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Related Courses Management for Internet of Things(Iot) Technologies in Engineering Training Plan

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Abstract: According to the requirements of the current market for Internet of things(IoT) technology, based on the data required by the actual application, according to the effective learning time of the current undergraduate engineering students in the University, the training plan of Internet of things(IoT) technology is developed by using the Management of Information Systems(MIS). Starting from the relevant courses, the training plan of each stage is listed, the courses of each stage are managed, and each stage is explained The required theoretical and practical hours. This paper puts forward the train of thought for the relevant course management of practical Internet of things(IoT) technical talents.

1. Introduction

Under the background of new engineering, the training plan of engineering students should change with the change of the background of the times. The development of Internet of things technology has covered the whole information technology field. In order to make the training plan of engineering students keep up with the development of information technology, the relevant courses of Internet of things technology should be close to the actual application.

The application of Internet of things(IoT) technology includes software application and hardware application, They are included: New York University's Muhammad Junaid Farooq puts the Internet of Things(IoT), enables powerful and unprecedented capabilities for intelligent and autonomous operation [1]. Jean Michel de Souza Sant'Ana used the Internet of Things (IoT) for Low Power Wide Area Networks (LPWAN) are wireless connectivity solutions for applications [2]. M. Centenaro put out the viewpoint for Many Internet of Things (IoT) applications require wireless coverage of high-density areas using low power devices with long battery lifetime [3]. With the advances in Internet of things (IoT), artificial intelligence, and communication technologies, edge computing offers a new solution to the problem by processing the data partially or wholly on the edge of a surveillance system [4]. The Internet of Things (IoT) are interconnected devices for exchanging information through sensors and actuators.One of the main physical sensors to understand the environment beyond the visible world is a radar [5]. Rustam Pirmagomedov considers emerging IoT applications for human augmentation, devices and design principles,connectivity demands, and security aspects [6]. The Internet of Things (IoT) can enable smart infrastructures to provide advanced services to the users [7]. IoT devices can be found in our apartments, places of work, cars, buildings, and in almost every aspect of life [8]. Abubakar U studies an Internet of Things (IoT) network employing a reconfigurable intelligent surface (RIS) over generalized fading channels [9]. For large-scale Internet of Things (IoT), backscatter

communication is a promising technology to reduce power consumption and simplify deployment [10].Management information system is widely used,Indonesia Telecom applied the system to manage the work efficiency of employees,The results show that the application of Management of Information System(MIS) in employee management has a certain impact on employee production [11]. This paper will use the technology of MIS to arrange the course.

The framework of Internet of Things (IoT) technology is shown in the figure.

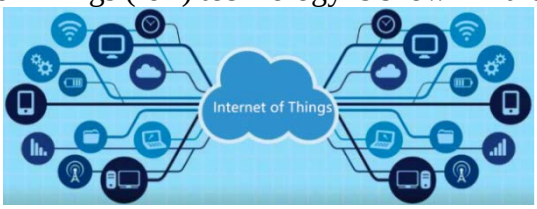

Fig.1 Application Framework of Internet of Things(Iot) Technology

In the current technical requirements, the requirements of software technology are deeper and wider than those of hardware technology. According to the statistics of data fed back by the application market, the proportion of software technology development is 70% left behind. The programming languages involved are C, C + +, Java, JavaScript, node.js, python, etc. the technologies involved in software development are front-end design, middleware design, script design, bottom design, database design, server technology development, communication protocol development, etc. The proportion of hardware technology development is about 30%. The technologies involved are application circuit design, PCB design, hardware mold design, special chip design, etc. The proportion of hardware and software technology in the Internet of Things(IoT) technology is shown in the figure.

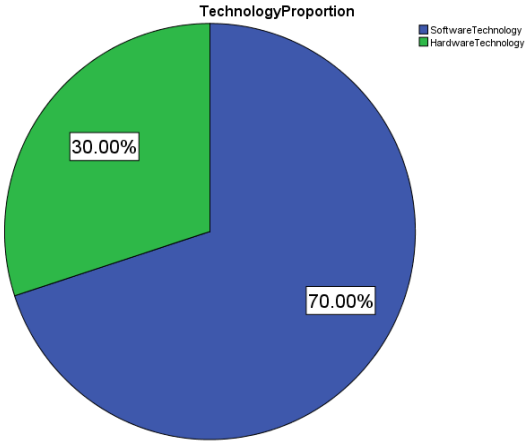

Fig.2 Proportion of Software and Hardware Technology in Internet of Things(Iot) Technology

Fig.2 Presents the Percentage Distribution of the Respondents by Technological Proportion. as Presented, Software Technology Accounts for 70%, Hardware Technology Accounts for 30%.

2. Methodology

According to the data analysis of the proportion of software and hardware technology, the proportion of software and hardware technology courses in the training plan of engineering students should be 7:3, or greater than 7:3. Take the undergraduate engineering students as an example. During the undergraduate period, the effective study time in the school is 3 years, and the fourth year is the off campus internship and graduation thesis related matters.

If the students can learn and have the basic development ability of related technologies during their stay in school, according to the requirements of Internet of things(IoT) technology development industry personnel, the hardware technology curriculum can be divided into two stages: the first stage is the basic course of Internet of things(IoT) technology development, such as PCB design with altiumdesigner software, mold design with AutoCAD or SolidWorks, etc.; the second stage For the design of hardware circuit, including analog circuit design, digital circuit design, MCU circuit design, etc. The number of course hours in each stage shall not be less than 54, including theoretical hours and practical hours. The proportion of theoretical hours and practical hours shall be allocated according to the actual curriculum. The course design is shown in Figure 3.

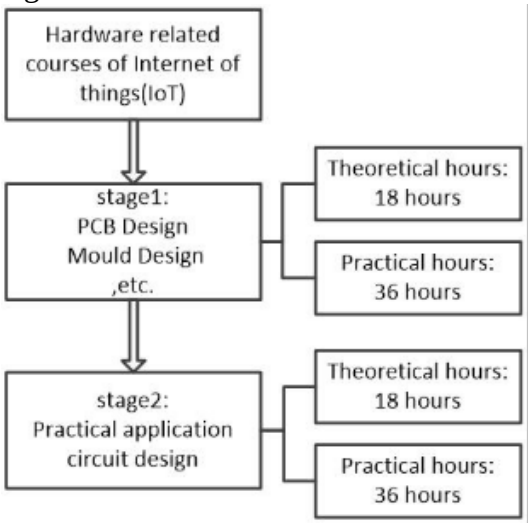

Fig.3 Framework of Hardware Courses of Internet of Things(Iot) Technology.

Figure 3 shows: the theoretical class hours of PCB design, mold design and other basic courses in the first stage are 18 hours, and the practical class hours are 36 hours, which can be adjusted according to the actual situation; the practical application circuit design theoretical class hours in the second stage are 18 hours, and the practical class hours are 36 hours, which can also be adjusted according to the actual situation.

Software technology curriculum can be divided into three stages: the first stage is the basic language course of Internet of things(IoT) technology development, such as C language, assembly language, etc;the second stage is the object-oriented course, such as C++,Java, JavaScript, node.js, python, etc.; the third stage is the actual application development course, such as script development, database development, server development, communication protocol development And so on. As for hardware technology courses, the number of course hours in each stage shall not be less than 54. If you want to lay a good foundation, it is better to be higher than 54, such as 72. It includes theoretical class hours and practical class hours. The proportion of theoretical class hours and practical class hours is allocated according to the actual curriculum. The course design is shown in Figure 4.

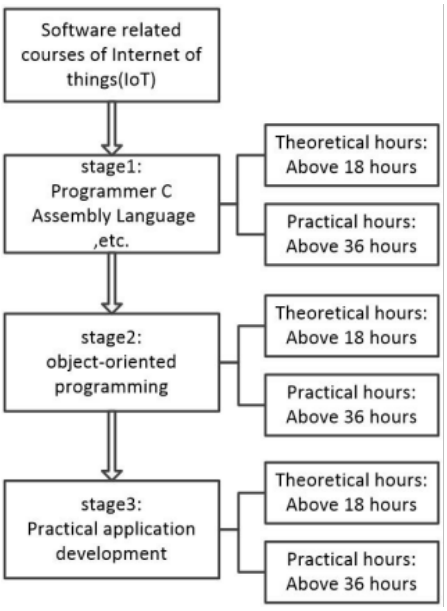

Fig.4 Framework of Internet of Things(Iot) Technology Software Courses.

As shown in Figure 4, the basic theory class hours of language in stage 1 are more than 18 hours, and the practice class hours are more than 36 hours, which can be adjusted according to the actual situation; the theory class hours of object-oriented courses in stage 2 are more than 18 hours, and the practice class hours are more than 36 hours; the theory class hours of practical application development courses in stage 3 are more than 18 hours, and the practice class hours are more than 36 hours , which can be adjusted according to the actual situation.

3. Results and Discussions

Fig.5 Shows the Time and Class Hour Allocation of Courses in Relevant Stages of Internet of Things(Iot) Technology in the Effective Learning Stage of Undergraduate Course.

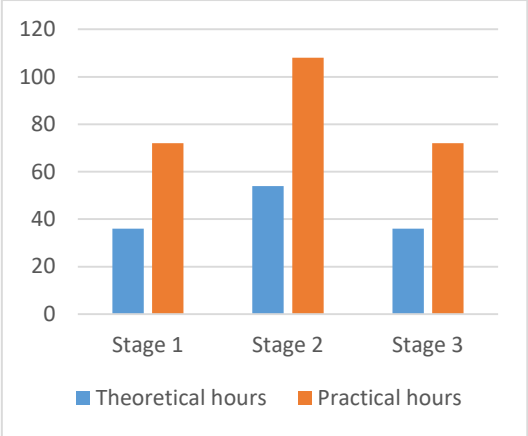

Fig.5 Time and Class Hour Distribution of Internet of Things Technology Courses.

Figure 5 shows the time and class hour allocation of courses related to Internet of things(IoT) technology. In the first stage, the basic courses of hardware technology and software technology will be offered in the next semester of freshman year, and the class hour allocation is as shown in the table. If such courses are offered in the first semester of freshman year, the students' reception

degree is not high. For the students just entering the University, they are not suitable for the University's class mode, and they are not suitable for the college The awareness of professional knowledge is not high. If the major related courses are opened too early, it may lead to low learning efficiency of freshmen, which is not conducive to the follow-up of the follow-up courses, so it is more appropriate to open them in the next semester. In the second stage, in the first semester of sophomore year, professional courses such as circuit design can be offered to lay the foundation for the hardware system of Internet of things technology. At the same time, because the basic programming language has been learned in the first semester of sophomore year, and there is a certain logic thinking. At the same time, the object-oriented programming course is offered. The students have a certain logic thinking, plus the assistance of hardware system, for object-oriented programming It's easier to learn. In the third stage, because the hardware technology has been learned and has certain programming ability, what the students lack at this time is the ability for practical application. In this stage, it is more appropriate to cultivate the system programming ability of the students. In this stage, it can also cultivate the more systematic and challenging technology of the students, which can shorten the distance required by the market technology and let the students learn Students can work more easily when they leave campus.

4. Conclusions

The application of Internet of things(IoT) technology has penetrated into every corner of our life. According to the feedback from the application market, we use the Management of Information Systems(MIS) to make statistics and analysis of the data. The Internet of things(IoT) technology development industry has a high demand for talents from the Internet of things(IoT) technology development, but also has a large talent demand gap. For the undergraduate engineering students, we should reasonably set up the relevant Transaction Processing System(TPS) technology.The course enables students to master a certain ability of Internet of things(IoT) technology development in the school. After entering the society, they can grasp the technology required in the work faster, realize employment faster, and serve the society faster.

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