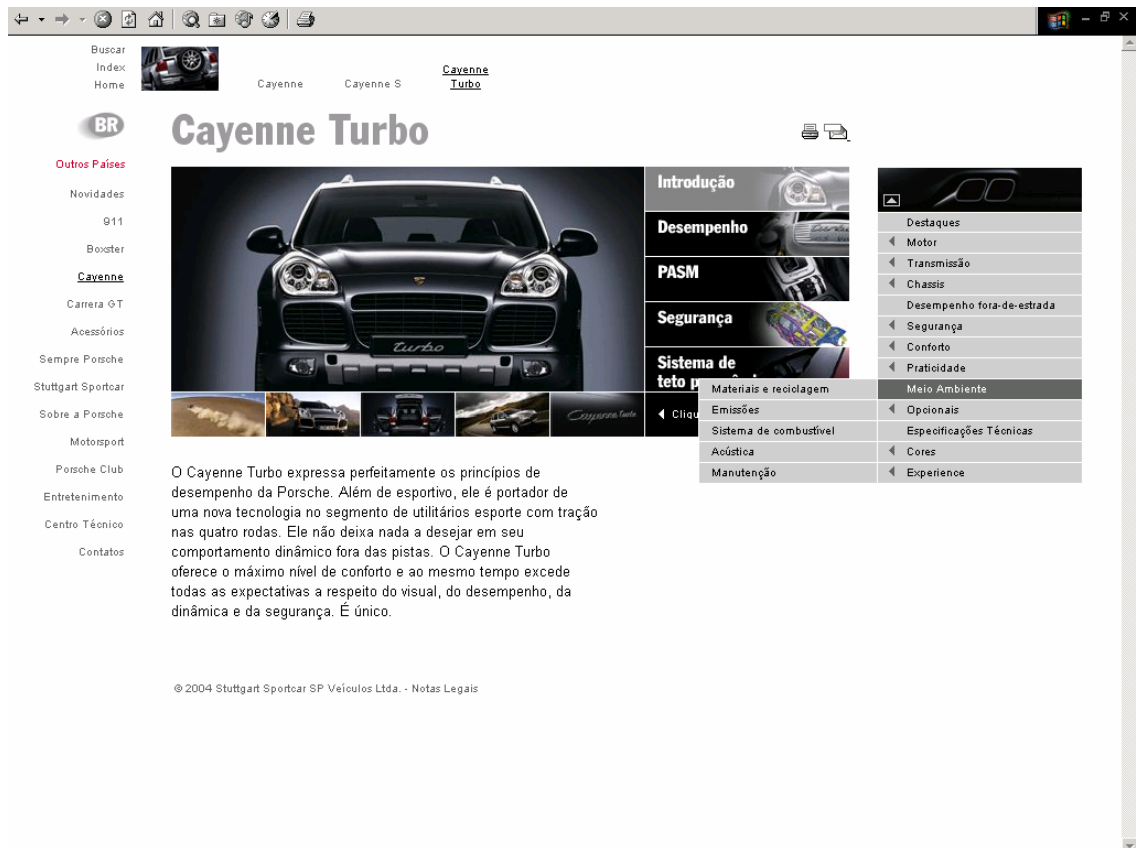


Image 17. www.porsche.com.br powered by Mambo

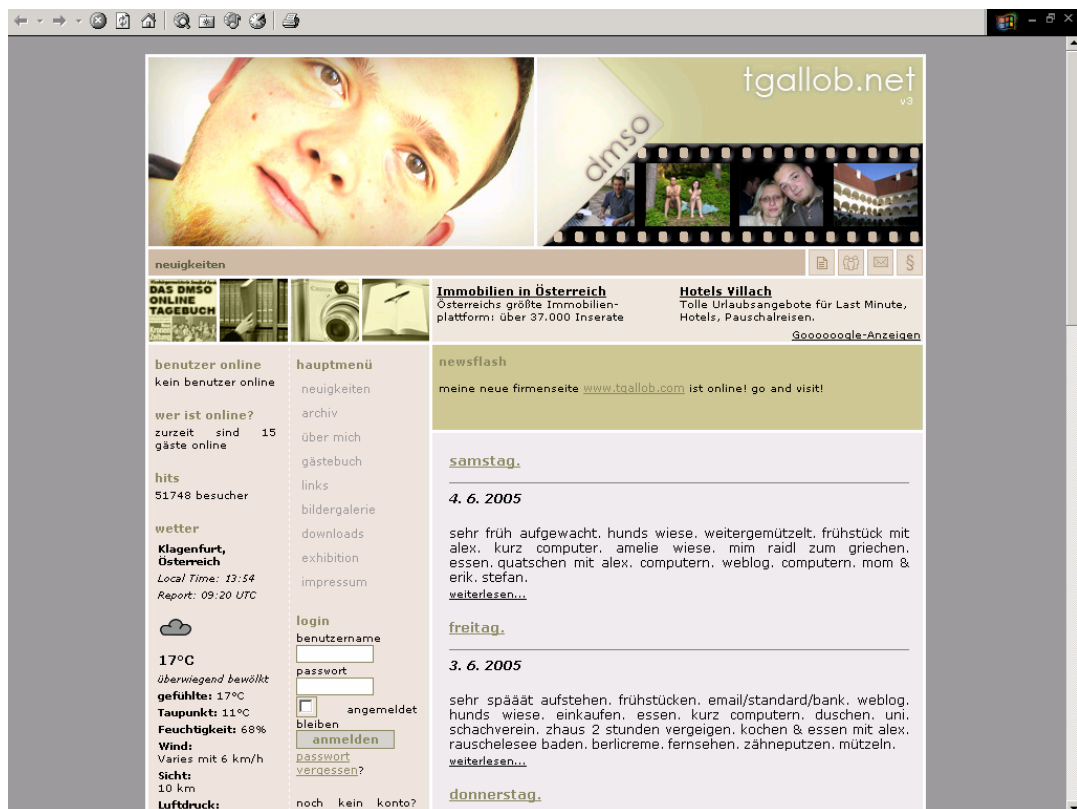


Image 18. www.tgallob.net powered by Mambo

8 TYPO3

A really professional CMS developed by Kaspar Skarhoj from Germany.

Rating by users at opensourcecms.com: 4,16 (1 equals poor, 5 means best) at May 10, 2005

8.1 Strengths

- Very powerful tool, robust and stable
- Great separating front-end from back-end
- Great in permissions and authorizing
- Unlimited possibilities of layout formatting
- Lots of features, plus available modules (extensions)
- Good SEO – Search Engine Optimization
- Multi-language support, multi-language interface support
- Great community, documentation available, forums
- Image resizing in cooperation with ImageMagick
- Login history, Trash, Site map

8.2 Weaknesses

- Only MySQL
- Too large demo database - 4MB, refreshing scripts might have problems
- Slow
- Size of installation on Windows servers – lots of duplicated directories, which are solved on Unix machines as symbolic links

- The generated content isn't in according to the last standards
- Not fully XHTML compliant – sometimes uses TABLE tags
- Too complicated, not intuitive, takes a lot of time (months) to learn
- Very confusing. One thing can be done several ways.
- No documentation about extensions
- Own script language to learn – the TypoScript
- No official English forum
- Limited workflow engine
- No document management

8.3 Opportunities

Good as an instrument for developers to create pages, but after several months of learning. The learning curve is really steep. It is more convenient for web design companies than for individuals. Good for medium sized or large intranet and Internet portals.

8.4 Threats

I can't imagine teaching inexperienced clients to edit the content by themselves. It is a total opposite of Exponent. It isn't the right CMS for personal homepages or small webs until you intend to occupy yourself with web designing. It takes a lot of time to create a web page you want. You need to learn the TypoScript to generate a menu and HTML to create design template.



Image 19. www.stadt-fuessen.de powered by Typo3

CONCLUSION

There is no way today to imagine Internet's contribution without web pages. Web pages development is growing from day to day and I assume that this trend will go on.

CMS is an important innovation that will be used more and more often in the years to come. According to the surveys, content management market is huge and it is growing day by day. This market will further grow from \$3.5 billion in 2001 to \$7 billion by 2006, says Ovum, a U.K.-based consultancy. [3]

It would be neither right, nor true, to pronounce which of the examined CMS systems is the best. Because all tested systems are top-quality products and each of them can be found mostly appropriate and suitable for a specific project.

I also didn't judge the admin / user interface, because it is very subjective. I prefer menus without sublevels. I like to have anything at first click. I do not need graphical icons, but someone could love it. I can't objectively say which is better.

I wasn't able to compare extensive components (modules, extensions, etc.); because of the fact that only for Typo3 there are approximately 200 modules. And for other systems there are many more. They usually are not centralized at one place. Many people contribute and develop own components. And moreover there are independent modules which can work with all CMS systems. I can write that eZ Publish is the only one without Calendar, but the next week there can be a module with it.

Drupal is suitable for sites, which are focused into text content. But it is possible to add all kinds of content. It is very strong in user roles, permissions and authorization, very convenient for web sites with a lot of contributors.

It isn't convenient for huge data web sites. There is no database replication, load balancing or static content export. Drupal isn't strong in projects where is necessary strong templating and layout engine. If you expect less sophisticated users to contribute, a more intuitive CMS would be better. To create an original, unique and individual layout is more difficult.

e107 is a very good, flexible and stable CMS system. It has so many themes that you would not need to know HTML and PHP to make it look as you want. But there is a limitation of formatting the layout.

It is one of the best choices for web portals which you don't have to adjust so strictly and closely. Very intuitive and simple user interface makes it convenient for a large scale of users. If you want a good, solid portal that doesn't require so much work to setup and understand, I would recommend e107. But e107 is not prepared for multi-lingual web sites.

eZ Publish has an extreme power in features, performance, etc. But the work with it isn't what I expected. It probably isn't my cup of tea. I'd prefer other solution.

Exponent is one of (or exactly) the best for sites, where you do not need a lot of add-ons and modules and where you wish the simplest interface for clients to customize the web site. There's no need to teach anybody anything. Everything is so intuitive that it can't be better.

You can have troubles to use this CMS with web sites, where forums, polls, quest books etc. are very important. You have to create your own modules or find free modules to do it.

Mambo is a good choice, especially because of great documentation and user-friendly interface. It has many modules, add-ons and templates to download which makes it very powerful and versatile tool, able to do nearly every project.

Mambo isn't good for newbies and PHP-not-aware developers. It is not so easy to strictly customize and organize content. Mambo isn't convenient for projects where you need about 200 different contributors and to limit their permissions strictly and closely.

If you search for a solution with an extensive expansion in future, you should invest your time to study the Typo3. Good as an instrument for developers to create pages, but

after several months of learning. It is more convenient for web design companies than for individuals. Good for medium sized or large intranet and Internet portals.

For the need of Tomáš Baťa University I recommend the Mambo system or the Typo3. Mambo doesn't have some important features. It is up to decision if it can be overlooked.

Other possibility is to take the Typo3 and in PHP adapt its interface. Clear unnecessary functions from the menu, add graphical icons instead of text links, add lot of TITLE attributes into tags and other contextual help. This solution takes a lot of time, especially for the developers. But it may be outsourced by an experienced web design company.

I would decide for the second, more complicated, solution. It adds the certainty and stability that there will be no need to change the solution in close years to come.

It is also possible to combine the best of all CMS systems together. One part of the site can be managed by Drupal, other part can be Exponent and the site in general can be in Typo3. Every directory can be a specific CMS system and they can be joined by external links.

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USED SYMBOLS AND ABBREVIATIONS LIST

B2B – Business To Business

B2C – Business To Customer

CMS – Content Management System

CRM – Customer Relationship Management

CSS – Cascading Style Sheets

CVS – Concurrent Version System

DB - DataBase

EAI – Enterprise Application Integration

EDI – Electronic Data Interchange

ERP – Enterprise Resource Planning

GNU GPL – GNU General Public License

GUI – Graphical User Interface

HTML – HyperText Markup Language

HTTP – HyperText Transfer Protocol

i18n - internationalization

IIS – Internet Information Services

LAMP compatibility – Linux, Apache, MySQL, PHP

PHP – recursive acronym for "PHP Hypertext Preprocessor" or Personal Home Page

R&D – Research & Development

RSS – RDF Site Summary or Rich Site Summary

SEO – Search Engine Optimization

SHTML – a HTML file enhanced by SSI

SQL – Simple Query Language

SSI – Server Side Includes

SWOT – Strengths, Weaknesses, Opportunities and Threats

TCP/IP – Transfer Control Protocol / Internet Protocol

URL – Uniform Resource Locator

WebDAV – Web-based Distributed Authoring and Versioning

WYSIWYG – What You See Is What You Get

WWW – World Wide Web

XHTML – eXtensible HyperText Markup Language

XML – eXtensible Markup Language

IMAGE LIST

Image 1. Components of a workflow [3]	19
Image 2. Working process of a CMS.....	22
Image 3. www.drupal.org	26
Image 4. www.bryght.com powered by Drupal.....	27
Image 5. www.ourmedia.com powered by Drupal	27
Image 6. Theme „Frame of mind“ for e107.....	30
Image 7. www.e107.org.....	30
Image 8. Default theme of e107.....	31
Image 9. Theme „Physioaqua“ for e107	31
Image 10. www.exponentcms.org	33
Image 11. Website preview	34
Image 12. Website editing	34
Image 13. eZ Publish administration interface	37
Image 14. www.ez.no	37
Image 15. Mambo architecture	38
Image 16. Mambo administration interface.....	40
Image 17. www.porsche.com.br powered by Mambo	41
Image 18. www.tgallob.net powered by Mambo.....	41
Image 19. www.stadt-fuessen.de powered by Typo3	44

APPENDIX LIST

A 1 : Non-translated quotations

A 2 : Feature comparison of each CMS

A 3 : Bachelor thesis assignment in Czech

APPENDIX 1: NON-TRANSLATED QUOTATIONS

[1] *PLOS, Richard. Audi scores by Internet*

Vydavatelství Computer Press udělilo importérovi vozů Audi do ČR titul „E-firma roku 2003“ za aktivní a dlouhodobé využití on-line marketingu, a to jak v komunikaci B2C (Business to Customer) tak B2B (Business to Business) prostřednictvím Internetového portálu www.audi.cz. „Asi 90 procent našich zákazníků běžně používá Internet ve své denní praxi, je proto logické, že se jim snažíme být nablízku i prostřednictvím tohoto nástroje. Internet jako nové médium představuje obrovský potenciál pro přímou komunikaci a odpovídá i tradičnímu zaměření značky Audi na progresivní technologie,“ říká David Liška, vedoucí Divize Audi společnosti Import Volkswagen Group. „O progresivitě Internetu jako nástroje komunikace svědčí nejlépe nárůst přístupů: Zatímco v roce 1999 webové stránky Audi pravidelně navštěvovalo necelých 10 tisíc uživatelů, v současnosti zaznamenáváme až 50 tisíc přístupů měsíčně.“

[5] *SMĚTALA, Petr. Integration platform TradeXpress*

Stejně tak jak neustále roste poptávka po komunikaci, spolupráci mezi softwarovými aplikacemi a e-commerce, roste i objem a různorodost potřeb v oblasti integrace informačních systémů. Podniky musí mít schopnost komunikovat s jejich partnery, zvýšit úroveň spolupráce mezi jejich aplikacemi a sdílet informace s cílem splnit očekávání zákazníka, zvýšit produktivitu a udržet svou konkurenceschopnost.

Integrační projekty zahrnují elektronickou výměnu dat (EDI), integraci podnikových aplikací (EAI), ale rovněž i integraci e-commerce aplikací (eEAI nebo B2B integrace).

APPENDIX II: FEATURE COMPARISON OF EACH CMS

Product	Drupal 4.6.0	e107 6.17	Exponent 0.96	eZ publish 3.x	Mambo 4.5.2	TYPO3 3.7
Last Updated	4/21/2005	10/19/2004	3/20/2005	5/18/2005	4/26/2005	12/13/2004
System Requirements	Drupal	e107	Exponent	eZ publish	Mambo	TYPO3
Application Server	PHP 4.3.3+	Apache recommended, IIS	PHP 4.1.2+	None	PHP 4.1.2+	PHP 4.1.2+
Approximate Cost	Free	0,00			Free	Free
Database	MySQL, Postgres	MySQL	MySQL, Postgres	MySQL, PostGreSQL, Oracle, MSSQL	MySQL	MySQL
License	GNU GPL	GNU GPL	GNU GPL	GNU GPL	GNU GPL	GNU GPL
Operating System	Any	Any	Most OS	Linux, Windows	Any	Any
Programming Language	PHP	PHP, Javascript, XML, XHTML 1.1	PHP 4	PHP	PHP	PHP
Root Access	No	No	No	No	Yes	No
Shell Access	No	No	No	No	Yes	No
Web Server	Apache, IIS	Apache, IIS	IIS, Apache	Apache	Apache, IIS	Apache, IIS
Security	Drupal	e107	Exponent	eZ publish	Mambo	TYPO3
Audit Trail	Yes	Yes	Yes	Yes	No	Yes
Captcha	Free Add On		Yes	No	No	
Content Approval	Yes	Yes	Yes	Yes	Limited	Yes
Email Verification	Yes		No	Yes	Yes	
Granular Privileges	Yes	Yes	Yes	Yes	Yes	Yes
Kerberos Authentication	No	No	No	No	No	No
LDAP Authentication	Free Add On	Yes	Costs Extra	Yes	Yes	Free Add On
Login History	Yes	Yes	Yes	No	Free Add On	Yes
NIS Authentication	No	No	No	No	No	No
NTLM Authentication	No	No	No	No	No	No
Pluggable Authentication	Yes	Yes	Yes	Yes	Yes	Free Add On
Problem Notification	No	No	No	No	No	No
Sandbox	No	Yes	Yes	Yes	No	Yes
Session Management	Yes	Yes	Yes	Yes	Limited	Yes
SMB Authentication	No	No	No	No	No	Free Add On
SSL Compatible	Yes	Yes	Yes	Yes	No	Yes
SSL Logins	No	No	No	Yes	No	Yes
SSL Pages	No	No	No	Yes	No	Free Add On
Versioning	Limited	No	Yes	Yes	Limited	Free Add On
Support	Drupal	e107	Exponent	eZ publish	Mambo	TYPO3
Certification Program	No	No	No	No	No	No
Commercial Manuals	No	No	No	Yes	No	Yes
Commercial Support	Yes	No	Yes	Yes	Yes	Yes
Commercial Training	Yes	No	Yes	Yes	Yes	Yes
Developer Community	Yes	Yes	Yes	Yes	Yes	Yes
Online Help	Yes	Yes	No	Yes	Yes	Yes
Pluggable API	Yes	Yes	Yes	Yes	Yes	Yes
Professional Hosting	Yes	No	Yes	Yes	Yes	Yes
Professional Services	Yes	Yes	Yes	Yes	Yes	Yes
Public Forum	Yes	Yes	Yes	Yes	Yes	Yes
Public Mailing List	Yes	No	Yes	Yes	Yes	Yes
Third-Party Developers	Yes	Yes	Yes	Yes	Yes	Yes
Users Conference	Yes	No	No	Yes	Yes	Yes

Ease of Use	Drupal	e107	Exponent	eZ publish	Mambo	TYPO3
Drag-N-Drop Content	No	No	No	No	No	No
Email To Discussion	Free Add On	No	No	No	No	Free Add On
Friendly URLs	Yes	Yes	No	Yes	Yes	Yes
Image Resizing	Free Add On		No	Yes	No	
Macro Language	Free Add On	Yes	No	Yes	Yes	Yes
Mass Upload	Free Add On		No	Free Add On	No	
Prototyping	No		Yes	Yes	No	
Server Page Language	Yes	Yes	Yes	Yes	Yes	Yes
Spell Checker	Free Add On	No	No	No	No	Free Add On
Subscriptions	Free Add On		No	Yes	No	No
Template Language	Limited	Yes	Yes	Yes	Yes	Yes
UI Levels	No	Yes	Yes	Yes	Yes	Yes
Undo	Limited	No	No	Yes	Yes	Yes
WYSIWYG Editor	Free Add On	Yes	Yes	Yes	Yes	Yes
Performance	Drupal	e107	Exponent	eZ publish	Mambo	TYPO3
Advanced Caching	Yes	Yes	No	Yes	Yes	Yes
Database Replication	No	No	No	Yes	No	No
Load Balancing	No	Yes	No	Yes	No	No
Page Caching	Yes	Yes	No	Yes	Yes	Yes
Static Content Export	No	No	No	Yes	No	Limited
Management	Drupal	e107	Exponent	eZ publish	Mambo	TYPO3
Advertising Management	Free Add On	Yes	Yes	Free Add On	Yes	Free Add On
Asset Management	Yes	Yes	Yes	Yes	Yes	Yes
Clipboard	No	No	No	No	No	Yes
Content Scheduling	Free Add On	Yes	Yes	Yes	Yes	Yes
Content Staging	No	No	No	Yes	No	No
Inline Administration	Yes	No	Yes	Yes	Yes	Yes
Online Administration	Yes	Yes	Yes	Yes	Yes	Yes
Package Deployment	No	Yes	No	Yes	Yes	Yes
Sub-sites / Roots	Yes	No	Yes	Yes	No	Yes
Themes / Skins	Yes	Yes	Yes	Yes	Yes	Yes
Trash	No	No	No	Yes	Yes	Limited
Web Statistics	Yes	Yes	No	Free Add On	Yes	Free Add On
Web-based Style/Template Management	Yes	Yes	No	Yes	Yes	Yes
Web-based Translation Management	Yes	Yes	Limited	No	Yes	Yes
Workflow Engine	Limited	No	Yes	Yes	No	Limited
Interoperability	Drupal	e107	Exponent	eZ publish	Mambo	TYPO3
Content Syndication (RSS)	Yes	Yes	No	Yes	Yes	Yes
FTP Support	Limited	No	No	No	No	Yes
UTF-8 Support	Yes	Yes	No	Yes	No	Yes
WAI Compliant	Limited	No	No	Yes	Limited	Free Add On
WebDAV Support	No	No	No	Yes	No	No
XHTML Compliant	Yes	Yes	Yes	Yes	Yes	Yes
Flexibility	Drupal	e107	Exponent	eZ publish	Mambo	TYPO3
CGI-mode Support	Yes	No	Yes	No	No	Yes
Content Reuse	Limited	Yes	Yes	Yes	Limited	Yes
Extensible User Profiles	Yes	Yes	Yes	Yes	Free Add On	Free Add On
Interface Localization	Yes	Yes	No	Yes	Yes	Yes
Metadata	Yes	Yes	No	Yes	Yes	Yes
Multi-lingual Content	Yes	No	No	Yes	Free Add On	Yes
Multi-lingual Content Integration	Free Add On	No	No	Yes	Free Add On	Yes
Multi-Site Deployment	Yes	No	Yes	Yes	Free Add On	Yes
URL Rewriting	Yes	No	No	Yes	Yes	Yes
Wiki Aware	Free Add On	No	No	Yes	Limited	Free Add On

Built-in Applications	Drupal	e107	Exponent	eZ publish	Mambo	TYPO3
Blog	Yes	Yes	Yes	Yes	Yes	Free Add On
Chat	Free Add On	Yes	No	No	Free Add On	Free Add On
Classifieds	No	Yes	No	Free Add On	Free Add On	Free Add On
Contact Management	Free Add On	Yes	Yes	Yes	Yes	Free Add On
Data Entry	Free Add On	No	Free Add On	No	Free Add On	Limited
Database Reports	No	Yes	No	Limited	Free Add On	Free Add On
Discussion / Forum	Yes	Yes	Free Add On	Yes	Free Add On	Free Add On
Document Management	Limited	No	No	No	Free Add On	No
Events Calendar	Free Add On	Yes	Yes	No	Free Add On	Free Add On
Expense Reports	No	No	No	No	No	No
FAQ Management	Yes	Yes	Free Add On	Free Add On	Yes	Free Add On
File Distribution	Free Add On	Yes	Yes	Yes	Free Add On	Free Add On
Graphs and Charts	No	No	No	Free Add On	Free Add On	Free Add On
Groupware	Free Add On	No	No	No	Free Add On	No
Guest Book	No	Yes	No	Free Add On	Free Add On	Free Add On
Help Desk / Bug Reporting	Free Add On	Yes	No	No	Free Add On	Free Add On
HTTP Proxy	No	No	No	No	No	No
In/Out Board	No	No	No	No	No	No
Job Postings	No	No	No	No	Free Add On	No
Link Management	Free Add On	Yes	No	Yes	Yes	Free Add On
Mail Form	Free Add On	Yes	Yes	Yes	Yes	Yes
My Page / Dashboard	Free Add On	No	No	Limited	No	Free Add On
Newsletter	No		Costs Extra	No	No	Yes
Photo Gallery	Free Add On	Yes	Free Add On	Yes	Free Add On	Yes
Polls	Yes	Yes	No	Yes	Yes	Free Add On
Product Management	Free Add On	Yes	Free Add On	Yes	Free Add On	Free Add On
Project Tracking	Free Add On	No	No	No	Free Add On	No
Search Engine	Yes	Yes	Yes	Yes	Yes	Free Add On
Site Map	Free Add On		No	Yes	No	Yes
Surveys	Free Add On	Yes	No	Free Add On	Costs Extra	Free Add On
Syndicated Content (RSS)	Yes	Yes	No	Yes	Yes	Free Add On
Tests / Quizzes	No	Yes	No	Free Add On	Free Add On	Free Add On
Time Tracking	No	No	No	No	No	No
User contribution	Yes	Yes	Yes	Yes	Yes	Yes
Web Services Front End	No	Yes	No	No	No	Free Add On

Commerce	Drupal	e107	Exponent	eZ publish	Mambo	TYPO3
Affiliate Tracking	Free Add On	No	No	No	No	Free Add On
Inventory Management	Free Add On		No	No	No	
Pluggable Payments	Free Add On		No	Yes	No	
Pluggable Shipping	Free Add On		No	Yes	No	
Pluggable Tax	No		No	Yes	No	
Point of Sale	No		No	No	No	
Shopping Cart	Free Add On	Yes	Costs Extra	Yes	Free Add On	Free Add On
Subscriptions	No		No	No	No	
Wish Lists	No		No	Yes	No	