Design and Implementation of Charity Donation System

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Abstract: *With the development of economy and society, more and more people are committed to charity. Philanthropy not only reflects the degree of economic development, but also represents the level of social development. Philanthropy is not only a balancer to adjust the gap between the rich and the poor, but also helps to reduce polarization, promote social morality, stimulate social responsibility and promote social harmony and tranquility. This paper designs and develops the charity donation system, analyzes the business process, data process and database design of the system, and realizes the core functions such as material management and donation management, which can improve the adverse phenomena such as asymmetric help seeking and donation information and opaque charity behavior in the process of charity promotion.*

Keywords: *Charity Donation System, Business Process, Data Flow, Database*

1. Introduction

The 2017 China Charity Donation report shows that in recent years, China's philanthropy has been widely concerned and recognized by all walks of life, and more and more enterprises have begun to expand the field of philanthropy. At present, there are some obvious problems in China's charities, which are mainly reflected in the lack of resource sharing platform for a long time. Due to the lack of statistics and quantitative standards of "number", the government lacks basis and reference for guiding and formulating policies for charities, charitable organizations go their own way, and the information of help seeking and donation is asymmetric, resulting in the unbalanced distribution of charitable resources, There is even a phenomenon that those who do good have no way to do good and those who ask for help have no way to ask for help. Charity is not transparent, which leads donors to doubt whether the donated property can be delivered in time and ensure the effect. In addition, the problem of social integrity needs to be improved, which makes the social public less motivated to take the initiative to do good. Therefore, it is very necessary to build an information exchange and service platform based on the national charity industry and serving the national charity.

2. Systems Analysis

2.1 Platform Structure Diagram

Charity donation system mainly includes front-end function and background function. The front-end is composed of donation management, logistics management and message operation. Donation management specifically includes four functions: publishing material information, asking for donated materials, collecting materials and querying materials. Users can collect materials while browsing the material list; Logistics management specifically includes two functions: uploading waybills and querying logistics. It obtains the corresponding logistics information through the national logistics query interface provided by Ali; Message operation specifically includes posting and viewing messages. Users can freely make healthy comments on this platform. The background management function consists of user management, message management and material management. User management includes three functions: querying user information, enabling user account and disabling user account; Message management includes two functions: viewing and deleting messages; Material management includes two functions: querying materials and deleting materials. The system function structure diagram is shown in Figure 1.
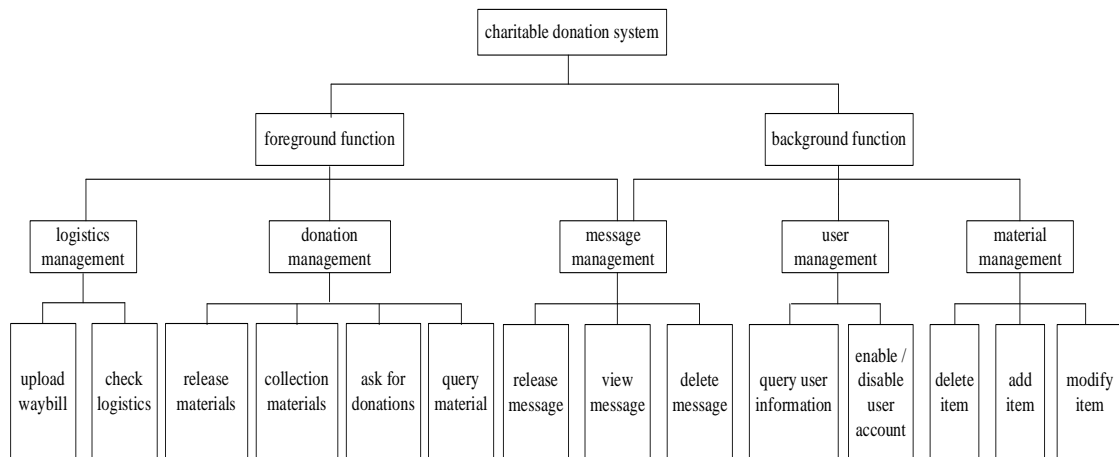
Fig.1 System Function Structure Diagram

The specific functions of the core module are as follows:

(1) User management module

It is used by administrators to manage user accounts, including querying user information, disabling illegal user IDs, and enabling legal user IDs.

(2) Material management module

It is used by the platform administrator to manage materials, including querying materials, deleting materials, modifying material information, etc.

(3) Message management module

It is used by the platform administrator to manage user messages, including browsing messages, deleting messages and other functions.

(4) Donation management module

It is used to publish material information or ask for gifts, including publishing material information, asking for gifts, querying materials, collecting materials and other functions.

(5) Logistics management module

It is used for users to manage express information, including uploading waybills, querying logistics and other functions.

2.2 Business Process Analysis

The main business processes of the system are as follows: first, users can log in to the donation system as users to register and generate user information table; After successful login, users can apply for donation on the platform according to their personal needs, and generate transaction information table and collection information table after operation; After the donor sends the express and uploads the express order number, both the donor and the recipient can query the latest logistics status of the donated or donated items at any time according to the waybill information uploaded by the donor; In addition, users can also browse and leave messages on the message board according to the message information to generate a message information table. As a manager, the administrator mainly carries out user management, item management and message management in the background. The business process of the donation system is shown in Figure 2.
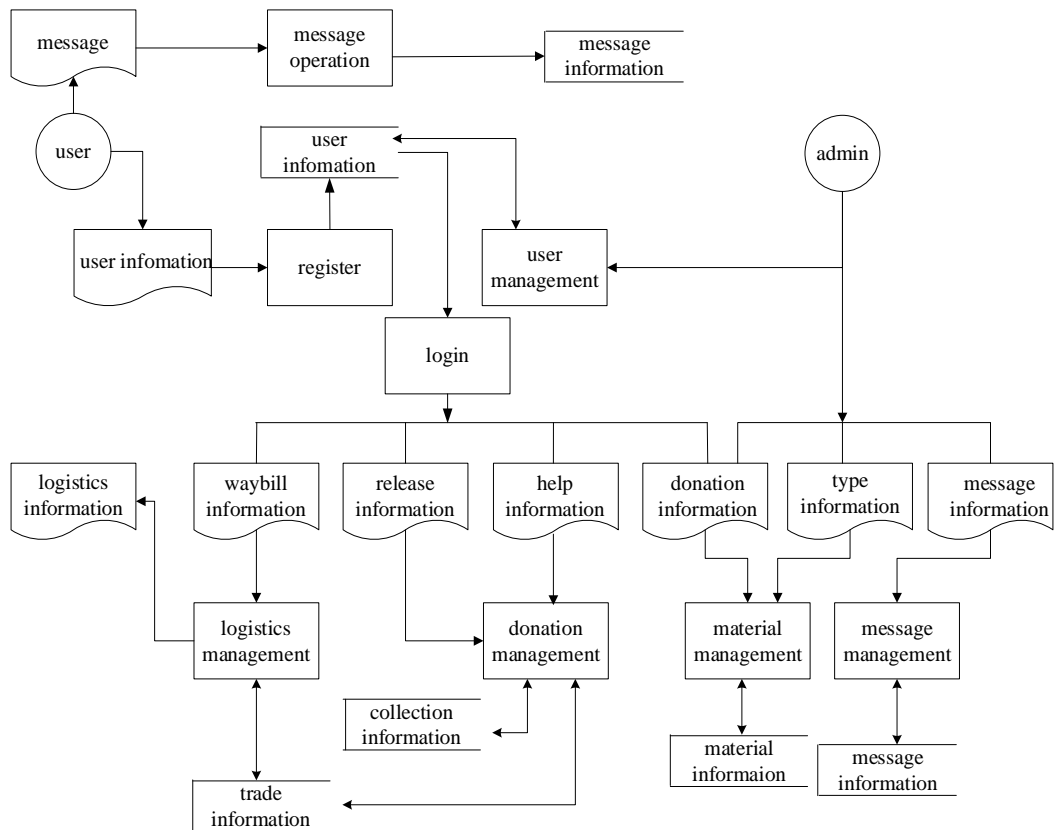
Fig.2: Business Process

2.3 Data Flow Analysis

Data flow analysis mainly includes the analysis of information flow, transformation and storage. Its purpose is to find and solve problems in data flow. The existing data flow analysis is mostly realized by hierarchical data flow diagram (DFD). Next, take the two first level data processing of P1 donation management and P2 material management as examples to decompose the second level data flow chart.

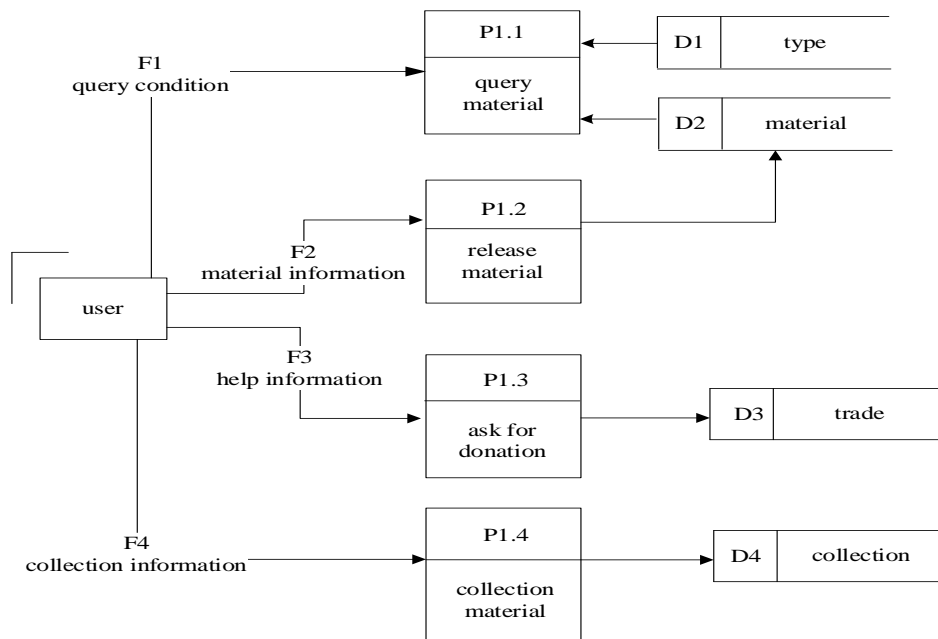The two-tier diagram of P1 donation management is shown in Figure 3.

Fig.3: Layer 2 Data Flow Diagram of Donation Management

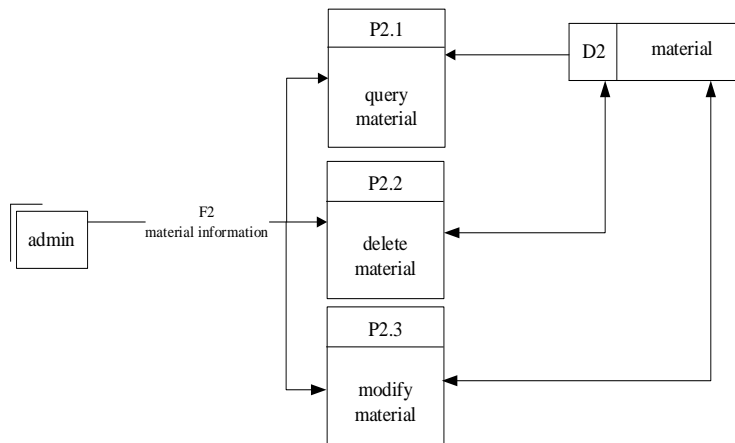The two-layer diagram decomposed by P2 material management is shown in Figure 4.

Fig.4: Layer 2 Data Flow Diagram of Material Management

3. System Design

3.1 Database Design

Database design refers to constructing the optimal database mode for a given application environment, establishing the database and its application system, so that it can effectively store data and meet the application needs of various users. The design content of database design mainly includes: conceptual structure design, logical structure design and physical structure design.

3.1.1 Conceptual Structure Design

The abstract conceptual data model is established by classifying, aggregating and summarizing the real world that users require to describe. This conceptual model should reflect the information structure, information flow, mutual restriction between information and the requirements of each department for information storage, query and processing in the real world. The established model should avoid the specific implementation details of the database on the computer and be expressed in an abstract form. The result of conceptual design calculation is E-R diagram.
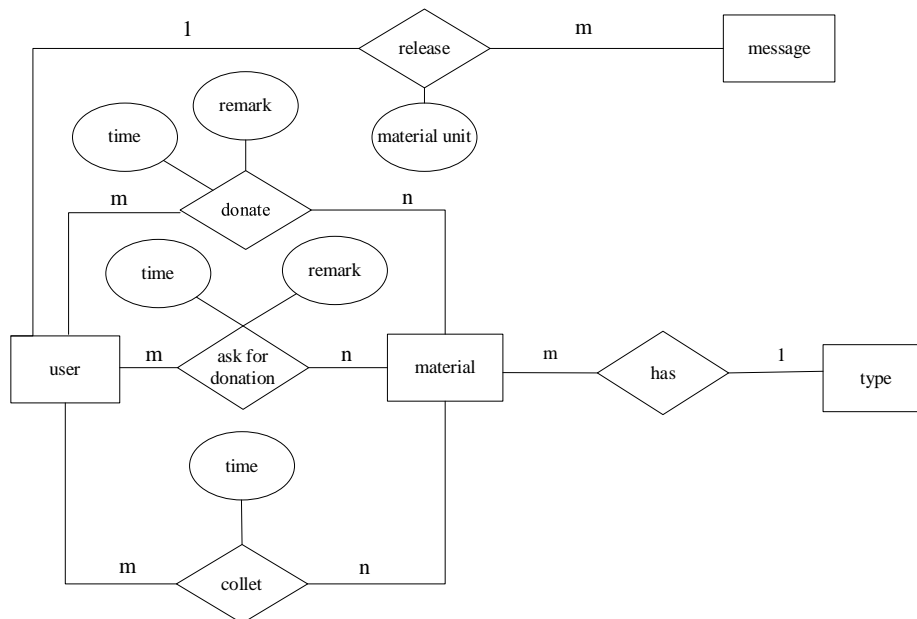
The system E-R diagram is shown in Figure 5.

Fig.5: E-R Diagram of the System

3.1.2 Logical Structure Design

The E-R diagram obtained in the conceptual design is composed of entities, attributes and connections, and the result of relational database logic design is a set of related relational patterns. Therefore, transforming the E-R diagram of charity donation system into relational model is actually transforming the entities, attributes and connections of the system into relational patterns.

The relationship patterns converted in the logic design phase are as follows:

user（user id，user name，user password，user phone，user address，user status，user role）

material（material id，material name，material unit, material description，material image，material status, type id）

message（message id，message content，user id）

type （type id, type name）

donate (user id, material id, remark, time)

donated (user id, material id, remark, time)

collection (user id, material id, time)

3.1.3 Physical Structure Design

Database physical design refers to designing the physical structure of the database, selecting RDBMS according to the logical structure of the database, and designing and implementing the storage structure and access mode of the database.

Through analysis and design, it is concluded that the system should include seven information tables: user information table, material information table, type information table, message information table, collection information table, donate information table and donated information table. The specific informations of the tables are shown in table 1 to table 7.

Table 1: User Information

field name	data type	primary/ foreign key	remarks
user _id	varchar(50)	primary key	user id
user _name	varchar(20)	no	user name
user _pass	varchar(50)	no	user password
user _pho	varchar(50)	no	user phone
user _address	varchar(255)	no	user address
user_ state	int(1)	no	user status
user_roleid	int(1)	no	user role

Table 2: Material Information

field name	data type	primary/ foreign key	remarks
m _id	varchar(50)	primary key	material id
m _name	varchar(20)	no	material name
m_unit	varchar(20)	no	material unit
m_desc	varchar(255)	no	material description
m _img	varchar(255)	no	material image
m_state	int(2)	no	material status
t_id	int(10)	foreign key	type id

Table 3: Message Information

field name	data type	primary/ foreign key	remarks
message_id	varchar(50)	primary key	message id
message_content	varchar(1000)	no	message content
Remark_name	varchar(20)	Yes	user id

Table 4: Type Information

field name	data type	primary/ foreign key	remarks
t _id	int(10)	primary key	type id

| t_name | varchar(20) | no | type name |

Table 5: Donate Information

field name	data type	primary/ foreign key	remarks
user _id	varchar(50)	primary key	user id
m _id	varchar(50)	primary key	material id
remark	varchar(20)	no	remark
time	datetime	no	time

Table 6: Donated Information

field name	data type	primary/ foreign key	remarks
user _id	varchar(50)	primary key	user id
m _id	varchar(50)	primary key	material id
remark	varchar(20)	no	remark
time	datetime	no	time

Table 7: Collection Information

field name	data type	primary/ foreign key	remarks
user _id	varchar(50)	primary key	user id
m _id	varchar(50)	primary key	material id
time	datetime	no	time

3.2 Code Design

The waybill number information is obtained from the receipt given by the express company when the user sends the express, and the waybill number information is automatically generated by adding 1 to the database primary key;

Format: XXXXXXXXXXXX consists of 8 to 12 digits. Different express digits are different.

4. System Implementation and Testing

The system is designed according to the expected function, implemented with PHP and SQL Server database, and the system is black box tested. Black box test is also called function test. It tests whether each function can be used normally. Since black box testing can be used to test common functions, and the conversion between data is also carried out according to the specification. Therefore, the system decides to use the black box method to test, which is tested from three use cases: message module, donation module and logistics module. Confirm, for example, whether the user can normally post messages, whether the user can normally use the material donation function, and whether the user can query the logistics status through relevant waybills, so as to ensure the normal operation of the system function.

5. Conclusion

This paper analyzes and designs the charity donation system in detail, analyzes the business flow chart, data flow chart and database design, and tests the implementation and function of the platform. With this platform, we can effectively establish people's sense of social responsibility, give more people the opportunity to devote their love, and enhance the credibility and cohesion of the society.

Acknowledgements

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