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Application and Research of Intelligent Security System Based on NFC and Cloud Computing Technology

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***Abstract*—With the rapid development of urbanization, community security and public security have become an important social issue. As conventional patrol methods can not effectively ensure effective supervision, this paper studies the application of NFC (Near Field Communication) technology in intelligent security system, designs and constructs a set of intelligent security system suitable for public security patrol or security patrol combined with current cloud service technology. The system can not only solve the digital problem of patrol supervision in the current public security, but also greatly improve the efficiency of security and improve the service quality of the industry through the application of intelligent technology.**

Keywords-component; NFC; Cloud computing technology; intelligent security system

I. BACKGROUND

Community security patrol is an important social security work. Both police and security personnel need to conduct periodic patrol security work in a certain area. With the rapid development of urbanization, the community is becoming more and more dense. At the same time, the uncertainty of floating population and the frequent occurrence of theft and robbery in the community make people pay more and more attention to the security and public security of the community.

The conventional patrol mode is nothing more than through the movement of personnel. Whether the patrol personnel cheat or hide favoritism, etc. can not be effectively supervised.

NFC technology is a short-range high-frequency wireless communication technology. At present, most smart phones in the market have NFC technology. Through NFC technology, short-distance communication between two settings can be realized, which is very suitable for security work.

Through NFC technology, patrol personnel can hold mobile phones where they need to sign in. Then, check in with the NFC function of the mobile phone. This data will be displayed in the background, which point the patrolman patrols to and when he patrols, including his behavior track. If the public security patrols and the alarm receiving center receives the alarm, it can quickly know which police are patrolling at the alarm point, and the police force can be deployed nearby immediately. NFC is real-time check-in, which can greatly improve the authenticity of patrol and make the emergency allocation of emergencies more efficient. In this way, in the construction of smart city, the duty support of public security or security personnel is greatly improved through the smart patrol system of NFC technology.

II. TECHNICAL INTRODUCTION

A. NFC Technology

Near field communication (NFC) has evolved from non-contact radio frequency identification (RFID), which is based on RFID and interconnection technology. Near field communication is a short-range and high-frequency radio technology. Like RFID, the near-field communication information is also transmitted through the electromagnetic induction coupling mode of the wireless frequency part of the spectrum, but there is still a big difference between the two. The transmission range of near-field communication is smaller than that of RFID, and the transmission range of RFID can reach 0-1m. However, due to the unique signal attenuation technology adopted in near-field communication, compared with RFID, near-field communication has the characteristics of low cost, high bandwidth and low energy consumption. Therefore, NFC technology has been supported by more and more manufacturers, and the chip price will be cheaper and more widely used. At present, NFC technology is mainly used in the mobile payment function, and the patrol field in the security industry is still in the initial stage of development.

In the intelligent security system, patrol personnel exchange, store and display real-time data with the background through the smart phone with NFC chip, which greatly improves the authenticity of patrol.

B. Cloud computing technology

Cloud computing is distributed computing, parallel computing, utility computing, network storage technologies, virtualization, load balance, and high Available) and other products of the integration of the development of traditional computer and network technology. It is a supercomputing mode based on the Internet. Cloud computing can be considered to include the following layers of services: infrastructure as a service (IAAs), platform as a service (PAAS) and software as a service (SaaS).

In the intelligent security system, the NFC patrol data and location data of patrol personnel are used as data sources to analyze the data through the cloud computing platform.

C. Artificial Intelligence Technology

Artificial intelligence (AI). It is a new technology science to research and develop the theory, method, technology and application system for simulating, extending and expanding human intelligence. The research in the field of artificial intelligence includes robot, language recognition, image recognition, natural language processing and expert system. Since the birth of artificial

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intelligence, the theory and technology are increasingly mature, and the application field is also expanding.

In the intelligent security system, the location data and time data of patrol personnel are used as data sources. Using artificial intelligence method to analyze data, optimize patrol path and patrol time, and improve security efficiency.

III. DESIGN OF SECURITY INSPECTION SYSTEM

A. System framework

Starting from the existing patrol system, cloud computing technology, NFC technology, artificial intelligence and other aspects, this paper proposes a security patrol system architecture suitable for community security, and verifies the security and effectiveness of the architecture in part, providing reference for other researchers, and providing basis for further research.

The system framework is shown in Figure 1.

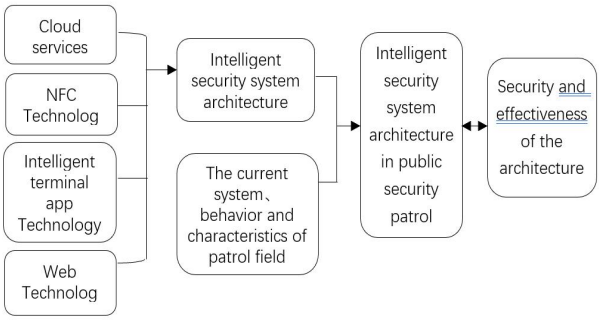

Figure 1. The system framework

B. Patrol data acquisition system based on NFC

The data collection of Community Patrol Inspection consists of mobile phone with NFC reader and tag card. NFC can only communicate with tag card in close range. For example, the value of this project is set to be less than 10cm, which basically eliminates the on-site cheating of patrol personnel. After the inspectors log in to the system, click the send data button, and the mobile phone will send the basic information and location information to the cloud computing center by 4G communication signal colleagues. The flow chart of NFC data acquisition is shown in Figure 2.

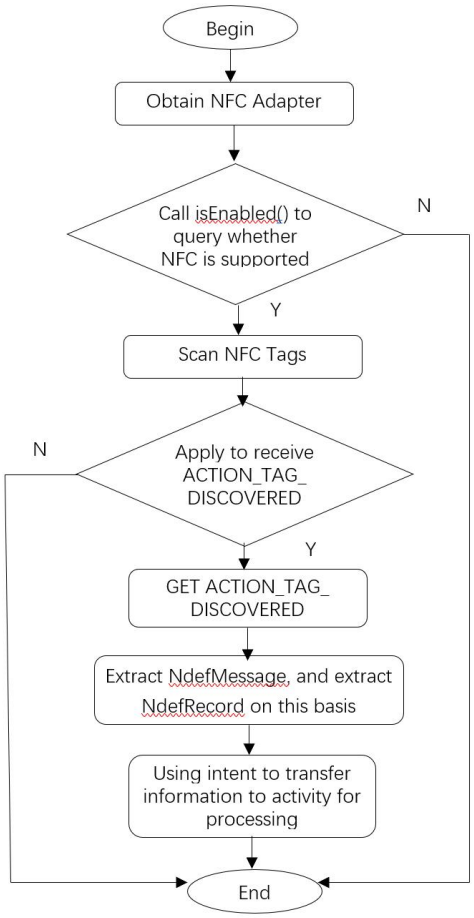

Figure 2. The flow chart of NFC data acquisition

C. Cloud Service Platform

In order to mine and analyze patrol data, based on Hadoop open-source cloud computing platform, cluster analysis, association analysis and in-depth learning methods are built under MapReduce architecture. The location information, path information, personnel information and other data in the patrol process are analyzed and processed to obtain the optimal configuration of personnel and path in the patrol process, and the query level of patrol information is built . There are four layers in this system platform. They are human-machine interface layer, data Processing layer, database layer and data integration layer. The system platform architecture is shown in Figure 3.

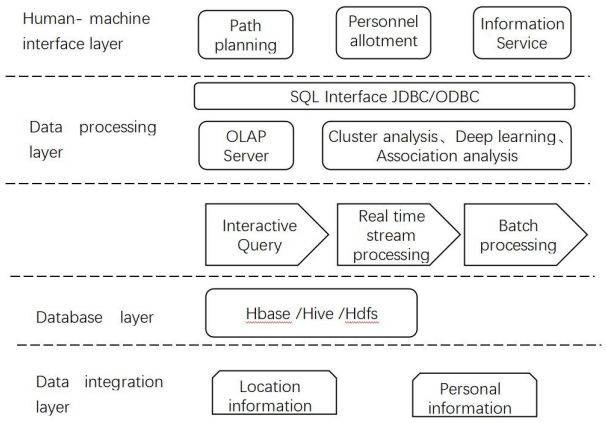

Figure 3. The system platform architecture

IV. SUMMARY

This paper analyzes NFC technology, cloud service technology and terminal app related technology, combined with the characteristics of public security patrol, designs a smart security patrol system. The system can not only solve the problem of digital patrol supervision in the current public security, but also greatly improve the efficiency of security and the service quality of the industry through the application of intelligent technology.

The research results of this topic can not only be used as a supplement to the current public security patrol, improve the security and effectiveness of security, but also as one of the standards of the next generation of patrol system, which has great use and practical value.

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