

The Cal Poly SmartPost System

A CPE Senior Project

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1. Introduction

When a student is deciding on a senior project, he might not know exactly what he wants to do. He might ask friends what they did their project on, or maybe he'll go around to teachers and ask if they have any projects that need to be done. Sometimes students in this situation find a project that really interests them, but sometimes they do not or are not genuinely interested in the project they choose. For this reason, requirement specifications were designed in order to create a system that makes this problem disappear. This senior project discusses the factors for choosing a system to support the necessary functionality and the implementation of these specifications. By the end of this report, it should be apparent that this type of system will be very powerful and highly beneficial to anyone that uses it.

2. Factors for Choosing a System

In order to implement the specifications, a system that can handle all of the necessary functionality must be determined. Since a website is a more global tool for students, teachers, and companies, a hosting website and an application must be chosen before implementation can begin.

2.1. Choosing Web Host

The main thought behind choosing a web host was that it had a good reputation and was reasonably priced. Most of this research involved looking at Top Ten reports for the best web hosting sites online, and looking into ones that were reliable and inexpensive. The hosting website used for this project was www.fatcow.com because of its high ratings and relatively low price.

Top 10 Web Hosting Providers - Updated May 2012									
RANK	TREND	SHARED WEB HOST	PRICE	SALES INDEX	UPTIME SPEED	CUSTOMER REVIEWS	EDITORS REVIEW	SCORE INDEX	VISIT
1	↑	iPage	\$3.50			 96+ 27-	 Watch Read	94%	Visit Site
2	↑	FatCow	\$4.67			 80+ 32-	 Watch Read	92%	Visit Site
3	↓	justhost.com	\$4.95			 87+ 37-	 Watch Read	89%	Visit Site
4	↑	1&1 TRUSTED BY OVER 10 MILLION CUSTOMERS	\$4.99			 65+ 27-	 Watch Read	88%	Visit Site
5	↑	HostPapa Green Web Hosting	\$4.95			 66+ 14-	 Watch Read	87%	Visit Site
6	↑	GoDaddy.com	\$6.29			 59+ 27-	 Watch Read	86%	Visit Site
7	↑	inmotion hosting	\$4.98			 60+ 15-	 Watch Read	85%	Visit Site
8	→	bluehost	\$5.95			 52+ 26-	 Watch Read	85%	Visit Site
9	↓	iXWEBHOSTING	\$4.95			 72+ 37-	 Watch Read	84%	Visit Site
10	↑	HOSTGATOR	\$4.95			 24+ 13-	 Watch Read	83%	Visit Site

Figure 1. Top 10 Web Hosting Providers - May 2012

2.2. Choosing Web Tool

After acquiring the domain space, a tool was needed to implement the system. Several content management systems were researched to determine the proper tool for the job.

2.2.1. Nucleus

2.2.1.1. Advantages

- Nucleus is a blogging-based system
- It has a fully modifiable website look with the assistance of various skins and templates
- Plugins can be added to provide more functionality without messing with the core code
- It is easy to install

2.2.1.2. Disadvantages

- Nucleus has very poor documentation
- It is not very intuitive to administer
- It is not easy to make changes to the skins and templates that are available

2.2.2. Mambo

2.2.2.1. Advantages

- Mambo has abundant documentation
- It is good for larger sites that need a lot of extras
- It has many modules to add functionality
- It has a good menu system
- It has a strong static page structure
- It already contains built-in membership
- It has been on the market for a very long time

2.2.2.2. Disadvantages

- Mambo has a very steep learning curve
- Its code base is more cluttered because it is older than Joomla
- Its built-in performance is pretty sluggish
- It has a weak weblog section
- It is hard to theme
- You need to pay for most of the good plugins

2.2.3. Drupal

2.2.3.1. Advantages

- Drupal is a great system for developers that want to write all the code themselves

- It can be used to build really fast websites
- It is very capable and flexible for adding custom features
- It is very flexible for customizing the design
- It has very clean core code
- There are very good developers available for hired assistance

2.2.3.2. Disadvantages

- Drupal is not very accessible like WordPress or Joomla because it targets developers rather than designers
- It features some very plain themes
- It is not very easy to install, configure, and customize
- Administration and content management is not easy or intuitive, and not very user friendly
- When it is greatly customized with custom features and functionalities, the code can become complicated to manage
- There are not many ready-made drop-in plugins

2.2.4. Joomla

2.2.4.1. Advantages

- Joomla is a very powerful content management system that has many capabilities
- It supports Gmail to streamline the registration process
- It has a vast Extensions Library that can provide a majority of its functionality
- It is meant to handle the creation of a community network with a membership area, newsroom, forums, articles, and input from external authors
- It caters to frontend users, designers, and developers alike to provide for a flexible and customizable content management system.

2.2.4.2. Disadvantages

- Joomla is becoming more user friendly, but it is not quite there yet
- It is not easy to customize the functionalities or add custom features
- There aren't easily downloadable themes, so they must be found outside of Joomla
- If you want to replace a theme, the new one needs to be compatible and support the existing site content in order for it to work

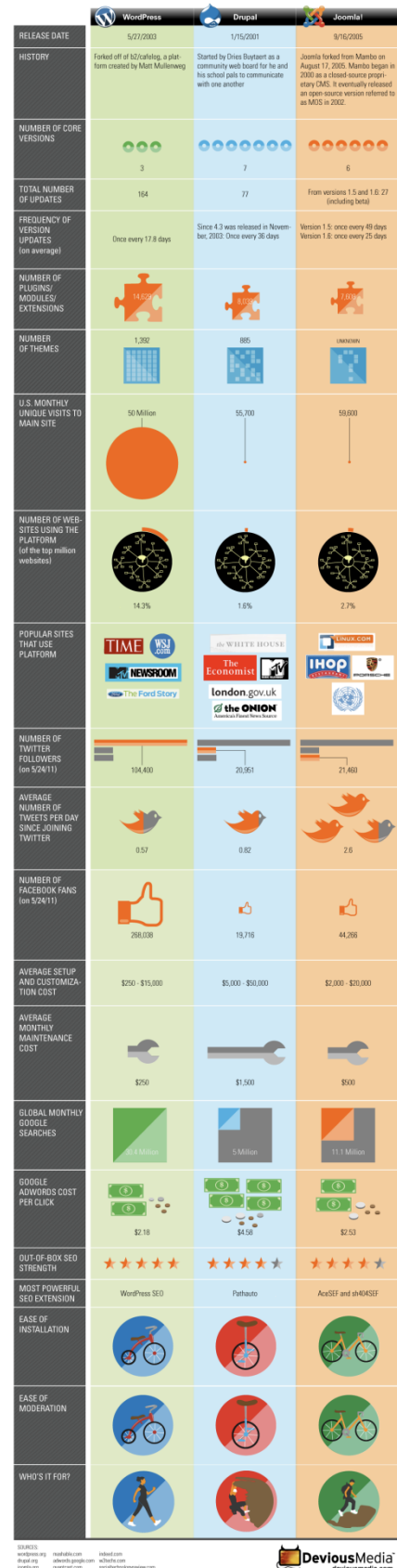


Figure 2. WordPress vs. Drupal vs. Joomla Comparison

2.2.5. WordPress

2.2.5.1. Advantages

- WordPress is easy to install
- It is easy to add popular and common features
- It is easy to find many themes and template designs
- It is easy to administer
- It has a very good plugin architecture
- It has a very large community
- There are many professional developers for hired assistance

2.2.5.2. Disadvantages

- WordPress is not easy to customize the functionalities or add custom features
- It is not easy to customize the design
- It is not ideal for a simple site that does not need blog features
- There are a lot of broken plugins that can cripple your website performance
- You must update your website constantly for security purposes

2.3. The Decision

The WordPress system was chosen because of its blog-centered design, user-friendly features, and powerful plugin capabilities. Even though some of its features are not very easy to customize, the features that it already has are enough for the type of system this project intends to build. Since project posting will be the main form of communication on the website, a blog format is exactly what the system needs.

3. WordPress Application

3.1. Setup

3.1.1. Set up a database

After acquiring a domain name, it is necessary to set up a database so that all the information on the website can be stored. A walk through on how to do this is provided by the hosting website.

3.1.2. Install WordPress

Click on the SimpleScripts icon in the Control Panel of the hosting site and find WordPress under the Blogs category. Installation of WordPress is simply click and go. This installation walks you through every step.

3.1.3. Design your website

After WordPress is installed, you can go to your website and make any changes you want. It would probably be easier to choose a theme first so that everything added onto it won't need to be changed or rearranged.

3.2. Use

There are two types of use when dealing with this kind of website. The first is how the administrator uses the site, and the second is how an average user uses it.

3.2.1. Administrator

The administrator will do several things when logged on to the website. One thing the administrator can do is design the overall look and feel of the website. This includes everything from the themes and images to its functionality. The administrator also must make sure that everything is up to date. Since WordPress is constantly being worked on, updates arrive quite often and need to be handled in a timely fashion. The administrator also must be able to respond to user comments and suggestions. When testing plugins and their functionality, the administrator can act like a user and navigate the website from the front end to see how it looks for users.

3.2.2. User

The average user is going to use this website to either post or look for a project description. But when a user first registers for a profile, he can add personal information and a profile picture. The only front end capabilities that an average user has are to create a new post or read posts in the post feed, comment on posts, and update profile information. Aside from that, the average user should be completely unaware of the back end of the website.

3.3. Plugins

WordPress plugins are used to extend the website's functionality. There is an entire directory online where these plugins can be found, downloaded, rated, and commented on. This directory can also be accessed through the administrator's dashboard to add the plugins directly to the website.

4. Website Capabilities

WordPress has many capabilities when it comes to blogging. In addition to these, WordPress has a very large plugin directory to add even more functionality to a WordPress website.

4.1. Tagging

Tagging is one of the main features of this website. When a person creates a new post, they have the option to tag the post with keywords that describe its main points. This allows other users to search posts based on tags rather than just searching for specific words in posts.

4.2. Tag Grouping

Posts that have the same tags are able to be grouped so that one tag search can bring up multiple posts having to do with that tag. This feature is especially useful because it allows users to find all of the projects that have to do with that tag instead of just one post that has a unique tag.

4.3. Profile Picture

The profile picture feature is not a necessary one, but it allows users to make their profiles more personable. Although this website is not designed for social networking, people who already use websites like Facebook and LinkedIn will probably feel more comfortable if this option is available to them.

Avatar

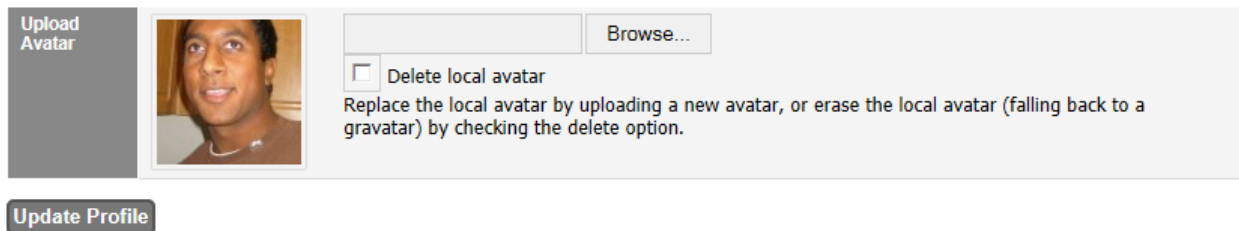


Figure 3. Personal Avatar Option

4.4. Login Section

When the website was finally live, the only way to log in to a profile was to go through the WordPress default Login form. A plugin was used to change this so that there was a login form on the website making a redirect unnecessary. This gave the website a more simple and similar feel and did not require users to spend time trying to figure out what was going on.



Figure 4. WordPress Default Login Form

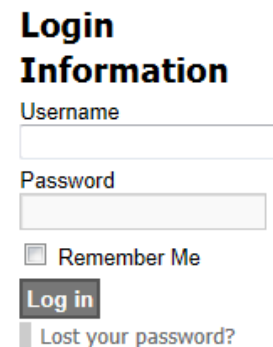


Figure 5. Front end Login Box

4.5. Registration Page

Like the login form, when a new user went to register for a profile they were redirected to a WordPress default registration form. In order to keep the registration process as simple and user friendly as possible, any redirection seemed to make things more complicated and needed to be changed. With the use of the Simplr User Registration plugin, the registration was able to be made its own page that could be accessed very easily by new users. It has the new user input the necessary information and then sends a conformation to the user's email.

Registration

Please fill out this form to sign up for this site

Personal Info

Your Username: *

First Name: *

Last Name: *

Contact Info

Email Address: *

Confirm Email: *

Register

Figure 6. Simplr User Registration Page Plugin

4.6. User Limitations

The limitations placed on users are at the full control of the administrator. Currently, all users have the ability to create, edit, and leave comments on posts. This is due to the fact that the administrative setting for users makes them Authors in the eyes of the system. This makes their capabilities limited to interacting with posts, which keeps the system from being tampered with.

4.7. Auto Tagging

The Auto Tagging plugin adds to the normal tagging functionality by suggesting tags that are suitable for a post. It is simply used when creating a new post and suggests tags based on the post content.

Auto Tag Test

By James on May 29th, 2012

This post is testing the auto-tag plugin capabilities. It is simply a test.

Related Posts:

- Auto-Tag Test 2
- Tag Test 2
- Creating New Post On Front End
- Tag Test 1
- Zemanta Test

May 29th, 2012 | Tags: auto tag, capabilities, post, Tag, Test | Category: Senior Project | Edit this post

Figure 7. Auto Tagging

4.8. Configurable Tag Cloud

The Configurable Tag Cloud plugin enables all of the tags to be modified and configured with a widget. Once the settings are updated, this tag cloud can be placed in one of the sections of the website template and those features will be visible to all users.

Current Post Tags

Alpha Magnetic Spectrometer
 auto tag
 backend
 California Science Center
 capabilities
 Feed Back
 feedback
 International Space Station
 NASA
 post
 project
 Random
 Science
 Space
 Space Shuttle Endeavour
 STS-134
 Tag
 Technology
 Test
 wordpress

Figure 8. Configurable Tag Cloud Tags

CTC: Current Post Tags

Configurable Tag Cloud Options

Title	Current Post Tags	Title shown in sidebar.
Number of Tags to Display	20	Controls the total number of tags in your cloud.
Min. Number of Posts	0	Tags with less than this number of posts will not be displayed.
Max. Number of Posts	100	Tags with more than this number of posts will not be displayed.
Font Display Unit	Point	What unit to use for font sizes.
Smallest Font Size	8	Tags will be displayed no smaller than this value.
Largest Font Size	22	Tags will be displayed no larger than this value.
Min. Tag Color		Beginning color for tag gradient. Please include the #.
Max. Tag Color		Ending color for tag gradient. Please include the #.
Cloud Format	List	How to display the cloud.
Show Tags	Yes	Display tags in cloud.
Show Categories	No	Display categories in cloud.
Show Empty	No	Display empty categories in cloud.
Display Post Count?	No	Show number of posts for each tag.
Sort By	Name	What field to sort by.
Sort Order	Ascending	Direction of sort.

Delete | Close Save

Figure 9. Configurable Tag Cloud Options

4.9. Contextual Related Posts

The Contextual Related Posts plugin provides semantic suggestions based on the title and content of a post. Users would see this as Related Posts when searching through other posts on the website.

Auto-Tag Test 2

By James on May 29th, 2012

This is testing the auto-tag capabilities from the backend of WordPress. Simply another test.

Related Posts:


- Auto Tag Test
- Tag Test 2
- Tag Test 1
- Creating New Post On Front End
- Zemanta Test

Figure 10. Contextual Related Posts

4.10. Gravatar Box

The Gravatar Box plugin allows users to see the avatar of the person who commented on a post. This provides little functionality in terms of relating posts, but it adds a more personal type of interaction between users and gives them the opportunity to see who they might be working for or with.

1 comment to Welcome!



James

April 5, 2012 at 1:16 pm · Reply · Edit

Comment

Figure 11. Gravatar Box

4.11. User Front End

The WordPress User Frontend plugin made the backend of the website invisible to users. It allows the administrator to make any backend changes necessary, but keeps these options from users so that the system cannot be easily compromised. It also provides several pages that make the navigation of the website very simple. It provides a page that is a feed of all the posts on the website. It also allows for the creation of a personal Dashboard page that shows all of the posts an individual has submitted and allows for editing of those posts. It also creates a frontend page for a user's profile and for writing a new post. These frontend functionalities make everything happening in the backend abstracted, which is what users will want when simply trying to create a new post or update their personal information.

Profile

The screenshot displays the 'Profile' page of the WordPress User Frontend plugin. It is organized into three main sections: 'Name', 'Contact Info', and 'About Yourself'.

- Name Section:** Contains fields for Username (admin, with a note 'Usernames cannot be changed.'), First Name (James), Last Name (Jenkins), Nickname (required) (James), and Display to Public as (James with a dropdown arrow).
- Contact Info Section:** Contains fields for E-mail (required) (jpenkin@calpoly.edu), Website, AIM, Yahoo IM, and Jabber / Google Talk.
- About Yourself Section:** Contains a Biographical Info text area (filled with 'Computers, Programming, Engineering'), a New Password field, a Confirm Password field (with a note 'Type your new password again.'), and a Password Strength indicator.

Figure 12. WordPress User Frontend Plugin Profile Page


Dashboard

admin's Dashboard

You have created 7 post

Title	Status	Options
Auto-Tag Test 2	Live	Edit Delete
Auto Tag Test	Live	Edit Delete
Creating New Post On Front End	Live	Edit Delete
Zemanta Test	Live	Edit Delete
Tag Test 2	Live	Edit Delete
Tag Test 1	Live	Edit Delete
Welcome!	Live	Edit Delete

Author Info



James
Computers, Programming, Engineering

Figure 13. WordPress User Frontend Plugin Dashboard Page

5. Specifications

Alex Abrahamian's senior project specified requirement specifications for the system that was implemented. Although these specifications were used when designing the website, not all of them were able to be met.

5.1. Achieved

5.1.1. Posts


Posts were a very essential part of the specification. When creating a new one, it needed to have font editing options and have a user interface that was simple to use. Because WordPress was based around blogging and adding posts, this was already part of the website before any administrative changes were made.

New Post

Title *

Category *

Description *

Upload/Insert 

Visual HTML

B I U " ABC [List Icons] [Link Icon] [Image Icon]

Path:

Publish Time: *

May 30, 2012 @ 15 : 14

Tags

Submit Post!

Figure 14. Creating a New Post

5.1.2. Tags

Tags were probably the most important aspect of the specifications because they were the link between projects. WordPress had some tag functionality from the beginning, but the Auto Tag plugin was added in order to make tagging easier and less biased.

5.1.3. Reader Stream

The Reader Stream was an important feature in the specifications because it allowed users to see all of the posts on the website. This allowed for random searching as well as searching based on personal interest. WordPress already had a way to display all of the posts, but the WordPress User Frontend Plugin was used to specify which page to put the post stream on.

5.1.4. User Profiles

The User Profile specification was handled for the most part. Users have a profile page where they can update their personal information and add an avatar. The only aspect of the profile that was not reached was the availability of public information. I did not see this website as being more than a place for people to post and find projects, so public personal information was not one of my top priorities.

5.2. Unachieved

5.2.1. Proper Tag Detection

This specification dealt with making sure that tags were not added when they didn't need to be. For example, if a user misspelled a tag, this functionality would recognize and edit it appropriately. The specification also mentioned handling tags that are ambiguous in nature. These features are fairly complicated and were not seen as viable tasks given the time constraint.

5.2.2. Folders

The folders mentioned in the specification would be able to contain read, unread, and starred posts for even more content grouping. There was a very underdeveloped plugin that was supposed to mark posts as read and unread, but this did not work with the system. Adding this functionality would require development of a new plugin or time to let the current plugin mature and be tested.

5.2.3. Tag Scoring

Tag scoring was a feature that would help establish credibility among users. This functionality would allow users to rate the tags that the author used for his post, and also allow the author to rate tags suggested by other users. The system currently has automated tagging so this seems somewhat unnecessary, but the auto tagging functionality still has some issues when it comes to adding more tags after posting. Tag scoring would be a useful tool, so if there is further implementation of these specifications then this should be addressed.

6. Potential Users

This website was designed to be very intuitive so that students, teachers, and even prospective companies could use it to either get projects out there or help with the finding of the right ones.

6.1. Students

Students would be able to use this system to find senior projects, multidisciplinary projects, side projects, and research projects. They would no longer depend on personal relationships to find a project that they are interested in.

6.2. Teachers

Teachers with project ideas or projects that they need students to work on could very easily add a post with descriptive tags that would attract students interested in the material. They would no longer need to have Info Sessions or present projects to classes they teach.

6.3. Staff

Staff members with projects or outside connections could post project ideas and make it very simple for students to see their options.

6.4. Alumni

Alumni tend to come back to their Alma Mater and propose projects from their companies, so they could very easily post this information and get in contact with a student or faculty member that wants to take on the task.

6.5. Companies

Companies often come to Info Sessions or talk to teachers about any projects that they might have, but this system eliminates the middle man and would allow companies to post their projects directly. This gives students the opportunity to get in contact with the company and get some professional networking experience.

6.6. Local Community

Local Community members that need help from students or teachers on a specific project could post a description on the website and get responses from people that are actually interested in the task.

7. Improvements

There are some improvements that could be made to this overall project in order to create a better system. One improvement for this system is to make it faster so that if multiple users are on it, it won't be unbearably slow. Several of the people that tested the functionality of the website said that it was slow at sometimes, so a better or more reliable server might be necessary. Another improvement would be to increase the functionality. This includes adding tag ratings, creating a public aspect of the user profile, and also possibly linking tags directly to an interests section of the user profile for easier access to these posts. This system could also be improved by having more testing done and coming up with suggestions for how to make the website more useful to users.

8. Conclusions

The Requirements Specifications written by Alex proved to be a really useful system for relating projects to people's interests. If all the aspects of the specifications were met, the system would be able to allow users to have a credible system to judge the projects that they are interested in. Because of WordPress and the many features that came with it, a system was able to be designed to serve the purpose of a distribution system for information and collaboration with an emphasis on projects. With this system, students will be able to find projects based on topic alone, and not just because they need a project or happen to know someone. Having students approach projects on an interest basis will have much better results than by any other means. Of course, WordPress is not the only system that can implement these specifications, so for those who attempt this, the system chosen should be based on your level of experience with web design and development. I chose WordPress because I have no experience in those fields, but if you do have that experience then you should look at systems that allow for more customizations. This would allow for development that is more specific to the specifications and not just for general use. Even though I did not complete the goal of getting the website approved by ITS and added to the Portal, I realized that this type of project should just be handed over to them completely. This way there is no need for approval, which is a very long and tedious process.

This was a very interesting project and made me wonder why Cal Poly does not already have a system like this. Everybody that tested the website or learned about the project expressed their enthusiasm for this type of system. Hopefully there will be a continuation of this project by another student or an implementation by the ITS department to get a system like this up and running through the school.

9. References

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<<http://joomla.org/>>

<<http://mambo-foundation.org/>>

<<http://nucleuscms.org/>>

<<http://wordpress.org/>>

10. Appendix

10.1. Plugin Development

10.1.1. Write and prepare your plugin

After writing your plugin, make sure all of your plugin files are together. You must also make sure that your plugin file can be certified for a license:

- It must be GPLv2 Compatible
- The plugin must not do anything illegal or be morally offensive.
- The plugin must not embed external links on the public site (like a “powered by” link) without explicitly asking the user’s permission.

10.1.2. Prepare the readme.txt file

Having a well-prepared readme file can make the rest of the process go much smoother. It should contain the following sections:

- Plugin Name
- Description
- Installation
- Frequently Asked Questions
- Screenshots
- Other Notes
- Changelog
- Stats
- Admin

10.1.3. Sign up for access to the Subversion Repository

Go to the WordPress Sign-up page, login, and fill out the Subversion repository request form with the Plugin Name, Plugin Description, and the Plugin URL.

10.1.4. Wait for approval and SVN access information

You must wait until you receive an email with the information you need to access the Subversion Repository.

10.1.5. Use Subversion software to upload your plugin files

Familiarize yourself with the SVN and upload your plugin files to the Plugin Directory.

10.1.6. Wait a few minutes for the system to add your plugin to the Plugin Directory

Once the system has added your plugin to the directory, you can use the plugin on your WordPress website and continue to make changes and updates.

You can visit <http://digwp.com/2010/03/add-plugin-to-wordpress-plugin-repository/> for more detailed information on this process.

10.2. Implementing Through the Portal

In order to add your website through the Portal, the ITS Enterprise Authentication Request Form must be filled out. The following document can be downloaded here:

<http://polydata.calpoly.edu/sites/polydata/files/requests/AuthenticationServiceRequestForm.doc>

Once the form is filled out, it will be reviewed by the Information Security Officer and an Identity Management team, and then they will send you the results.

Although the original intent of this project was to have a link to the website in the Portal, I chose not to continue through this process because of the specifics that ITS needs and the amount of time it could take. It would be a lot easier and probably save time to hand them the project to add to the Portal themselves.