

# Design and Implementation of Community Information Management System

Zhaoming Huang<sup>1,2</sup>

<sup>1</sup>*School of Information and Management, Guangxi Medical University, Nanning, Guangxi, China*

<sup>2</sup>*The First Affiliated Hospital of Guangxi Medical University, Nanning, Guangxi, China*

**Abstract:** In 2020, new coronaviruses are sweeping Wuhan and the world, and the community is the center of people's lives. Therefore, for the safety of people in each community, it is necessary to collect the information of all communities. This system exists to help the community understand the physical conditions of the people in the community and information about the movements during the epidemic. The functions of this system are as follows: the living staff, staff, and outsiders in the community are registered, managed, archived, and browsed, so that the community staff can clearly grasp the physical conditions and trends of the living staff. This graduation design system uses VS to design the interface and framework. The computer language used in the back end is C # language, and the database uses the MySQL database commonly used by most junior developers. The primary structure of the system was achieved, allowing community workers and ordinary people to meet the basic needs of the system used, so that the community during the outbreak could be orderly and stable. This design can ultimately help the community managers increase their ability to master the community, and facilitate the orderly and complete management of the community.

**Keywords:** New Coronaviruses; Community Management; MySQL; Physical Condition Collection; Design and Implementation

## 1. Introduction

### 1.1 Background and Current Status of the Project

With the arrival of the new coronavirus, community information is extremely important for the safety of community members. How to use information technology to achieve

statistics, summary and query of the information of visitors and community residents is the problem we need to consider. At the same time, due to the variety and complexity of the work of community managers, in addition to the collection and statistics of information of community residents and outsiders, they also have to complete other tasks assigned by superiors, which aggravates the difficulty of community management <sup>[1]</sup>.

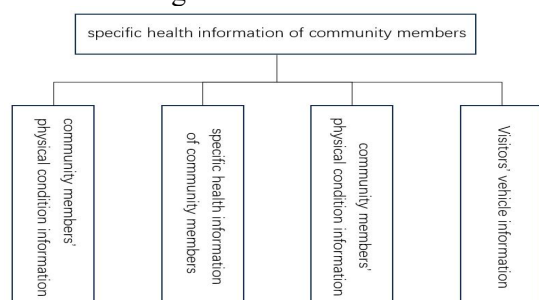
### 1.2 Significance of System Design

The purpose of this paper is to integrate community public cultural service information and related resources by using information technology and taking the information management of activity centers as the core <sup>[2]</sup>. The significance of the community management system is that it can help the community to better manage the information of community personnel, such as physical condition, and the realization of the basic functions of the community management system can greatly strengthen the community's grasp of the physical condition of community personnel, and at the same time, it is also different from the traditional management of community personnel, and truly realize a highly accurate information grasp of the physical information of community personnel. The realization of the basic functions of the community management system can help the community to simplify, standardize and accurately the daily complicated work.

### 1.3 Objectives of the System Design

The system mainly includes the physical condition of community personnel, returnees from other places, vehicle information collection, and the physical condition of community personnel is queried, and the community administrator inquires about community personnel and other four modules,

as shown in Figure 1, the physical condition of community personnel combing, and the physical condition registration of visitors is the main component of the community system, and the physical condition of community outsiders is added, queried, and registered functions. The design of this system is a simple community management system, which can easily input the information of all community personnel into the system, and realize various functions of vehicle and personnel information, as shown in Figure 1.



**Figure 1. Functions of Vehicle and Personnel Information**

## 2. System Analysis

### 2.1 System Feasibility Analysis

Feasibility analysis is the analysis and evaluation of the technical, operational, and economic feasibility of a project [3]. The purpose of a feasibility analysis is to demonstrate a pre-planned scenario and determine whether the problem can be solved in the shortest time and at the least cost. From the three aspects of technical feasibility and economic feasibility, the analysis of whether the system development is suitable for research;

#### 2.1.1 Technical feasibility

The system is developed through the C# language as a computer programming language, the front-end uses Visual Studio 2012 to create the interface required by the system, and the database uses the MySQL database used by most junior developers.

C# combines the simplicity of VB's simple visual operation with the high operational efficiency of C++, which shows that its ability is strong and perfect, the syntax style is simple, the language function is innovative, and the convenient support for component-oriented programming has become ECMA and ISO standard specifications [4]. However, it is worth noting that C# is ostensibly derived from C++,

but incorporates the advantages of other languages, such as Pascal, Java, VB, etc. [5].

In terms of databases, compared with other database. mysql has the advantages of fast speed and low cost which makes it a favorite backend database for ordinary people.

#### 2.1.2 Economic feasibility

This system is easy to develop, and is developed through some free development software tools on the Internet, and many of the software are now open source software. The design was planned to be developed in just two weeks, requiring less effort and money, so it was economically viable.

#### 2.1.3 Operational feasibility

The users of this system are community personnel and managers, there is basically no difficulty in operation, it is very simple and easy to understand, in summary, the system is feasible in operation.

#### 2.1.4 User demand analysis

The system needs to have two different ways to log in to the system, the user side of the resident and the community administrator side of the community staff to log in:

##### (1) Community common user port

It can basically realize the functions of logging in to the system, registering new personnel (including physical condition and information tracking), and querying the physical condition of community personnel (such as temperature, whether there are symptoms such as cough and cold).

##### (2) Ports for community workers and administrators

It can basically realize the functions of logging in to the system, browsing the information and physical condition of all community personnel (including the physical condition and information tracking of community personnel and outsiders), and querying the physical condition of community personnel (such as temperature, whether there are symptoms such as cough and cold).

## 2.2 System Performance Requirements

### 2.2.1 Appearance requirements

Due to the wide range of users using the system and the user groups across all ages, the elderly can also use the system to query the physical condition of a person in the community, so the interface of the whole system needs to be simple and clear, and directly show the functions of each part. The

function of each module is very clear, with no redundant interface.

### 2.2.2 Easibility of use

Simple and clear functions are an important part of the system. It is very important to improve the functions while using simple functions, so this design interface is clear, which basically enables users to understand the functions of each module interface in the first use.

### 3. System Design

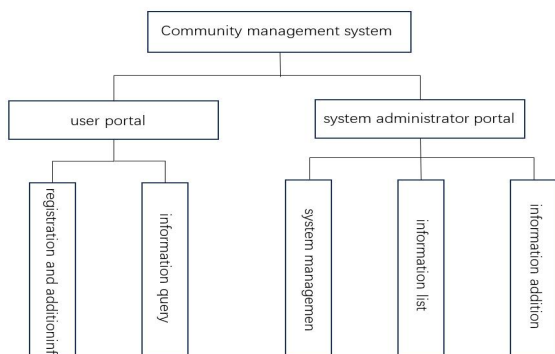
In the system design stage, in order to meet the needs of various users in the community, the system architecture, design direction and technical aspects are formulated. Finally, the system design can be developed smoothly, quickly and accurately as planned.

#### 3.1 System Architecture

The system is based on the B/S structure (Browser/Server) and has the characteristics of strong scalability.

#### 3.2 Overall System Design

The purpose of the overall design is to determine the overall development idea of the system, and to design the connection between the interfaces of the whole system and the functions they have [6]. Therefore, the overall design plays a very important role in the whole system design, and is the main thought flow in the process of realizing the system development, and the most important work is to distinguish the needs of each module and each login method, and clearly distinguish several interface modules and the functions that each interface should have. The system has the following two functional modules: user port and system administrator port. This is shown in Figure 2.



**Figure 2. User Port and System Administrator Port**

The functional modules are described as

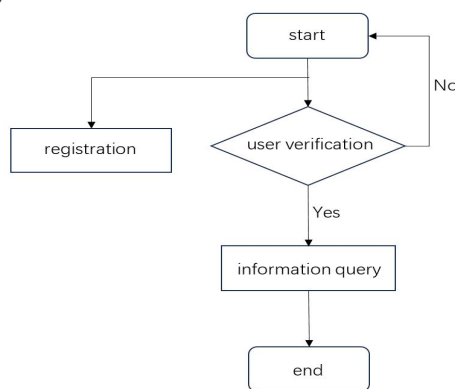
follows:

(1) User port: The user port has the following two main functions: the registration and addition of outsiders and the query of their physical condition by entering the information of community personnel, and finally allowing community personnel or visitors to register and query various information.

(2) System administrator port: The user portal is composed of system management, information list, and information addition, and this module mainly allows the community administrator to browse the information and physical condition of all people in the community, and can query the information and physical condition of a specific person in the community.

#### 3.3 Detailed Design of the System

The detailed design of the system refers to the refinement of the system operation, in the detailed design, we have understood the basic needs of users at all levels of the system through demand analysis, such as the function of each interface, the overall idea, the concretization of the operation, and the process, and finally complete the detailed design of the system through the implementation of these [7]: Community members can log in to the system through the user portal to register and query their own information, and community member users can only view and register their own personal information. The flowchart of the community member process is shown in Figure 3.



**Figure 3. The Flowchart of the Community Member Process**

With the rapid development of information technology and digitization, the community information system has gradually become an important tool for urban management and community service. The fifth plenary session

of the 18th CPC National Committee put forward the proposal to implement the strategy of strengthening the Internet power, implement the "Internet plus" action plan, develop the sharing economy, and implement the national big data strategy.<sup>[8]</sup> Community information system can provide more convenient and efficient services for community residents, optimize the community management process, improve the level of community governance, and promote the property company to improve their management efficiency and service quality, providing a foundation for the community information, intelligent management.

Community information system usually consists of hardware, software, data and personnel.<sup>[9]</sup> The hardware mainly includes server, network equipment, terminal equipment, etc.; software includes operating system, database, application software, etc.; data is the core of the community information system, including community residents information, community resource information, community service information; personnel are the designers, managers and users of the community information system, their quality and ability directly affect the operation effect of the community information system. Application scenarios of community information system<sup>[10]</sup> includes community management: community information system can be used for property management, security monitoring, environmental monitoring, etc. Public services: the system can provide public services such as medical care, education and elderly care. And business services: the system can cooperate with merchants to provide shopping, housekeeping and other services. Challenges and countermeasures for community information systems is data security: need to strengthen data encryption and backup to ensure data security and system stability: need to improve the stability of system hardware and software, user privacy protection, etc.

Community information system is an important part of the information society, which is of great significance for improving the level of community governance and service quality. With the development of technology and the progress of the society, the community information system will be continuously upgraded and improved, bringing more

convenient and efficient services to the residents. At the same time, it is also necessary to pay attention to the problems and challenges existing in the development of the system, strengthen research and practice, and promote the healthy and sustainable development of the community information system.

### 3.4 System Database Design

The database is a functional part used to store all kinds of data information, and a complete system needs an appropriate database design to complete. The data at the front end of the system should be referenced from the database, which combines a large amount of data required by the system according to a certain format model and provides functions such as storage, daily maintenance, retrieval, and query.

#### Database table design

The system mainly designs three main database tables, namely the community personnel information table, the community personnel health information table, and the community personnel vehicle information table;

(1) First of all, it introduce the community personnel information table that community residents and visitors must add, and the functions and descriptions that the community personnel information table should have, it as shown in Table 1:

**Table 1. Community Personnel Information Table**

Column name	Data type	Can be null	Note (remarks)
ID number	VARCHAR(50)	No	Also the account for user login
Name	CHAR(10)	No	None
Situation	Int	No	0 for normal physical condition, 1 for abnormal physical condition , specific details can be checked in the health information form
Temperature	float	No	None
Phone number	VARCHAR(50)	No	None

(2) Secondly, introduce the health information table of community personnel, when the value of the situation column in the information table of community personnel is "1", it means that the visitor has an abnormality, and his specific physical condition must be truthfully added into the information table of community personnel, and the specific functions and

descriptions of the health information table.

(3) The third data table community personnel vehicle information table, when the visitor or the person who enters the community uses the vehicle to enter and exit the community, the information needs to be registered to enter the community personnel vehicle information table, so as to play the purpose of information tracking in place.

#### 4. System Implementation

The main task is to debug, run, and present the results of the framework, ideas, ideas, and directions of the system on the computer, and to turn the system design that was originally imagined in the mind and written before into a complete system that can be executed. And the following directions determine the direction of implementation of the system.

##### 4.1 Development Environment

(1) The development environment of the hardware

CPU: Intel Core i5-7300HQ CPU @ 2.50GHz  
2.50GHz

RAM: 16G

(2) The development environment of the software

Operating system: Win10 Education Edition

Development Tools: Visual Studio 2012

Database: MySQL

##### 4.2 Implementation of System Function Modules

4.2.1 Login module for ordinary users of community residents

In the interface of ordinary user login of community residents, community members can enter the system by selecting the login method of the user port and entering the corresponding user name (i.e., ID number). Community residents and ordinary users can also check their physical conditions by entering the information of people in the community

4.2.2 Add module for new recruits or visitors to the community

The interface can use this registration function when community members and visitors enter the community for the first time, and the physical condition and related information of new visitors can be added, The specific operations that can be performed by the community staff or community administrator module:

This module is only available to community staff or community administrators who can log in to the system in this way, and the community administrators perform a number of operations on the module, browsing the specific information and physical condition of people in the community and querying the information and physical condition of a specific community person, and the community administrator can browse the physical condition and contact information of all people in the community here, and other information.

4.2.3 Community administrator query

This module is also only available to the community administrator to log in to the system in this way, and only the administrator can operate the module, where the community administrator can enter identity information to query the physical condition and contact information of a person in the community.

##### 4.3 System Testing

4.3.1 Program debugging

Debugging a program can be used to find errors in the program code as quickly as possible, and then make changes and prevent various problems in the system. And it also makes the system function less error-prone. The process of code debugging is to simulate the running of a program, and then find out the problems of the system by debugging and viewing the results of the debugging. It as shown in Table 2.

**Table 2 Community Personnel Registration Module Test Information Form**

System Debugging Number:1	Registration of community personnel information
Interface name:	Community personnel registration
Main functions of the interface:	Entering the information of community personnel into the system
Required data table:	ID number, Name, Situation, Temperature, Temperature
Potential scenarios:	1. Successful registration 2. Error or unsuccessful registration
Actual debugging situation:	Successful registration

4.3.2 System testing

Testing is the last stage of every system development, and system testing is to perform the actual operation of the system and evaluate whether the results and processes of the

operation are as expected. The purpose of system debugging is to meet the different needs of users at all levels, to detect possible errors or various possible analyses due to improper operation, and then to find the most suitable solution and continuously improve in the process of continuous testing and debugging of the system. The commonly used system test method is white box test and black box test method, due to time and environmental factors, the system adopts black box test method test. Test results: When the user is operating normally at all levels, the system can basically complete the corresponding functions displayed according to the prompts as scheduled; Therefore, the system basically completes the expected functional requirements and can be used in the daily management center of the community.

### 5. Summary and Outlook

This paper designs a basic community information management system, and its functions are mainly to deal with the information collection, statistics, and monitoring of each community person during the epidemic. Its function is to make the work of each community work position better coordinated, timely grasp the latest information of the whole community, and finally simplify the information management workflow of the community, improve the efficiency of the management of the whole community, and bring a computerized problem-solving idea to the whole community, and provide a new idea for the community to manage other things or activity planning and other problems in the future.

Subsequently, this community management system will continue to be improved, and finally become a fully functional community information management system.

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