

Design and Implementation of Mobile Police Based on Big Data

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Abstract—In recent years, big data processing related theories and techniques get more and more attention from industry and academic. On the one hand, the scientific research produces a large amount of data. Analyzing these data is an important part for scientific research. On the other hand, with the continuous development of information technology, enterprises accumulate a large amount of structured and unstructured data during informatization process. MAPGIS mobile police operational platform is based on existing police geographic information system and other police service system construction and application, the application of mobile computing, wireless communication, space geographic information, intelligent information service technology and meet requirement of front-line police officers in multiple data fusion, information integration, collaboration, real-time monitoring, real-time communication, real-time command and real-time scheduling and other major business, and has distinct mobile Internet era characteristics of modern police integrated service management system.

Keywords- MapGIS mobile police combat platform; police geographic information system; mobile GIS technology; software design; real time communication

I. INTRODUCTION

Since 2002, mobile police in many provinces and cities in the domestic public security departments began to apply. "Golden Shield Project" phase II projects focus on police geographic information system to promote the construction of public security information continue to improve, the public security industry in our country begun to taste the sweetness of information. Social security situation and modern crime means upgrade, began to test the ability of front-line police officers^[1-2]. Existing police geographic information system and other police information platform focus on information resource integration and flat conductor scheduling, to move individual information and applications has been little involved^[3]. Considering the characteristics of the frontline policemen mobility, sudden and urgent task of strong, how to let the police at the scene "eye view four, ears", in the shortest time and command center information exchange to share^[4]. The simplest process to maximize the scene processing business, the deepest level of statistical analysis all kinds of data, allowing officers to master information update more accurate, faster response, it is the core problem of mobile police development need to face^[5].

The MAPGIS mobile police operational platform is based on the existing police geographic information system and other police business system construction and

application based, mobile technology in the application of calculation, wireless communication, space geographic information, intelligent information service in the existing system, achieve the mobile geographic information technology and real-time retrieval, decision-making and command service effective integration to meet needs of industry security in data fusion, information integration, collaboration, real-time monitoring, real-time communication, real-time command and real-time scheduling and other major business, construction with distinct mobile Internet era characteristics of modern police integrated service management system^[6].

II. STATUS QUO ANALYSIS

From the existing police mobile applications, mainly in the following aspects: (1) the lack of more police business software support, business intelligence analysis, data acquisition in different areas of the function is severely limited, unable to meet the needs of new business and new characteristics; (2) and the combination of police service application system is loose, the lack of data exchange and sharing, data exchange and sharing complex operation, information transfer capability is severely limited; (3) the police mobile communication business there, wireless, cable, microwave, involving a variety of means of communication, lack of integrated communication service ability, communication coordination level is low; (4) the police mobile system is the application support services act of one's own free will, less, resulting in the low level repeated construction, low resource utilization rate.

III. DEMAND ANALYSIS

A. Safety requirements

Front-line police need to use mobile terminal via public mobile network query and interactive public security information network data, read the data and upload process may bring security risks to the public security information system: illegal users can receive from anywhere with a mobile wireless signal through the public mobile network attack public security information network; use network services without authorization, the wireless channel resources may be intensive, criminals may use the vulnerability to enter the public security network to steal information^[7-8]. To solve the problem of security access and information security for mobile devices, is the primary problem to be solved in the direction of public security information. Therefore, must be established in line with the requirements of the Ministry of public security of the security access system, submitted through the online

real-time, asynchronous way and so on many kinds of communication way through, realize the public security information network based on extension and development of mobile GSM/GPRS/CDMA/3G, and public security access system based on VPN/VPDN Technology. And to establish a full range, multi-level security service system, to ensure the system's identity authentication, authentication, authentication, IMSI authentication, ICCID authentication, IMEI authentication, access control, information security, network isolation, log audit, virus prevention and system management security mechanism^[9-10].

B. Integrated demand

Construction of public security information is also of existing information resources integrating and upgrading process, MAPGIS police mobile platforms also need police geographic information platform and other police platform data fusion and utilization, including police business system, support system, police geographic information platform, PKI and PMI System integrated with. And police business system combination is and the existing population management system, police station of the integrated management system, comprehensive policing management system, high intelligence judged system and a series of public security industry is closely related to the for handling the case to the public security department, query, statistics, and other functions of business application system integration, achieve mutual access^[11]. MapGIS mobile police operational platform to call the relevant business system data through the business geography related database to provide business application system to provide business information access interface. Integrated with the technology support system, is the integration of the video surveillance system, wireless GPS positioning system, Internet Cafe Hotel Industry alarm system, fixed telephone alarm system, etc., it can integrate all kinds of social monitoring resources, and realize real-time monitoring of any sudden and mobile^[12]. MAPGIS police mobile platforms in follow the Ministry of public security ministerial standards based and police geographic information system integration, realize the map calls and service, tool calls etc. is reduce duplication of development, make full use of the innovative practice of existing resources, while ensuring the continuity of the public security information process.

IV. SYSTEM DESIGN

The overall design of MapGIS mobile police combat platform, is currently the general service framework for police geographic information system of police platform based on business needs, and the actual service model innovation oriented, service data management and real-time analysis as the core, a variety of data from multiple systems related to the acquisition, transmission, storage, query, calculation, output of several key links of design, for police officers, to provide immediate information, understand the decision standard, intuitive, and realize the automation of all kinds of business support and in real time, through the analysis and scheduling of the data, a variety of business to achieve the police business within the scope of the whole society and the automation of processing intelligent management, in order to promote

the whole process of the construction of the mobile information industry.

MAPGIS police mobile platforms will use the geographic data and various police data integration management and visualization analysis, multi-level temporal and spatial information service, standardization of police data acquisition and integration of key technologies, business development of mobile terminal real-time positioning and communication, highly visual analysis and collaborative management, mobile GIS software services and application platform, the platform architecture can refer to the diagram.

GIS layer and public security data layer mainly refers to police geographic information platform and use MAPGIS spatial data engine and the Oracle database management system (DBMS) to build the system of public security comprehensive database based on. The data layer is responsible for the management of all kinds of data acquisition and maintenance, can quickly perform a large number of data update and retrieval and other data services operation. MAPGIS police mobile platforms using Oracle database management system to store the system space and non space data, including spatial data (including based terrain data and geological data) can the police geographic information system management can also be managed through spatial database engine MapGIS-SDE and other non spatial data, including general policing system information, data and other types of directly through the Oracle database management system of management.

The supporting layer of the server is composed of various kinds of middleware, including the three parts of the custom tool set, the custom database and the running engine set. Custom tool is used to construct all kinds of information system support information, form a customized library; the library defines all kinds of information in the application server, which constitute the support environment of the upper application module. Basic operating platform from the integration, coordination, management and service four aspects of the application system support.

Mobile terminal operation support layer is starting from the demand of the police mobile police, on the server side development general function modules and features proprietary module based on, based on the service oriented architecture, further encapsulation, only need to invoke these services, you can quickly realize the business of the mobile terminal application of GIS function, such as: analysis of positioning, data storage, such as online maps and achieve the Ministry, provincial and municipal level police geographic information system network operation and interoperability and to promote data sharing and utilization, thereby greatly reducing application development industry and trade volume.



Figure 1. System overall frame diagram

Mobile application layer is MAPGIS mobile police operational platform of end user layer, according to the different business content, mobile police terminal through the mobile application layer implementation in all types of mobile office and mobile law enforcement to achieve real-time integrated query, community policing, intelligent surveillance, refers to the essential scheduling, patrol ZhaQin, mobile office and so on many kinds of functions. Platform also has a wealth of access terminal support, to achieve smart phones, smart phones, smart phones, PDA, notebook computers and other mobile phone applications.

MapGIS mobile service platform needs to ensure that any place, any time and any way of information flow, that is, the Ministry of public security "3A" requirements, in order to meet the needs of the public security work, improve management efficiency and efficiency. First line police can directly achieve information verification, intelligence collection, emergency linkage, video transmission, mobile law enforcement, dynamic management and other functions, providing security, transportation, criminal, fire and other aspects of timely and accurate information, to different police intelligence and complex information into a comprehensive analysis. The functional module design of MapGIS mobile police combat platform is as follows:

The application of mobile police is the extension of the function of police information comprehensive inquiry to the wireless direction. In order to ensure that in the shortest time to find the required data from the mass information, MapGIS mobile police combat platform with intelligent data source search and multi data source selection function, and can be based on business and management needs, to limit certain business or user's available data sources and query depth, such as for non traffic police users, when you need to query the driver information, you can only use a comprehensive query platform to provide data source query. MAPGIS police mobile platforms have alarm ratio on the dynamic configuration, can according to the needs

of the business and dynamically assigned need alignment of business and data source, such as for the resident population can be configured for inquiry platform at large staff ratio, for traffic management business library or police comprehensive platform accident escape staff ratio, oriented police comprehensive platform or intelligence system of clinical control warning staff than peer. General query module includes both based query functions, such as multi-source data query, the second generation ID card, license plate recognition, comparison alarm, fault reporting, and includes special query function, such as query personnel, goods inquiry and case query. For different security patrol, traffic police, criminal police, border police and other police personnel to provide different business data retrieval and analysis, such as Interpol to fugitives, detained persons, missing persons, drug addicts, involved, vehicle involved, involving goods, etc. information of relational query.

The function of MAPGIS mobile police operational platform, starting from the frontline policemen action of high mobility and security of demand, provide surveillance and early warning, appointment reminders, the same group view, a key alarm, greatly enhanced the combat capability. Command center dispatched instruction, dispatching command issued directly to participate in police mobile terminal, an acousto-optic prompting police prompt execution of the task. And to support visual surveillance information display, you can view all blocking control point distribution and duty, master the same group of police information and call in a group, ensure the plug and control the timeliness of the field of information communication. A key alarm is in response to the sudden situation is not easy to carry out a program of text operation, the police can be a key to the police and the command center request support.

One of the highlights of the MAPGIS mobile police operational platform, that is, the PC client to achieve the police information service based on extended to frontline policemen handheld terminal, in the current dispatching mode, only the command center can master the comprehensive police alarm information, OPS officer basically are in a state of "information isolated island", the lack of active intelligence analysis and site flexible alarming ability. Platform can help front-line police officers to view the current state of alert, police trend, surveillance information and keep abreast of the neighboring police officers, and can be uploaded on-site disposal of feedback information to enhance and ensure dispatching decision-making more scientific.

Daily patrol is a police line, the main contents are as follows. Strengthen the duty evaluation is improve the patrol alarm rate and services rate of an important means. Based on MAPGIS police mobile platforms patrol Chaqin function design objective is, strengthen self-management ability of the patrol police. The police know the area where the daily patrol group, patrol area patrol section, police reported information in the terminal display, support online view will patrol point information and patrol section to.

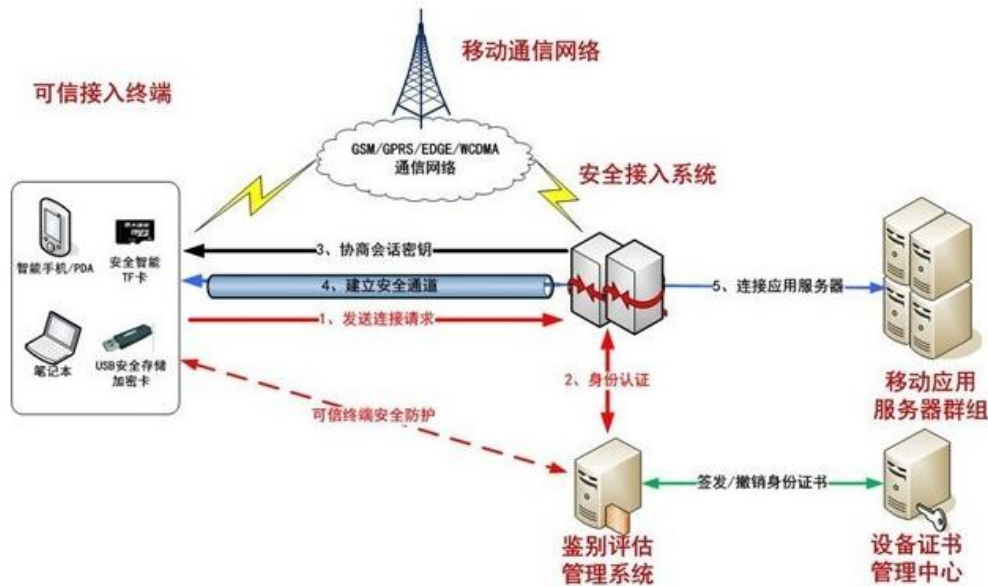


Figure 2. Network topology graph

V. CONCLUSIONS

The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g”. Avoid the stilted expression, “One of us (R.B.G.) thanks . . .” Instead, try “R.B.G. thanks”. Put applicable sponsor acknowledgments here; DO NOT place them on the first page of your paper or as a footnote.

Implementation of mobile GIS and police geographic information system and a plurality of policing platform of information sharing and interoperability, cross platform mobile GIS integrated service application platform of core. Based on platform development, it can be applied to mobile GIS police application system in various fields such as security, patrol, command, traffic police and other fields. It is the purpose of realizing data sharing, scheduling, command and other comprehensive services of the cross system. Therefore, we need to understand the current situation and development trend of key technologies and applications of mobile GIS and multi service business services, analyze the actual needs of different information sharing and interoperability between different police services in mobile law enforcement, combined with the development of mobile GIS and the research status of the technology.

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