

Research on Assistant Risk Early Warning Model of Community Security Big Data Mining Based on Artificial Intelligence

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Keywords: Big Data Mining, Artificial Intelligence

Abstract: With the advancement of the information construction, the intelligent community as an important component of intelligent city is put into construction. As a new mode of social management innovation under the new situation, the advantages of intelligent community are embodied in its full integration of existing public resources and infrastructure, and the realization of the knowledge mining of image information, so as to make community service and management more information-based and intelligent. Based on the common needs of intelligent community management, this paper analyzes the overall functions of the community management system in detail, puts forward the intelligent community architecture on the basis of big data technology, and realizes the intelligent community management by using wireless communication, RFID, video monitoring, etc. Finally, MyEclipse 10.0 + Tomcat are used to develop the environment, and SSH framework and MySQL database are applied to design and realize the intelligent community management system, making community services more efficient, and community management more standardized and scientific.

1. Introduction

The traditional community can only meet people's living needs, and there are deficiencies in the quality of community property service, community safety, community information construction, etc. With the continuous expansion of community population and area, as well as the limited number of community administrators, the pressure on community management and community services is increasing, which brings about great trouble to community administrators.^[2] With the advancement of the information construction and the application of big data technology in the community, the concept of intelligent community came into being. As an important component of intelligent city, intelligent community aims at the actual needs of residents and the work content of community management, relies on various sensing and communication terminal equipment to sense information, uses wired and wireless communication networks to transmit information, utilizes the intelligent processing platform to mine integrated information, and realizes the intelligence of information collection, transmission, processing and application, making community management more refined and community service more humanized, so as to establish a modern community service and comprehensive community management system.

2. Overall architecture design of intelligent community management system

2.1. Functional analysis of community management system

Common system participants include users, organizations, external devices or various external hardware and software devices, and realize information interaction with the system in the process of system operation. According to different management categories, the system is divided into system management module, community information management module, community property management module, intelligent access management module, community security joint defense module.

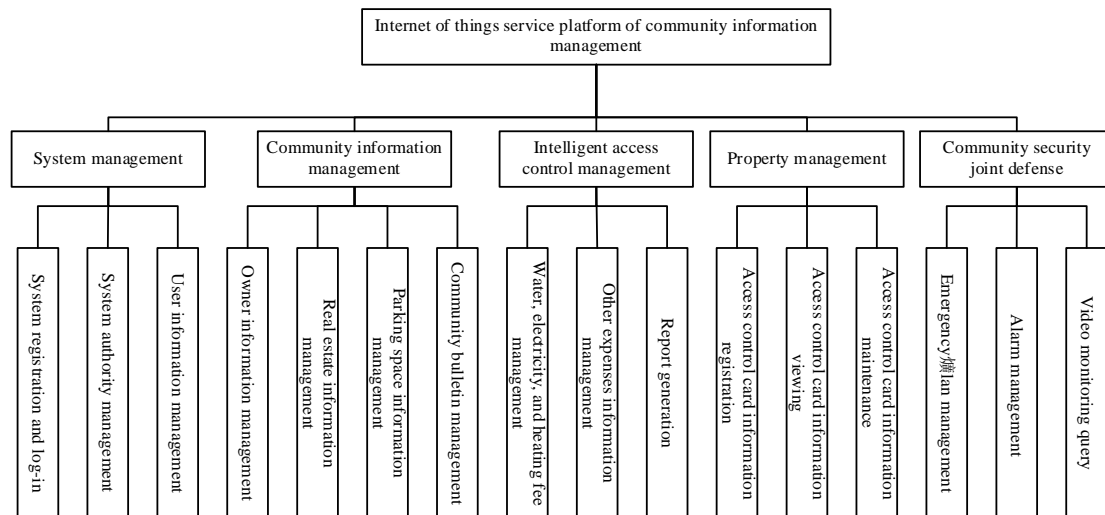


Fig.1 Functional structure design of community management system

The function analysis of each module is as follows: (1) System management. Set permissions for system administrator and ordinary user respectively. (2) Community information management. System administrator can add, modify, search and delete basic information of the owner, add, modify, search and delete real estate information, add, modify, search and delete parking lot information. In addition, he can also publish the community bulletin. (3) Property management. The system administrator can count the water, electricity, heating, gas and property management fees, display them in the form of reports, export reports, view the current expenses of a household, and modify and delete the expense information. Ordinary users can view the expense information, when the balance of a certain expense is insufficient or overdue, the scroll captions will appear on the upper part of the system page to hint the user for payment. (4) Intelligent access control management. The system administrator can register the access card information, mainly including the card owner information, and set the card authority and effective date for the community access, residential access, parking lot access, etc. In addition, he can also cancel, modify and view the card information. (5) Community security joint defense management. In case of illegal invasion or emergency incidents such as fire, gas leakage, house water immersion, etc., the system will automatically alarm through intelligent equipment. In the meantime, no matter what the current system administrator is doing, the system page will pop up alarm information (alarm location, alarm category) to remind the management personnel to deal with it as soon as possible. In addition, the security system should be able to automatically start the security equipment in the community. For instance, in case of fire, the security system of the intelligent community should be able to automatically start the fire-fighting equipment in the community. In addition, the historical alarm conditions can also be viewed.

2.2. Main applied technologies of big data community

The functions of community management system are divided into three categories according to the main applied technologies: RFID application system, ZigBee application system and video application system. RFID application system includes basic information management and intelligent access control. Among them, basic information management includes residential information, real estate information, water, electricity and heating costs, property management costs, etc. Intelligent access control mainly includes residential access control and parking lot access control. ZigBee application system includes intelligent home security and community public security, which are realized by various sensor modules and ZigBee devices. Security protection includes gas leakage alarm, perimeter illegal intrusion alarm, fire alarm, house flooding alarm, etc. Video application system includes video security monitoring, which is realized by using image acquisition equipment. Video files collected by video monitoring equipment can be stored for one month, and the function of query and playback by time can be realized.

3. Design and implementation of community information management system

3.1. Database design

In this paper, the database information table of the community information management system is divided into seven types, which are described in detail as follows:

Administrator information table -adm: including the basic registration information of the administrator; Personnel information table-person, including the basic information of community personnel; Access card information table-card, including the corresponding authority of RFID access card; Property management table -busi, including the property types and costs involved by the owner; Monitoring location information table-mon_loc, including the monitoring equipment information involved in each monitoring location; Real-time alarm information table-alarm, including the real-time alarm location alarm content and other relevant information; Community announcement table-notice, including the issuer and bulletin information

The personnel information table is associated with the access card information table through cardNo, the administrator information table through ID card number, and the property management table through p_addr (address). The monitoring location information table and the real-time alarm information table are associated with the physical address of the device. The administrator information table is associated with the notice table-notice through userName.

3.2. Node code of fire alarm terminal

Fire alarm is mainly through the collection of temperature and concentration information to avoid fire caused by gas leakage. Under a fixed time interval, temperature and concentration sensors, these terminal nodes will send the acquired information package to the coordinator, and the coordinator will upload the acquired information to the server for analysis and processing. Once there is a fire, the police system will give an alarm, and no matter what kind of operation is proceeding, the community information management system will pop up the alarm interface.

The terminal node program is as follows:

```
#define GENERICAPP_ENDPOINT 10
If(events& SEND_DATA_EVENT)
{
GenericApp_SendTheMessage();
osal_start_timerEx(GenericApp_TaskID,SEND_DATA_EVENT, 6000);
return(events ^ SEND_DATA_EVENT);
}
voidGenericApp_SendTheMessaged()
{
Unit8tvalue;
TEMPERATURE temperature;
temperature BUF. Head='&';
tvalue=readTenp();
temperature BUF.value[0]=tvalue/10+'o';
temperature BUF.Value[1]=tvalue/10+'o';
temperature BUF. Tail='C';
afAddrType_t_my_DstAddr;
my_DstAddr.addrMode=(afAddrMode_t)Addr_16Bit;
my_DstAddr.endPoint= GENERIC_ENDPOINT;
my_DstAddr.shortAddr=0x0000;
AF_DataRequest(&my_DstAddr, &GenericApp_epDesc,
GENERICAPP_CLUSTERID,
sizeof(temperature);
(unit8*)&tempetature,
&GenericApp_TransID,
```

```

AF_DISCV ROUTE,
A_DEFAULT_RADIUS);
)
}

```

The terminal node will send data to the coordinator every certain time interval. The timing function uses `osal_start_timerEx()` in ZigBee protocol stack, and the transmission frequency is 6 seconds. It is set as single-wave sending (`afAddrMode_t`) `Addr_16Bi`, the destination port number is set as `GENERICAPP_END-POINT`, and the coordinator port number is `0x0000` by default.

3.3 Community information management system test

In order to test whether the system meets all business requirements, the simulation test is carried out for each part of the functions by running the system. Table 1 only shows the test results of the main functional modules of the system. The system test has carried out case test for all functions, and the tested bugs have been repaired normally. However, the reliability control of the system is still not strict enough and needs to be improved.

4. Concluding remarks

Intelligent community makes the community property administrators realize the transformation from the traditional labor control to the modern intelligent management, thus the community residents can better interact with the outside world. With the comprehensive popularization of intelligent community, whether to achieve the sharing and reuse of various resources is the key to the future development of intelligent community. The community information management system in this paper realizes the high-degree integration of information, as well as the service centered on the needs of residents, and informationized and modernized management.

Acknowledgement

Key Projects of the Supporting Plan for Excellent Young Talents in Colleges and Universities of Anhui Province (`gxyqZD2016529`),

Key project of natural science research in universities of anhui province (`KJ2016A493`, `KJ2018A0887`).

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