

# *School Hospital Management System Based on WeChat Platform*

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**Abstract:** In order to provide a convenient platform for school students to visit the hospital and simplify the previously complicated and tedious process of visiting the hospital, we decided to develop and design a school hospital management system based on the WeChat applet. The WeChat applet is based on the MVC framework model, which can make the input, output and processing of the program separate and the division of labor at each level is clear. The system can be divided into two parts: the user side and the management side, which can realize the daily temperature reporting and advance registration of school students, while the doctor can view the registration information from the user side, make diagnosis and manage medicine, etc. Starting from the management and daily work of the school hospital, the overall goal is to use the best computer technology and mature management system in our society, to renovate and upgrade the school's internal medical office, so that it can provide better services and build a "smart school hospital".

## 1. Introduction

In the 21st century, with the gradual progress of China's economic information construction process, the traditional management methods have been impacted, and the importance of information technology in the medical industry and various links has been highlighted, and new opportunities and challenges are currently unavoidable for school hospitals, and the Internet platform represented by the WeChat mini-program is an aspect of our work that needs attention and utilization in the new period.

Since its release, WeChat has rapidly expanded and gained popularity at a rapid pace. Today, close to 1.4 billion <sup>[1]</sup> users have WeChat applications installed on their cell phones, so WeChat applets can be used as a vehicle for our campus medical service room applications today. Previously, school medical service offices have not introduced an electronic information management system in their system, and generally consume a lot of time in all aspects such as students queuing up for appointments, waiting to be seen, and medicine inquiries, while being relatively quick in actually seeing a doctor. All of the work is done offline using manual statistics. This can not only be time consuming and make seeing patients inefficient, but it can easily lead to some data loss and misclassification when the medical office is understaffed or when there is too much information about the cases of school personnel.

At present, although there are many management systems about school hospitals<sup>[2, 3]</sup>, most of them are too functional and complex, which not only do not target the actual situation within school hospitals, but also cause a waste of system development. Therefore, the traditional manual approach is gradually being replaced by information-based management systems. The school hospital management system is mainly oriented to the information of students' case files, the stock information of some basic drugs, and the comprehensive management information, so as to achieve the standard of daily work, reduce the workload of medical staff, and improve the comprehensive strength of the school. Therefore, it is necessary to rectify the medical office of each school and improve its service level. From the perspective of the operation and management process of the future school infirmary applet land, it can bring the following benefits to the school: convenient access to patients, improvement of the medical level of the infirmary, long-term preservation of information, standardization of school hospital management, etc. Therefore, we have always believed that it is necessary to adopt efficient management methods and models, advanced engineering and scientific technologies, and study and design a microsoft applet for an integrated management system<sup>[4]</sup> of university hospitals.

## 2. Development Technology

### 2.1. B/S Architecture

With the gradual improvement of B/S architecture in recent years, both PC side and cell phone side have been developing towards B/S architecture. The data hierarchical presentation mode of B/S architecture mainly includes: view processing layer, logical relationship analysis layer, access data presentation layer, each layer is related, the core technology is www browser technology<sup>[5]</sup>. Mobile users only need to enter the corresponding URL in the browser to access, without downloading APP, which is convenient for users and reduces the cost of research and development<sup>[6]</sup>.

### 2.2. WeChat-side Tools

The MINA framework provided by the WeChat app development tools is a responsive data binding system and is currently the more respected MVVM model. It consists of two main pieces: the page view layer and the application logic layer. MINA makes it easy to synchronize data and views, making the native app experience more intense for developers. Unlike previous web servers, which first load the view layer html and css, then load the logic layer javascript, and finally return the data to the page. WeChat applet is based on NativeSystem, so the two layers of information based on view layer and logic layer will be loaded at the same time. This loading method not only improves the loading speed and reduces the response time, but also greatly improves the user experience.

### 2.3. MySql Database

At present, there are several common database management systems on the domestic market, such as MySql, Oracle, DB2, SQLSever, etc. Oracle has been chosen by fewer people because of its fees and high late costs; DB2, which is better in terms of stability and performance, but it is more suitable for handling large amounts of data; SQLSever is from Microsoft, but MySql is a relational database software<sup>[7]</sup>, which accesses the database through the most commonly used exact language SQL. As MySql has many significant advantages such as: open source, easy installation, small size, fast execution, cross-platform, etc. It can be seamlessly connected and used with backends written in different languages, and it stores all data in one single data table, so it is faster to execute and

more flexible to use.

Therefore, it is not surprising that MySQL can be used as a database both for our students in this program and for some companies whose website pages, backend construction and software and other related applications<sup>[8]</sup>.

### 3. Overall Design

#### 3.1. General Functions

After full market research and detailed analysis of the application requirements of the applet, each functional module of the applet user side and system administrator backend is planned according to the principle of "high cohesion and low coupling". The main functions of the school hospital management app include registration and login, registration and consultation, querying drug information, reporting temperature, etc. The details are shown in Figure 1.

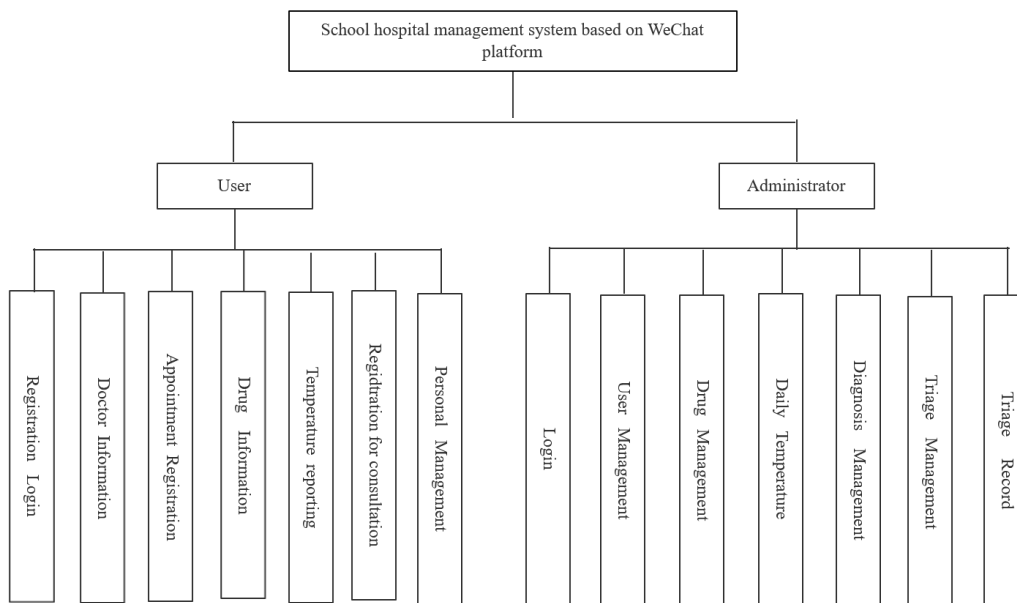


Figure 1: Core function diagram

#### 3.2. Data Flow Diagram

The core functions of the information management system of the school hospital<sup>[9, 10]</sup> were analyzed, and only the backend administrator of the school hospital has the highest authority, whether to manage users, manage diagnoses and medicines, or perform temperature management, the administrator is not restricted.

The basic operations include the modification of basic information such as name and phone number, registration of daily temperature data, description of the condition before the visit, and viewing the cost of the whole diagnostic process and the specific diagnostic results, all of which can be viewed from the My screen. Both students on the applet side and school administrators on the browser side need to pass the account and password verification audit, and only if the verification is successful can they be correctly assigned permissions and qualified for the relevant operations. Therefore, the specific data collation procedure is displayed as can be seen in Figure 2.

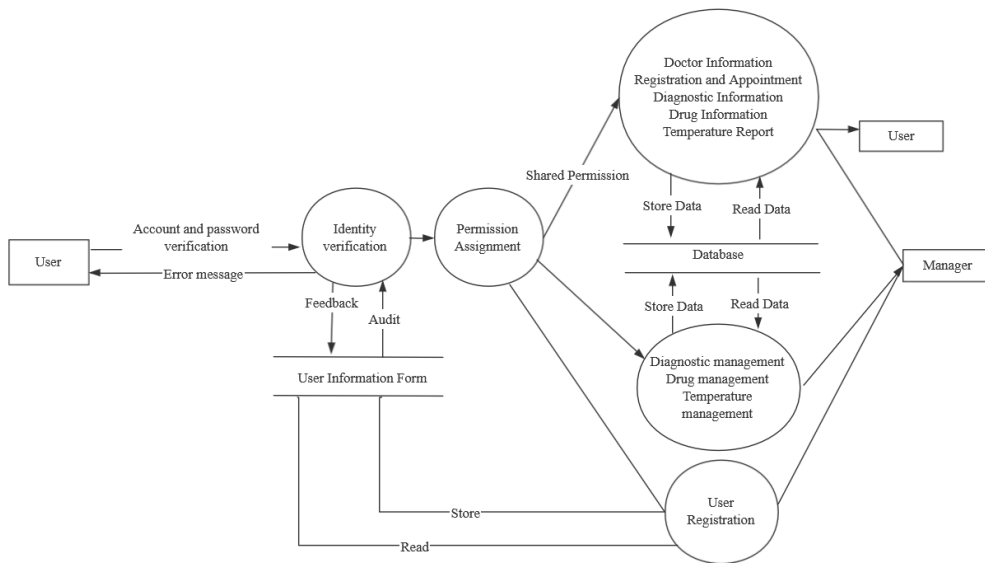


Figure 2: Data access diagram of the school hospital system

### 3.3. Conceptual Model

Based on the analysis of the actual needs of the users and the data flow diagram of the school hospital management system, we designed the conceptual model of the entity diagram of the students. We followed the basic principles of database design and clarified the number of tables we should design and the specific fields, types, lengths, etc. of each table to complete the creation of the corresponding information data tables.

After the analysis of the specific entity-attribute relationships, the entity diagram of student users, the entity diagram of the case generated after the completion of the doctor's visit, and the specific attribute diagram of the drug and body temperature, etc. are included. The details can be seen in Figure 3, Figure 4, Figure 5 and Figure 6.

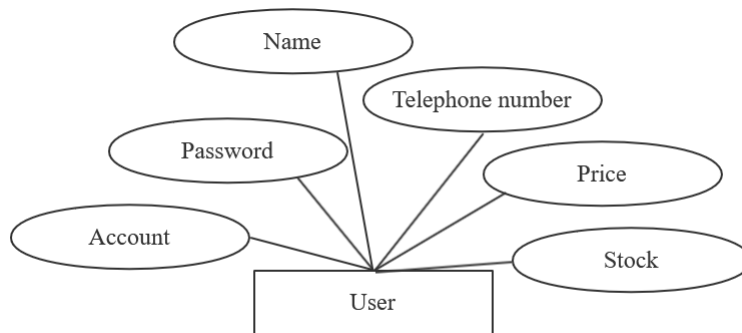


Figure 3: Entity diagram of student users

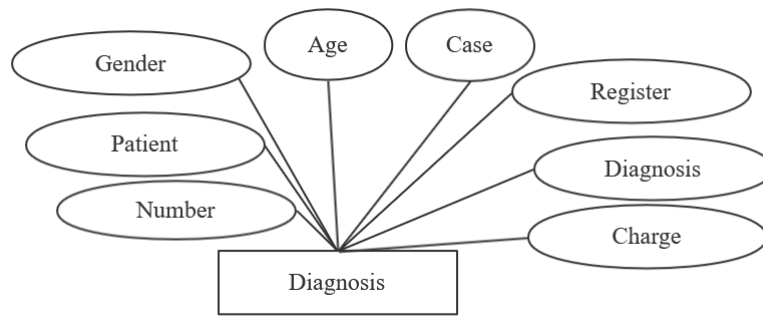


Figure 4: Entity diagram of the case

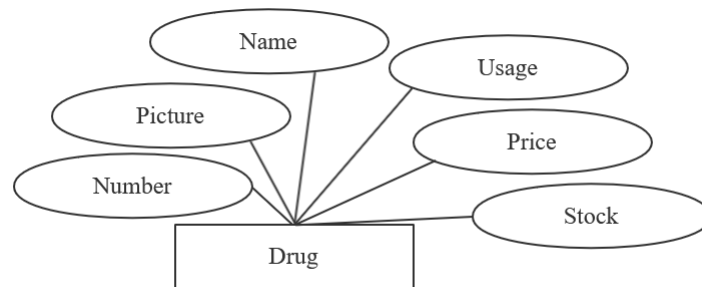


Figure 5: Entity diagram of the stock drug

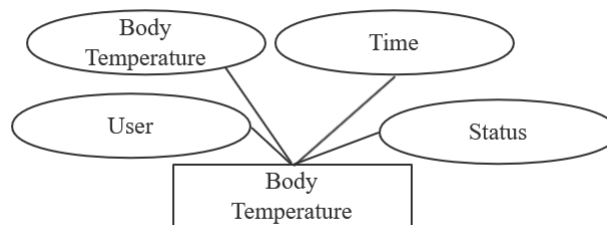


Figure 6: Entity diagram of the body temperature of the outbreak

### 3.4. Database Design

Based on the requirement analysis, E-R diagram is used to build the abstract information structure, determine the interaction between one entity and another entity, and then start from the whole and design the data table of each part in detail. The school hospital management system mainly contains four tables, which are the doctor table to record the basic information of doctors, the medicine table containing the details of drugs, the case table for students' visits and the temperature table for daily temperature registration.

## 4. Overall Realization

### 4.1. Small Program Home Page

The Login interface is accompanied by a picture of the hospital. Below the picture of the red cross is a bar for entering the account number and a bar for entering the password, students can enter their account information and set the password information to see the doctor information

interface. At the same time, new students can also click the register button to enter the account registration interface.

#### **4.2. List of Doctors**

The student entered the account number in the first step, then filled in the correct password and then came to the home screen of the applet. Here, the list page about all medical doctors will appear. Enter the doctor list, and the basic personal information of the doctor is displayed. Click the corresponding doctor to enter the doctor details page. Here, you can fill the recent symptoms of the body into the disease input box. After describing your own disease, there is a registration button. Click it to indicate that the doctor has made an appointment for the visit.

#### **4.3. List of Drugs**

When students find that they have run out of a particular medication and want to continue purchasing it but don't know if the school hospital has it in stock, or if they forget how to use the medication and the exact dosage due to their sloppy forgetfulness after the visit, they can retrieve the medication information by going to the medication list, which also contains the specific price information of the medication.

#### **4.4. Temperature Registration**

During the COVID-19, students should obey the arrangement of the school. Students should log in to the school hospital applet every day, and then they can report their body temperature. Select the body temperature report button, according to the real temperature measured by the thermometer, and then fill in the data, which can be reported to the background body temperature management interface. The school leader can also see the students with abnormal body temperature from the background page.

#### **4.5. Visit Management**

The relevant person in charge of the management of the school or the doctor can enter the background management page of the small program of the school hospital after entering the relevant password for login, and can consult the corresponding student registration information behind the specific doctor through the diagnosis management, and then fill in the diagnosis results and diagnosis fees after the student has been interviewed. If the doctor finds that the condition in the school clinic at this time cannot cure this symptom, he can click the triage button in time to make a connection with the off campus hospital. All registration information, diagnosis information of medical treatment and triage information records can be queried.

#### **4.6. Drug Management**

The system administrator can browse the management interface of medical drugs to see the detailed information of drug pictures, names, usage prices and stocks, etc. He can also click the three small icons in the upper navigation, which represent the operations of adding drugs, modifying drugs and deleting drugs for the corresponding drugs.

#### **4.7. Temperature Management**

Clicking on the temperature management on the left side, you can see the temperature level

under the corresponding user ID, the time of registration, and the specific information whether the temperature is abnormal or not. There is also an operation button to delete the temperature information at the back, which can remove a certain temperature record from the database.

## 5. Conclusion

In this paper, we designed a WeChat applet for school hospital management based on the problems in the daily management of the school hospital, which not only simplifies the tedious process of medical treatment for students, but also greatly reduces the workload of school hospital workers and frees up more time for studying complex cases. At the same time, the hospital management system based on the WeChat platform also responds to the call of "smart campus" and contributes to the future development of "Internet + health care". In order to further enhance the experience of students, there are some minor problems with the system that need to be improved later.

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