

Model development for web - atlas system applying in administration management

Bui Ngoc Quy

Department of Cartography, University of Mining and Geology, Viet Nam
E-mail: Buingocquy@humg.edu.vn

Abstract. Traditionally, the maps are very important tools in government management and decision making. Nowadays, information technologies blooming as well as wide spreaded of internet involve the evolution in cartography technologies. The combining of cartography and internet creating new map generation - web maps. This new maps allow users see and apply it in any place which have internet connection. Web maps have many advances over traditional maps. Therefore, there are many researcher applying them in socio-economical and culture aspects. This paper describes research results in development of a model for web atlas applying in administration management in Hanoi, Vietnam.

Keywords. Webatlas, Web Map, Electronic Atlas, Internet map, Administration management.

1. Introduction

Administrative management is a very important field and has a huge impact on political stability and socio-economic development of a country or locality. The socio – economic constantly evolving, so the management of state administration must also be constantly improved, enhanced and completed to meet the requirements of each development period of nation. Map and GIS technologies have been continuously improving and perfecting support management and decision support for authorities[1]. The construction of webatlas support system for the administrative management is acritical issue, especially as the Internet infrastructure has been developed as today.

2. WebAtlas design model to support the administration

2.1. Technology based

In [2, 3] presented the method of construction and development of systems based on Map-Xtreme webatlas. This is a method to optimizes using the database map that the agencies is carrying out construction. This paper present the MapXtreme application for building a system to management, display, analysis, calculation for a Web-based

managing administration together with geographical information systems to help users to easily access and use information that is most intuitive.

2.2. Main design

2.2.1. Workflow (figure 1)

Applications are developed on the web environment, the map developed on MapInfo's MapXtreme environments follow the geographic information system's standards [4, 5]; the system's functions are developed in Microsoft ASP.Net.

2.2.2. Database development

The administrative map database is based on MapInfo format. All data used overall administration base and a decentralized level of detail by three administrative levels: City; the district-towns; communes, wards and townships.

2.2.3. Site administration design

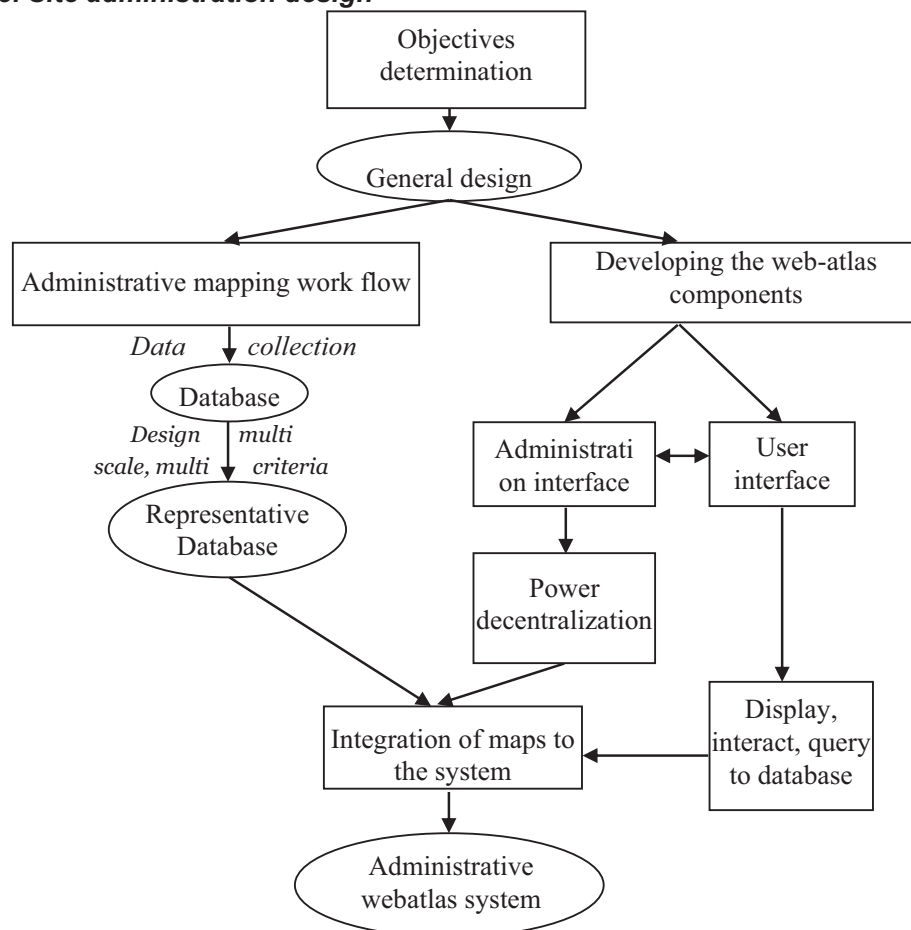


Figure 1. Web-atlas sytem development work

An administration of a website system is updates, fixes and adds information. So, depending on the purpose of each site that needs to system administration interface design accordingly. For the administrative web-atlas system, the interface is designed to easily identify and decentralization of administrative units under the directory tree. In this directory tree each directory level would be corresponded to a level administrative unit (City, County, district towns, commune, ward or township). In the system administration, there are tools to manipulate the map as the user interface, however there are some differences such as management: decentralized power to the system log, update and repair database.

2.2.4. Designing the user interface

The user interface is designed with many different functional groups menu such as interacting with the map; display attribute information, query information on maps and in data-bases; create the thematic map database, ...

2.2.4.1. Designing the directory tree for administrative units

The administrative units in the webatlas system is designed in directory tree similar as in the system administrator. Each administrative unit in the city will be linked to a site map and the corresponding database attribute. Users can click to search for administrative units as well as related information and displays the map of administrative units on the website interface.

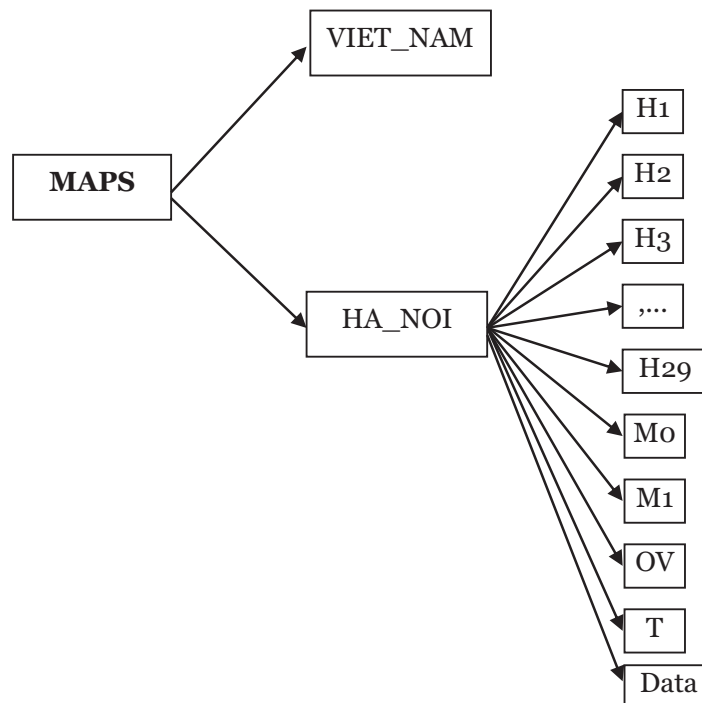


Figure 2. Database storage in atlas.

MAPS (The folder to store the map data)	
H1	(Map of Ba Dinh District)
H2	(Map of Ba Vi District)
...	...
H29	(Map of Tu Liem District)
M0	(The first scale map display)
M1	(The second scale map display)
T	(Full scale map display in Ha Noi)
Data	(Database of administration information structure, maps and annually data...)

Table 1. Database storage in atlas

ID	Name of admintration unit	Unit
T	Hanoi Capital	1
H1	Ba Dinh District	2
H1_X1	Quan Thanh Commune	3
H1_X3	Doi Can Commune	3
...
H2	Ba Vi District	2
H2_X1	Phu Chau Commune	3
H2_X2	Tay Dang Town	3
...
H3	Cau Giay District	2
H4	Dong Da District	2
...

Table2. Database storage of admintration unit

2.2.4.2. Developing the basic functions

Web-atlas system is designed as an interact-tive software with maps through the web, users can display the entire map on the interface or it can turn on / off separately to display the content layer maps; can zoom in, zoom out, move the map in different directions; map display according to the different scale, mea-sure distances on the map, display information properties of all objects on the map, ...

Below is a description of the code for some basic tools to interact with Webbased map [5]:

+ Zoom in:

```
<cong_cu_bd:ZoomInTool ID="ZoomInTool1" runat="server"
MapControlID="MapControl1"/>
```

+ Zoom out:

```
<cong_cu_bd:ZoomOutToolID="ZoomOutTool1"runat="server"
MapControlID="MapControl1"/>
```

+ Pan move:

```
<cong_cu_bd:PanTool ID="PanTool1"runat="server" MapControlID="MapControl1"/>
```

+ Scale:

```
<cong_cu_bd:ZoomBarTool ID="ZoomBarTool1" runat="server" ZoomLevel="12500"
MapControlID="MapControl1" />
```

```

<cong_cu_bd:ZoomBarTool ID="ZoomBarTool2" runat="server" ZoomLevel="6500"
    MapControlID="MapControl1" />
<cong_cu_bd:ZoomBarTool ID="ZoomBarTool3" runat="server" ZoomLevel="3550"
    MapControlID="MapControl1" />
<cong_cu_bd:ZoomBarTool ID="ZoomBarTool4" runat="server" ZoomLevel="1500"
    MapControlID="MapControl1" />
<cong_cu_bd:ZoomBarTool ID="ZoomBarTool7" runat="server" ZoomLevel="500"
    MapControlID="MapControl1" />

```

2.2.4.3. Develop the function to create them-atic maps on webatlas

Besides the basic functions to interact with the map, Hanoi administration web-atlas system was built to create a thematic criteria different from base map data and attribute information in database systems. The system can perform creation of administrative units based on the data area, population, ... combined with the color index; the division level indicator which produces thematic maps on the website.

2.2.4.4. Develop the advanced query function

The system is to build an engine to search objects on the map at all administrative levels (city, county, district communes, wards, towns, villages, ...). After performing this search function, the user can display a map of the objects on the search interface of web-atlas. In addition, this tool can also search for administrative units according to statistics (area, population, ...) and display maps for the administrative units that can simultaneously view all details of those administrative units.

3. Result

3.1. Main system administration

Database administration via secure web system with account and password for each member of the system.

Figure 3. Login.

After login, depending on which authority is permitted administrators can use the different functions of the system, management system is divided into 3 levels (1st, 2nd and 3rd) corresponding to administrative level (city, district and commune district). The 1st level administrators can use all the functions of the system.

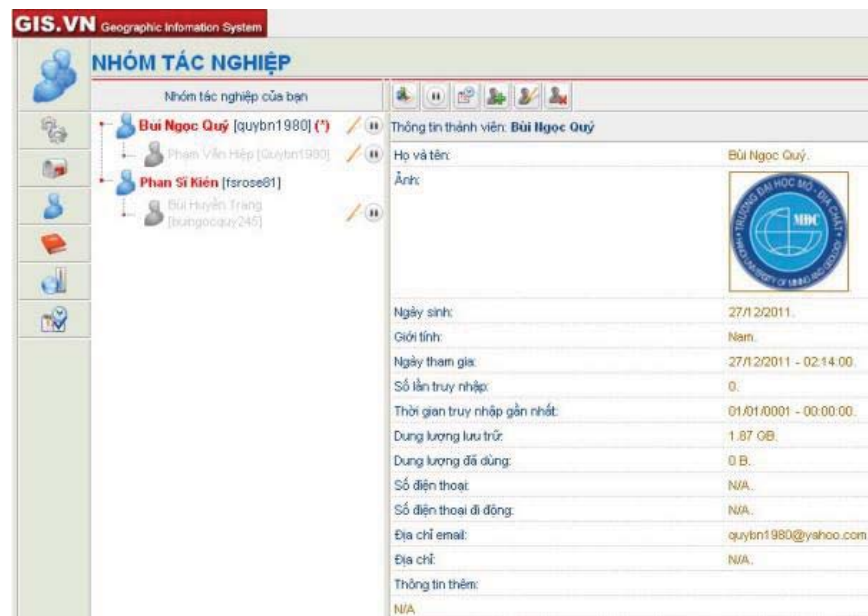


Figure 4. User interface of system administration and member administration.

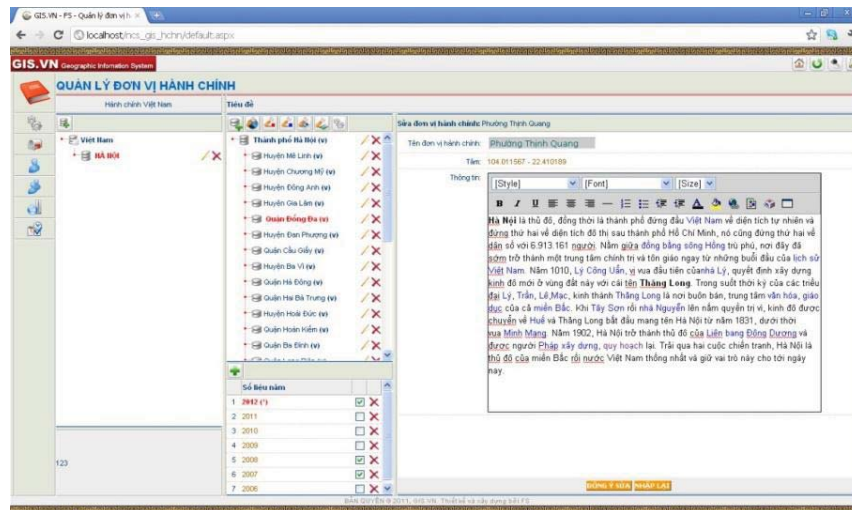


Figure 5. Updating the information for administrative units.

With the functions of the system administrator, we can update the administrative data such as area, population, population density, number of male, female,... the multimedia data, the inventory report, the documents via e-mail system or other features of the system.

3.2. User interface

Users can use the utilities of Web-atlas system to lookup the information is integrated on the map by the support tools as zoom in, zoom out, move, measuring, search, create thematic maps, ...

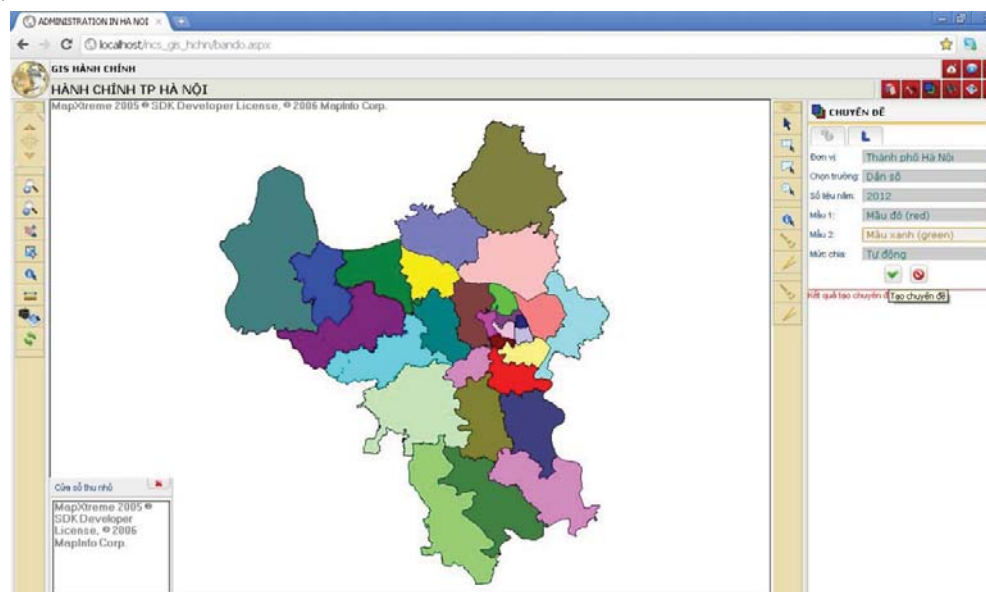


Figure 6. Create the thematic map based on database in web-atlas system.

4. Conclusion

Through research and practical implementation web-atlas systems for the administration of Hanoi, we found Web-atlas system can be installed on personal computers, local area network or internet and can be applied to the provincial-level administrative divisions, cities, the departments management ... system can help the managers, experts, ordinary users can use to view, search, searching, analysis and calculations ... The administrative information based website together with geographical information systems in an intuitive way on the map. The system can edit, update, supplement easily at any time on the system. Create and display thematic map quickly with supporting multi-criteria criteria and multi-temporal data of different years for the comparison and evaluation of a more favorable way. The information provided on the system along multiple dimensions: both on the map, search by administrative units, search by objects ...

With this model, we can create an archive system information to help the leaders, professionals, researchers ... have complement views on the administrative of Hanoi in particular and the provinces in the country in general. That can help to make policy, strategy or prediction for the next year more convenient and simple as to compare against the data in the text.

The development of map and GIS technologies, together with the rise of the Internet infrastructure of the localities in our country today is the deployment of administrative web-atlas systems support for management of the provinces is entirely feasible. However, the extensive development system should pay attention to the security issues.

References

- Menno-Jan Kraak and Allan Brown, "Web Cartography", ITC-Division of Geoinformatics, Cartography and Visualisation, Enschede, The Netherlands.
- Bui Ngoc Quy, "Establishing and developing Web Atlas system base on Mapxtreme foundation" Scientific-Technical Journal of Mining and Geology, No. 34; 4/2011, page 59 -63; ISSN 1859-1469.
- Bui Ngoc Quy, et al "Application of Electronic Atlas for Land management in Ha Noi", VNU Journal of Science, Earth Sciences, 25 (2009) 153.
- Bui Ngoc Quy, "Researching and constructing of Administrative Electronic Atlas of Hanoi", Scientific-Technical Journal of Mining and Geology No. 27; 2009, page 100-105; ISSN 1859-1469.
- MapXtreme 2005 Developer Guide (2006), MapInfo Corporation.