STRUCTURAL DESIGN OF THE DATA BASE ON THE INTERNET OF THINGS FOR PRODUCT QUALITY CONTROL

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Abstract. Database management system structure and function, providing data definition language DDL and data manipulation language DML, and some other user functions. Product quality control database structure design, including logical structure design and physical structure design.

Keywords: DBMS, database for product quality control, database model diagram.

Introduction

A database management system is a software for managing databases. It provides functions such as database definition, data manipulation and database operation management. This article introduces the organization and functions of the database management system. The structure design of the product quality control database, taking the milk quality control database as an example, we introduced its logical structure through the database model diagram, and introduced its physical structure, fields, data types, whether it is empty by taking the milk information table as an example.

Database Management System Structure and Function

DBMS is a large-scale software for manipulating and managing databases, used to establish, use and maintain databases. It manages and controls the database uniformly to ensure the security and integrity of the database. Users access the data in the database through the DBMS, and the database administrator also maintains the database through the DBMS. It can support multiple applications and users in different ways to create, modify and query the database at the same time or at different times.

Most DBMSs provide data definition language DDL (Data Definition Language) and data manipulation language DML (Data Manipulation Language) for users to define the schema structure and permission constraints of the database and implement operations such as adding and deleting data. The database management system (DBMS) structure is shown in Figure 1 [1].
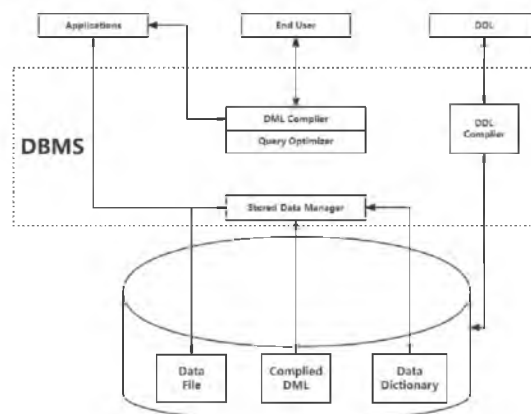

Figure 1. DBMS structure

Structure Design of Product Quality Control Database

Taking the milk quality control database as an example (Figure 2). Model diagram of milk quality control database shows the milk quality control database model, which introduces the associations between the various tables. For example, in the milk information table, MID (Milk ID) is used as the primary key in the table, and CID (Cow ID) is used as a foreign key, and CID is the primary key in the milk information table, so that the cow can be queried in the milk information table through CID, and MID is also used as the foreign key of the fat content table and other tables, so that it can be know which cow the fat content record came from, so as to manage and control milk quality [2].
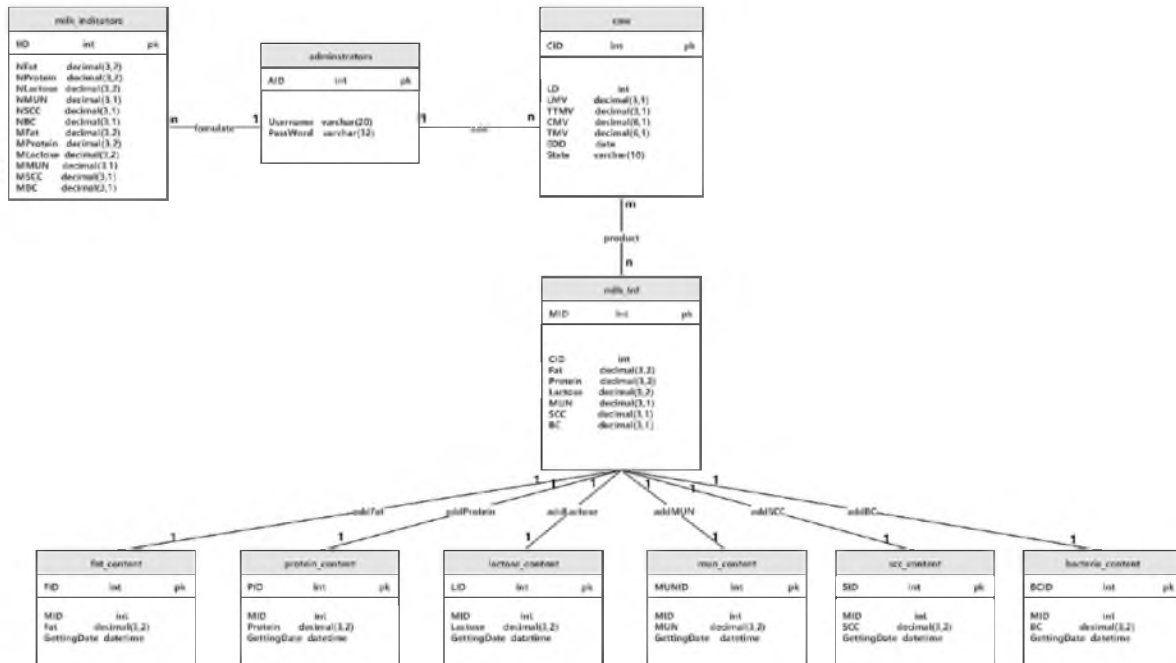

Figure 2. Model diagram of milk quality control database

The MID (Milk ID) field is an int data type. This field is used as the primary key of the table to uniquely identify each record. Whenever a new record is inserted into the table, the field will increment by 1, so the field is Unique.

The CID (Cow ID) field is of type int. It is the primary key in the cow information table. It uniquely identifies each cow. It is used as a foreign key in the milk information table. Through this field, you can know which cow the milk record comes from.

The Fat field is a decimal (3,2) type, similar to floating-point numbers in the C language. The first parameter 3 means that the total number of digits of the data is 3, and the second parameter is 2, indicating that the data is after the decimal point. There are two bits, indicating that the accuracy is 0,01.

The Protein field is of decimal (3,2) type, similar to floating-point numbers in C language. The first parameter 3 indicates that the total number of digits of the data is 3, and the second parameter is 2, indicating that the data is after the decimal point. There are two bits, indicating that the accuracy is 0,01.

The Lactose field is a decimal (3,2) type, which represents a floating-point number. The first parameter 3 indicates that the total number of digits of the data is 3 digits, and the second parameter is 2, indicating that there are two digits after the decimal point of the data, indicating the accuracy is 0,01.

The field of urea nitrogen in milk (MUN) is a decimal (3,1) type, which represents a floating-point number. The first parameter 3 means that the total number of digits of the data is 3 digits, and the second parameter is 1, indicating that the data has one digit after the decimal point. Indicating that the accuracy is 0,1.

The somatic cell (SCC) number field is of decimal (3,1) type, which represents a floating-point number. The first parameter 3 means that the total number of digits of the data is 3 digits, and the second parameter is 1, indicating that the data has one digit after the decimal point. Indicates that the accuracy is 0,1.

Bacteria content (BC) field decimal (3,1) type, which means floating point number, the first parameter 3 means that the total number of digits of the data is 3, the second parameter is 1, indicating that there is one digit after the decimal point of the data, indicating the precision is 0,1.

Table 1. **Milk information table structure**

Milk Information			
Field name	Data type	Is it empty?	Is it a primary key?
MID	int	No	Yes
CID	int	No	No
Fat	decimal (3,2)	No	No
Protein	decimal (3,2)	No	No
Lactose	decimal (3,2)	No	No
MUN	decimal (3,1)	No	No
SCC	decimal (3,1)	No	No
BC	decimal (3,1)	No	No

Conclusion

We first introduced the structure and function of the database management system. It provides the data definition language DDL (Data Definition Language) and the data manipulation language DML (Data Manipulation Language) for users to define the schema structure and permission constraints of the database to realize the addition of data, delete, etc.

Next, we introduce the logical structure of the milk quality control database through the database model diagram, and introduce the physical structure of the single table, field names, attributes, whether it is the primary key, whether it is the primary key, whether it is null or not by taking the milk information table as an example.

References

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