Design and Implementation of Education Information Management System Based on Android

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Abstract: As a major development of education, youth is concerned with the education of young children is a top priority. With the rapid development of the mobile Internet, the state has developed an "Internet +" action plan and established the "China Internet + Alliance", so it is imperative to use the mobile Internet to achieve education management. However, there is a lack of research on education informatization. The main purpose of this paper is to study the implementation of education information management system and use the advantages of mobile internet to design a new education system. This article takes the early childhood education as an example, mainly through the needs analysis of the system, clears the parents and teachers' demand for the system's functional requirements and system performance, and studies the realization of the system. The study finds that the education management system effectively alleviates the problems existing in today's education, and provides an effective tool for teachers to effectively improve the quality of teaching, making education more informative and intelligent, and has far-reaching significance for cultivating children's healthy growth.

1. Introduction

It has always been thought that children's education is a hot issue of social concern, and children's healthy growth is inseparable from family education. However, due to various reasons, parents have more than enough energy for children's education. Based on the above reasons, this paper proposes a management system based on Android system to alleviate the problems existing in the management of early childhood education in parents and kindergartens, and realize the common education of homes. However, there are many common problems in the existing preschool education products on the market: on the one hand, the parental version of the product has outstanding functions, which increases the burden on the kindergarten and is hindered in product promotion. In addition, the product emphasizes the management function. The design of some modules is not related to the data and education of the push. The software is a product of the common breeding of the home, and the product should be designed according to the attributes of education. Therefore, it is extremely important to design a product that simultaneously satisfies the real-time interaction between parents and teachers, and feedback data to each other to establish a positive circular information exchange.

Education informatization has become more and more mature in recent years. In 2016, Chen Jianlin et al. [1] used the scientific measurement software to visually analyze the educational informationization process in China in the past 20 years in order to study the normal changes and development in the process of foreign language education informationization, and clarified the overall education informationization research. The veins, evolutionary processes and research hotspots are used to infer the normal changes in the informatization process in the past two decades. The study found that the integration of the Internet and foreign language education has further promoted the development of education. In 2016, Zhang Jinbao et al. [2] analyzed the positive significance of the educational information service model in response to the development background of big data. From the analysis of the theory and practical experience of different countries, the study found that the existing education system is not mature, and the system is not Perfect, the impact is weak. In 2017, Chen Enlun et al. [3] used the education informatization to promote education and poverty alleviation, analyzed the existing functional education poverty

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alleviation model with the ability to improve information technology, and the cross-border collaborative education poverty alleviation guided by information technology and teaching integration. Mode, propose a new stage of education, precision poverty alleviation should focus on the construction of teachers, to promote endogenous development as the goal. In 2017, Xiao Xiaohua et al. [4] summarized the history and current situation of the research on the basic education informatization evaluation index system based on the comprehensive application literature research, content analysis and planning document analysis in order to study the basic education informationization problem. The general process and method for the construction of the basic education informatization evaluation index system have been developed. Research shows that the promotion of education development must strengthen standardization and scientific education.

With the development of the network, the Android system is increasingly affecting our lives. In 2016, Dong Chao et al. [5] conducted research and analysis on the third-party login protocol provided by two famous domestic Internet companies in order to solve the problem of forgery authentication in third-party login services, through reverse engineering and cryptographic protocol analysis methods. On the basis of obtaining the official vulnerabilities of relevant manufacturers, according to the actual security requirements, the application authentication method based on trusted third party application identity information is proposed. The results show that the proposed solution can not only completely defend against this kind of solution. Attack, at the same time has the characteristics of excellent performance and compatibility. In 2016, Li Qiang et al [6] introduced the forensic model of domestic and foreign forensic models and real-time communication applications of mobile terminals, referring to traditional digital forensics. Analytical model, combined with the characteristics of Android mobile intelligent device and QQ, proposed a QQ forensic analysis model under Android system. The research shows that the model has obvious advantages in forensic analysis. In 2016, Xie Lixia et al. [7] proposed a detection model based on benign samples for the phenomenon of malicious software flooding on Android platform and the inadequacy of existing detection models. The model consists of a feature information acquisition module and a detection and recognition module. The experimental results show that the detection model has a high detection rate. In 2017, Wang Cong et al. [8] proposed a privilege escalation attack detection scheme based on the analysis of the Android security mechanism and the analysis of the privilege escalation attack principle. The experimental results show that the method can effectively improve the privilege attack. Detection provides a feasible solution to solve the reliability problem of the privilege attack detection model.

The main research work of this thesis is based on the research and implementation of the early childhood education management system of Android system [9-10], designing a system jointly managed by teachers and parents, to achieve real-time communication between teachers and children in all aspects of kindergarten performance. At the same time, parents can reflect the performance of the child's home to the teacher, so that the parents and teachers complement each other to jointly educate the child [11-12].

2. Methods

2.1 Analysis of Early Childhood Information Management System

The application object is a kindergarten teacher. When logging in to the application, the user should be divided into two types, an administrator user and a normal user. The administrator generally refers to the class teacher and has the authority to add and delete children's information and other teacher information. Ordinary users only have permission to view child information. After the administrator logs in successfully, the child's personal information and the teacher's information, including name, gender, student number, date of birth, contact information, photos, and information notes, are first entered. The app requires a list of students and a list of faculty lists showing the student's name, gender, student number and contact details, as well as the teacher's name, gender, and contact details. In addition to the modification function, all users can modify their personal information to prevent information changes.

2.2 Analysis of Early Childhood Education Interactive System

The main interface displays the user name and avatar registered to the application. If the parent logs in to the application, the user name is a photo of the child's name avatar. The main interface should also display the function of the app: baby dynamics, message board, notifications, baby evaluation, system settings. Each function is a small module, and each module display information is composed of a function name and a picture for easy identification. Click on each function module to jump to the corresponding interface.

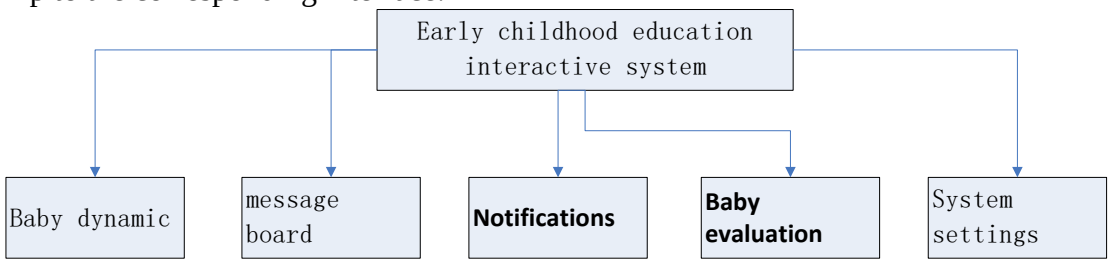

Figure 1 The function of the early childhood education interactive system

Baby Dynamics is a situation in which teachers and parents publish young children at school and at home. Because the child usually behaves differently at the parents and in the school, the parents can see the child on the "other side" of the school, and the teacher can see some performance of the child at home.

When parents raise any questions or comments about the child's growth education, they can leave a message to the teacher on the message board. If the advice is given to the school, the teacher can feedback the parent's suggestion to the director. If the parents' opinions or suggestions are feasible, the class or kindergarten will be improved.

Notifications are also essential in the application of the Early Childhood Education Interactive System. Anything in the class or kindergarten that requires parents to be notified can be posted to parents, such as tuition fees, school and vacation time, and important homework assignments.

The baby evaluation function is to regularly summarize and evaluate the performance of children's learning, extracurricular activities and life. The baby evaluation function provides an important information reference for the education of young children. When the evaluation content is accumulated for a certain period of time, the advantages and disadvantages of the child's life and learning can be analyzed, so that the child can better exert its advantages and target The lack of aspects can focus on cultivating education.

System settings can change the user password and log out. The user clicks the system setting to jump to the setting interface, clicks the change password, enters the old password and the new password, and after the modification is successful, switches to the login interface and logs in again. Click Sign out to sign out of the app.

3. Results and Discuss

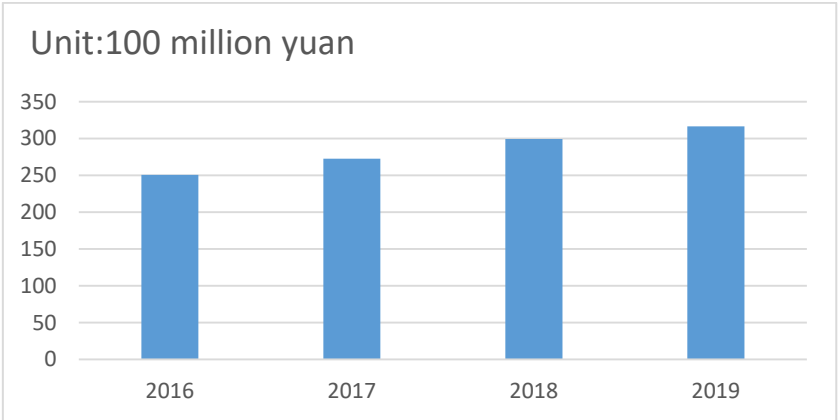

Figure 2 Education information investment trend

It can be seen from Figure 2 that the investment trend of education informatization has increased year by year from 2016 to 2019, indicating that China attaches great importance to the development of education information management.

3.1 Design goals and principles

The purpose of this system is to enable users to manage the educational management of early childhood education through a comprehensive educational information management system. Therefore, the main design principles of system design are:

(1) Simplicity. Because the purpose of the user's use of the system is because it is convenient, fast, and easy to operate, therefore, the system should not be too complicated in the design process, as long as the function is complete, the operation is as simple as possible.

(2) Targeted. The educational information management system developed in this paper is mainly aimed at the staff of the Early Childhood Education Office to facilitate the management of the educational work in the kindergarten education. Therefore, in the system design process, the special group of school staff must be considered, and the system must be designed. Meet the work habits of the staff.

(3) Practicality. After the system is commissioned and run, it needs to be tested several times before it can be applied to the practice. The final user is the school administrator, so the practicality of the system needs to be very strong.

(4) Feasibility and adaptability. Before the design of the system, the feasibility analysis of the technology required for system development must be carried out, and the more popular and mature technologies should be used as much as possible. In the adaptability of the system, it is necessary to fully consider the changes in the external conditions of the system and to adapt to future development needs.

(5) Security and confidentiality. Since the system is based on network access, it is necessary to pay attention to the necessary protection of the data, and the key data is not illegally read and modified. Therefore, the system design needs to consider the access control mechanism. For different applications, network environments and storage, separate technologies should be used to achieve real security of the system and data.

(6) Aesthetics and ease of use. The system-friendly interactive interface not only eliminates the visual fatigue of the system users, but also improves the work efficiency of the system users. Therefore, the system design style and interface must be considered beautiful and generous in the system design.

3.2 Implementation of the system

First, the basic hierarchy between the various modules and components of the entire application is designed. The system includes the contents of the client and the server, as shown in figure 3. It can be seen from the above figure that the HTTP-based text JSON format protocol is used to communicate between the client module on the left and the service module on the right. For the client, the HTTP request in the Android application framework is used to receive data from the API interface of the server, and then presented to the Android interface layer.

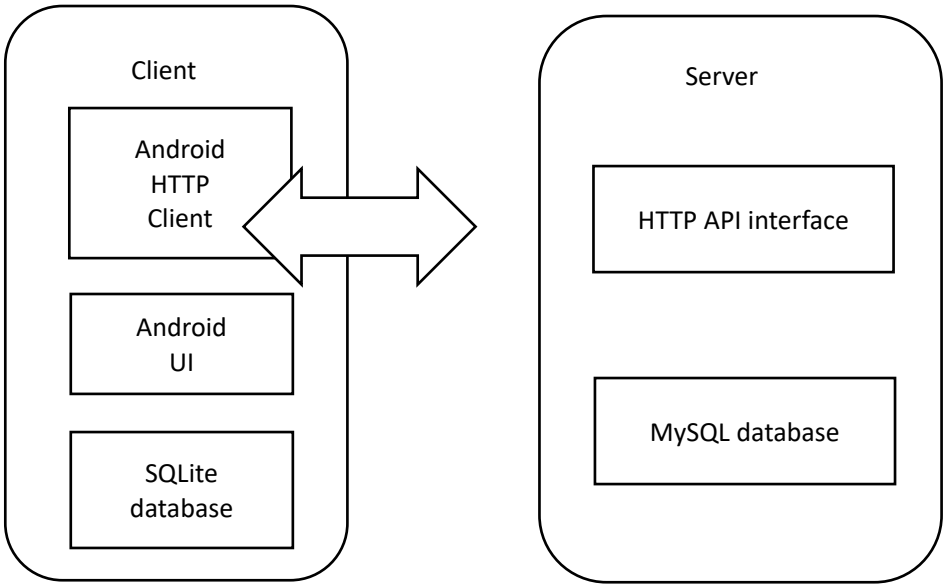

Figure 3 system overall frame diagram

Client design includes client interface design and client program architecture design. Interface design is the premise of system implementation. Each interface is designed to make the developer clear the idea when developing the software, and also make the application visible. Through the program architecture design, different class packages are designed for the program, and the class files are classified into different class packages.

Figure 3 mentions that the client and server use the JSON protocol because of its ease of use and high efficiency. The design of a general protocol requires consideration of three principles; versatility, simplicity, and uniform coding. Versatility is the first consideration. If the function of the protocol is flawed, it may affect the whole system. When designing the protocol, the situation should be considered as comprehensive. The network protocol is transmitted between the client and the server through the network. The simpler the protocol, the faster the interaction between the client and the server, the smoother the user experience, and the smaller the burden on the server. At present, most applications support multiple languages, and it is necessary to consider the compatibility problems of common protocols in different encoding situations. In general, we will use UTF-8 encoding to construct data.

3.3 Improvement and optimization of application functions

The baby evaluation function is regularly evaluated by the teacher on the performance of the child in the kindergarten, including various course learning conditions, performance of extracurricular activities, diet and rest, etc., and long-term evaluation and accumulation, so that parents and teachers can master all aspects of the child's changes. Trends, make adjustments immediately if there are problems. Because the baby evaluation needs to evaluate many aspects, the parameters are more, and the implementation is more complicated, so this function needs to be realized.

When many baby's evaluation information accumulates in a certain amount of time, it is necessary to analyze these evaluation information, which requires the use of big data knowledge to find out the advantages and disadvantages of the child, as well as the reasons for the advantages and disadvantages, and the cultivation of the child. Play a guiding role.

Although the performance of the server and client is analyzed, the system performance needs to be optimized. The optimization of the system includes code optimization, data transmission optimization and client interface layout optimization.

4. Conclusion

The education and growth of young children has always been the most important issue for parents. In order to enable children to grow up healthily and receive a good education, parents will not hesitate to invest all their energy and financial resources. Kindergarten education is the enlightenment stage of children's education, and plays a vital role in the children's education. However, at present, in kindergartens and families, there are still some cases of neglecting children's growth education and even child abuse. Frequently, parents and teachers jointly set up children's growth and education. Parents and teachers complement each other in early childhood education to ensure children. Receive a good education and grow up healthily.

With the rapid development of the mobile Internet, the country has developed an "Internet +" action plan, so it is imperative to use the mobile Internet to achieve early childhood education. In view of the problems of children in the process of receiving early childhood education, this paper implements an early childhood education management system based on Android, adopting C/S architecture model, which is a solution in the field of mobile Internet, helping teachers and parents to jointly manage children's education problems. The mobile phone of the Android operating system has now become a manual, so the design of the early childhood education management system based on the Android system can help almost all parents and teachers pay attention to the children's education problems.

References

[1] Chen Jianlin, Wang Jing. The Normal Change and Development in the Process of Foreign Language Education Informationization——Based on the Visualization of Education Informationization[J]. Foreign Language Electrotechnical Teaching, 2016(2):3-9.

[2] Zhang Jinbao, Liang Yue. Reconstruction of Educational Information Public Service System in the Context of Educational Governance Modernization[J]. China Electro-chemical Education, 2016(4):7-13.

[3] Chen Enlun, Chen Liang. Research on the Model of Precise Poverty Alleviation in Poverty-stricken Areas under the Perspective of Education Informationization[J]. China Electro-chemical Education, 2017(3): 58-62.

[4] Xiao Xiaohua, Xu Zhigang. A Review of Research on Informatization Evaluation Index System of Basic Education at Home and Abroad[J]. Research of Audio-Visual Education, 2017(3):29-34.

[5] Dong Chao, Yang Chao, Ma Jianfeng, et al. Third-party login vulnerabilities and solutions in Android system[J]. Chinese Journal of Computers, 2016, 39(3): 582-594.

[6] Li Qiang, Liu Baoxu, Jiang Zhengwei, et al. Analysis of QQ Forensics Model under Android System[J]. Information Network Security, 2016(1): 40-44.

[7] Xie Lixia, Zhao Binbin. Malicious software detection of Android system based on benign samples[J]. Computer Engineering and Design, 2016, 37(5): 1191-1195.

[8] Wang Cong, Zhang Renbin, Li Gang. Android privilege escalation attack detection technology[J]. Journal of Sensors and Micro-systems, 2017, 36(1): 146-148.

[9] Zhang K, Suo J, Chen J, et al. Design and implementation of fire safety education system on campus based on virtual reality technology[C]// Computer Science & Information Systems. 2017.

[10] Zhang B, Ye Y, Shen X, et al. Design and implementation of levee project information management system based on WebGIS[J]. Royal Society Open Science, 2018, 5(7):180625.

[11] Fan Y. Design and Implementation of Distributed Crawler System Based on Scrapy[J]. IOP Conference Series: Earth and Environmental Science, 2018, 108(4):042086.

[12] Zhou C, Cao Q. Design and implementation of intelligent manufacturing project management system based on bill of material[J]. Cluster Computing, 2018(5):1-9.