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Introduction to Content Management Systems in Libraries:
Installation and Customization of Drupal 6

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Introduction to Content Management

CMS Review (2007) reports there are currently over 200 companies marketing content management systems (CMS) to corporate customers, and another 80 open source projects offering access to comparable content management services and software. The rise of CMS platforms is indicative of the growing need of businesses and organizations to organize and distribute digital information in an efficient manner amongst their client base and users. Whether it be text, pictures, sound, film or graphics, this digital “content” represents the body of information that organizations wish to efficiently organize, publish and manage. CMS offers a means to organize, arrange and edit all digital content using a software application and with the end goal to publish it online.

It is the ease of use that draws many users to take advantage of CMS. The small learning curve allows users to create a customized and unique web presence that incorporates the details they identify as priorities for their organization’s image. With the script written by professionals the potential of the website immediately expands from a simple presentation of text-heavy information, to an interactive online community with the incorporation of networking and communication tools. From synchronous communication to discussion forums, CMS opens a door for any user to create as much dialogue as he or she chooses for their website. Douglass (2006) wrote in regard to these customizable features and specific applications, “A CMS can generally be customized by adding or removing specific features, so that the end result is only those features that you want for your community. Features included with a CMS can include file management, photo galleries, private messaging, discussion forums, articles, polls, and much more” (p. 22).

Along with a wide variety of unique social networking tools, CMS offers the ability to streamline efforts to maintain and update a website. CMS offers special administrative access to control and limit the editing abilities of individual members of the company or organization. This feature allows an efficient distribution of work, along with controlled access to sensitive and

private materials. Access restrictions not only offer more effective time management on the efforts of a company to regularly maintain their website, but also a strict user controlled environment which allows administrators to be fully and constantly aware of who alters content and when. Austin and Harris (2008) wrote, “With a CMS, work can be distributed across multiple authors without sacrificing site security” (p. 5).

Content Management in Libraries

Key features like ease of use, flexibility, equitable work distribution and security make CMS systems a valuable tool for libraries wishing to create and maintain a strong online community for patrons to engage and participate in the development of their library system. Harris (2008) stated, “With increasing levels of interactivity and social connectedness in the commercial Web, our library sites need to become just as much of an engaging experience for our users. A content management system provides a set of tools that allow libraries to remain focused on the end result of patron happiness” (p. 48).

CMS allows libraries to skip the initial time involved in developing and creating programming script, and dive directly into content to provide a more receptive online environment for patrons. Austin and Harris wrote, “Libraries are about content: acquiring it, storing it, indexing it, retrieving it, and presenting it. Content management systems (CMS) help libraries accomplish these tasks on the Web by providing a back-end structure for a Web site so that the authors can focus on content” (p. 5). By providing this back-end structure libraries can begin customizing their CMS in accordance with need and patron demand. Many CMS platforms offer add-ons or modules unique to library systems which increase ease of everyday processes such as cataloguing or patron notification. Harris reported, “There are already many free library modules available for download from Drupal.org, including tools for working with MARC records, collecting book reviews from

users, and interacting with library catalogs” (p. 48).

Library Journal recently named the Worthington Library system in Ohio "Library of the Year for 2007." One of the largest efforts made by this library system was to revive their online presence, and they accomplished this using Drupal. The site (<http://www.worthingtonlibraries.org/>) features many of the key web 2.0 characteristics that Drupal can incorporate. The children's department posts podcasts of both story time readings as well as updates on programming in both English and Spanish. Drupal offers many modules to facilitate an easy incorporation of these media files into sites, so updating with new audio files is a simple process in which the entire staff can participate. The teen department harnesses podcasting tools, as well as maintains a blog which is a core module in Drupal. They have used it to advertise programs and events, as well as create open forums for teens to discuss books and contemporary issues. The home page features an embedded search bar for their online catalogue (OPAC), as well as Youtube videos, ebook downloads and a blog news feed.

Introduction to Drupal

Drupal is a free, community-driven, open-source, module-based, extensible content management framework used for the creation of dynamic websites. It provides a simplified way for web developers of all levels of programming skill to build modern, interactive, highly functional websites. Douglass stated, “Drupal is for anyone who wants to have a web site that is well suited for (but not limited to) multi-user communities. Drupal is for bloggers who want more than just a blog, groups who need to cooperate online, activists who want to spread a message, educators who want to provide online learning tools, artists who want to share media online, businesses or individuals who want to sell goods online, and programmers who want to work with a platform that is extensible, clean, efficient, and well architected” (p.3). A categorized sidebar

controls the administration pages to configure your website with a series of radial buttons and checkboxes. The core installation of Drupal provides a host of options for creating a basic community website. It includes options for blogs, forums, polls, RSS, block configuration, internal site search, taxonomy, user-permissions and statistics to name a few. The Drupal community has provided thousands of additional options that can be downloaded, installed and configured for free.

Drupal Technology and Requirements

David Mercer stated, “What the Internet needs is something that makes it easy for people to do whatever it is they want without having to pour intellectual resources into understanding the technologies on which the internet is based. What the Internet has got is precisely this – Drupal!” (p. 1). What WYSIWYG editors like Dreamweaver were for HTML, Drupal is for PHP/MySQL. It is true that a person with no programming experience can create a highly functional Drupal website, but anyone familiar with applications like Dreamweaver knows that the more you know about the underlying technologies, the more likely it is that your web creation will be pleasing to you and its audience and that you will be able to manage the website after its initial creation. A Drupal website is uniquely suited to the data-driven Web 2.0 environment. The dynamic website technology used by Drupal and other content management systems include databases and scripting languages that run behind the scenes on a web server. “Dynamic sites are those where the content and design live separately. The content lives in a database that is placed on a webpage only when needed or asked. The benefit of this is that it allows for quicker page loading and it allows just about anyone, with limited or no web design experience, to update their own website via an administrative backend” (Dynamic Web Page, 2008). With Drupal, both the creation and administration of a dynamic website can be performed through a much simplified administrative web interface. Arah (2008) described content management systems like Drupal as, “...essentially a web-hosted application for producing other web-hosted web applications, and its beauty is that it

lets you do that without writing a single line of code.”

Drupal websites require access to more server-side resources than simple, static HTML websites. An Apache web server that supports PHP and MySQL is needed. (To test Drupal, Apache/PHP/MySQL can simply be installed on a Mac or PC without the need for an actual server.) PHP is the server-side scripting language designed for the web and is the language of Drupal. PHP scripts can be embedded within an HTML page and when the user submits a command through a web interface, a PHP server interprets and acts upon it. MySQL is the database software that stores all the unique data of your Drupal website. PHP offers a host of commands used to store and access information on databases like MySQL. Although advanced knowledge of Apache, PHP and MySQL aren't necessary to create a basic Drupal website, advanced development, customization, modification, and problem solving can be made easier with experience using these three tools. For the vast majority of average users starting out with Drupal, the online community is the place to go for assistance and advice.

Drupal Online community

One of the most important aspects of Drupal is the online development community that surrounds it. Douglass stated, “Drupal is also a vibrant online community with thousands of enthusiastic people from around the world. This community spans the Drupal.org site, several mailing lists, user groups in various countries, a number of nonprofit organizations, some small companies, and a growing army of freelancers who earn their living partially or completely from using or developing Drupal. The community has events, often coinciding with major conferences, and is an excellent example of massively distributed cooperation” (p. 3). A complete newbie might still have some difficulty configuring a basic Drupal website, but with the help of various online forums, he can receive advice and assistance. Thousands of themes and modules have been created

and posted on the Drupal website that can be downloaded, installed, edited or simply used for learning. For an advanced programmer, Drupal might represent a platform on which he can install his own custom-scripted module. For a novice, Drupal might represent a platform on which he can install a community-contributed open-source module without the need to learn complicated web programming languages.

Planning and Installation Using a Testing Environment

It is recommended that Drupal be installed on an Apache web server that supports PHP and MySQL. This can be done either on a live web server or using a locally installed WAMP (Windows, Apache, MySQL, PHP) package. WAMP packages usually provide a graphical web browser interface for configuring the MySQL databases and for tasks such as backing up data. The WAMP package that Mercer (p. 33) recommends is Apache2Triad. Installation of this package was seamless on our Windows XP system, but we ran into problems installing it on a Windows Vista system.

We discovered two ways to overcome the Vista compatibility problem. Our first inclination was to locate an alternative to Apache2Triad called WAMPServer. Apache2Triad and WAMPServer are similar products and offer identical PHP and MySQL functionality, but with slightly different localhost interfaces. One member of our testing team who had some prior PHP and MySQL experience was able to configure WAMPServer to run on his machine, while the other member with more limited scripting and database experience chose to consult the experts on the Drupal discussion boards. Both eventually got their testing environments up and running. Drupal does offer a “system off-line” function to block users from site access during maintenance, which is ideal when your production site has already been installed on a live web server. As we discovered though, many modules are still in beta mode and installing them can result in the

corruption of your entire Drupal site. We decided to test all of the contributed, 3rd party modules on a local WAMP systems prior to installing them on our live online Drupal site.

Testing modules and other basic Drupal functions on our local installations required editing of PHP code on several occasions. The first instance as mentioned before was with the WAMPServer setup, which doesn't automatically prompt the user to choose global user password, which is required during the Drupal installation. This required us to find the "config.inc.php" Drupal file and manually enter a password into the script. With some knowledge of PHP, such alterations amount to little more than an annoyance. For many Drupal users that have no HTML or PHP experience, this could be a showstopper until an expert can be consulted.

With a WAMP installed, we could now install Drupal. There are several Drupal versions, the newest of them is Drupal 6. Knowing that our ISP provided support for Drupal 6, we of course chose to test this version on our local installations. Drupal is a single file that needs to be downloaded and unzipped, renamed to simply "drupal" and put into the "htdocs" directory in Apache2Triad or the "www" directory in WAMPServer. Navigating to <http://localhost/drupal> will bring you to the Drupal setup screen. Navigating to <http://localhost/phpmyadmin> will bring you to a screen where you create and name the MySQL database that will be used for your Drupal installation. After the database is created, it is just a matter of going through a series of Drupal setup pages where you will name your Drupal site, create an administrator username and password and choose a main email address for your new site. Remembering the chosen usernames and passwords throughout this whole process is critical as a complete re-install might be necessary if they are forgotten. On a local installation, manually entering your ISP's SMTP is needed for Drupal to have emailing functions, and again this requires the editing a PHP script. For the sole purpose of testing Drupal modules, the use of emailing isn't necessary. We assumed that our live

installation on the web server would provide a more seamless interaction between PHP and its SMTP server, which turned out to be correct.

When the installation is confirmed, a new administration page will appear at <http://localhost/drupal>. The administration page consists of five sections. The main section is Content Management, where you will find options for adding, configuring, and managing the various content types that are available in Drupal. Site Building is where you will configure the layout of your site, choose themes and modules, design menus and create URL aliases for pages that are created. User Management is where you will determine the access rules, roles and permissions that your site users will have. Site Configuration provides a variety of choices for file types and uploads, date and time, error reporting, site information (title, slogan, email address) and site maintenance messages. Reports is where you can see logs of site updates, user errors, available updates and status reports.

The core installation is a basic version of Drupal. The initial generic look can quickly change with basic administrative options and the several themes and modules that are made available as part of the core installation. It can be assumed that the themes and modules of the core offering will actually work and all that is needed is to choose checkboxes in various places in the administrative menus to activate changes. The true potential of Drupal comes from installing contributed 3rd party themes and modules.

Trouble Shooting Using the Drupal Open Source Community

Mercer (2008) noted, “Forums are probably the single greatest problem solving resource and information based asset,” and upon facing installation issues with the Drupal 6 software, this statement rang true. Categorized into “support,” “general,” and “development” the forum section

of the online Drupal support page, offers an interactive and contemporary means to troubleshoot a range of issues with the Drupal platform from simple to complex. Before posting an individual question or technical issue, users may search the forums using keywords or phrases that best reflect their problem. If perusing returned posts does not yield a desirable answer, then he may create a forum posting with the specific question they are looking to answer. Differing from major troubleshooting approaches with software where users are required to contact individual companies or distributors, the power of Drupal lies in this open source community always available to share and address issues together.

During the initial set up of Drupal 6 the software would not connect with the MySQL database server. Initially choosing to use Apache2Triad as suggested in the Mercer text, we realized that the Apache2Triad example highlighted in the text was being run on the Windows XP operating system, while both of us were running Windows Vista. After choosing to use WAMPServer in lieu of Apache2Triad, were able to get Drupal to run successfully on one of our test machines with some PHP manipulation. The other member of our testing team, who faced the same problem, relied upon the forums for assistance. Having searched the forums to no avail, this team member posted a unique question about using WAMPServer and Drupal that can be found here: <http://drupal.org/node/338282>.

As demonstrated by the post the response was quick and succinct. Multiple users responded to the post, for both clarifications regarding our issue and with quick suggestions. One of the suggestions listed recommended temporarily turning off anti-virus software on the machine and then reinstalling WAMPServer, because it most likely wasn't allowing the needed registry changes to occur during setup. Within five minutes of taking the users suggestion the issue was resolved and Drupal was installed on this machine. Following the time signatures it is safe to say the issue

was resolved within an hour, and we were able to create a relationship with a user familiar with the specific software of this testing machine and therefore establish a connection that will behoove us in any further troubleshooting issues with my MySQL server.

Aside from the wealth of information in the online forums, the Drupal site offers embedded synchronous chat for users to communicate regarding a variety of issues. Using the FreeCode Internet Relay Chat (IRC) network, Drupal provides a series of channels ranging from support, to advanced coding, to simple geographic proximity for users to socialize. Users can download a variety of IRC clients, including Miranda IM, that was recommended by Drupal user Walt Esquivel (2007) in his article, “Internet Relay Chat: an intro to Miranda IM (Windows) and Colloquy (Mac OS X).” It supports a wide variety of chat clients, and requires little resources to run and can be installed using a flash drive or even a floppy disk. Users may customize interface or code add-ons to embed audio or support file transfers. Many of the Drupal sites can be searched using “drupal” as keyword when searching within the IRC, or the Drupal site lists the address of specific channels. I found a wide variety of users participating in Drupal chat, from computer programmers to students such as ourselves new to the CMS. Advanced users well versed in the software were able to quickly provide answers in an approachable manner that left the troubleshooting experience pleasant and social rather than impersonal and stressful. Users were willing to use personal examples of work to highlight the changes particular modules in question would make, and quickly revert back to unaltered versions of their Drupal sites which emphasizes the instantaneous flexibility of the Drupal CMS.

Planning and Discovering Drupal Tools

Taxonomy

Drupal provides a taxonomy module as part of the core installation. This and other modules

can be activated through the administer section site building option. After activating this module, the user will have the ability to "tag" pages or blogs with keywords, which will automatically populate a taxonomy list. Although the automatic import creates a complete list of tags, there is no hierarchy assigned to terms. The site administrator can use these terms or add terms to create a hierarchy of broad and related terms. The administrator can edit or add to the taxonomy list in the administrator section. Once parent terms are determined, related terms can be applied under each parent to create a series of related terms. With this standard in place, the creation of content is then more easily organized with a series set options. When a taxonomy is enabled, users are provided with suggested terms and keywords through a drop down menu when tagging their own pages, making the search process more efficient and user friendly. The site search function is also enhanced with the ability to filter searches.

The following list is the standard set of terms and suggested synonyms that are applied to our Drupal site:

Events

Children events-- Synonyms: kids events

Adult events--Synonyms: parent events

Teen events-- Synonyms: young adult events

Technology

Computers-- Synonyms: laptop, Apple, Mac, PC

Internet--Synonyms: Wi-Fi, Ethernet, hotspot

Gaming-- Synonyms: Video games, Xbox, Nintendo, Wii, Atari, PS3, PS2, Xbox360,

Playstation, Gameboy, DS, PSP

Contact-- Synonyms: telephone, email

Staff-- Synonyms: employees, librarians

Reference-- Synonyms: find

Search

The search module comes with the core installation, but also must be activated it through the administer section's site building option. Once the module is activated a page will be created called "drupal/search." To ensure this page becomes functional the administrator must first go to search settings page and "re-index site," then go to the status report page and click "run chron manually." If this is not done, no search results will appear, as no index had yet been created to search. On the search settings page, weighting of search results can also be adjusted based on age of posts, keywords applied and number of comments. The higher the number that is applies in these areas, the higher the influence they will have in search results.

RSS Aggregator

While the blog feature of Drupal comes with an RSS feed button, an additional RSS Aggregator module can be activated which allows the site administrator to create a list of collected content from external RSS feeds. The RSS Aggregator can have categorical terms applied and each feed can be placed under an appropriate subject heading. This provides libraries an opportunity to receive live updates from major news outlets relevant to their patron base, as well as updates from best-seller lists provided by agencies such as the New York Times. Compiling a list of display feeds can be performed in the administrator menu's feed aggregator. From here you can add a new category, or contribute a feed to a category already in place. By selecting "Add Feed" the administrator can enter the URL of the RSS feed and select a category to place it in. Once the link is added and the browser is refreshed, the feed and its contents will immediately appear in the aggregator menu. Administrators can also force updates by simply selecting "updating items," which is an option listed with every link title listed in the RSS

aggregator.

The administrator can also access display settings while managing the RSS links under the settings tab. The number of headlines are displayed can be chosen, and at what rate old content should be removed from the feed output. Drupal will enable content to be removed on a very flexible time frame ranging from every hour, to 16 weeks and all time spans in between.

Blogs

The blog feature of Drupal is an automatic module that can be accessed from the administer menu. Posts can simply be entered in text format and instantaneously appear once the content is submitted, however in order to create a dynamic and engaging series of blog posts using the standard blog module, some basic HTML are needed. When composing an entry the author is given the opportunity to select between filtered and full html. The filtered options allows for basic tags which affect text such as the bold tag `` and tags which generate ordered and unordered lists such as `` and ``. With the filtered option enabled, Drupal will automatically insert paragraph and line breaks with every carriage return. The full html option better suits the needs of those wishing to incorporate media and active links within the posts. In order to construct each of the blog posts on our production site (<http://www.michaelnack.com/drupal>), we used HTML `<table>` tags that allowed text and images to be placed alongside one another, rather than on top of one another as done with the filtered html option. HTML `<div>` tags or special Drupal page formatting modules could also be used. Along with basic HTML skills, the author of blog posts should be aware of the ability to revise posts using the revision option. Drupal will embed a footnote at the end of each blog post once the user submits the note he or she wishes to be displayed with the edited post. Comments can be enabled in various levels from read only, to restricted access, or disabled completely. Attachments can be submitted with a blog post, and Drupal will create a content page for the attachment that will be to from the blog post with code constructed by the

software. Authors can change a their signature with each post, or simply be recognized by their log in information by default. All access and permissions for posting can be moderated by the administrator.

Themes

Drupal comes with six default themes that can be activated and configured. There are also thousands of third party themes available for download at the Drupal website, many of which are uniquely designed to fit a specific business or professional need. In order to download a third party theme the administrator simply downloads a single files and unzips it. It then needs to be copied and pasted into the drupal/sites/all/themes directory (if a themes folder is not already there, one can be created). Once installed in this directory, the theme will appear in the Administer, Site building, Themes section. Here you can choose to adjust colors and layouts of your new theme. Advanced users can also alter the CSS style sheet to make a unique theme.

Implementation and Installation of Live Site

The Drupal.org website lists web hosting companies that are known to support Drupal. GoDaddy was a name we recognized and from speaking with the sales and tech support people beforehand, we were sure we would have the support needed if any problem came up. GoDaddy has a “quick-install” section that offers an array of ready-to-install web applications for blogs, wikis, content management, finance and galleries. The Drupal installation process was much simpler than our local installations. It consists of the same steps, but much of it is automated. Added instructions and explanations were provided during each step of the process.

The standard steps include: Setup the database, choose a directory, configure. We were first asked on which of our purchased domains to install Drupal. Since we only purchased one domain,

that choice was simple. GoDaddy knows that a MySQL databases is required for Drupal so it automatically names one, asks for a choice of password and then creates it. Warnings are provided to avoid overwriting existing files in a directory already used. We were then prompted to choose an administration username, password and email address. There was no need to alter any PHP files for this installation. Within minutes, this new Drupal installation was live and ready for configuration.

Our completed Drupal website can be found here: <http://www.michaelnack.com/drupal>

Security Issues

Drupal offers a tremendous range of security and user access features that site administrators need to consider while developing their site. Mercer suggested to start with a fairly rigid set of access to users as a preliminary caution, as the ability to expand access can easily and quickly be edited. He writes, “Some of you might feel that the site should grow organically with the community, and so you want to be extremely flexible in your approach. However, you can take it as a given that Drupal’s access policies are already flexible, given how easy it is to reconfigure, so it is good practice to start out with a sensible set of access rules” (p. 116).

Drupal comes installed with two user account settings: anonymous and authenticated user than cannot be deleted. Administrators can edit the access to content of these users by editing their roles and ability to access various types of content on the site from blogs, to pages, to stories, or individual pages on the site.

Site administrators can also create unique profiles for users of the website, and as Mercer notes, “Drupal gives us fine grained control over what users can accomplish” (p. 117). By accessing user management the site administrator can add user profiles with titles such as, “blog moderator” or “forum moderator” that would allow particular staff members, or approved users, to

edit particular pages on the website. This feature would not only streamline the website update and maintenance process for large companies or libraries, but allow restricted access to particular pieces of the website for better control over managing and monitoring site security. With designated users for particular pieces of content, the webmaster or site administrator will be able to monitor edits and content.

Conclusion

Harris wrote, “Libraries excel at creating experiences but may not have the digital tools necessary for success. An open source content management system like Drupal provides the tools that let libraries maintain their focus on user services while operating within a technology enriched framework” (p. 48), and after researching, testing, designing, implementing and publishing a Drupal website this positive supportive statement of the potential of Drupal has been affirmed. Drupal will allow libraries to embrace and incorporate the social networking and web 2.0 technologies that have reshaped the way people live their lives. Drupal can act as a bridge to connect library patrons to a network of organized and interactive content, without the need to invest large portions of library funds to pay programmers and digital organizations to develop their webpage. The flexible and adaptive range of modules can allow any site to include synchronous chat, forums, blogs, media, search tools to enhance user experiences and even circulation and cataloguing tools for staff.

While the addition and management of content can be edited and maintained with a small learning curve, to create a truly dynamic and engaging site libraries would benefit from a site administrator with experience using web design tools such as CSS, PHP and HTML. With this background the site administrator will be able to add and edit current modules, as well as design unique modules to directly meet the needs of the site. Although a clean and interactive site can be

created with no programming background, to create a truly unique and graphically engaging site it would require the site administrator well versed in these languages. With introductory work in CSS, PHP and HTML we were able to modify modules and edit the style and layout of certain modules, as well as format page content to meet our layout needs.

Using Drupal proved an invaluable exploration of open source tools, capabilities and the community which facilitates their growth and flexibility. As the community grows the options available to users grows, the issues and concerns with everything from code to usability are more quickly solved. Despite the growth in usage and available third party material, to ensure the success of Drupal based sites the programmers and advanced users of the tool need to educate novice users to create a new generation of troubleshooters, problem solvers and contributors. The key factor to ensure Drupal and open source software like it stay relevant is to make sure users are engaged and the services and outcome of using the tools is relevant and appealing.

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