

Digest of Content Management Systems

CMS Technology

CMS products vary significantly. Each one has a different balance of features: themes, speed, scalability, features, back end interface, extensibility, and so on.¹

As there is no one true CMS, the merits of each CMS must be weighed against the requirements of the project to find the best match. Some CMSs have special purposes and may not be considered for general purposes. The comfort level of the CMS implementers with the design and methodology of the CMS developers should not be overlooked. This is particularly true of a project which anticipates heavy customization. We recommend that prospective users & their technical staff review the architectures of multiple CMS packages and weigh them in the light of the CMS' feature set and their specific requirements and planned uses.

This document is an attempt to provide a high-level sense of the different approaches to CMS taken by a few leading systems, and a pointer to their key strengths and weaknesses. It does not attempt to be exhaustive.

www.opensourcecms.com is an excellent, if not complete, resource for hundreds of open source content management systems from which we culled a comparative chart in the appendix. The body of this digest addresses the CMS² packages which The Linux Box team actually evaluated and tested to one degree or another. (The are presented in alphabetical order):

1. Drupal is a highly configurable, modular system intended to meet many different needs
2. eZ publish is a document centric, application development framework
3. Mambo is for those who are looking for simplicity
4. Moodle is geared for teaching and learning
5. SchoolCenter
6. TIKIWIKI³ portal for collaboration for those who seek freedom and customization
7. Typo³
8. Zope/Plone – Application development and Content management framework

In each case we identified the key strength of the content management system, addressed it's features and built-in functions and relatively weak areas. The list we compiled is by no means comprehensive⁴.

Caveat: like all systems, CMS software is updated frequently and this assessment may become dated quickly. A companion document is the PDF version of slide presentation that The Linux Box made at the 2005 MAGCU⁵ conference that outlines the elements that should be considered when selecting a content management system.

The comparisons in the appendix address: System requirements, Security, Support, Ease of Use, Performance, Management, Interoperability, Flexibility, & Built in functions/Commerce.

1 OpenSourceCMS.com provides demonstrations, reviews, rankings and articles about many popular content management systems.

2 Content Management System

3 Made reference there to **mediawiki**

4 **Exponent** is fast becoming popular but we've not yet reviewed it in depth. We included it in the appendix.

5 Michigan Association of Governmental Computer Users (magcu.org)

Digest of Content Management Systems

Drupal (<http://www.drupal.org>)

Drupal aims to be a modular and extensible, standards-based content management system that is easy to use. "Drupal aims to provide a slim, powerful core that can be readily extended through custom modules."⁶ Each module adds functionality to the system, such as blogs, forums, or picture galleries. This system allows Drupal to power pages ranging from a personal weblog to a large multi-user community portals and corporate e-commerce sites. Two other important principles of the Drupal project are security and high-quality, elegant code.

Drupal excels at providing targeted content in a community setting and many of the add-on modules are designed to enhance this functionality. The core Drupal system has the concept of user roles which allows the administrator to assign users permission to perform various operations throughout the website. For example a user could be assigned the role of Forum moderator that would allow them to add, edit or delete any content in the website's forum section, but not anywhere else. Drupal provides a nice GUI interface for the administrator to create and assign roles to users.

Another way Drupal supports community sites is through Taxonomy. Taxonomy is the study of classification. In Drupal, Taxonomy allows content to be categorized in any way the user chooses. Drupal also provides functionality to view content bases on Taxonomy. With this system, administrators no longer need to place content manually – the site organization is handled by Drupal! If a decision is made to change the layout of the site at a later date, only the Taxonomy views need to be changed, and the content will automatically show up in the new location. There is also a module to restrict permissions based on Taxonomy. For example a taxonomy for a travel agency may have two categories for pages – Hotels and Airfare. A user assigned the role of "HotelAgent" would be able to edit pages belonging to the "Hotel" taxonomy, but not "Airfare." It is important to notice the difference between taxonomy_access and regular user role permissions. User roles grant global permission – to edit pages for example – taxonomy_access restricts that permission to only certain categories, giving a very fine grain of control to the administrator.

Customization is a an important element in every aspect of Drupal development. This includes the ability to create and use themes for a Drupal website. The Drupal core comes with several different theme engines for theme developers to use. There is also a good selection of free themes available from the Drupal website.

Another benefit for community-based sites is Drupal's ability to run multiple sites from the same code base. All that is required is a separate configuration file for each different site. Drupal is designed to allow multiple sites to share a single database, or to each use a separate database. Each site is completely independent and can have it's own content, theme, userbase etc; however, the code used to run all of the sites is the same. This offers a reduced overhead compared to other CMS's.

For developers, Drupal offers a robust, secure API that makes writing add-on modules safe and easy. The Drupal website also has full documentation on the API and tutorials and manuals on how to get started developing for Drupal and examples of how to write good code using the API. The Drupal core searches for new modules upon startup, so adding a new module to your system is as easy as writing the code and placing it in the /modules directory.

Although administration and configuration of Drupal and it's associated modules is extremely easy, installing Drupal, add-on modules and themes does require some knowledge of system administration

6 Quoted from <http://drupal.org/principles>

Digest of Content Management Systems

tasks. The system administrator must be able to copy and decompress files, configure a SQL database and in some instances edit configuration files by hand. These are common system administration tasks, but may be beyond the scope of end-users.

A feature that makes Drupal attractive to large websites with lots of traffic is it's caching feature. Caching eliminates timely database queries by saving a copy of a page when it is accessed. From that time until the cache "expiration" the saved page will be sent whenever Drupal gets a request for that page. Drupal's caching has been tested on sites receiving tens of thousands of hits per day.

Drupal is currently a very active project in the open source community and thus has a large base of users and developers. Because of this it is easy to find answers and reported bugs are fixed very quickly. This is a benefit to end users and developers alike.

Overall, Drupal's key audience is community based sites with multiple users and varied content. It is flexible and powerful enough to be shaped into any kind of site that is needed. This power and extensibility comes at a price – user friendliness. In order to tap the full potential of Drupal, you must be willing to examine and perhaps edit the code. For developers and administrators this is a rewarding experience, however, if you are looking for a drop-in solution that allows customization without in-depth knowledge check out Mambo.

Sites using Drupal:

- <http://www.theonion.com>
- <http://mtv.co.uk>
- <http://www.fishersnet.net>
- <http://www.royaloakschools.com>

Digest of Content Management Systems

eZ publish (<http://ez.no/>)

eZ publish began as a publication-centric CMS system, based on PHP, XHTML, XML, and SQL. It has since grown in scope and now aims to offer a unified platform providing web publishing, e-commerce, intranet and extranet content management, document management, blogging, photo galleries, forums, portals, and custom modules, among other things.

One of the stronger aspects of this system are its work flow and versioning capabilities. Users can keep track of all changes that they made to their content themselves as well as changes made by authors to whom they permit access to the CMS. The time and the author of changes are logged, creating an audit trail for future reference. Version control is built into the content object system, which allows 'undo' functionality, allowing authors to revert content to earlier versions, if need be. eZ publish also provides a system for collaboration on authoring site content. The collaboration system allows users to draft, verify, and publish content to the site directly. eZ publish provides subscription capabilities to content that allows users to subscribe to updates of content. Whenever a part of the site is modified or new content is published, subscribed users are sent a notification via email. eZ publish also contains a work flow engine that provides users with a capability to add business logic. This allows certain actions to trigger other events. These can be extended to provide custom functionality, such that businesses can build-in data updates, verification emails, and the like.

A preview mode is built in, which allows authors to see content the way it will look on the site. This allows drafting, development, and experimentation without breaking the live site. WYSIWYG⁷ editors are used throughout the system, allowing non-technical authors to edit objects through a well known interface, similar to that of traditional office suites.

Security and user management in eZ publish also reflects its focus on collaboration and publication. It contains a more advanced privilege system than many similar CMS systems. Users may grant privileges on classes, objects, and on separate parts of the content tree. LDAP support makes it easy to manage large groups of users. Another nice security feature is that ability to consistently keep track of users who are logged in and allows administrators to end user sessions at any time. SSL⁸ support is built in and ensures secure data transmission. Additionally, eZ publish provides a plug-in enabled authentication system. This means that you can use third party databases with login information to authenticate users in addition to the internal user database.

While eZ publish does give its users a lot of control over content presentation, it provides its own templating language. This is a drawback in some ways, in that designers familiar with standard design technologies must learn additional tools. Standard CSS⁹ is also supported, though it offers designers less control. However, content can be published in a variety of formats, including HTML, PDF, and email. This is a powerful feature, in that it allows reuse of content and does not require duplications across formats. eZ publish also allows users to publish the same object in several different places in the content tree at the same time. Updates made to the original object will be visible on each location in the content tree. This allows you to reuse content, while keeping it up to date. A central repository is used where users can upload images, videos and other files.

eZ publish is designed to be scalable and implemented in enterprise environments. In addition to caching of HTML output, eZ publish also caches many of the internal structures like role and permissions, settings and compiled templates. The result is that a minimal amount of PHP code is run

7 What You See Is What You Get

8 Secure Socket Layer

9 Cascading Style Sheets

Digest of Content Management Systems

on each page request.

Additionally, eZ publish can be set up to take advantage of database replication facilities. This enables eZ publish to perform read queries from slave database servers while write requests are written to the database master. This results in the database request load being divided between several servers. Finally, eZ publish supports load balancing between several Apache servers.

One unique feature eZ publish offers, is allowing several sub-sites within the same content tree. These multi-sites can be self contained with their own menu structures etc. You can also have completely separated sites using the same eZ publish installation which is very useful when hosting a large number of virtual hosts on the same system.

eZ publish provides an RSS¹⁰ module that allows users to create RSS feeds from the content tree. RSS import is also supported, allowing integration into content tree external sources. eZ publish supports WebDAV¹¹ out of the box. This allows you to upload and download content from the eZ publish server directly from a WebDAV client.

A number of the standard applications are built into eZ publish.

- ✓ Blogs
- ✓ contact management
- ✓ forums
- ✓ photo galleries
- ✓ polls
- ✓ searching, and
- ✓ a site map

are all included -- out of the box.

Additionally, it provides

- ✓ shopping cart functionality and
- ✓ product management.

PayPal is the only default payment option, but other types can be built in through a payment PHP API. Shipping and tax modules can be built into the work flow tools and automate the purchasing and shipping process.

Overall, eZ publish is a great solution for those interested in having nearly fully integrated system. Work flow and authoring are the central foci of the application, but the other modules are nice if you don't necessarily need them to be fully comprehensive. The shopping cart features and product management are probably better implemented on more commerce-centric platforms, but given the PHP and SQL platform, these could be easily integrated. The same goes for ERP and CRM, in that eZ publish provides a good basis for these types of environments, but leaves a lot of the actual definition, in terms of what actions are to be performed, up to the user. However, commercial support and development is available for eZ publish, if needed.

eZ publish is available under a dual-licensing scheme, allowing people to re-brand the product, if desired. In addition to commercial support and customization services, commercial installation and hosting options are also available, for those that do not desire to host it themselves.

10 Really Simple Syndication

11 Web-based Distributed Authoring and Versioning (HTTP extensions)

Digest of Content Management Systems

Mambo (<http://mamboforge.net/projects/mambo/>)

Probably the most downloaded open source CMS, Mambo's 'Power in Simplicity' methodology makes it an excellent choice for those who need to get a good-looking news, blog, and/or forum area setup quickly and painlessly. Out of the box, Mambo comes with many pluggable modules, providing a slick-looking control-panel based administration area, through which it is possible to manage site layout and content, users and contacts, themes, modules, banners, LDAP¹² support and other features. Mambo is written in PHP and has a large and active development and user base.

Ease of use is Mambo's primary objective. The editing functions on the front end are clearly marked by large colorful icons. Editing content requires no knowledge of Wiki¹³-style language, which is advantageous to less web-savvy users. The WYSIWYG editors are selectable and administrators can provide multiple editors, based on the users' needs.

Content organization consists of defining menu items and pages. Images, links, and textual content can be added through a panel-like interface, making it easy for content managers to quickly author professional-looking content. Image alignment and presentation (borders, sizing, etc) are editable through the GUI¹⁴. Each page also includes hit-counters, so administrators can keep track of popular pages and compare statistics at a global level.

Mambo provides some nice looking themes, composed of css and image packages. There are also a few commercial design groups that specialize in providing custom Mambo themes for organizations. While their implementation of themes does provide designers with a good bit of freedom, other systems, such as TikiWiki, which employ Smarty¹⁵, do a better job of giving total creative control to site designers by pulling stylistic elements nearly completely out of the application code.

Mambo does a good job of providing a nicely featured website management tool. The product's emphasis is on managing on line content, making it easy for non-technical users to control the layout and look and feel of the site, the organization of information, and who can have access to it. There is less of a focus on publishing and document management, as Mambo lacks features such as advanced version control (there is some basic versioning functionality built in), indexed full-text document searches, or work flow tools, but this is not surprising, as Mambo's intended audience is more general in scope.

Overall, Mambo's strengths lie in its simplicity. It does not attempt to be a completely full-featured CMS system, but what it does provide, it does in an intuitive and user-friendly manner. Its target audience consists of those who need an easy to setup, easy to use, web content management system that incorporates basic functions, such as blogging and news feeds, while at the same time providing a modular interface through which additional functionality can be provided.

¹² Lightweight Directory Access Protocol

¹³ The term *wiki* refers to either the Web site or the [software](#) used to create the site. *Wiki wiki* means "quick" in Hawaiian. The first wiki was created by Ward Cunningham in 1995.

¹⁴ Graphical User Interface

¹⁵ Although Smarty is known as a "Template Engine", it would be more accurately described as a "Template/Presentation Framework." That is, it provides the programmer and template designer with a wealth of tools to automate tasks commonly dealt with at the presentation layer of an application. I stress the word *Framework* because Smarty is not a simple tag-replacing template engine. Although it can be used for such a simple purpose, its focus is on quick and painless development and deployment of your application, while maintaining high-performance, scalability, security and future growth. <http://smarty.php.net/rightforme.php>

Digest of Content Management Systems

Moodle (<http://moodle.org>)

Moodle's focus is online learning and Moodle excels at this. Even if one wishes to ignore the course delivery utilities in Moodle, there are a host of other compelling features that make it worth considering. This includes LDAP integration, per class calendars, forums and student enrollment. Visually, it is less flexible than many alternatives. A theme is chosen system wide and navigation is locked. For more information visit:

Moodle is a content management system for education and training. It is designed as a tool producing internet-based courses and web sites. It does so by employing a social constructionist pedagogy, with a focus on collaboration, activities, and critical reflection. It is well suited for providing completely on line classes, as well as supplementing the face-to-face learning environment. Moodle is written in PHP and supports full database abstraction, allowing administrators to choose from most popular databases. Most text entry areas can be edited using an embedded WYSIWYG HTML¹⁶ editor, which offers a familiar interface to users.

Moodle's constructivist philosophy drives its development and the system is designed to provide hands on, construction-centric environments, with a focus on interaction and social interaction between students and teachers. Course listings show descriptions for every course on the server and guests are free to view the contents. Courses can be categorized and are searchable. There is no limit to the number of courses and administrators can create thousands of courses, if desired.

Course management in Moodle is very flexible. Various types of instructors are definable by the administrator. A teacher has full control over all settings for a course and can restrict even other teachers from modifying course content. Moodle supports user logging and tracking and can provide activity reports for each student, along with graphs and details about their involvement with each module. Students can be given a choice of course formats, which allows them to choose per week, per topic, or a discussion-focused social format for absorbing course material. Students and instructors are notified of recent changes to the course material upon login, making it easy to keep current with the community. Instructors have control over grading and can define their own scales.

Assignments in Moodle can be specified with a due date and a maximum grade. On line submission allows students to upload their assignments (in any file format) to the server and are date-stamped upon submission. An instructor can choose to allow late assignments and late assignments are clearly marked for instructors. Instructors can leave feedback on assignments and notifications of this can be sent to students via email. Quizzes are also supported by Moodle and allow instructors a lot of flexibility. Time windows can be setup, allowing teachers to schedule quizzes in advance. Questions can be stored in categories for easy access, and instructors can share categories, allowing collaboration of content amongst instructors. Various question types are supported, including multiple choice with single or multiple correct answers, true/false, short answer, numerical answers with range specifications. Questions can be comprised of text and graphics and Moodle supports importing content, making it easy for teachers to develop them using other tools and import at a later time. Question order can be shuffled randomly, which reduces the risk of cheating when direct supervision is not possible. Quizzes are automatically graded and can be attempted multiple times, if an instructor chooses.

Collaboration and communication are central to Moodle. A loggable chat module allows instructors and students to discuss lessons, assignments, and activities interactively. This module can be employed effectively to allow completely on line course instructors to provide 'office hours'. Moodle

16 Hyper Text Markup Language

Digest of Content Management Systems

also offers a versatile forum area, in which various different types of forums are available. These can be setup as desired and popular uses include faculty-only discussion areas, course news, and public forums. Individual forums can be subscribed to by each user and users can be sent copies of postings via email. Both the chat and forum postings can optionally have the authors' avatar or photo attached. A survey module is also included which instructors can get feedback from students, the results of which can be used to produce several different types of graphs. Polls are also supported, in which instructors allow users to choose the direction of topic focus, for instance.

A resource module provides storage and display of Word documents, Power Point slides, Flash videos, and audio files. Users can upload and manage content to the server and the files can be linked to the web pages and included in the course pages. This makes it easy for instructors and students to distribute documents. Peer learning is enhanced via the Workshop Module.

Moodle emphasizes strong security features. From a user management perspective, instructors can allow and disallow access to nearly every area of their courses. The site manager can enforce more restrictive security policies through an online administrative GUI, but Moodle attempts to reduce administrative involvement to a minimum, instead passing this role onto instructors. Moodle's plug-in authentication modules allow support of several authentication models, which allows easy integration with existing systems, such as LDAP. SSL, certificates and TLS are supported. Moodle also allows external databases to authenticate, meaning any database containing at least two fields can be used as an external authentication source. Data transmission is also secure. Forms are all checked, data is validated, cookies are encrypted, etc.

Plug-in "themes" allow the administrator to customize the site colors, fonts, layout, etc., to suit local needs. Designers familiar with CSS have control over the way Moodle looks, but not in how it is laid out. The administrator has some control in this capacity, but Moodle lacks some of the degrees of visual customization that other CMSs offer. However, Moodle has a very simple and intuitive design, so this is not too much of a problem from a usability perspective.

Moodle supports plug-in language packs, which provide localization to any language. These can be edited using a built-in web-based editor. There are currently 43 language packs available. Each user has a choice over the preferred language within Moodle and every user can specify their own time zone (dates in Moodle are translated to that time zone).

Moodle may be used in the non-education centric enterprise for cost effective learning Kiosks, and for new policy, regulation or compliance issue training, so that employees can be trained quickly, concurrently, in multiple locations and management can track who all took the training program and how well they learned the material.

Overall, Moodle provides an excellent interface for educational purposes focusing on the constructivist pedagogy. Moodle allows instructors to reduce the amount of resources required (paper and printing costs), while at the same time offering a centralized, integrated community providing forums, chats, and discussion. The flexibility in the course material and administration make it an excellent choice for on line courses and as companion to class room.

Example sites:

- <http://courses.aquinas.edu/>
- <http://bpds.domath.ca/moodle/>

Digest of Content Management Systems

SchoolCenter (<http://www.schoolcenter.com/>)

SchoolCenter is the only application discussed here designed explicitly for a K-12 environment. It is also the only commercial application in this comparison. Its appropriateness is a balance between its utility and its costs/restrictions.

SchoolCenter sites are either hosted by SchoolCenter or on machines sold as appliances to schools. All maintenance is performed by SchoolCenter. SchoolCenter operates with a hierarchy flowing from administrators to teachers to students. Most SchoolCenter sites' top level pages start at the district level and allows a user to navigate to their specific interest. SchoolCenter offers a unique but simple content editing interface which is not WYSIWYG. Aspects of page layout can be controlled via the web and classrooms can be locked to or released from the established graphical theme.

We do not know what off-the-shelf content management systems the company evaluated because they do not list them, but the results are plainly not true if you look at at least few of the items in the table at this location.

	SC	OTS
Education-Specific User Levels	Yes	No
Import Gradebook Software Files	Yes	No
Dissemination of Content from District Down to Schools	Yes	No
Basic and Advanced User Modes	Yes	No
Profanity Filter	Yes	No
Parent Registration to View Student Info	Yes	No
Educational Image Gallery	Yes	No
Teacher Training Guides	Yes	No
Education-Specific Components	Yes	No
Product Evolution Based Solely on the Needs of Educators	Yes	No
Automatic Software Updates	Yes	No
New Releases tested Exclusively in K-12 Districts	Yes	No
Requests from K-12 Educators are Top Priority	Yes	No
Designed and Tested to Work with Education-Specific File Types	Yes	No

(http://www.schoolcenter.com/education/components/scrapbook/default.php?sectiondetailid=37&sc_id=1128036422):

For a more complete live demonstration than is available at schoolcenter.com, visit: <http://www.districtofquality.com/admin> user:bethm pass:demo

Example sites:

- <http://www.benlogan.k12.oh.us/>
- <http://www.churchill.k12.nv.us/>
- <http://www.lamphere.k12.mi.us/>
- <http://www.dorchester2.k12.sc.us/>

THE LINUX BOX

206 South Fifth Avenue, Suite 150, Ann Arbor, Michigan 48104 Tel:734.761.4689 Fax: 734.769.8938 www.linuxbox.com

Digest of Content Management Systems

TIKI WIKI (<http://tikiwiki.org/>)

TikiWiki derives its name from the Wiki-style CMS made popular by WikiWikiWeb. Wikis allow users to edit content directly within the website, however, Tiki can be used just as effectively to provide controlled delivery of content and applications. Tiki ships with a tremendous number of additional features, making its name somewhat misleading. Out of the box, TikiWiki ships with several built in applications. These include standard features you would expect in a CMS, such as a blog, forum, image gallery, user registration and communication tools, and polls. Tiki also offers several additional features, including: JgraphPad drawings, file galleries, chat rooms, quizzes, RSS feeds, surveys, trackers, maps, newsletters, games, inter-user messaging, and a user organization module for calendars, tasks, notes, file storage, newsreader, to name a few. Adding your own, custom modules to Tiki is quite easy for developers, as the interfaces for doing so are well-defined and simple to use.

Tikiwiki is a general portal and collaboration framework. While it enables the construction of simple or complex hierarchies, the specifics of a school district's hierarchy would have to be developed and maintained by the web master. Tikiwiki (or just Tiki) offers both WYSIWYG editing and Wiki style input. It does not include a revision approval system, but does have robust revision browsing, notification and rollback features. Layout and visual trimmings can be controlled via the web interface, but also by editing Tiki's templates which use the Smarty templating engine. For further information see: <http://tikiwiki.org> (demonstrations available)

The number of features Tiki provides is made possible by its robust, highly modular framework, written in PHP. Tiki offers a Wiki as its core module and this is the most frequent use of the system in practice. Wikis are an ideal interface for groups of users to collaboratively create web pages and author content. This is useful for a range of activities, from a platform for collaboration within an intranet, to massive on line documentation authoring, etc. Wikis employ a pseudo markup language, or content formatting syntax, which is used to modify the contents' presentation when published to the site. This syntax can be a bit cumbersome for some users, as they must take time to learn the syntax in order to format their content. This approach differs from many of the other CMS systems, most of which provide WYSIWYG-style editing; providing a more familiar interface. However, once this simple language is mastered, a higher level of control is given to users than that given by HTML editing alone. Tiki's language includes rules for defining new pages, allowing users to introduce new categories for discussion and to link to those already existing, effectively creating a relational network of content. Version control is built in, making it easy for administrators to verify content and roll it back to previous states, if need be.

The templating engine it employs, Smarty, ties the modular design together nicely. Smarty allows application developers to provide templates to designers, with placeholder-like syntax defining content areas. This has several advantages. First, designers can dramatically alter the appearance and layout of modules through their templates, as the content presentation is no longer tied to application logic. Application developers and designers can work independently, reducing the risk of introducing bugs to each other's work. Additionally, designers do not have to worry about learning scripting languages and can instead focus their attention where it belongs. Smarty makes Tiki a good choice for those that would like near-complete control over the appearance of the CMS.

The ADOdb database abstraction library that Tiki uses allows one to choose from nearly every popular commercial and open source database for content storage. This makes Tiki very versatile and allows for ease of migration from one system to the next.

Security in Tiki is comprised of a user/group permission model. In this model, users are given membership to one or more groups, each group providing the user with certain capabilities, such as

Digest of Content Management Systems

read and write access to certain areas of the site. Permissions can be accumulated if the user is a part of more than one group. Individual user permissions require the creation of a group and assigning it a single member. This security model allows administrators to exercise a decent amount of control over what content various types of users will have access to, but does not allow these users to grant access to other users. As such, Tiki is not as ideal a candidate for collaborative authoring and publication processes as some of the other CMS systems are, which allow users to grant privileges on their own information.

Tiki's on line documentation is quite good compared to some of the other CMS systems available. They provide a 350 page, illustrated manual for installing, configuring, developing, and customizing Tiki. Additionally there are thriving forums and communities on line, as well as additional documentation. Tiki's development community was among the top 10 on the Sourceforge online development system.

In summary, Tiki is a great choice when freedom and customization are central. Tiki provides quite a few applications that are configurable from a graphical administration panel. The administrator may choose to enable as many or as few of these features as they would like. Tiki's primary use is as a Wiki, meaning it is a great choice for collaboration and development of on line documentation and intranet content. Tiki's database abstraction layer is speedy and flexible, and also makes it possible for developers to integrate Tiki with other systems more easily. Overall, Tiki is not as robust as some of the other Enterprise-level CMSs, but makes up for that in freedom of choice.

Example sites:

- <http://www.linuxbox.com>
- <http://www.exclusivite.ca/Accueil>
- http://www.fca.at/tiki-view_articles.php

An alternate, simple wiki-like CMS that the Linux Box likes for intranets is Mediawiki described in detail in <http://www.mediawiki.org/wiki/MediaWiki>

Digest of Content Management Systems

Typo3 (<http://typo3.com/>)

Typo3 is, among the open-source content-management systems covered here, the most like commercial page-centric content management frameworks, and has a highly-evolved set of structural concepts. The system began as a (Danish) commercial product in the late 1990s, but has since been released as free software (GPL).

Typo3 is implemented on PHP, but PHP knowledge is not required for most uses. Users are intended to structure most content using Typo3's own "declarative template language" (a sort of hierarchical property page, or ini-file, concept). Typoscript is suitable for templating of documents based on the value of Typoscript variables, which are inherited by documents in a hierarchy. If conditional evaluation of variables or other properties is required, PHP must be used.

Some of Typo3's strengths include:

- document hierarchy concept
- distinct "back-end" and "front-end" editing—back-end editing is done in a filesystem-browser interface (implemented in PHP), and involves editing document properties and templates; front-end editing is document centric, and allows users to edit properties and content on the web page itself
- WYSIWIG page editing
- full-text search engine capable of handling PDF and Word documents
- scheduled publishing
- version history (for database-stored documents, the default)

Typo3 does provide versions of most recognizable sorts of applets and convenience features (eg, a forum system, a calendar), including a newsletter-publishing module. Some of these would be usable out-of-the-box, others would require modification to be useful.

Digest of Content Management Systems

Zope and Plone (<http://zope.com/> <http://plone.org/>)

Perhaps one of the most unique approaches has been taken by the developers behind Zope. Zope is an object-oriented applications server, written in Python, that is meant to be used as a Content Management Framework, or CMF. A CMF is a platform upon which web applications can be developed and deployed, while maintaining a common interface and shared resources (database, templates, etc). In Zope's case, this framework includes an object-oriented database, the ZODB, a webserver, and a unique permissioning system and access control list (ACL). By itself, Zope is not really usable or useful for most organizations, as it aims to provide a platform upon which custom portals and applications can be built, usually in it's native Python programming language. Fortunately, Zope includes an interface through which various 'Products' can be installed.

One such product available to Zope is Plone. Plone acts as a portal, utilizing the object-oriented aspects of the underlying Zope framework, while adding a hierarchical directory structure. After registering with the system, users are given a home directory and the ability to publish and store their own content, granting and receiving access permissions to other user's homes, as well as common areas. This structure is very useful for larger organizations that have a need for centralized storage of data for users, while maintaining a granular security policy, allowing for controlled sharing and privacy.

Plone, like Tiki, is a general purpose CMS. It is being used by a number of high profile sites and has been the subject of several published books. Plone is flexible enough to have a school district's hierarchy overlaid upon it. With additional configuration, Plone could also perform the desired page release authorization function.

Zope's greatest strength lies in its extensible nature. By default, a Zope installation exists only as a platform for deploying products. Products can utilize built-in features of Zope, such as permissioning. Python developers can develop products for organizations, which can specifically target needs. What a product does is almost entirely up to the developer, as the focus of Zope and the ZODB is on object-oriented content and encapsulation and preservation across sessions. Thus, depending on the products in use, one Zope deployment can be completely different in appearance and function from another.

Security in Zope might seem a little frightening, at first, to those administrators familiar with the traditional Unix-style permissioning scheme. Zope and Plone still give the administrator the standard user and group ownership, however, the traditional permissions stop there. Zope allows users to be assigned roles within the system. The role that a particular user has is dynamic and depends upon the role that is assigned relative to the object in question. Furthermore, the permissions available to any given user are also dynamic across objects, meaning that an administrator's role may not mean the same, based upon what they are attempting to do.

This ability is useful to publishing-centric deployments, in which users wish to grant permissions on the fly to collaborators. However, Zope does not provide a very robust versioning system, such as CVS. Only one version of a published document is possible at any given time and versions must be submitted and approved before another version can be checked out. This effectively blocks the work flow on the document and makes massive multi-party concurrency unattainable. While efforts have been made to introduce CVS systems into Zope, as of the writing of this document, the results have been unstable and lack full feature sets.

Another one of the main drawbacks to Zope is its relative inability to function modularly with other

Digest of Content Management Systems

systems. Because it relies so heavily on the ZODB for object storage, it is difficult to make this information available to other platforms. While there have been attempts to port Zope to RDBM systems, the results have been less than impressive.

In summary, Zope attempts to provide an object oriented CMF that can be extended to meet an organization's specific needs. Deploying Zope requires installation of additional packages, or an investment in development. The ZODB and content storage can be somewhat limiting, if sharing data across systems is desired. However, as far as providing a fully integrated system that is versatile and can meet content management needs for intranet, extranet, and internet environments, Zope is a good choice, if you have the time and resources to extend it to meet your needs.

Example sites:

- <http://www.jpl.nasa.gov/>
- <http://www.oxfamamerica.org/>

Appendix: Opensourcecms.com – sample comparison System Requirements:

Product	Drupal 4.7.4	Exponent 0.96	eZ publish 3.x	Mambo 4.5.2	Moodle 1.4	Plone 2.0.5	Tiki CMS/Groupware	TYPO3 3.8
Last Updated	10/18/06	03/20/05	05/18/05	09/12/05	09/02/04	05/11/05	05/21/05	07/06/05
System Requirements	Drupal	Exponent	eZ publish	Mambo	Moodle	Plone	Tiki CMS/Groupware	TYPO3
Application Server	PHP 4.3.3+	PHP 4.1.2+	None	PHP 4.1.2+	PHP 4.1.2+	Zope		PHP 4.1.2+
Approximate Cost	Free			Free	Free	Free	Free	Free
Database	MySQL, Postgres,	MySQL, Postgres	MySQL, PostGreSQL, Oracle, MSSQL	MySQL	MySQL, Postgres	Zope	Any - best supported is MySQL	MySQL
License		GNU GPL	GNU GPL	GNU GPL	GNU GPL	GNU GPL	GNU LGPL	GNU GPL
Operating System	Linux, Windows	Most OS	Linux, Windows	Any	Any	Any	Any	Any
Programming Language	PHP	PHP 4	PHP	PHP	PHP 4.1.0 or later	Python	PHP 4.1.0 or later	PHP
Root Access	No	No	No	Yes		No	No	No
Shell Access	No	No	No	Yes		No	No	No
Web Server	Apache, IIS	Apache, IIS	Apache	Apache, IIS	Any	Apache, IIS, Zope	Apache, IIS	Apache, IIS

Security:

Security	Drupal	Exponent	eZ publish	Mambo	Moodle	Plone	Tiki CMS/Groupware	TYPO3
Audit Trail	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Captcha	Free Add On	Yes	No	No		No	Yes	Free Add On
Content Approval	Yes	Yes	Yes	Limited	Yes	Yes	Yes	Yes
Email Verification	Yes	No	Yes	Yes		Limited	Yes	Yes
Granular Privileges	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Kerberos Authentication	No	No	No	No	No	Free Add On	No	No
LDAP Authentication	Free Add On	Costs Extra	Yes	Yes	Yes	Free Add On	Yes	Free Add On
Login History	Yes	Yes	No	Free Add On	Yes	Free Add On	Yes	Yes
NIS Authentication	No	No	No	No	No	Free Add On	No	No
NTLM Authentication	No	No	No	No	No	Yes	No	No
Pluggable Authentication	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Free Add On
Problem Notification	No	No	No	No	No	No	No	No
Sandbox	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Session Management	Yes	Yes	Yes	Limited	Yes	Free Add On	No	Yes
SMB Authentication	No	No	No	No	No	Free Add On	No	Free Add On
SSL Compatible	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
SSL Logins	No	No	Yes	No	Yes	No	Yes	Yes
SSL Pages	No	No	Yes	No	No	No	Limited	Free Add On
Versioning	Yes	Yes	Yes	Limited	Yes	Yes	Yes	Yes

Support:

Support	Drupal	Exponent	eZ publish	Mambo	Moodle	Plone	Tiki CMS/Groupware	TYPO3
Certification Program	No	No	No	No	Yes	No	No	No
Commercial Manuals	Yes	No	Yes	No	Yes	Yes	No	Yes
Commercial Support	Yes	Yes	Yes	Yes	Yes	Yes	Limited	Yes
Commercial Training	Yes	Yes	Yes	Yes	Yes	Yes	Limited	Yes
Developer Community	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Online Help	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Pluggable API	Yes	Yes	Yes	Yes	Yes	Yes	Limited	Yes
Professional Hosting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Professional Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Public Forum	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Public Mailing List	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Third-Party Developers	Yes	Yes	Yes	Yes	Yes	Yes	Limited	Yes
Users Conference	Yes	No	Yes	Yes	Yes	Yes	Limited	Yes

Performance:

Performance	Drupal	Exponent	eZ publish	Mambo	Moodle	Plone	Tiki CMS/Groupware	TYPO3
Advanced Caching	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Database Replication	No	No	Yes	No	Yes	Costs Extra	Limited	No
Load Balancing	Yes	No	Yes	No	No	Yes	No	No
Page Caching	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Static Content Export	No	No	Yes	No		Free Add On	Yes	Limited

Management:

Management	Drupal	Exponent	eZ publish	Mambo	Moodle	Plone	Tiki CMS/Groupware	TYPO3
Advertising Management	Free Add On	Yes	Free Add On	Yes	No	Free Add On	Yes	Free Add On
Asset Management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clipboard	No	No	No	No	Yes	Yes	No	Yes
Content Scheduling	Free Add On	Yes	Yes	Yes	No	Yes	Yes	Yes
Content Staging	No	No	Yes	No	Yes	Free Add On	Limited	No
Inline Administration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Online Administration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Package Deployment	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Sub-sites / Roots	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Themes / Skins	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Trash	No	No	Yes	Yes	No	Free Add On	No	Limited
Web Statistics	Yes	No	Free Add On	Yes	Yes	Free Add On	Yes	Free Add On
Web-based Style/Template Management	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

Interoperability:

Flexibility	Drupal	Exponent	eZ publish	Mambo	Moodle	Plone	Tiki CMS/Groupware	TYP03
CGI-mode Support	Yes	Yes	No	No	Yes	Free Add On	No	Yes
Content Reuse	Yes	Yes	Yes	Limited	No	Yes	Yes	Yes
Extensible User Profiles Interface	Yes	Yes	Yes	Free Add On	No	Yes	Yes	Free Add On
Localization	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Metadata	Yes	No	Yes	Yes	No	Yes	No	Yes
Multi-lingual Content	Yes	No	Yes	Free Add On	Yes	Free Add On	Yes	Yes
Multi-lingual Content Integration	Free Add On	No	Yes	Free Add On	Yes	Free Add On	Limited	Yes
Multi-Site Deployment	Yes	Yes	Yes	Free Add On	Yes	Yes	Yes	Yes

Digest of Content Management Systems

Flexibility:

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

Commerce:

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

Digest of Content Management Systems

Basic Glossary

CMS: Content Management System

CSS: Cascading Style Sheets

GUI: Graphical User Interface

HTML: Hyper Text Markup Language

LDAP: Lightweight Directory Access Protocol

MAGCU: Michigan Association of Governmental Computer Users (magcu.org)

RSS: Really Simple Syndication

UI: User Interface

Smarty: "Although Smarty is known as a "Template Engine", it would be more accurately described as a "Template/Presentation Framework." That is, it provides the programmer and template designer with a wealth of tools to automate tasks commonly dealt with at the presentation layer of an application. I stress the word *Framework* because Smarty is not a simple tag-replacing template engine. Although it can be used for such a simple purpose, its focus is on quick and painless development and deployment of your application, while maintaining high-performance, scalability, security and future growth." <http://smarty.php.net/rightforme.php>

SSL: Secure Socket Layer

WebDAV: Web-based Distributed Authoring and Versioning (HTTP extensions)

Wiki: The term *wiki* refers to either the Web site or the [software](#) used to create the site. *Wiki wiki* means "quick" in Hawaiian. The first wiki was created by Ward Cunningham in 1995.

WYSIWYG: What You See Is What You Get