

Scenario

Surrounded by high mountains, with average altitude from 380 to 2000 meters, Fu Hsing Township in Taoyuan County is measured 350.7775 square kilometers. In such natural environment, the scenery is beautiful, but the attractive natural environment takes the local government a great deal of budget to maintain the roads and bridges or to fix them when the facilities are damaged. In respect of management, except for the provincial highways, county roads and township roads which are given ID number, the rest of village roads, farm roads, and bridges are not given ID number whose basic records are not recorded, either. Moreover, the staff transaction may cause the management problems of engineering and property.

In order to effectively solve the described problems and create a set of sustainable mechanism suitable for this township, the Fu Hsing township office plans to build a complete set of GIS system with expectation of storing and managing geospatial data and acting as the aided tool for policy maker to make the decision with better efficiency and correctness.

Solutions

To effectively apply the census and the result, this project has designed a complete database of farm roads and bridges, and with the map server a complete set of WebGIS system is built up.

“Farm Roads and Bridges Information System” is the Web-GIS system built for this project. The database is built using Microsoft Windows SQL Server 2000, and with the internet map server—SuperWebGIS as the map server; the system can generate maps and provide GIS functions. In respect of web development, ASP.NET 2.0 / JavaScript is used to design the web. In the future users in related units do not need to install any internet browser plug-ins but simply through the browser software of Win 2000 or Win XP operating system to use the functions provided in the system.



Farm Roads and Bridges Information System Interface

Solutions

- Build a set of Web-GIS system with SuperWebGIS.
- File display, query and management can be conducted online via Web-GIS.

Results

The roads and bridges data in Fu Hsing township and the GIS position function are the major part of “Farm Roads and Bridges Information System”; moreover, the internet GIS function is built with Web-GIS technology, allowing users in all units to do query or orientation on web.

The system function architecture can be divided into four parts: Basic Map Manipulation, Thematic Layer Query, GIS Position and Management.

- 1. Basic Map Manipulation:** “Farm Roads and Bridges Information System” provides various map browse tools, and users can use Zoom to Full Extent, Zoom In/Out, Pan or Measure tools to do basic browsing according to the needs.
- 2. Thematic Layer Query:** “Farm Roads and Bridges Information System” provides various layer data such as bridge, mile point, disaster point, suspension bridge, cadastral map, road, aerial photography, terrain map, etc. As users directly click any bridge, mile point or disaster point, the attribute data of ID number, road name, distance and village name and the surveying photography of the clicked centroid will show on the screen.

Besides, if the user has the administrator authentication, the attribute data of the facility can be modified with the modification function.

- 3. GIS Position:** “Farm Roads and Bridges Information System” provides ten methods to position: Village Position, Cadastral Position, Coordinate Position, Mile Point Position, Farm Road Position, Bridge Position, Damaged Road Position, Damaged Bridge Position and Suspension Bridge Position. Users can select the suitable position method according to the need through clicking the list to rapidly and efficiently search the wanted centroid.

- 4. File Editing and Management:** The system uses account authentication mechanism as the foundation of the web management. Through the account authentication, users can manage web, increase or modify disaster centroid, load road maintaining data or load farm roads according to the authentication so that data is maintained and updated.

“Farm Roads and Bridges Information System” can act as the basis for construction unit when proceeding with the construction and resource distribution, which can effectively prevent the same project from being repeatedly budgeted due to engineering staff transaction. Also, it assists the financial administrative unit to precisely control the budget by managing the accurate data of roads and bridges, reducing the unnecessary expense. Furthermore, “Farm Roads and Bridges Information System” provides a cross-unit service platform for integration of geographic information files and system. As a result, the business procedure is effectively simplified, the administrative cost has been significantly reduced by 18% and the service quality and efficiency is also improved.



Through “Suspension Bridge Position” method, the wanted centroid can be found out rapidly.

Results

- The WebGIS architecture can be the basis for the construction unit when proceeding construction and distributing resources, and the financial unit can also effectively control the budget by managing the roads and bridges data through the system.
- Cross-unit service platform can effectively simplify the business procedure, reduce the administrative cost and improve the service quality and efficiency.

Software Used

- SuperWebGIS 2.1
- Microsoft® Windows Server 2003
- Microsoft® SQL Server 2003