

## Design of Music Teaching System based on Internet of Things

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### Abstract

The Internet of things is an important part of the new generation of information technology, and also an important development stage of the "information" era. As the name implies, the Internet of things is the Internet connecting things. This has two meanings: first, the core and foundation of the Internet of things is still the Internet, which is an extension and expansion network on the basis of the Internet; second, its user end extends and extends to any object to carry out information exchange and communication, that is, things information. Internet of things (IOT) is widely used in the integration of network through intelligent perception, identification technology and pervasive computing, which is also known as the third wave of world information industry development after computer and Internet. The Internet of things is the application development of the Internet, not so much the Internet of things is the network, but the Internet of things is business and application. Therefore, application innovation is the core of IOT development, and Innovation 2.0 with user experience as the core is the soul of IOT development. Throughout the world, today more and more people like music, more and more people learn music, music teaching is also more and more important. But in the early stage of music teaching, we must learn staff music to master the tone and rhythm of music. For children who just learn music, interesting teaching is very important. The existing music teachers simply draw notes on the music teaching board. They need to draw staff regularly and read them out by themselves. It is not only time-consuming and laborious, but also very important for children who just learn music. Wrong pronunciation may affect children's life. In addition, the existing technology teaching board still does not exist instrumental mold demonstration, viewing, hard music education not only is not conducive to the cultivation of art creation, but also causes the formation of bad habits. Therefore, the practice of music is also very important, so the music teaching system based on Internet of things is urgently needed.

### Keywords

IOT; Music Teaching System; Application Development.

### 1. Introduction

Looking at the present, facing the impact of the tide of knowledge change and the severe social situation, how to develop music education, how to keep pace with the times, how to inherit, maintain and carry forward the national traditional culture and absorb the nourishment of foreign art are worthy of further study by every music educator. It is also related to the survival and development of the music cultural heritage inherited by the Chinese nation for five thousand years. Due to academic pressure, students only focus on the study of professional courses, thus ignoring the cultivation of comprehensive quality. Music literacy has become a "appendage", leading to the lack of aesthetic education. However, "education without aesthetic education is incomplete education". The importance of music lies in that music can not only cultivate sentiment and enrich life, but also permeate every corner of life and is the carrier of a lot of knowledge. It can imperceptibly activate thinking, develop intelligence, and promote the development of students' potential and physical and mental health. Based on the above, we

should urgently need the music teaching system, conform to the trend of the times, take the Internet of things as the leading, strengthen the music quality education of students, let them feel the artistic image in the singing, and get the artistic enjoyment and edification in the music appreciation. So that their personal ability to grow faster and more comprehensive, more perfect mind. But now the music education system is just hard cramming teaching, boring staff, and there is no convenient instrument preparation in the classroom, so that teaching is completely implemented in theory, not in practice.

## 2. System Scheme Design

This project provides a music teaching system based on the Internet of things. By introducing the Internet of things technology, music education can be carried out more easily. Through registration, the students' information is imported into the database, and the music teaching is selected according to the students' interest trend. The system can arrange music preview or self-study according to students' spare time, and can simulate online. For teachers, the system can prepare lessons before class in advance, release daily tasks, audition and evaluation summary of students, etc. combined with cloud data, the system can find out what needs to be changed by each student and suit the remedy to the case. On the other hand, the system combines some entities in practice to create convenient teaching equipment.

Internet of things (IOT, Internet of things) is an extension and expansion network based on the Internet. It combines various information sensing devices with the Internet to form a huge network, realizing the interconnection of people, machines and things at any time and any place. The Internet of things is an important part of the new generation of information technology. IT industry is also called pan Internet, which means the connection of things and everything. Thus, "the Internet of things is the Internet connected with things". This has two meanings: first, the core and foundation of the Internet of things is still the Internet, which is an extension and expansion network on the basis of the Internet; second, its user end extends and extends to any item to carry out information exchange and communication. Therefore, the definition of the Internet of things is a kind of network that connects any object with the Internet according to the agreement through radio frequency identification, infrared sensor, global positioning system, laser scanner and other information sensing equipment, so as to realize the intelligent identification, positioning, tracking, monitoring and management of goods.

The basic characteristics of the Internet of things, from the perspective of communication objects and processes, the information interaction between things and people is the core of the Internet of things. The basic characteristics of Internet of things can be summarized as overall perception, reliable transmission and intelligent processing.

Overall perception—you can use RFID, two-dimensional code, smart sensors and other sensing devices to sense and obtain all kinds of information of objects.

Reliable transmission—Through the integration of Internet and wireless network, the information of objects can be transmitted in real time and accurately for information exchange and sharing.

Intelligent processing—Using various intelligent technologies, analyze and process the sensed and transmitted data and information, and realize intelligent monitoring and control. According to the above characteristics of the Internet of Things, combined with the viewpoint of information science, around the flow process of information, we can sum up the functions of the Internet of Things in processing information:

(1) The function of obtaining information. It mainly refers to the perception and recognition of information. The perception of information refers to the perception and sensitivity of the attribute state and its change mode of things; the recognition of information refers to the expression of the state of things in a certain way. (2) The function of transmitting information. It

is the task of transmitting, transmitting and receiving information, and finally transmitting the state information and its change mode from one point in time (or space) to another, which is often called the communication process.(3) The function of processing information.It refers to the process of information processing. Using existing information or perceived information to generate new information is actually a decision-making process.(4) The function of application effect information.It refers to the process in which information is finally put into effect. There are many forms of expression. The more important thing is to keep the object in the pre designed state by adjusting the state of the object and its transformation mode.

### 3. Software Design

Using the development process of standard software engineering, the music teaching system based on Internet of things is designed and implemented.Through the design of system architecture, functional modules, flow chart, system class diagram, database E-R model and data dictionary, the detailed design of the system is completed.Through the introduction of Internet of things technology, the corresponding data of students can be transmitted to the database in time, so that the music education system has a better accuracy, avoids the traditional education methods, and reduces the corresponding pressure of music teachers' teaching and students' problems after class.

(1) Student client: students can log in to the system through the individual user of the student client, and select the corresponding music learning according to their personal interests. Students can also browse the music data in the system, consult the corresponding information, share their learning experience, and ask the teacher for their own questions.

(2) Teacher side: the client interface owned by excellent music teachers or professors can master the training trend and the completion of extracurricular tasks of students in real time. Not only students can communicate, but also teachers can exchange experiences and organize activities to advance the development of music education or music and inject vitality into the education system.In addition, the loading of the system makes teaching more interesting and convenient.

(3) School management: provide corresponding services for colleges and universities that pay attention to music literacy, store students' data into the big database, connect with the corresponding music official website, and timely provide systematic organization activities, so as to infiltrate the idea of music education.

### 4. Hardware

(1) E-book writing board: it is used to display the teaching of corresponding courses and to do corresponding exercises. According to the different situations of students and teachers, the size can be selected. The handwriting mechanism enables students not to rely on the keyboard to write, so as to facilitate the memory and writing of staff.It also reduces the use of blackboard writing and other physical work (distinguish between fixed and portable).

(2) Adaptive tripod: the system can be applied to most of the terrain, regardless of the location, anytime and anywhere.

(3) Image acquisition card: placed in the image acquisition module, used to connect with the image processor.

Its link and storage function is realized in the communication serial port and data memory. The communication serial port is connected with CDMA module and ZigBee network module, and CDMA module and ZigBee network module are connected with cloud server through Internet.Flash memory and RAM memory are set in the data memory.

Design Bluetooth and USB interface in the classroom fixed eBook writing board: to achieve the acquisition of free network resources, further expand the scope of music education.

Design the cabinet and storage compartment: provide services for fixed-point music education, realize the physical teaching of music in the classroom, store the instrument in the storage compartment, and connect the chassis with the e-book writing board.

## 5. Innovation

(1) The project of this program adopts the e-book writing board which can be standardized and convenient to write notes, and on this basis, it also sets up the electronic intelligent network to play teaching music, so as to realize the standard teaching of music interest, prevent teaching errors from affecting the children's enlightenment education, and reduce the problem of not being able to practice music.

(2) The project also uses the classroom to store a variety of different types of musical instruments, which can facilitate the on-site intuitive teaching, improve the teaching intuitive, interesting, easy to understand, and can be performed and demonstrated on site.

## Acknowledgments

The project was funded by Liaoning University of Science and Technology 2021 College Students Innovation and Entrepreneurship Training Program.

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