



Design of English Practice System Based on Cloud Computing Technology

Xiaoqin Zhang

Yichun Early Childhood Teachers College Yichun, Jiangxi, 336000, China

*Corresponding author's e-mail: 59711001@qq.com

ABSTRACT

With the development of information technology, the field of education has gradually used information technology as an important tool to improve teaching efficiency and teaching quality. Nowadays, schools have relatively high requirements for students' self-learning ability. In order to meet the students' self-learning needs, this paper constructs an English practice system based on cloud computing technology. The system is self-adaptive, can screen and sort the topics, and provide users with an efficient and practical English practice system.

Keywords: *Cloud computing; English; system; platform*

1. INTRODUCTION

In the traditional teaching method, the students in a class receive the same education, but the students' comprehension ability is very different, which causes the students' learning effect to be different. In order to allow more students to choose the difficulty and time of study according to their own situation and promote the development of education field, information technology has become the best way to solve this problem. The English practice system based on cloud computing technology constructed in this paper allows students to choose the difficulty of the topic according to their own needs, which is more suitable for the students' learning situation. Students can make their own study plans in the system and choose appropriate study content. This article provides a more intelligent platform for English learning.

2. CLOUD COMPUTING TECHNOLOGY

Cloud computing technology is to decompose the huge data computing basic program into countless small programs through the Internet, and then process and analyze it through a system composed of multiple servers, and return the results to the user. The emergence of cloud computing has greatly improved the efficiency of computer operations and fully utilized the spare servers [1]. Due to the scalable high-performance computing capabilities of cloud computing, cloud computing technology has been widely used in society today. Cloud computing technology integrates

distributed computing, utility computing, parallel computing, network storage, hot backup redundancy, virtualization and other computer technologies [2].

Cloud computing technology is mainly composed of four parts, namely data access and processing, system security, resource allocation and sharing, and flexible application of services [3]. These four parts correspond to data center technology, cloud security technology, software-defined technology and mobile cloud computing technology [4]. The data center of cloud computing is mainly hardware equipment, which is responsible for organizing, processing, storing and transmitting data. In the data center, platform providers provide software and hardware infrastructure for cloud computing, while service providers use websites and collection apps to serve end users. End users refer to us who use the software [5].

Nowadays, the applications that people are facing are becoming more and more intelligent, and more and more operations can be realized in the software, all of which rely on cloud computing technology [6]. Applying cloud computing technology to the mobile terminal can give full play to the computing and storage advantages of cloud computing technology, break through the resource limitations of the mobile terminal, and improve user experience. Cloud computing technology has also brought software development to many people. Today, even if there is no server, it is possible to use cloud computing technology to build a platform framework to provide services for users. The English practice system constructed in this paper uses

cloud computing technology, virtualizes the server, reduces the cost of developing the system, improves the software efficiency, and can provide users with better services [7].

3. FRAMEWORK OF ENGLISH PRACTICE SYSTEM

According to the needs of students and teachers, the functional modules of this system are designed as shown in Figure 1.

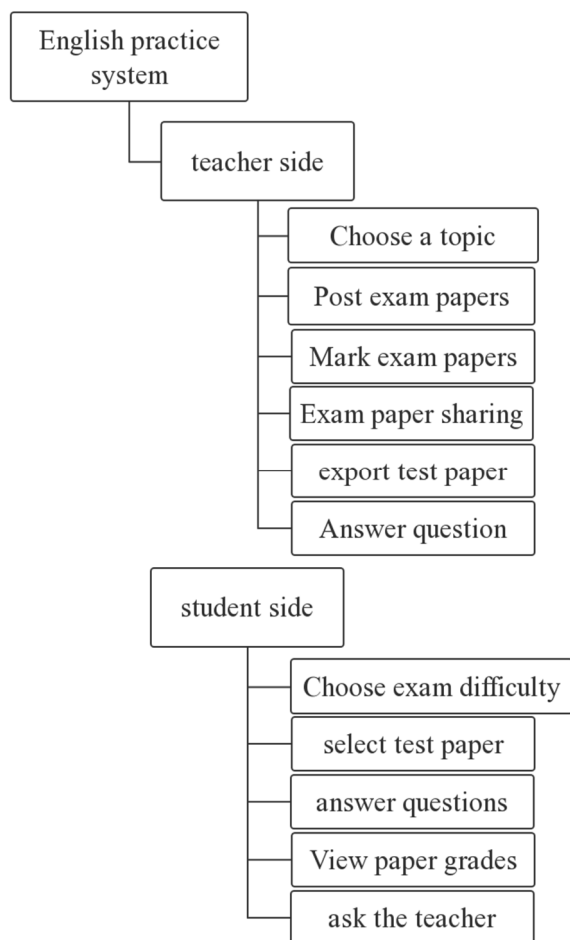


Figure 1: System function modules

The main function of the teacher terminal is to search for questions in the question bank, and then combine these questions to form a whole paper. Teachers can also upload test papers directly and distribute them to students. After the students complete the answers, the system will automatically mark the multiple-choice questions, and the teacher will mark other questions. When teachers see a test paper with a high degree of completion and excellent grades, they can share the test paper. Teachers can also view and answer questions from students [8].

The main function of the student terminal is to choose the test paper. The system will sort the papers

according to the difficulty of the papers, and students can choose papers according to their abilities. After completing the test paper, students can ask questions to the teacher [9].

The system uses a three-tier architecture, and puts business rules, data access, legality verification and other work in the middle layer for processing. In the general case of the system, the client does not directly interact with the database, but establishes a connection with the middle layer through COM/DCOM communication, and then the middle layer sends the request to the database [10].

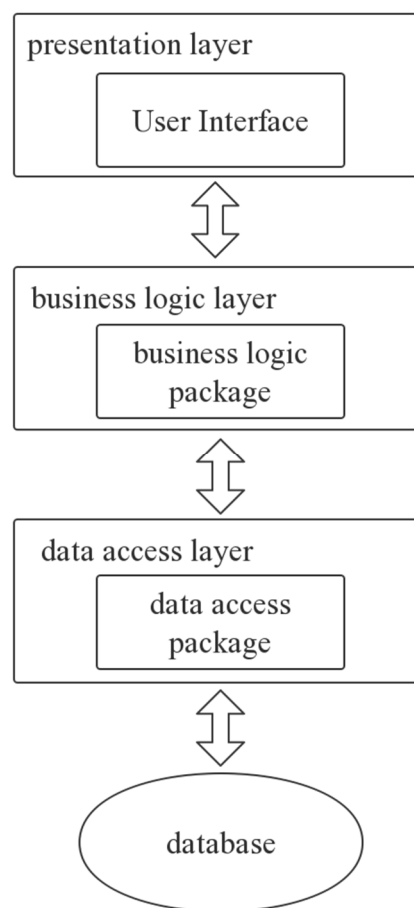


Figure 2: The three-tier structure of the system

4. SYSTEM DATABASE

A complete English practice system needs to be supported by a question bank with a large number of questions. Question bank is the core part of this system, which is related to the practicability of the whole system [11]. To establish a question bank, we must first determine the theoretical model, and let the question bank follow the mathematical model of the classical test theory for development and management [12]. Then it is necessary to set and measure each attribute of the topic, so that the system has a complete standard for the

judgment of the topic. Finally, the questions should be collected to make the question bank more scientific and standard. There are two sources of questions, namely, excellent test questions on the Internet and invited experts to make propositions. When setting up the question bank, we should also pay attention to the dynamic maintenance of the question bank. The question bank should be dynamic and change according to changes in the situation. The maintenance of the question bank can only be carried out by the administrator, and this function cannot be opened to all users [13].

Table 1: Tables in the database describing topics

property name	Property description	type of data	Data length	Is it allowed to be empty
ItemID	Question number	char	10	no
ItemDesc	stem	ntext	16	no
ItemA	Option A	ntext	16	yes
ItemB	Option B	ntext	16	yes
ItemC	Option C	ntext	16	yes
ItemD	Option D	ntext	16	yes
Answer	reference answer	char	10	yes
ItemAna	Topic Analysis	ntext	16	yes
Diff	difficulty	float	8	yes
Div	distinction	float	8	yes
KPID	Corresponding to the main knowledge ID	char	10	yes
Switch	it's usable or not	char	10	yes

The attributes of the title are divided into basic parameters and specific descriptions. The basic parameters of the question are mainly the number of the question, the unit to which it belongs, the knowledge point of the investigation, the difficulty, the degree of distinction, and so on. The specific description of the topic includes the stem, options, standard answers, and topic analysis.

The calculation of the difficulty of the question is the focus of the question bank. The calculation method is as follows:

$$DIFF = 1 - \frac{\bar{S}}{S}$$

In the formula, \bar{S} is the average score of the question, and S is the score of the question. Although this formula can roughly get the difficulty of the question, it is not rigorous enough. The revised formula is as follows:

$$DIFF_n = 0.382 \times DIFF_{n-1} + 0.618 \times \left(1 - \frac{\bar{S}}{S}\right)$$

The initial value of the difficulty coefficient in the formula is given by a number of experts and teachers based on experience. After many experiments, it can be confirmed that the formula is effective. This formula can eliminate chance to the greatest extent, and the obtained score is close to the real difficulty of the question [14].

In order to simplify the system, teachers can also score the questions and make corrections.

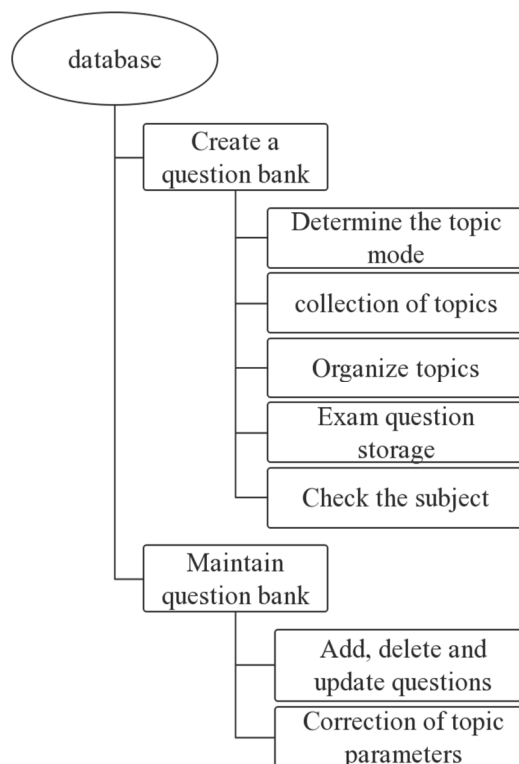


Figure 3: Database Structure

5. OPTIMIZE AUDIO RESOURCES

Audio and video resources are indispensable in the English teaching system. There are many audio and video resources on this platform for students to learn, but most of the resources are filmed by teachers relying on mobile devices, and there will be a certain degree of loss of image quality after uploading to the platform. In order to provide students with better audio and video resources, this platform uses RTP transmission to optimize audio and video [15].

This platform uses WebRTC technology, which is a real-time audio and video communication technology

based on Web browsers [16]. There are audio modules, video modules and transmission modules in WebRTC. The transport module in WebRTC is responsible for the RTP/PTCP protocol. RTP can provide information such as payload type, synchronization source, timestamp, serial number, etc. for audio and video. WebRTC will package and send the collected information in the system. The receiver will unpack after receiving the message. After an RTP painting is started, the communicating parties of Caiyu's painting will periodically send RTCP messages, which contain the specific statistical information of the data sent and received by the communicating parties. The feedback of the RTCP protocol in WebRTC can ensure the data security and integrity in the audio and video transmission process, and improve the audio and video transmission quality.

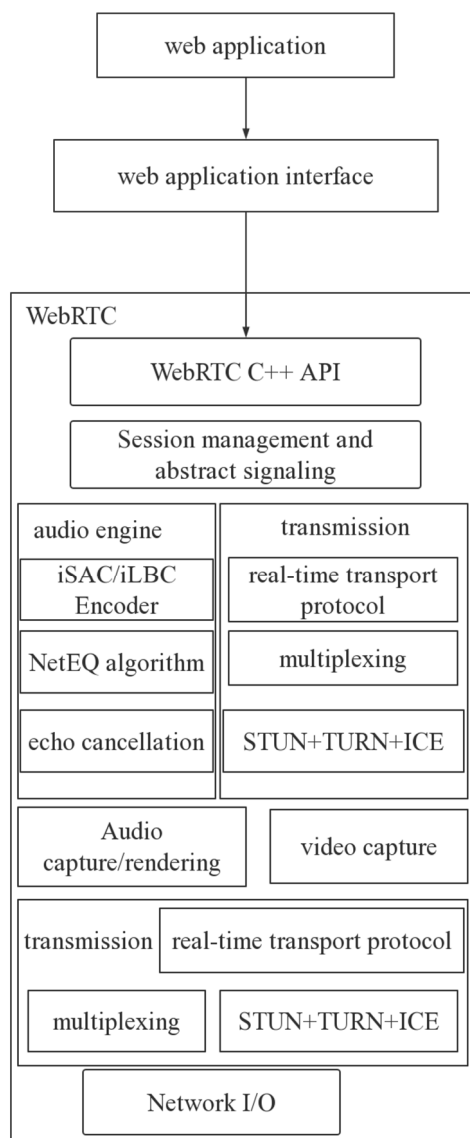


Figure 4: WebRTC Architecture

6. CONCLUSION

The development of network technology provides information support for the informatization of education. This paper uses cloud computing technology to build a database-based English practice system. In this system, students can contact anytime and anywhere according to their own needs, and can communicate with teachers, which can effectively meet the needs of students for English practice and mock tests, and has high application value.

REFERENCES

- [1] Liu Shitao, Wang Xiaopeng, Ma Shaoxiong, Wang Ligu, Zhang Hailiang. Research on Integrated Application and Architecture Based on BIM + Cloud Computing Technology [J]. Science and Technology Innovation, 2022(05):118-121.
- [2] Li Yan. Application Research of Cloud Computing Technology in Computer Security Storage [J]. Network Security Technology and Application, 2022(01):66-67.
- [3] Cai Jing. A Humble Opinion on the Application of Cloud Computing Technology in the Teaching of Computer Professional Courses in Higher Vocational Education [J]. Electronic Components and Information Technology, 2021,5(12):127-128.DOI:10.19772/j.cnki.2096-4455.2021.12.057.
- [4] Wang Lei, Tian Maoqin, Gu Ronglong. Research on the application of big data and cloud computing technology in smart campus [J]. Changjiang Information and Communication, 2021, 34(12): 105-107.
- [5] Wang Zhuo. Design of educational information management platform based on cloud computing technology [J]. Modern Electronic Technology, 2021, 44(24): 64-68. DOI: 10.16652/j.issn.1004-373x.2021.24.014 .
- [6] Lu Huiling, Cao Hui. Narrative Teaching Method of Vocabulary Practice in English Classroom [J]. Overseas English, 2020(22): 188-189.
- [7] Wang Zhenxing. Research on College English Teaching Mode Based on Artificial Intelligence [J]. Journal of Jiamusi Vocational College, 2020,36(09):107-108+111.
- [8] Zhu Yanyan. Optimization path of higher vocational English teaching based on systemic functional linguistics [J]. Journal of Shandong Agricultural Engineering Institute, 2020, 37(04): 162-163+175. DOI: 10.15948/j.cnki.37-1500/s.2020.04.063.

- [9] Zhao Min, Zhao Yajun. Theoretical Support and Exploration of Optimization Scheme Based on Existing Interactive English Oral Practice Platform [J]. Industry and Technology Forum, 2020,19(03):200-201.
- [10] You Xiaoyu. Research on the Construction of College Students' Oral English Practice Platform in the Context of Communication [J]. Chinese Journal of Multimedia and Network Teaching (Early Issue), 2019(08):14-15.
- [11] Wu Tao, Zhang Hui, Wu Min. Research on diagnostic evaluation model in college English diagnostic practice system [J]. Computer System Application, 2018, 27(11): 90-95. DOI: 10.15888/j.cnki.csa.006644.
- [12] Fan Jiaolan. The application of output-driven hypothesis theory in college English teaching [J]. Overseas English, 2018(10):61-62.
- [13] Liu Zipei, Zhao Weijie. Factors Affecting Chinese College Students' English Pronunciation Learning and How to Use Mobile APP to Practice English Pronunciation [J]. Overseas English, 2018(07): 52-53.
- [14] Yu Yiqi, Guo Chen. Research on the Teaching Strategy of Simulated Practice in Science and Technology English Interpretation Course—Taking the Department of English (Technical Translation) of Shanghai University of Science and Technology as an example [J]. Home of Drama, 2017(22):158-162.
- [15] Meng Xiaofeng, Cixiang. Big Data Management: Concepts, Technologies and Challenges [J]. Computer Research and Development, 2013, 50(01): 146-169.
- [16] Wang Yijie, Sun Weidong, Zhou Song, Pei Xiaoqiang, Li Xiaoyong. Key Technologies of Distributed Storage in Cloud Computing Environment [J]. Journal of Software, 2012, 23(04): 962-986.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

