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# Open-Source IT Support for Effective Social Entrepreneurship

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**Abstract** - To better support its mission, a non-profit organization needs to effectively reach out to the public, collect information and opinions from the public, support effective brainstorming and discussions, implement effective business processes for non-profit operations, and support effective governance of the organization. The latest information technologies have provided better alternatives for non-profits to run smoother and more effectively.

In this paper we conduct a critical study of two popular open-source contents management systems, Drupal and WordPress, introduce Drupal to social entrepreneurs, and explain how it can support most of the tasks outlined above. Specific guidance is provided for setting up an organization's public website that supports smooth communications and effective governance. This paper also outlines a PHP and Ajax based real-time information sharing system which can be adapted to support various forms of fast data sharing and brainstorming for organization members through the Internet.

*Index Terms* – social entrepreneurship, IT support, business process management, web contents management systems.

## INTRODUCTION

While social entrepreneurship differs from business entrepreneurship in its not-for-profit nature, they share similar challenges in effective communications and governance. To better support its mission, a non-profit organization needs to effectively reach out to the public, collect information and opinions from the public, support effective brainstorming and discussions, implement effective business processes for non-profit operations, and support effective governance of the organization. The latest information technologies have provided better alternatives for non-profits to run smoother and more effectively.

In this paper we conduct a critical study of two popular open-source contents management systems, Drupal and WordPress, introduce Drupal, the most popular open-source contents management system in the world, to social entrepreneurs, and explain how it can support most of the tasks outlined above. Since most non-profit organizations have tight budget and limited support staff, this paper provides an easily accessible tutorial to guide anyone who is comfortable with the basic computer operations, typically a

college computing program sophomore, to set up an organization's public website that supports smooth communications inside the organization and with the public, as well as effective governance of the organization. This paper also outlines a PHP and Ajax based real-time information sharing system which can be adapted to support various forms of fast data sharing and brainstorming for organization members through the Internet.

## DRUPAL VERSUS WORDPRESS

Since non-profit organizations typically have tight budgets and lack IT support staff, it is much more cost-effective to adopt an open-source Contents Management System (CMS) for its web portal and information exchange platform. A comprehensive study was conducted to compare the two most popular open-source CMS systems, Drupal and WordPress. The following are our main findings.

Shared strengths:

- Both Drupal and WordPress can be installed on low-end server computers to provide quality services to around 1000 active users.
- The installation processes for both Drupal and WordPress are simple and can be conducted by a typical college computing program sophomore.
- Non-IT staff can conduct most of the tasks of managing user accounts, creating and managing web pages, and creating and managing discussion forums and blogs. Only a part-time consultant is needed to help create new document types, back up the server data, and conduct the basic server maintenance including applying security patches and system updates.

Drupal versus WordPress:

- While WordPress is easier to set up and maintain for websites supporting single person or group blogs, Drupal is more powerful for supporting blog community of ten or more authors and the ability to navigate directly to an author's blog.
- Drupal has better support for the user accessibility management of discussion forums, which is important in supporting an organization's hierarchical management structure.

Our conclusion is that for popular non-profit organizations, Drupal is the better choice. To address the relatively higher installation and maintenance cost of Drupal over WordPress, we have developed the following streamlined process of setting up a typical non-profit organization's website.

### BEST PRACTICE IN SETTING UP A DRUPAL WEBSITE

In this section we outline the best practice of setting up a typical non-profit organization's website to support information distribution, communications with the clients, and the internal communications. The example website is for Seidenberg Institute for Computing Innovation, a computing faculty development platform in the greater New York City area.

#### Selection of a Server Computer

There are two choices: (1) setting up a local PC running Linux, and (2) using a server hosting service like Bluehost ([www.bluehost.com](http://www.bluehost.com)). The former needs an investment of around \$800-1000 for the PC, the monthly cost (\$50) for accessing the Internet with a static IP address, the annual cost of maintaining a domain name for the website (around \$20), and the yearly server maintenance cost. The latter has no upfront investment for a physical server machine, and the costs include the monthly server hosting fee (around \$10-\$30) and the annual cost of maintaining a domain name for the website (around \$20). It is obvious that using a server hosting service is a better choice in most of the cases.

#### Installation of the Ubuntu Operating System

Since our aim is to lower the cost and improve system performance, Ubuntu is a good choice as the server operating system. To install Ubuntu on your computer, follow the steps below:

1. Download the current Ubuntu Desktop installation ISO file from [www.ubuntu.com](http://www.ubuntu.com).
2. Burn the Ubuntu installation ISO image on a blank writable DVD. Roxio's Easy Media Creator is one of the many disk burners that can do this.
3. Put the new Ubuntu installation disk in the computer, and then reboot the computer. Make sure that the computer boots up from the disk. Then follow the on-screen instructions to complete the setup of Ubuntu on your computer. Remember your Ubuntu user name and password.
4. Now you need to update apt-get package information so you can install the necessary software on the server.
  - a. Start a terminal window. Run "su -" to request to work as super user (root).
  - b. Enter your password.
  - c. Run "apt-get update" to update the apt-get information on available packages to install.
  - d. Run "logout" to exit the super user session.

#### Installing MySQL Database Server

MySQL community version is a popular open-source database server from Oracle.

Run command "sudo apt-get install mysql-server" to download and install the current MySQL server prepared for Linux. At the time of writing it installs MySQL 5.1. You will specify a password for user root of MySQL. This password is different from that for Ubuntu. MySQL will be installed as a Linux service, and it will start automatically at system boot up time.

#### Installing Apache Web Server

Apache web server is the most popular open-source web server. Drupal runs on top of the Apache web server.

1. Run "sudo apt-get install apache2" to download and install Apache.
2. Run "sudo gedit /etc/apache2/httpd.conf" and insert the following line in it:

```
ServerName localhost
```
3. While you are in your home folder, run command "ln -s /var/www www" to create a symbolic link or shortcut "~/www" to "/var/www", the document root folder for Apache. Each web site of yours on Apache will be in a folder under "/var/www". The Apache web server's installation folder is "/etc/apache2".
4. Launch *Firefox* web browser and visit <http://localhost>. You will see a screen declaring that "It works!" *Firefox* is rendering HTML file "/var/www/index.html". *Apache* has been installed as a Linux service and it will automatically start at Linux boot-up time.
5. At any time, you can restart Apache web server by running "sudo apache2ctl restart".

#### Installing PHP

Drupal is implemented in PHP, so it is mandatory to install the PHP module.

1. Run "sudo apt-get install php5 libapache2-mod-php5" to install PHP5 on your Linux system.
2. Run command "sudo apache2ctl restart" to restart Apache web server.
3. To test your PHP5 installation, run command "gedit ~/www/testphp.php", and insert the following line into the file:

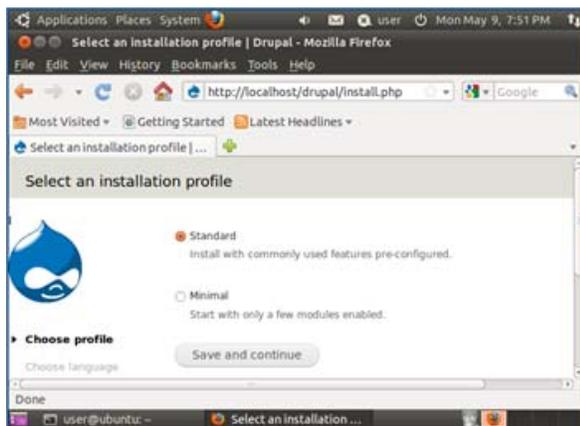
```
<?php phpinfo(); ?>
```

4. Save the file, and use *Firefox* to visit <http://localhost/testphp.php>. If you see a screen listing the supported features of your PHP installation, you have succeeded in installing PHP5 in Apache.

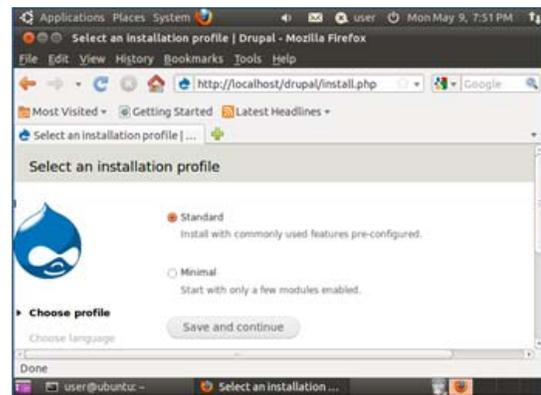
## SETTING UP A DRUPAL WEBSITE ON APACHE

Drupal is a powerful open-source contents management system supporting a rich repertoire of social networking tools. This section guides you to set up a Drupal site from scratch.

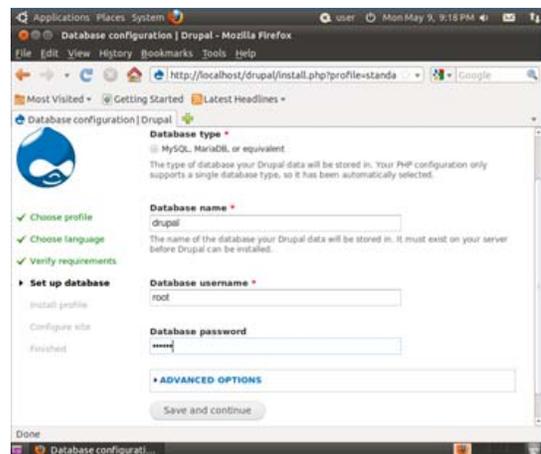
1. Run command “sudo apt-get install php5-mysql” to install PHP5 support for MySQL.
2. Run “sudo apt-get install php5-gd” to install PHP5 module supporting *GD* image library.
3. Run “sudo apache2ctl restart” to restart Apache.
4. Run “cd ~/www” to change the terminal working folder to “~/www”.
5. Run “wget http://drupal.org/files/projects/drupal-7.0.tar.gz” to download Drupal v7.0 installer “drupal-7.0.tar.gz”.
6. Run “tar -zxvf drupal-7.0.tar.gz” to unzip the installer file into folder “drupal-7.0”.
7. Run “mv drupal-7.0 drupal” to rename the folder as “drupal”, or any name of your choice. You can now run “rm drupal-7.0.tar.gz” to delete the Drupal installer.
8. Run “cd drupal/sites/default” to change working folder.
9. Run “cp default.settings.php settings.php” to make a copy of file “default.settings.php” and name it “settings.php”.
10. Run “chmod a+w settings.php” to give the web server write privileges to the configuration file.
11. Run “cd ..” to move working folder up one level. Then run “chmod a+w default” to give the web server write privileges to the default folder.
12. Run “mysql -u root -p” to launch the MySQL admin console. Enter your MySQL password upon request.
13. Run “create database drupal;” in the console to create database “drupal”, and then run “quit;” to quit the MySQL admin console.
14. Launch a web browser to visit <http://localhost/drupal/>. The browser will display like the following:



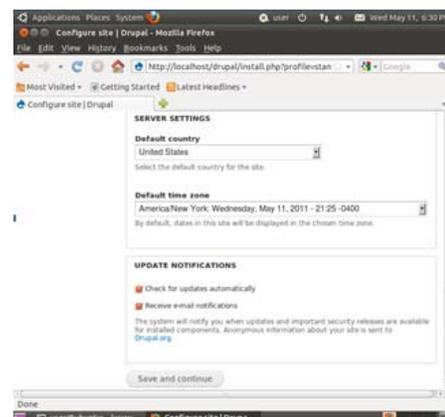
15. Make sure “Standard” is selected. Click “Save and continue”.



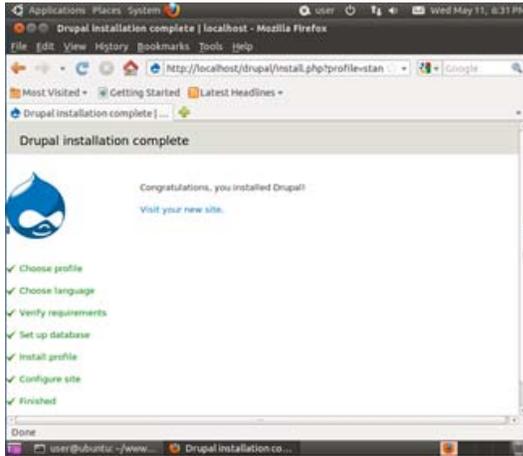
16. Click “Save and continue” to accept “English” as the default language.
17. Review the requirements verification page. Resolve any problems reported on this page. Then click “Save and continue”.



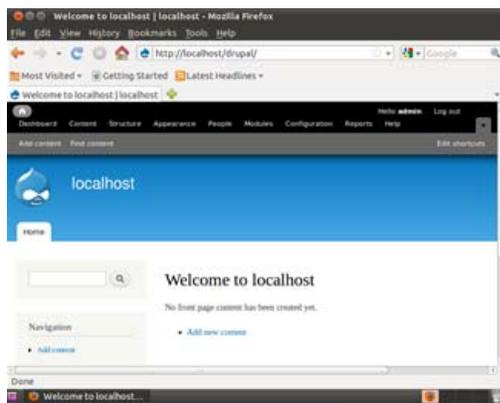
18. Enter “drupal” as database name, “root” as database user, and your MySQL password. Then click “Save and continue”.
19. In the Site Information section of the “Configure site” pane, keep “localhost” as site name, a valid email address as the site email address. In the Site maintenance Account section, enter “admin” as user name, and a password for the admin on the Drupal site.



- In the Server Settings section, fill in appropriate information, and then click “Save and continue”.



- Click the “Visit your new site” link. Your Drupal installing is now complete.

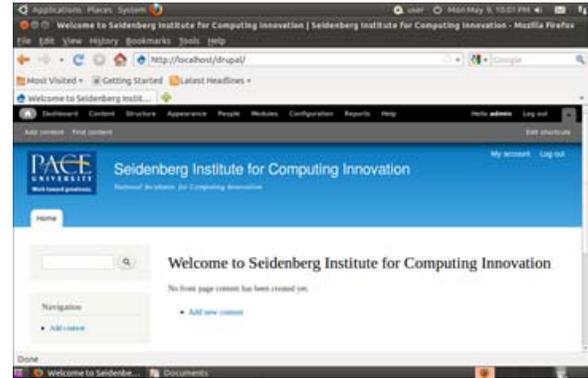


- Run
 

```
chmod a-w ~/www/drupal/sites/default/settings.php
```

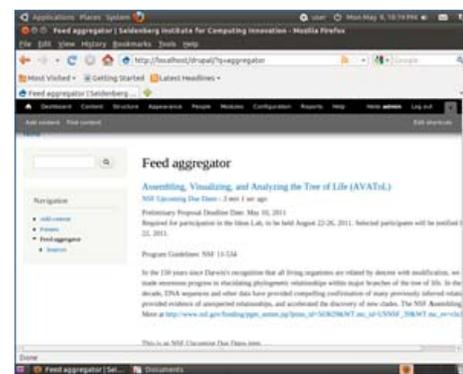
 to make file “settings.php” not writable. Otherwise you will see security warning in Drupal.
- Run “`chmod a-w ~/www/drupal/sites/default`” to make folder “default” not writable. Otherwise you will see security warning in Drupal.
- Click the “Configuration” tab.
  - Click “Site information”, and enter “Seidenberg Institute for Computing Innovation” for site name, and “National Incubator for Computing Innovation” as slogan. You can enter any contents of your choice.
  - Scroll down to the bottom of the page, and click button “Save configuration”.
- Click the “Appearance” tab, and then click the “Settings” link for the default theme.
- In the “Appearance” page, select the “Global settings” tab in the upper-right corner, uncheck “Use the default logo”, then browse for your organization logo file for uploading.

- Scroll to the page bottom, and click “Save configuration”. Now the Drupal home page looks similar to the following screen:



### Enabling Social Networking Features

- Click the “Modules” tab. Check “Aggregator”, “Blog”, “Forum”, “Poll”, and click the bottom button “Save configuration”.
- Click the “Modules” tab. Click “Feed aggregator” at the bottom right of the page.
- As an example, now you will add news feeds for NSF upcoming due dates. Click the “Add feed” link.
- Enter “NSF Upcoming Due Dates” for *Title*, and `http://www.nsf.gov/rss/rss_www_funding_upcoming.xml` for *URL*. Click “Save” at the bottom.
- Select the “LIST” tab in the upper-right corner, and click the “update items” link to download the latest feeds for NSF upcoming due dates.
- Click the house icon to go back to the Drupal site home page.
- Click the “Feed aggregator” link in the *Navigation* menu to read the latest news feeds.



- Click the “Add content” link in the Navigation menu, and choose “Blog entry” in the “Add content” page.
- Type any contents as the blog’s title and body.
- Scroll down to the bottom of the page, and click “Save”.
- Now your first blog has been published and is ready for people to post comments.

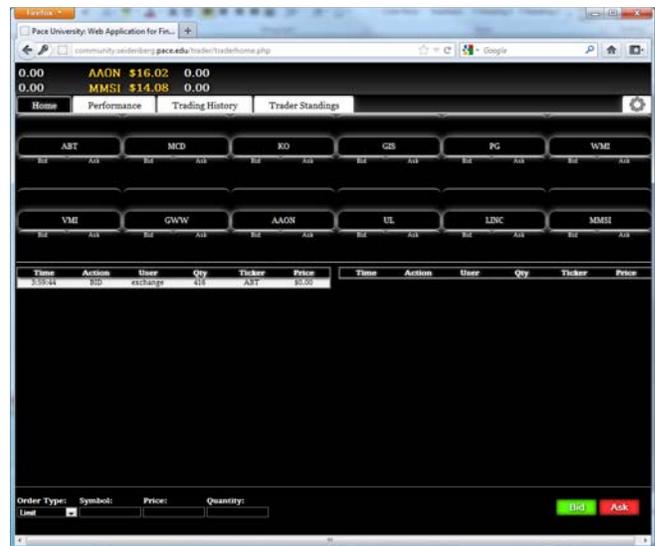
12. To add links to blogs and polls in the *Navigation* menu, click the “Structure” tab, and then click the “Menus” link.
13. Click the “list links” link for *Navigation*.
14. Check “Blogs” and “Polls”, and then scroll to the bottom of the page to click “Save configuration”.
15. Click the house icon to go back to Drupal’s home page. You can see that the *Blogs* link has been added to the *Navigation* menu.
16. Now you can click “Add content”, and choose to add a “Forum topic”. You can now create your first discussion forum post.
17. Now you can click “Add content”, and choose to add a “Poll”. You can now create your first poll.

Example applications of the above best practices include the website for *Seidenberg Institute for Computing Innovation* at <http://community.seidenberg.pace.edu/innovation>, the Pace University Computer Science Department website at <http://community.seidenberg.pace.edu/cs>, and the Pace University Westchester Faculty Council E-Platform at <http://community.seidenberg.pace.edu/wfc>.

### REAL-TIME INFORMATION SHARING

Another important form of efficient communications for non-profit organizations is real-time messaging and joint decision-making through the organization’s website. These functions are currently partially supported by separate services like Facebook and Twitter. A better solution is to take advantage of the existing Apache and PHP based website outlined in the previous section and support the real-time information sharing as part of the website’s functions. The major advantages of this scheme include the flexibility of adapting the real-time information sharing to various applications, integrating the real-time information with the documents maintained by the organization’s website, and better support of information privacy.

This real-time information sharing mechanism was studied through an interdisciplinary project of providing an online stock trading simulator through web browsers. The trader project was implemented as a website on the Apache and PHP based website described in the previous section. The instructor can create student accounts, configure the initial stock distributions, and start and terminate the simulation sessions. The students join the live trading session through a web browser based interface, as shown below, from anywhere on the Internet.



This project is implemented with the PHP and Ajax technologies. Its main technology ability is that any information entered by a participant is made available to all participants instantly no matter where they are. This ability can be used to support various forms of real-time information sharing.

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