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Building Tourism Information System by Using Open Source Software

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Abstract: Tourism information systems are becoming an increasingly popular vehicle for sharing information amongst tourists and are fast gaining an online presence. However, information organization and exchange in such websites is usually unstructured, rendering interoperability between communities difficult. Furthermore, specialized software to create such communities at lowcost-targeted at the specific common information requirements of tourists-has been largely lacking. At the same time, the tourism information and resources are growing explosively. We need to develop a new website to dissolve the problems above, especially the interoperability between users. The website should be a reusable platform for advanced structured online collaboration in tourists. Drupal, Vanilla and WordPress support structured ‘Web 2.0’ style community amongst tourists, makes heterogeneous data resources available to the collaborating tourists. These three open sources software provide the map query, communities and blog respectively. We believe that such a framework is required to achieve optimal productivity and leveraging of resources in tourism. We expect it to be particularly beneficial in highly interdisciplinary areas, such as hiking and cartography, as well as having broad utility across the geological sciences.

Key words: Drupal, vanilla, wordpress, open source software, tourism information

INTRODUCTION

It is an important and primary method for tourists getting the tourism information by using Internet. In China, netizen usually use the popular Baidu, Sougou and QQ map services. However, netizen only could get this information passively. The website users could not change the content, the display styles, or upload the information they like, not to mention to place a marker on the map. Compare with the proprietary software, the open source software are becoming more and more popular than ever before. The open source software is widely used in the website construction (Reilly and Williams, 2006). Using open source software can reduce the cost, otherwise the transparent source codes allow developers to fix the bugs in them and protect their website from network attack.

In this study, our goal was to develop website for creating moderated web communities that shares new and beautiful photos from tourists as well as navigation services in a trip. To create interoperable communities, we wanted to structure the community knowledge in a machine interpretable format as well as reuse existing, available knowledge bases. In order to reduce the cost, it was evident that we needed to make use of the open source software for this purpose. We are using Drupal to

provide the map service, the Vanilla and WordPress will provide the forum and blog services.

REQUIREMENTS AND DESIGN

We use MySQL database management system and Drupal CMS (content management system) to storage the nodes and web pages. Drupal’s searching module could be used in searching tourism information. The OpenLayers module could provide many map layers, such as the OSM Streets Maps, Google maps, Yahoo Maps, Bing Maps. Nowadays, more and more websites are using OpenLayers to provide the map services (Burnett, 2009; Palazzolo and Turnbull, 2012; Steiniger and Hunter, 2013). The blog service is provided by WordPress. Vanilla could be used as a forum. The accounts exchange could be fulfilled by the jsConnect plug-in of Vanilla.

Drupal’s configuration Drupal is a CMS, which is written in PHP. Drupal has a basic core and various modules. The modules could be separated into core modules and extension modules. When the Drupal was installed, we would have these core modules. The website developers only have the right to enable or disable these modules. The extensional modules should be downloaded and installed by developers. The install process just likes

“building blocks”. It is very simple to developers to establish their website. Otherwise, everyone could change the codes, because Drupal is open source and the source code could be downloaded freely. The Drupal official website said that there are more than 15,000 developers around the world to develop the Drupal and more than 760,000 people from 228 countries are using websites build with Drupal in 181 languages (<http://Drupal.org>).

In this study, we use Geofield, Views and OpenLayers modules to provide the map services in Drupal. The Geofield module will provide a new content type, the Views module will display the map data layers and meanwhile the OpenLayers modules will provide the data source of the map data layers (Table 1).

Configurations of the Geofield module Downloaded the newest Geofield, OpenLayers and Libraries modules and put them into this directory:

<http://localhost/Drupal/sites/all/modules/>. Make a new directory named “libraies” under sites/all. Download the geoPHP library file, you also could get the software from git software repository, or downloaded it from the project of the GitHub. Unzip the geoPHP library file into sites/all/libraries. Enable Geofield, OpenLayers and Libraries modules. Add a content type named “Jingdian” in the “LABEL”, choose the “Geofield” in the “FIELD TYPE” (Fig. 1).

Configurations of the Views module The simplest method to display an OpenLayers map is using Views module. The tourism information data layer could be made by the Views module. Then we could use OpenLayers module to display the data layers. Add a new “View” in admin/structure/views/add.

In “Page details”, you could make some configuration (Fig. 2). Click the button in Fig. 3, you could see a map. If your computer connects with the Internet, there should be a map (Fig. 3).

Configurations of the OpenLayers module: OpenLayers is a JavaScript which used to develop the WebGIS clients. OpenLayers support the web service criteria, including WMS (Web Mapping Service) and WFS (Web Feature Service), which are made by OpenGIS society. Through the remote service, users could get the map data provided by the OGC service and display them in the browsers’ OpenLayers client. OpenLayers module and submodules add the OpenLayers JS library files into the Drupal, allow users get Views and fields from different map providers.

OpenLayers modules have many map layers, including Google map tiles (normal, satellite, hybrid and physical maps), three Yahoo! map tiles (satellite, street and hybrid) and three Bing map tiles (satellite, street and hybrid). The OpenLayers also need other auxiliary

Table 1: Drupal and custom modules implemented in our website

Parameters	Name	Functionality	Download address
CMS	Drupal 7.21	Mapping service	http://www.drupal.org/
Modules and plugins	Captcha, recaptcha	Anti-spam	http://www.drupal.org/project/
	Orchid	Exchange accounts	
	Geofield, geoPHP, openlayers, views	Map display	
	Ctools, Entity, features, libraries, panels, pathauto, reference, rules, services, token	Universal auxiliary modules	
	Flickr, JiaThis, fivestar, API, voting, voting up/down, Private Messages, Userpoints	Social modules	
	Wysiwyg, IMCE, IMCE Wysiwyg	Editor	

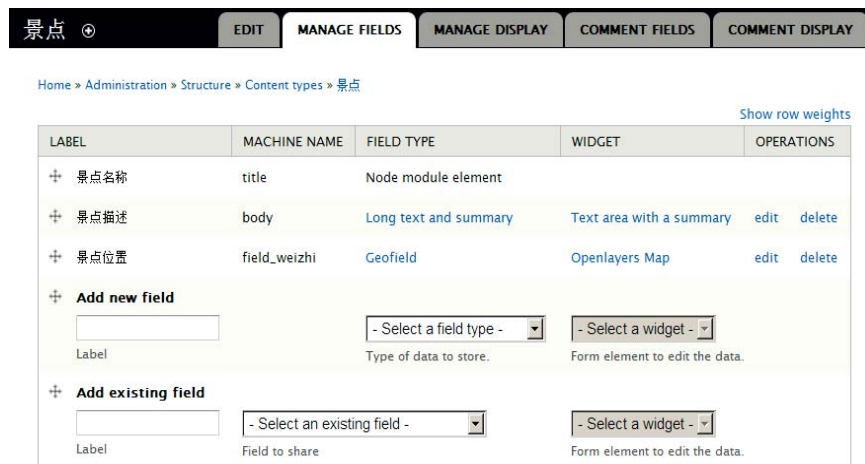


Fig. 1: Content type configuration of the “Jingdian”

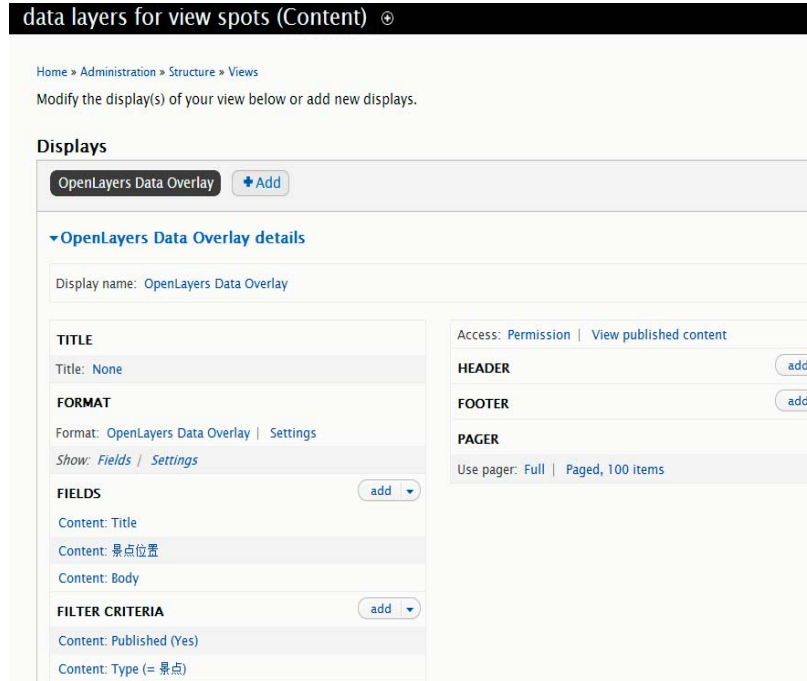


Fig. 2: Configurations of the views module



Fig. 3: Display the openlayers map by using views module



Fig. 4: Configurations of OpenLayers

modules to fulfill some functionality, such as: Libraries API, Proj4js, CTools, Views and geoPHP.

In order to separate it from other map data, we will make a custom map layer in our website, to display the tourism information (Fig. 4). The homepage of the Drupal could be seen below (Fig. 5, 6).

Configurations of the vanilla and wordpress: We use the Vanilla to build our forum; the WordPress will be used as a blog (Table 2). In the blog, the photos in the Flickr could be seen (Fig. 7).

Vanilla, WordPress Vanilla is an open source software, it support plug-ins and version using many different language could be download from its homepage (<http://Vanillaforums.org/>). The social tools and many other powerful plugins make Vanilla become more and more popular in communities' website. Vanilla is very flexible and could be connected with your own blog and much other software seamlessly. Nowadays, there are more than 500,000 websites are using Vanilla as their forums. Vanilla is one of the most powerful forum software in the world. Otherwise, Vanilla could display all posts in the homepage according to their post time. Vanilla is also very extensional by using plug-ins. As an open source software, Vanilla has more than 10,000 developers in the world. There are so many Vanilla plugins that web designer could use them to do anything they want.

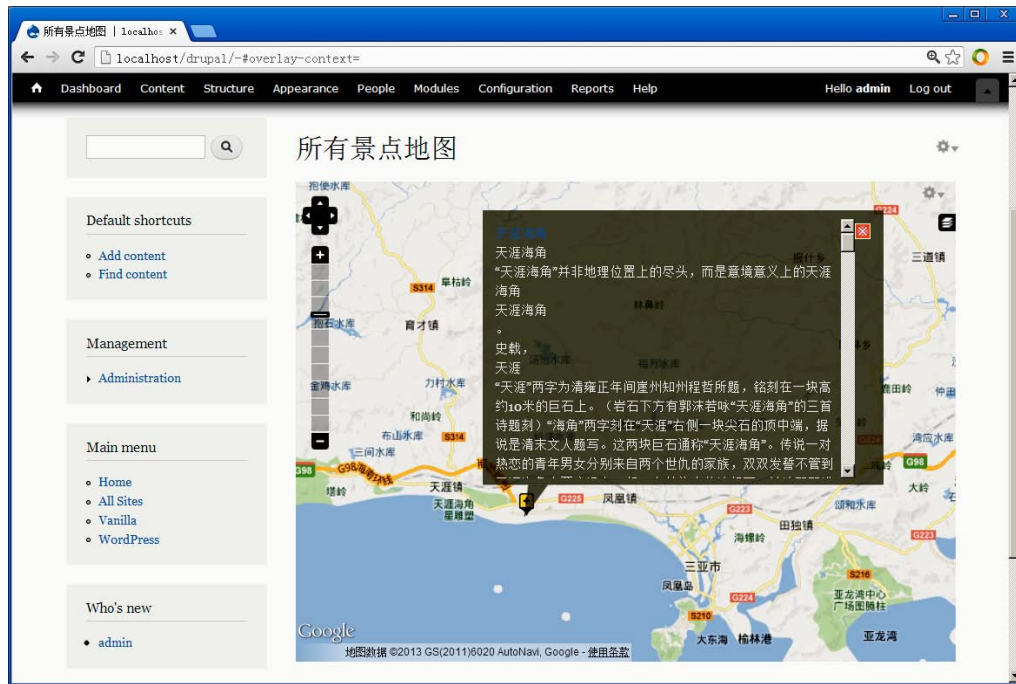


Fig. 5: Interface of the Drupal website displayed on the iPhone4. From top to down, they are OSM cycling map, Google normal map and Google hybrid map

Table 2: Vanilla, WordPress, and its plugins

Parameters	Name	Functionality	Download website
Main program	Vanilla 2.0.18.4 WordPress 3.5.1	forum blog	http://Vanillaforums.org/ http://WordPress.org/
Modules and plugins	categories2menu-plugin-1-7-2, chinese-preference-plugin-0-1b, contact-form-plugin-3.40, fileupload-plugin-1-5-2, friendslinks-plugin-0-1, jscnnect-plugin-1-0-3b, plupload-plugin-0-1b, qna-plugin-1-0-8b, signatures-plugin-1-1-5, whosonline-plugin-1-3 WP Vanilla Connect	Universal auxiliary modules Account exchange	http://Vanillaforums.org/addon/browse/plugins http://WordPress.org/extend/plugins/wp-vanilla-connect/



Fig. 6: Homepage of the Drupal website displayed on the Google Chrome browser

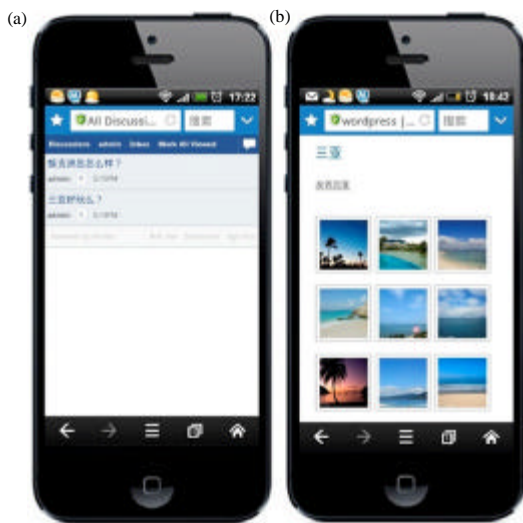


Fig. 7(a-b): Homepage of (a) Vanilla and (b) WordPress website displayed on the iPhone4

Another reason that we choose Vanilla as our forum software in the website is that Vanilla allows the Twitter, Facebook, Google and other OpenID accounts to sign in. Vanilla is the only one software that is very suitable to browse by using phones. Users could very conveniently browse the content and post information through their own smart phones.

WordPress is an open source blog software and content management system, which written in PHP and MySQL. The WordPress was developed by Matt Mullenweg and Mike Little, it is a more widely known fork of b2/cafelog is WordPress. WordPress 3.0 was download by world users more than 6500 times. There are more than 16.7% websites are using WordPress in top 1000,000 websites from Alexa rank. The WordPress is the most popular blog.

Software in the Internet: WordPress have many kinds of plug-ins. Users can upload their photos and browsing them through browser and smart phones. But the appearance is not very good. Another much more serious

JS Connect Settings		
You can connect to multiple sites that support jsConnect.		
Add Connection		
Client ID	Site Name	Authentication URL
15233787	wordpress	http://localhost/wordpress/wp-content/plugins/wp-vanilla-connect/wp-vanilla-connect.php
1936622116	drupal	http://localhost/drupal/orchid/jsconnect

Fig. 8: Configuration of the jsConnect plugin

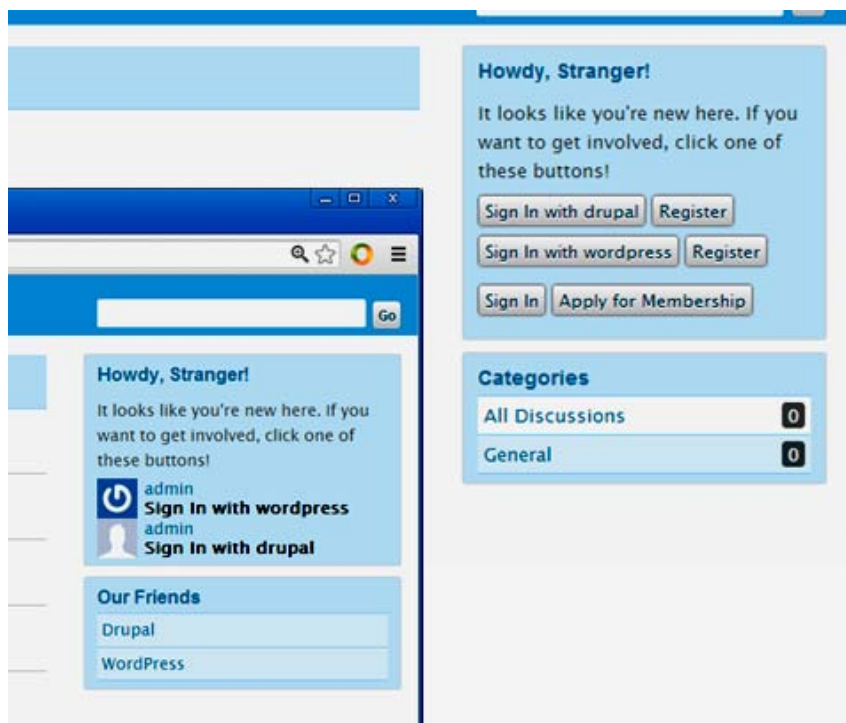


Fig. 9: Exchange accounts of the Drupal, Vanilla and WordPress

problem, the file sizes of photos are very big. Developers usually could not afford the cost of virtual disk for the website users. The Flickr.com provides the ability to upload photos, reviews and albums. So we decided to use the Flickr.com.

Browsing photos on Flickr.com Flickr.com is a website providing sharing photos services. It is a image hosting and video hosting website and web services suite that was created by Ludicorp in 2004 and acquired by Yahoo! in 2005. The AP I (Application Programming Interface) of the Flickr could support many kinds of program and systems, including the most popular iPhone and Windows 8.

We could connect our blog with the Flickr by using the Awesome Flickr Gallery plug-in, so that we could provide the powerful photo album for users. Moreover, because the photos are stored at the Flickr servers, this will reduce the cost of hardware when we build the website.

Exchange accounts of the drupal, vanilla and wordpress: Website users always want to sign in one time when they browsing the websites. For example, when one user signed in in Drupal, he/she do not want to register or sign in again in the WordPress. Otherwise, users would go through much more complex procedures when they use

the website. We use the jsConnect plugin to solve this problem. Theoretically, jsConnect could connect any website, but until now, there are only Drupal and WordPress could connect with Vanilla seamlessly. We need to configure the Orchid in Drupal and WP Vanilla Connect plug-in. In the Orchid configuration page: admin/config/Vanilla/orchid, we need to input the Client ID, Secret and address of Vanilla (Fig. 8).

After some simple configurations, we could exchange accounts among different websites. If one account signed in one website, such as Drupal or WordPress, the account was also signed in the Vanilla (Fig. 9).

DISCUSSION AND FUTURE WORK

Comparison with other similar websites: The website we built has three advantages below.

- **It is free open source website:** All software we used in this website are open source, their source code could be downloaded through internet. The developers could get the newest code from the GitHub website, such as: Drupal (<https://github.com/Drupal/Drupal>), WordPress (<https://github.com/WordPress/WordPress>) and Vanilla (<https://github.com/Vanillaforums>)
- **Enhancing the interactivities of the website:** There are many tourism information websites in China. But

all of them get the map service and navigation services from third party commercial companies. These map services are lack of interactivities, users could not change the content information and they only could get them passively. Nowadays, the Web 2.0 technology is much more popular than ever before. Website users should be the content information provider. The website we built also could provide the blog and forum services. We enabled the Private message plug-in, which allow users communicate with each other

- **Social sharing function:** By using the JiaThis module, users could share with other people on the QQ zone, SinaWeibo, Tencent Weibo, Renren and Kaixin communities (Fig. 10)

Comparisons of different map modules of Drupal and WordPress: Drupal has two modules to display the map: OpenLayers JavaScript module and GMap module from Google API. The OpenLayers module uses JavaScript API to display maps.

Comparisons of different map modules of Drupal and WordPress: Drupal has two modules to display the map: OpenLayers JavaScript module and GMap module from Google API. The OpenLayers module uses JavaScript API to display maps. It allows developers using different base tile sets, including Google Map, OpenStreetMap, Bing



Fig. 10: Transmit the content information to the Tencent Weibo by using JiaThis Plug-in

Map, Yahoo Map, etc., (Palazzolo and Turnbull, 2012). Although, the GMap module is easier to install, but GMap is belongs to Google Company, when you use it, you should get the authority from Google. Moreover, GMap module is not an open-source software, we could not get the source code. So we could not change the codes either.

Comparing with Drupal, there are many kinds of modules to display maps, such as MapPress, Google Maps Anywhere, Google Map Shortcode, they are all from Google. Just like the GMap module, it is not open source software. You even should pay for them when you use the Platium version of them.

Compare with GeoMOOSE: GeoMOOSE is a web client to display maps, it is also a very popular software in the world (Steiniger and Hunter, 2013). The configuration procedure is very simple. It also can provide different map data layers, such as GoogleMap, OSM Map. But the most drawback is that there is not one Chinese version. And it is using MSCompanion to make the further development. But the MSCompanion is not very easy to know how to use. So in this study, we do not choose GeoMOOSE.

CONCLUSION

Nowadays, there is not a very overall website to provide the interactive service on the tourism information sharing, not to mention the blog and forum at the same website. Our website can provide these services. We use Drupal, Vanilla and WordPress to build the website. Otherwise, the great number of modules and plugins of them bring a great convenient to develop the website they want.

Along with the development of the Internet technology, the architecture and function of this website need to be modification in many aspects, as well as the art design. We believe that the web designer would get more

and more code from the open source communities to renew this website, in order to improve the tourism information searching services.

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