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Application of Modular Interface Design in Student Dormitory Management System*

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***Abstract*—This paper analyzes the application of modular interface design in the student dormitory management system, and explains the realization process of the modular interface design of student dormitory management system starting with the current trend of the modular interface design. It is of great practical significance to demonstrate the history and current situation of the dormitory management system, to understand its future development and to improve the dormitory management system from the progress of the era. The ultimate goal is to design a safe and efficient dormitory management system to complete the school's work requirements for student dormitory management.**

Keywords: interface design, modularization, student dormitory management system

I. INTRODUCTION

Interface design is becoming more comprehensive with the development of social technology, and is widely used in various areas of people's life, such as: flat visual interface design, multimedia interface design, VR technology interface design, auxiliary teaching interface design, information management interface design, etc. Interface design is the bridge between design and audience. Due to the development of computer technology, the download and application of various APPs have made interface design important and popular. The front-end engineers and UI designers of the computer profession are all committed to making the audience have a good experience while delivering all-round information. The audience can perform interface operations without professional training. The modularity of the interface design greatly eases the visual pressure of the users and makes the audience's acquisition of information more efficient.

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II. THE CURRENT TREND OF MODULAR INTERFACE DESIGN

Interface design plays a very important role in the application program. In the process of interaction between the user and the application program, the interface design can give the user an intuitive feeling, while the background code and database are invisible to them, so the interface is the bridge between the user and the designer. From a psychological perspective, the interface can be divided into two levels of feeling and emotion. A good interface design should not only give users a beautiful, intuitive visual experience, but also awaken the emotions deep in the user's heart, achieving the effect of resonance. In the historical background of excessive information, simple and flat interface design is more popular with users, and this tendency has gradually spread to all directions of visual communication design. Mapping to interface design, modular design undoubtedly provides designers with a good choice. For example, the interface design of Taobao APP is easy to understand and beautiful. Since then, JD APP and Pinduoduo APP have followed this tradition and continue to innovate on this basis. The interface design of Taobao APP is undoubtedly a successful case in modular interface design. At the same time, this effect not only relieves the visual pressure of the user, but also effectively improves the browsing efficiency. This allows users to get the information they want while quickly distinguishing the primary and secondary information.

III. APPLICATION OF MODULAR INTERFACE DESIGN IN STUDENT DORMITORY MANAGEMENT SYSTEM

Contemporary schools attach more and more importance to the management of student dormitories. Living in the Internet era, the modular design of student dormitory management system has become an inevitable trend.

The main functions of the student dormitory management system are: user login, student accommodation management, visitor information management, administrator information management, and item repair management. Therefore, there are interface design of user login, interface design of student information management, interface design of visitor information management, interface design of administrator information management, and interface design of item repair

management. In each interface design, the designer must understand the function of each module and the public's visual habits and preferences, and design the accessible operation interface as much as possible. Therefore, the interface designers must have close communication with the back-end designers.

A. Overall function module

The main functions of the dormitory management system are: user login, student accommodation management, visitor information management, administrator information management, and item repair management. (See "Fig. 1")

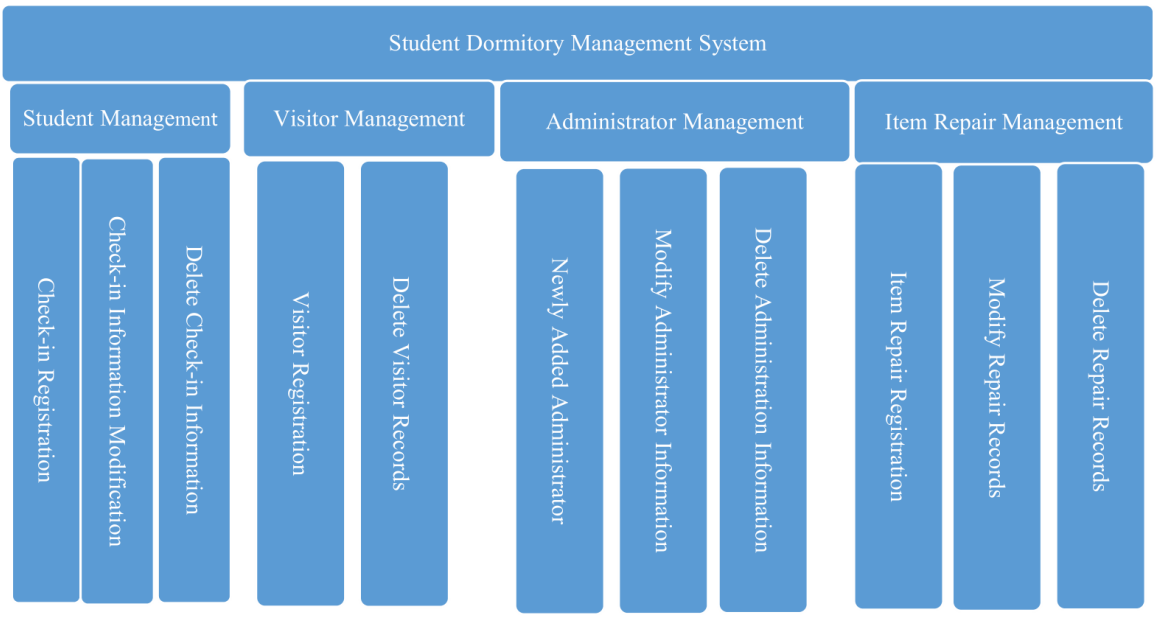

Fig. 1. Overall function module diagram.

B. System module design

The student dormitory management system is an important part of the current university information management system. The administrator can directly access the dormitory management system after logging in the dormitory system successfully. The system has four modules, namely, student accommodation management module, visitor management module, administrator management module, and item repair management module.

1) Student accommodation management module

This module is mainly designed for dormitory administrator to manage student accommodation information. If the logout user can log in again, each dormitory supervisor has his own user name and password to enter the system and perform related operations. After the dormitory administrator enters the system, the administrator can register the student's check-in information, modify the student's check-in information, delete the student's check-in information, and query the student accommodation information. The flow chart of student management is shown in "Fig. 2".

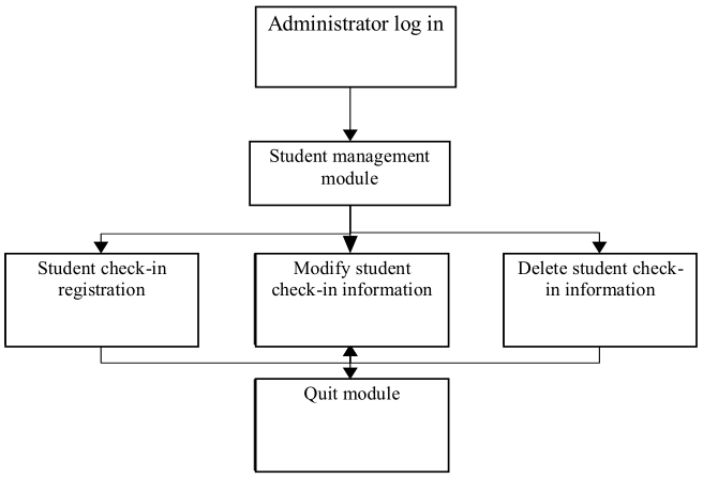

Fig. 2. Student management flowchart.

2) Visitor management module

This module is designed for visitor management. After the administrator logs in the system, he can enter the visitor management module to perform visitor registration and delete visitor records. The modification process is shown in "Fig. 3".

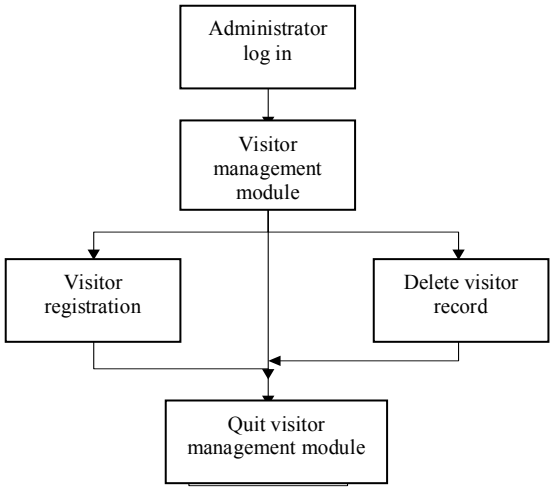

Fig. 3. Modification flowchart of visitor information.

3) Administrator management module

The function of this module is to add the basic information of the dormitory administrator, modify the information of the dormitory administrator, and delete the information of the dormitory administrator. The flowchart is shown in "Fig. 4".

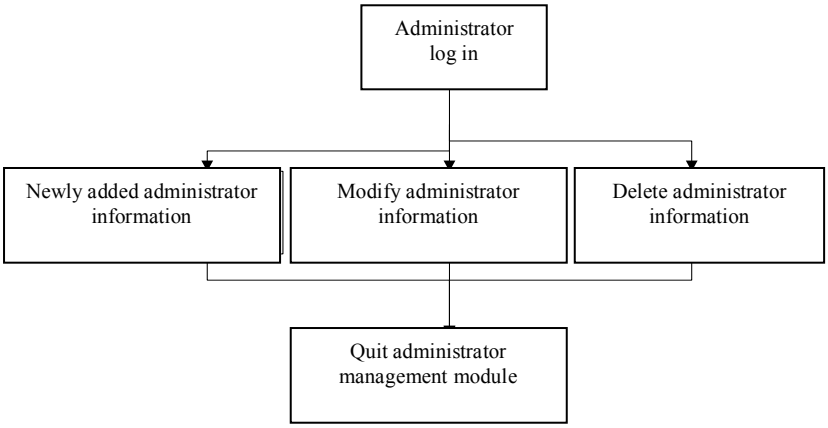

Fig. 4. Administrator information management process.

4) Item repair management module

The function of this module is to implement the repair registration of items, modify the repair records, query the repair records and delete the repair records, and save the information of the items in the data.

The administrators log in the system and perform the item repair operation. They can register and save the item information, such as item name, repair number, repair reason, the dormitory to be repaired, the name of the repair man, and the repair time. After that, the item repair information registration is successful. (As shown in "Fig. 5")

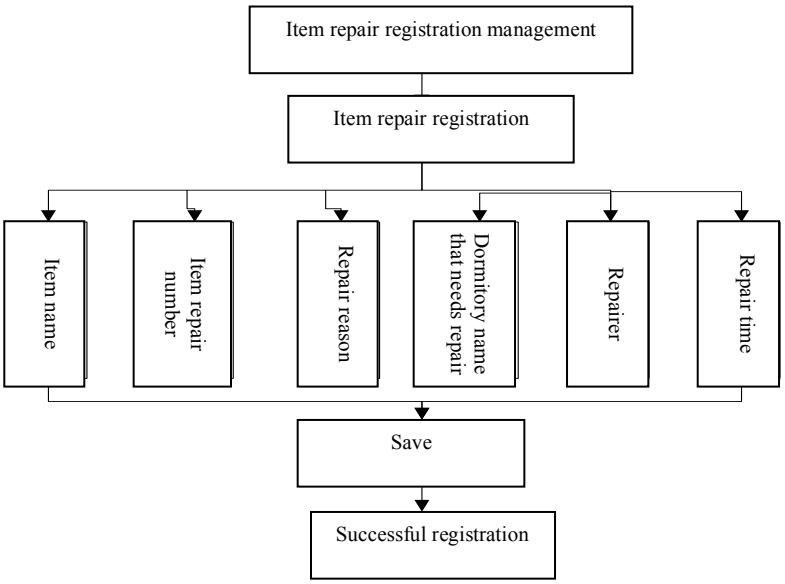

Fig. 5. Item repair registration process.

For information on the items to be repaired, the administrator can search by dormitory name or item name. The administrator can input the keywords in the search box. All the information that meets the conditions will appear, showing the item name, repair number, repair reason, the dormitory to be repaired, the name of the repair man, and the repair time. (As shown in "Fig. 6")

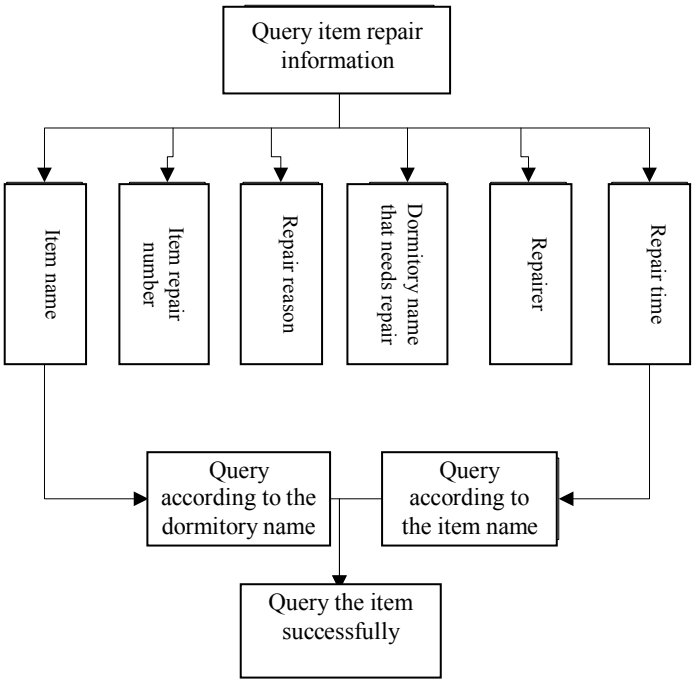

Fig. 6. Query process of item repair information.

The direct carrier of user interface design is various multimedia devices or industrial products, which have strict technical standards. For the user interface design, all products that need screen display have specific technical parameters, such as the media screen pixel and resolution size, and the size of the picture format used. These are the specifications and guidelines that must be followed for user interface design, and the visual design is done within the limits of these specifications. Therefore, standardized design requirements, whether for user or interface design, have a direct impact. Because of this, modularity is easily accepted by user interface design in terms of technical specifications.

IV. IMPLEMENTATION PROCESS OF MODULAR INTERFACE DESIGN OF STUDENT DORMITORY MANAGEMENT SYSTEM

After logging in the main interface, the entire interface includes four functional modules, including the student management module, the visitor management module, and the administrator management module. The login module consists of a user name and a password. The user name and password information has been stored in the database. The interface design conforms to the user's aesthetic conventional thinking. It does not need excessive design, and aims at being simple and pretty. It is necessary to prevent excessive design to bring complete strangeness to the user. This is one of the important reasons why there are so many similarities between various products. After logging in the main interface, the four functions are placed in the left navigation bar according to the reading habits of the majority of users, which is convenient for users to perform operations. People can click the menu on the navigation bar, and the sub-menus will appear below. The operation is very easy. "Fig. 7" shows the main interface after logging into the system.

Fig. 7. Main interface of student dormitory management system.

A. *Student management module design*

This picture is the login page. The login module consists of two parts: user name and password. The user name and password information have been stored in the database. The administrator can log into his account to enter the system for operation. If the user name and password are incorrect, an incorrect user name or password prompt will appear. The system login diagram is shown in "Fig. 8":

Fig. 8. System login page.

As shown in student check-in registration function, the administrator inputs the student number, name, gender, class, hometown, telephone number, dormitory name, check-in time, departure time and other information. After saving the information, the information has been recorded in the database and displayed on the page. Other options besides gender are required. The administrator can also search for information based on student number and dormitory name. The student check-in registration chart is shown in "Fig. 9":

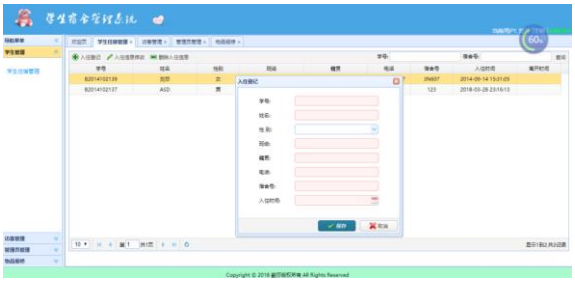

Fig. 9. Student check-in registration chart.

For the student number, name, gender, nationality, phone number, dormitory name, and check-in information entered by the administrator, there may be partial information updates that must be modified prior to the student check-in information. The specific operation is to modify the information saved when clicking check-in, click save, then the student's check-in information is modified successfully. The student check-in information modification diagram is shown in "Fig. 10".

Fig. 10. Student check-in information modification diagram.

The function of deleting student check-in information is to delete information for students who want to leave the school. The specific operation is to select the row to be deleted, and click the check-in information option to delete. Then, a prompt box pops up, and the administrator can click OK to delete the student check-in information. The deletion of student check-in information is shown in "Fig. 11":

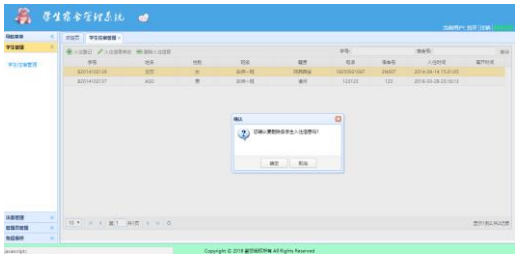

Fig. 11. The deletion of student check-in information.

B. *Visitor management module design*

It is necessary to register the foreigners visiting the dormitory. The specific operation is to click the visitor registration menu. There will pop up dialog box. The administrator enters the student name, ID number, visiting purpose, visiting time, leaving time and other information,

and saves the information. After inputting these information into the database and display it on the page, the administrator can also perform information query based on the name or ID number. The query function can be performed based on one attribute. If information is registered, all information in the visitor registration form is queried. The visitor registration chart is shown in "Fig. 12":

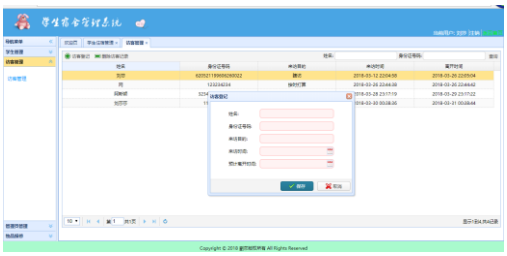

Fig. 12. Visitor registration.

It is convenient to delete the previously registered visitor information. The specific operation is to select the row to be deleted, and click the check-in information to be deleted. And a prompt box pops up, the administrator performs the operation. "Fig. 13" shows the deletion of visitor records.

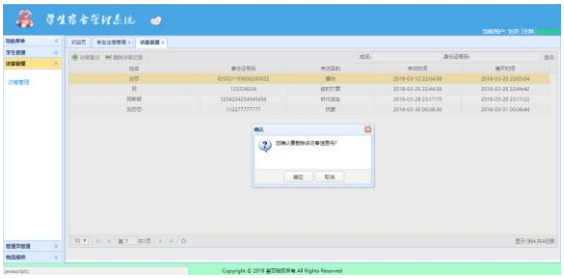

Fig. 13. Delete the visitor record.

C. Administrator management module design

The administrator can enter the user name, password, real name, phone number and other information to become the administrator of this system. The administrator can operate the student information and query the information based on the real name or phone number. If no information is entered, all information in the administrator table is queried. The newly added administrator information diagram is shown in "Fig. 14".

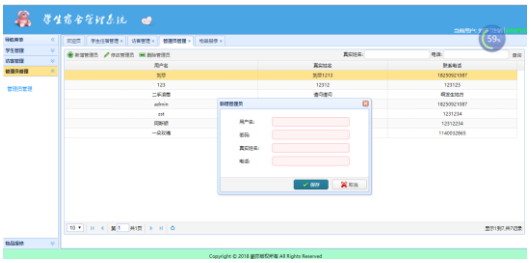

Fig. 14. Newly added administrator information.

The administrator of this system can modify the user name, password, real name, phone number and other information that has previously entered. The modification of administrator information is shown in "Fig. 15":

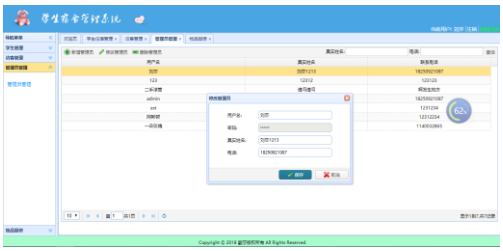

Fig. 15. Modify the administrator information.

When replacing the administrator, it is necessary to delete the information of the outgoing administrator. The specific operation is to select the row to be deleted, and click the check-in information to be deleted. And a prompt box will pop up. If the administrator clicks the OK, deletion is successful. If the administrator clicks the cancel, he will return the last step. "Fig. 16" shows the deletion of the administrator information.

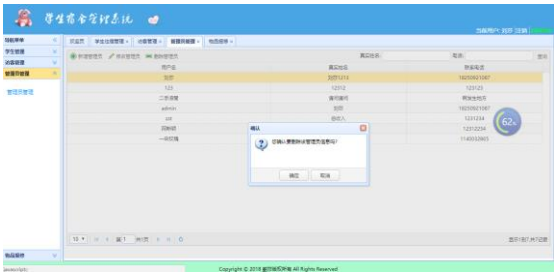

Fig. 16. Delete administrator information.

D. Item repair module design

The living furniture of the dormitory needs the repair. The administrator records the items, the number of repairs, and the reason for the repair, the dormitory name, the repairer, and the repair time according to the information reflected by the student. It can conduct information inquiry according to the item and dormitory name. The registration of repaired items is shown in "Fig. 17".

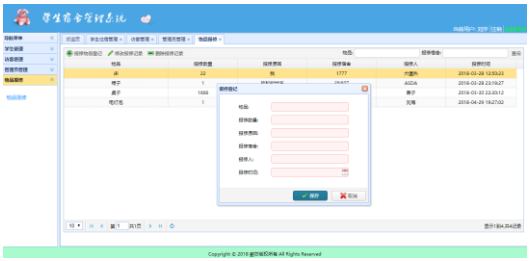

Fig. 17. Registration of repair items.

The administrator will modify the information entered previously, such as the number of repairs, the reason for the repair, the dormitory name to be repaired, the name of the repairer, the time of the repair, etc. The modification diagram of repair records is shown as "Fig. 18".

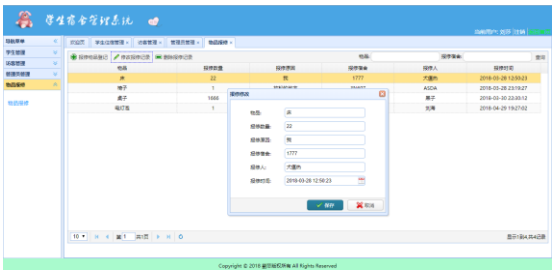

Fig. 18. Repair record modification.

The administrators can clean up or delete useless or unwanted information. They can select the row to be deleted, and click the repair records to be deleted. And a prompt box pops up. If the administrator clicks the OK, deletion is successful. If the administrator clicks the cancel, he will return the last step. The deletion of repair record is shown in "Fig. 19":

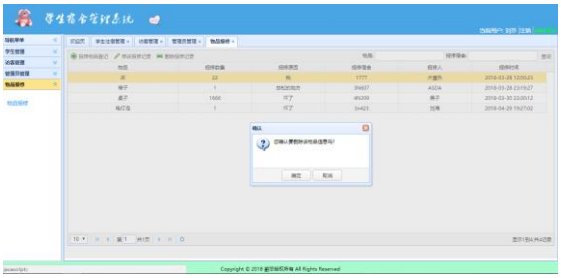

Fig. 19. Delete the repair record.

This paper takes the modular design of the student management system as an example to illustrate the realization process of the modular interface design of the student dormitory management system. Whether in the process of developing a system or in the process of interface design, modular design is very important. The student management module includes functions such as student registration, modification, deletion, etc. At the same time, the data in the database must be designed. All information is distributed horizontally. The first line is the name of the student information, and the vertical column is the information or data of different students. The administrator can add controls for check-in, information modification, and deletion in the navigation bar of this page. Placing them in a conspicuous location reduces the user's cognitive burden, and this step-by-step method is more easily accepted by users. From this perspective, it can divide a page into many modules, and each module has its role and function. This saves time and improves work efficiency for both designers and users.

V. EMOTIONAL REQUIREMENTS FOR THE IMPLEMENTATION OF INTERFACE DESIGN MODULARIZATION

A. Emotional needs at the instinct level

It is known that vision and hearing are the two most active sensations among the five senses. Among them, vision is the first impression of the audience and has a very important role. Gestalt psychology emphasizes integrity, and believes that people's cognition of a thing is carried out as a whole, a grasp of a certain "shape", and a perception process that forms a "shape". When the audience first sees an interface, it has formed its overall "shape" in the brain. The whole is greater than the part and can affect the part. This cognitive process is formed by the interaction of the user's visual physiology and psychology, previous visual experience and a variety of sensory functions. In the process of interaction between the audience and the interface, the visual and auditory senses of the audience are fully used. Now, most of the interface design does not involve the sense of touch, smell, and taste. It is believed that it will gradually appear in the future. Visual design in interface design can bring beauty and feeling to people. It is one of the main responsibilities of designers. Design works must not only play a role as a bridge of communication, but also meet aesthetic requirements. Beauty is a kind of enjoyment, an experience that can make the audience resonate and evoke the emotions of the audience. In addition to visual design, auditory design can also convey information. Taking the interface design of a website as an example, sound is one of the indispensable elements in an interactive interface, and it is a very important way to convey information, especially, beeps and warning sounds. Users have become accustomed to the sounds made when using the system. These sounds not only have the function of conveying information, but sometimes can also shorten the distance between the audience and the operating system or the media, increasing interest. For example, when receiving a transfer notification in the Alipay APP, there is also the sound of gold coins falling.

B. Emotional needs at the behavioral level

At the behavioral level, not only the interface design should be easy to understand, but the most important thing is to adhere to the "people-oriented" principle and design an interface that is easy to operate and highly usable. It is necessary to prevent abandonment of the use of the media due to complex operations and unfamiliar interfaces. Therefore, how to design and conceive a concise, smooth, and interesting interactive interface, make the most reasonable structural layout and clear usage guidance for users, and make people use the product in a pleasant mood is a key problem needed to be solved.

VI. CONCLUSION

The modular interface design of the system is beneficial to designers and users. For designers, the interface is divided into several small modules, then it is designed separately, and finally they are combined into a larger system. And this kind of design is not arbitrary. As Paul Rand said: "Design is not simply piecing, arranging, or even editing; Design is to give it value and meaning by clarifying, simplifying, clarifying, decorating, making it solemn, persuasive, and even a little interesting." Therefore, in interface design, it is very important to be clear. People must be able to identify what it is in order to use the interface better. Second, interface design exists for interaction, and it is through this

carrier that people are more closely linked. Finally, the interface design should not only attract the user's attention, but also allow the customer to have control over the interface. This is undoubtedly the most relaxed state for the user. At the same time, for users, the modular interface design can relax people's eye pressure, and make users get information more efficiently. It is also of great significance to improve users' visual aesthetics.

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