Design and Implementation of Police Mobile GIS Command System

Chao Wang

Wenzhou Institute of Surveying and Mapping, Wenzhou, Zhejiang, 325000, China

Abstract: The current situation and demand of police management based on geographic information, networking, cloud computing, webService, arcgisServer and Wencheng public security, put forward the general idea to build a set of mobile police office system, and discusses the SOA architecture, data integration, data mining, data storage and visualization of mobile Internet the key content of the final completion of a complete set of police mobile command system GIS.

Keywords: GIS geographic information; Internet of things; Sky map; Mobile office

Corresponding Author: Wang Chao (1983-), male, national registered surveyor, mainly engaged in surveying and mapping geographic information related work. Email, 122353122@qq.com.

1. Introduction

With the deployment of police geographic information system (PGIS), various demonstration applications based on PGIS are running on the line, and the GIS based police information construction is playing an increasingly important role.[1] The public security police command in Wencheng deployment, the police through the intercom and command center communication and confirmation, so the command center to understand the distribution of police dispatcher, but when there is an emergency command center, police personnel according to the distribution of knowledge, experience from the incident to the nearest police resources, and scheduling. This method has certain scheduling delay and uncertainty, and requires the dispatcher to have a deep understanding of the local terrain conditions, high requirements for person-nel. When it is necessary to command and arrange multi police containment, it is a great test for the commanders. Therefore, it is urgent to study and construct a police command system based on mobile GIS, which can help command center spatial visualization to understand the distribution of real-time police force, and provide space analysis assistance for dispatching command.[2]

2. Architecture Design

2.1 Architecture Design

The project to the information infrastructure to support geographic information resources as the basis, the comprehensive use of computer technology, communication technology, GIS technology, data integration technology, the technical architecture of unified, the police data and geographic information resources organically, realizes

the online geographic information convenient, efficient and secure sharing service. Through the level of division was decomposed into several logical platform, reduce the implementation complexity, three-dimensional network structure characteristics of the whole structure presents a longitudinal multi-level, transverse grid, support layer, data layer, service layer, application layer, platform layer five parts of front-end users through hardware and software construction, realize integrated the application of integrated service management, geographic information data and thematic data such as police information of multivariate data. The system is divided into the following layers:

1) Hardware support layer: software and hardware support layer is the main platform running support, including database server, application server, network equipment, operating system software and other facilities for Wencheng County Public Security Bureau police electronic map based on the construction of police command system of mobile GIS to provide hardware and software support. The hardware equipment needed for this project mainly comes from the software and hardware purchased by Wenzhou public security PGIS platform. Including ArcgisServer basic GIS platform, Skyline three dimensional service platform, Oracle database software, etc.

2) Data layer: data layer is the main function layer of storage and management of data, responsible for data storage logic rules, data reading and writing, data backup and other functions. It includes database software, data processing program and database. The database includes spatial database and police integrated information database. Spatial database includes: map database, place name address, road network database, 3D scene database. Police comprehensive information resource database includes: the police information database, the deployment of police information database, light engineering database.

3) Service layer: service layer connection data and applications, will provide data to users in the form of services, all data access and processing logic is encapsulated into a service, make use of data more secure and convenient, efficient sharing. Including 2D map service, image map service, dynamic thematic map service, address matching service, spatial query and spatial analysis service, service, service, service three emergency police information etc.

4) Application layer: the application layer is the interface for users to provide various business functions and interaction, the service layer provides various services package provides users with friendly interface function, for user

interaction. Including map browsing, map switching function and address query function, path analysis function, police information query and display function, the deployment of police function, online collection function, emergency function etc.

5) Front-End user layer: this project front-end users can use PC end and mobile end of these two kinds of hardware to view and use the system. PC can use any public security network machine, through the browser to visit the city public security PGIS platform, browse the data results of the project construction. Mobile police use standard communication equipment, connected through public security network security client in the PSTROE platform to download and install Wencheng police command system, you can log in using.

2.2 Network Architecture

Network architecture will mainly use public security private network, mobile terminal network using Telecom or mobile network operators VPN services and servers to connect, to form a reliable communication between internal and external network equipment. The police command system is deployed in the hardware server provided by the City Public Security Bureau, and uses the same computer room environment as the original PGIS server and PSTORE platform to ensure the normal and stable operation of the system. Project procurement server equipment is mainly used for emergency command system Wencheng deployment, through various departments linkage intranet docking emergency linkage.
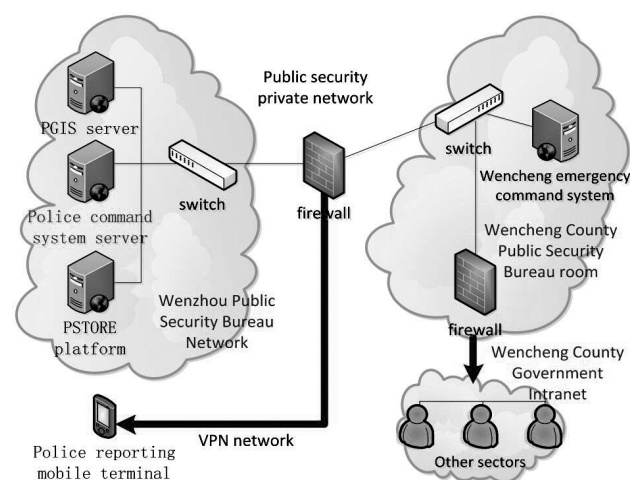

Figure 1. Network architecture diagram

3. Function Design

3.1 Police Online

In the map, the location of the online police officers is

displayed in the form of dots and icons, and the basic information of the online police officers can be viewed. You can also query the police at the query interface, and get the police information and locate it on the map.

3.2 Police Cars Online

Show the position of the online police car on the map, and view the basic information of the online police car. Provide vehicle query function, according to the keywords query police car, access to police car information and positioning on the map. It can be used to understand the position of the police car in real time, and provide the basis for the reasonable call of the police car.

3.3 Sentry Box Online

In the map according to a variety of box categories, classified display box position distribution, and can view the basic information of the box. Provide post query function for the user, according to the keyword search box, get information booth and locate on the map, so that the user can understand the real-time online public security status, provide the means for the public security lights project inspector.

3.4 Electronic Monitoring Display

The position distribution of the electronic monitoring equipment is displayed on the map, and the basic information of the electronic monitoring equipment can be viewed. Provide electronic monitoring query according to the keyword query function, electronic monitoring, electronic monitoring and positioning to obtain information on the map, based on the map, quickly find a point near the electronic monitoring equipment, to provide help for the rapid and accurate monitoring of video call.

3.5 Position Service

In the map to display their geographical location, and as a location information transmitted to the background command center, so that the auxiliary decision-making system can update the police position in real time, and shared to other police officers.

3.6 Place Name Address Service

We can query the address database according to the keyword, and locate the result of the query on the map. We can also query the nearest address description of the location according to the location selected on the map.

3.7 Path Planning

According to the two points on the map, the road path planning between two points is analyzed to find the path between two points, and show them on the map, at the same time express the starting point to the end of the path of travel.

3.8 Deployment of Police Force Command

Provide the police command function deployment in the mobile terminal, the deployment of police officers, police and other police checkpoints, facilities in the key position, set up patrol path, set the alarm range, the deployment of participants can see the specific circumstances of the deployment, and arrive at their posts according to the requirements. Deployment personnel can view all kinds of deployment through mobile phone, and adjust.

3.9 Emergency Plan Management

Plotting the emergency plan based on electronic map generation, aid distribution, rescue personnel evacuation routes, route plan, to prepare for the event of an emergency, can quickly call the emergency plan, the formation of a scientific and reasonable rapid decision-making.

3.10 Online Data Acquisition

On the map quickly and manually drawing point line area, mobile acquisition roads, residential, points of interest and other data can be saved offline, online upload space database, realize the dynamic updating of spatial data.

4. Concluding Remarks

The goal of this project is to build a set of internal and external cooperation of police command system combined with mobile GIS technology.[3,4] In Wencheng County topographic map data, image data, refinement of the road and cell data under the support of the PGIS platform and PSTORE platform mobile terminal security construction of two development based on providing public security intelligence data (Wencheng police officers, police cars, lights, booth, electronic monitoring) space display solutions. And value-added services, auxiliary police to quickly manage scheduling and deployment of police resources, serving the people.

References

[1] Deren Li, Zequn Guan. Integration and implementation of spatial information systems[M]. Wuhan University of Surveying and Mapping Press, 2000. (in Chinese)

[2] Guang Liu, Jingwen Ceng, Qingfeng Zeng. WebGIS principle and application development[M]. Tsinghua University press, 2016. (in Chinese)

[3] Libo Yao, Renli Wang. GIS data management based on Oracle Spatial spatial database[J]. Mapping and Geospatial Information, 2006,29(2):81-83. (in Chinese)

[4] Gang Zhang, Yingjuan Shang. Spatial data organization and management based on[J]. ArcSDE Research and Development, 2007(9):58-65. (in Chinese)