# WEB ENABLED OPEN SOURCE GIS BASED LAND INFORMATION SYSTEM

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## ABSTRACT

*With the development of information technology, especially the internet explosion, managing and sharing data becomes easier than ever. In addition, the advent of open source software enables Web developers to save a lot of money for their projects. Moreover, current data is not only pure data attributes but also spatial data. Web technology combined with GIS technology, also known as WebGIS technology, has opened a new trend that is the management and sharing of geographic data.*

## 1. INTRODUCTION

In modern life, tourism has become essential needs of society, not only a key economic sector of the country but also a bridge of exchange between peoples, countries and regions in a country, and can contribute to improving the image of Vietnam to the world as well as countries in the region.

With the explosion of the internet, promoting travel easier and more convenient than ever. Just surf the Web; you can have a lot of information about where you want to. Put yourself in the customer, a traveler who needs two most important things is that the destination information and tourist maps. However, in the current system website, most of them only to provide information without the tourist map. Foreseeing this need, we have studied the OpenGeo Suite of open source to build a Website promoting tourism in Hue city integrated a Web-based geographic information system (GIS) utility has many friendly most customers, the best service to customers.

## 2. WEBGIS AND OPENGEOSUITE

WebGIS is a combination of two components such as Web and GIS, WebGIS for the functions of Gis given up on the Web via a network environment. The user at the client can easily access, query, manipulate, and edit geographic data with the basic functions of GIS without having to have knowledge and experience in Gis.

### 2.1 Webgis Architecture

A typical client is a Web browser and server-side includes a Web Server that provides a WebGIS software programs. Client often requires a map or a few images processing geographic information through the Web to a remote server. Server required conversion into the internal code and call the functions of GIS by forwarding requests to the WebGIS software. The software returns the results, then results are formatted for presentation by the browser. The server then returns the results to the client to display or send the data and analysis tools to the Client for use in the client.
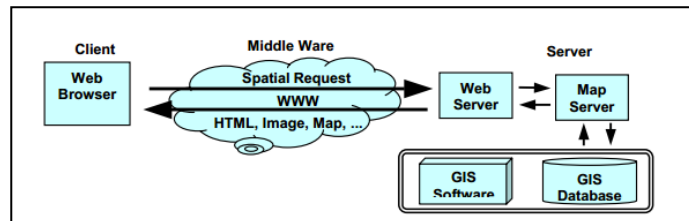


**Fig. 1. The architectural diagram for a generic web application**

## 2.2 Opengeo Suite architecture

The OpenGeo Suite brings together the OpenGeo Architecture into a single, easy-to-install integrated software package. By developing each individual component of the OpenGeo Suite individually, OpenGeo Suite is the fastest way to get your geospatial information on the web, leveraging the power of best-of-breed open source geospatial software...
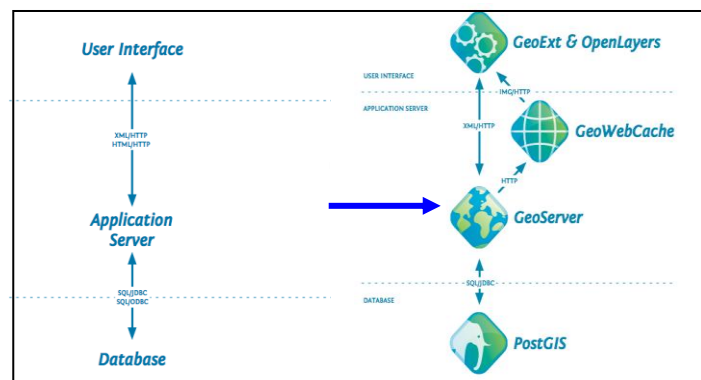


**Fig. 2. The OpenGeo architecture**

PostGis: database management system.
GeoServer: Server.
GeoWebCache: Caching to speed up map display.
GeoEditor: Add, modify and delete database.
Styler: Styled Layer Descriptor.
GeoExplorer (OpenLayers and GeoExt): composes map layers into web-based interactive applications.

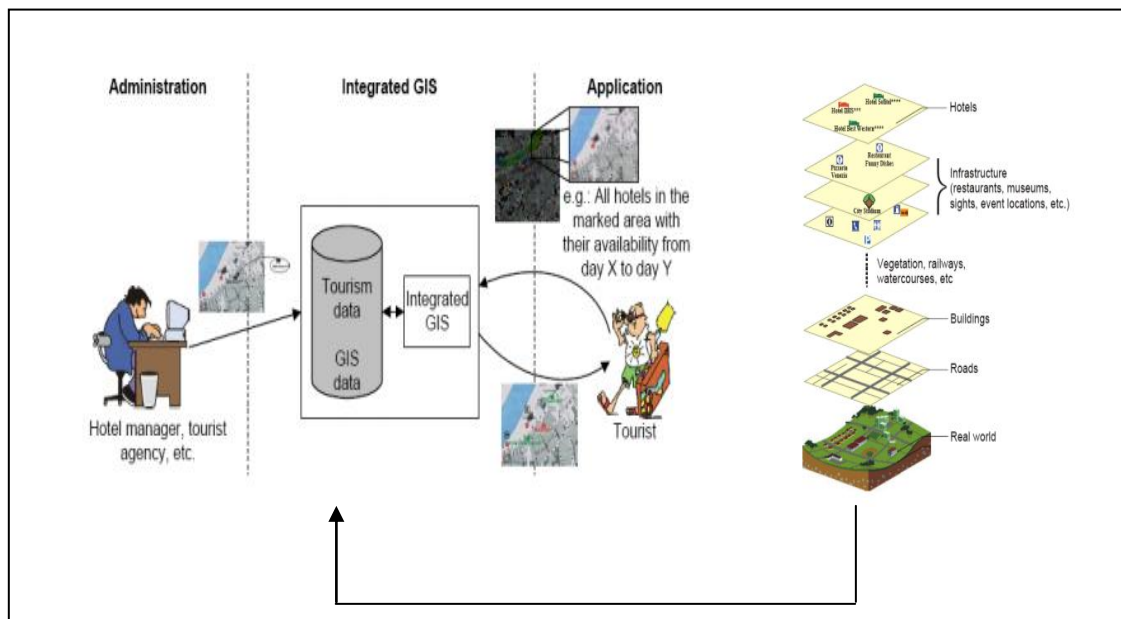## 2.3 The process of building Hue city tour WebSite

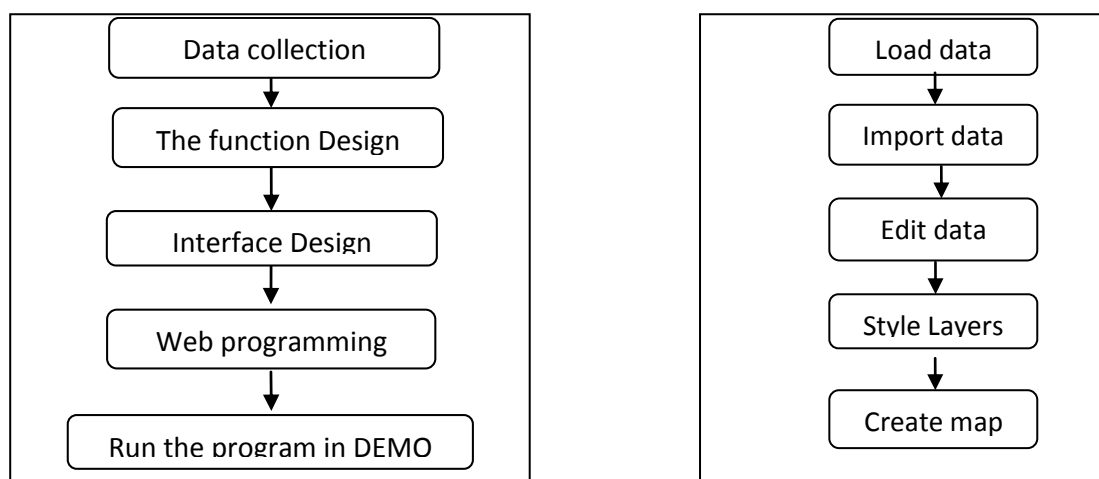**Figure 3. The structure of a WebGIS**

To build a structure webgis, we must execute:



**Fig. 4. Processing diagram of establishing Hue's tourism WebGIS**

## 3. RESULTS

**Table 1. Basic functions of Hue's tourism WebGis**

| ID | icon | Function | Interpretation |
|----|------|----------|----------------|
| 1 | | Layer Switcher | Show the layer according to user requirements |
| 2 | | Print map | Print out an area as required by the users in pdf file |
| 3 | | Pan map | Move map to the left, right, up, down below to go to different areas on the map |

| 4 | | Get feature infor | Get the information of the object when the user clicks on the object space |
|---|---|---|---|
| 5 | | Mesuare length/area | Users can draw directly into the map and get the values of distance, area |
| 6 | | Zoom in/out | Zoom in different proportions |
| 7 | | Previous extent and Next extent | Show map in level previous zoom or level of next zoom |
| 8 | | Max extent | Show full map |
| 9 | | Show legend | Annotation objects on the map to the user by displaying data |
| 1 0 | Tìm kiếm | Find locations | Show details for search sites |



**Fig. 5. Interface of the home page**
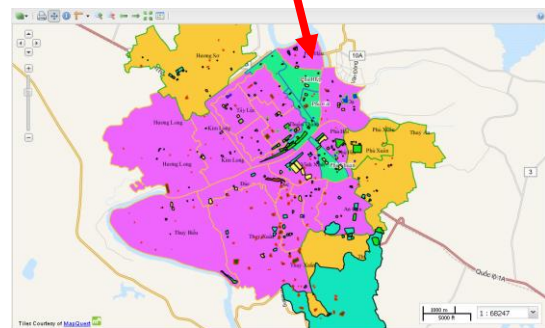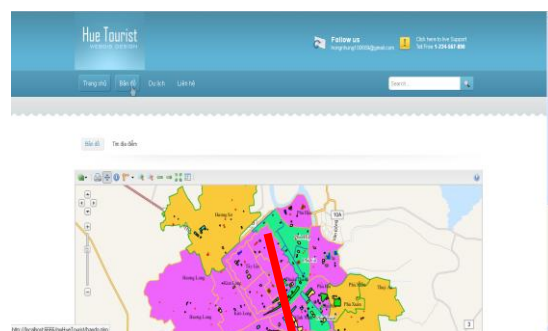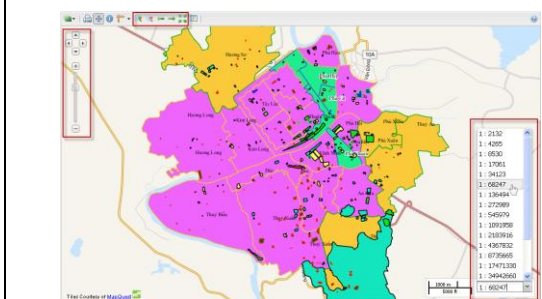


**Fig. 6. The zoom tool**



**Fig. 7. Map layout**
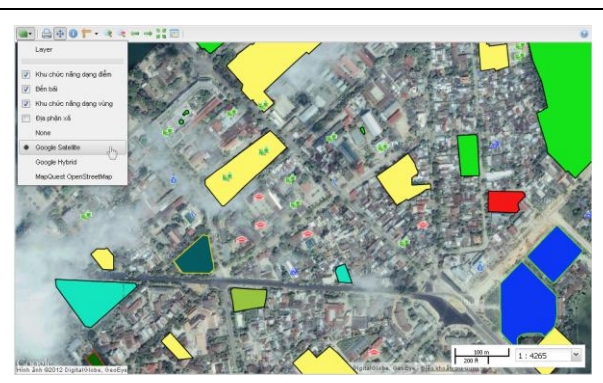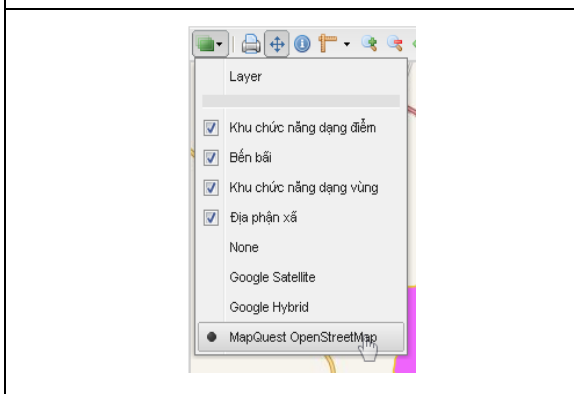
| | |
|---|---|
| **Fig. 8. Layer functions** | **Fig. 9. data layers on the Google Satellite** |



| | |
|---|---|
| **Fig. 10. data layers on the Google Hybrid** | **Fig. 11. data layers on the MapQuest OpenStreetMap** |



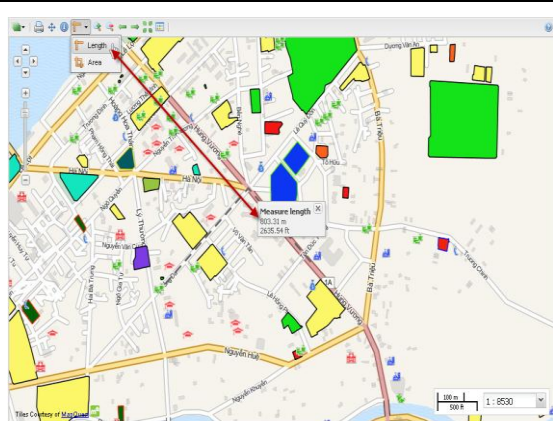| | |
|---|---|
| **Fig. 12. Legend of the data layers** | **Fig. 13. Queries information** |



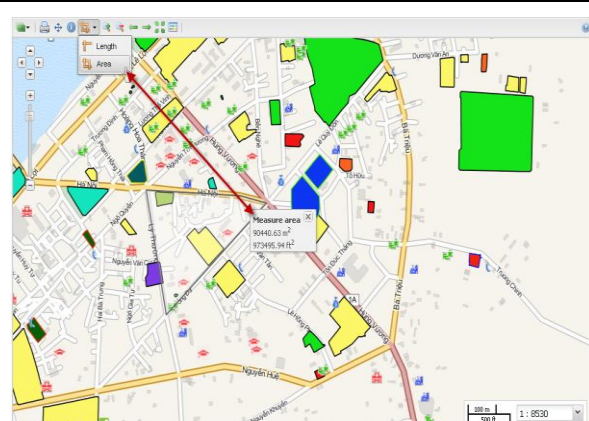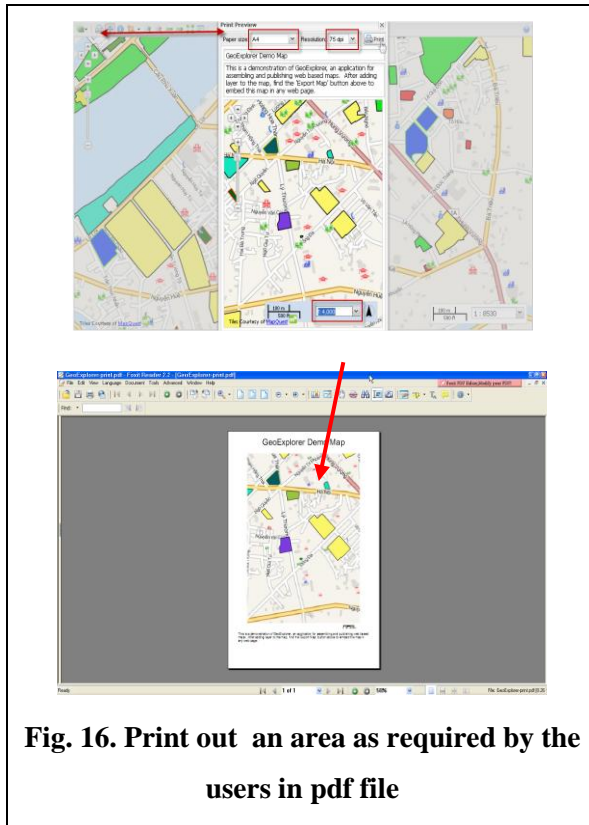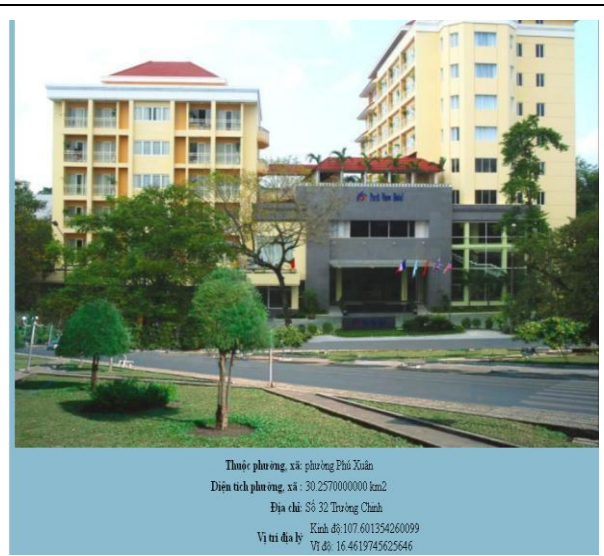| | |
|---|---|
| **Fig. 14. Distance extraction** | **Fig. 15. Area extraction** |
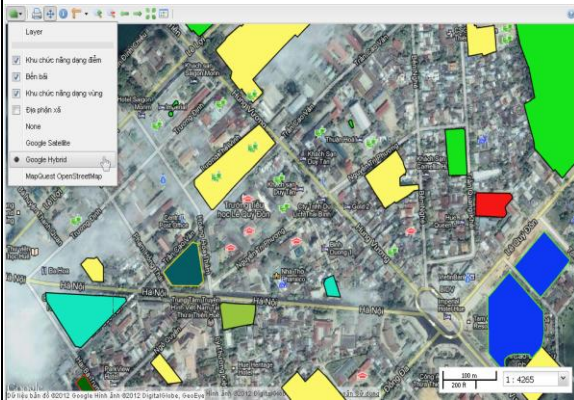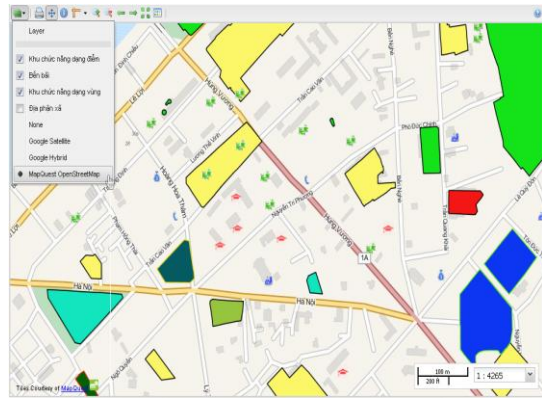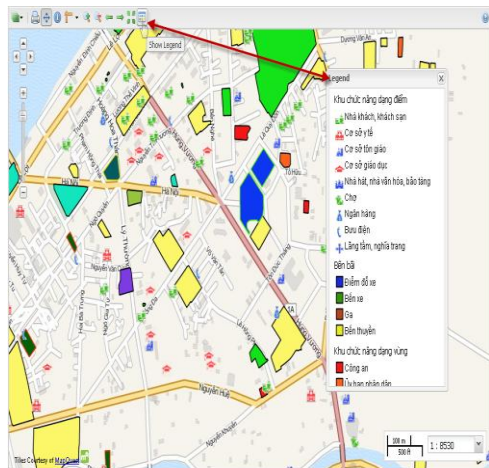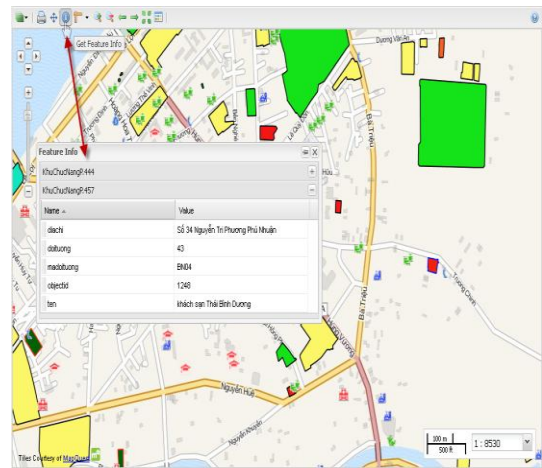
**Fig. 16. Print out an area as required by the users in pdf file**



Thuộc phường, xã: phường Phú Xuân
Diện tích phường, xã : 30.25700000000 km2
Địa chỉ: Số 32 Trường Chinh
Vị trí địa lý  Kinh độ:107.601354260099
Vĩ độ: 16.4619745625646

**Fig. 17. Show details for search sites**

## 4.    SUMMARY

Website is built on the OpenGeo Suite software interoperability with powerful online and can meet the storage requirements, security, sharing and displaying spatial data efficiently, speed high. The program contributed to a database system and spatial properties have the ability to share and process information online. From WebGIS site, users do not have to purchase and install the GIS computer programs that can be analyzed, computing, storage, information sharing environment directly through the program is built with a computer that has Internet connection and any web browser .

## 5.    REFERENCES

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[2]   http://PostGis.org/

[3]   http://geoServer.org

[4]  http://www.openlayers.org/

[5]   http://geoext.org/

[6]  http://www.climategis.com/