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Retraction

Retracted: Design of the Student Attendance Management System Based on the Internet of Things Technology

Mobile Information Systems

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

In addition, our investigation has also shown that one or more of the following human-subject reporting requirements has not been met in this article: ethical approval by an Institutional Review Board (IRB) committee or equivalent, patient/participant consent to participate, and/or agreement to publish patient/participant details (where relevant).

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] H. Xun, B. Zou, and C. Duan, "Design of the Student Attendance Management System Based on the Internet of Things Technology," *Mobile Information Systems*, vol. 2022, Article ID 1990530, 13 pages, 2022.

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Research Article

Design of the Student Attendance Management System Based on the Internet of Things Technology

Hongmei Xun[1] **Bojun Zou**[2] **and Chenyu Duan**[1]

[1]*Graduate School, Changchun Institute of Technology, Changchun 130000, Jilin, China*
[2]*School of International Education, Changchun Institute of Technology, Changchun 130000, Jilin, China*

Correspondence should be addressed to Hongmei Xun; 0216064@ccit.edu.cn

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The IoT refers to the linking of items to a network through message-generating devices; in the connection process, communication and information circulation are carried out through the information dissemination medium to realize intelligent identification, tracking, supervision, and other functions. Attendance management is a system for assessing employee attendance, including being late, leaving early, and asking for leave. Student attendance refers to the attendance rate of students in class. This article aimed to study the design and research of the student attendance management system based on the Internet of things technology, and use this system to accurately record students' attendance and develop good habits for students. An effective attendance management company has been developed to enhance the collection of information for student management in universities, to keep track of teachers' and students' teaching attendance in real time, and to connect teachers and students in real time using computer technology. Access to the Android version of the software speeds up the collection and processing of information and can play an important role in improving the efficiency of personnel management. On the basis of analysing the operation logic of the attendance system, matching programs and the attendance system software are designed. The experimental results of this article show that the attendance rate of students with utilitarian personality is the highest, as high as 70%; the attendance rate of students with helpless personality is 13%; the attendance rate of students who follow the current personality accounted for 10%; and the attendance rate of nonmotivated students accounted for 7%. It can be seen from this that personality is an important factor affecting students' attendance rate. The attendance rate of positive psychology with goals is the highest, and the attendance rate of students without clear goals is the lowest. The student attendance management system of the Internet of things technology has been applied in practical work, but with the continuous construction and development of the school, the continuous improvement of new software and hardware, and the emergence of new needs in practical work, the student attendance management system is easy to crash when processing a large amount of data at the same time.

1. Introduction

The technology that has the strongest bearing on life today is the IoT. The advent of the Web of Objects narrows geographical differences, expands people's horizons, connects all aspects of the world into a single entity, and brings the world into the digital age. All areas of society are inextricably linked with the Internet of things. At present, China is vigorously pursuing the strategy of "rejuvenating the country through science and education," and the future of college students is the future of the country. As enrolment continues to build up, so do the number of management difficulties for university students. How to raise the day-to-day administration of students and reduce their truancy rate is of paramount relevance to the current trend in education. This paper is based on the design and research of the student attendance management system based on the IoT technology, using the current popular IoT technology and the combination of student attendance management to enhance the information collection of college student management and real-time grasp of the teaching attendance of teachers and students. It is hoped that this will go some way to improving the current attendance rates and improving the quality of higher education.

The traditional attendance management uses the class teacher or the monitor to conduct roll call. Using this method will be very difficult for the class teacher, and it may not be impartial and selfless for some students. The class teacher has many other things, so the traditional attendance method exists, which is seriously insufficient. Information networking of objects is different from traditional time and attendance management skills. The fact that it recognises moving objects means that there is no need for direct contact during the attendance process, and this goes some way to improving the speed with which attendance can be completed. Avoiding direct contact also respects the privacy of students, reduces the sense of surveillance, creates a healthy teaching atmosphere, and makes it easier to achieve teaching results. The introduction of the Internet of things technology into colleges and universities has promoted the reform of the education system to a certain extent, and is of great significance to the cultivation of talents.

As our society keeps on growing, the issue of education has attracted more and more attention. University students, as high-quality talents of today, are of importance to the overall development of the community. How to improve students' attendance and promote the improvement of education is a key issue that needs to be addressed by universities at present. Lin et al. proposed the concept of the IoT integration, enabling computing service equipment deployed at the edge of the network. With the benefits of distributed infrastructure and closeness to end customers, it is possible for both faster response and improved access to service improvements for IoT solutions. To develop a fog/edge computing-based IoT environment, it is important to first study the architecture, enabling technologies and related issues of the IoT, and then explore the integration of a fog/edge computing with it [1]. Yang et al. presented the leading LPWAN technologies in both unlicensed and licensed spectra. While each of these services differs in a number of aspects, they all have one commonality: they use narrowband delivery mechanisms as leverage to deliver on three fundamental objectives, namely to achieve high overall system throughput, extended signal cell life, and widespread footprint. In addition, a concept of useful bandwidth has been introduced, which links these objectives to transmission bandwidth in order to balance these conflicting goals for optimal overall system performance [2]. Rathore et al. proposed a combined IoT-based delivery model for smart city planning and urban growth using big digital insights. The rapid growth in population density in cities needs the services and facilities to be provided to meet the demands of city dwellers. As a result, the increasing demand for sensors, agents, and smartphones and other embedded devices has created a huge commercial possibility for a new age version of the Web of Objects, where all equipment can be interconnected via the Internet. On this basis, the authors propose a comprehensive array of systems consisting of the deployment of a wide range of categories of agents, including smart home agents, and in-vehicle networks to cope with urbanisation [3]. Sun et al. proposed a new approach to mobile edge computing, the IoT architecture, where the edge IoT is used to process a stream of material at the moving edge. In particular, every BS is attached to a single fog knot, where the fog knot offers computational facilities domestically. Above the fog knot, an SDN-based mobile phone heart is conceived to promote forwarding of data packets between the fog knots. Meanwhile, the authors propose a hierarchical fog computational infrastructure in every fog node to deliver agile IoT-enabled offerings while keeping user flexibility [4]. On the strength of advances in soil-defined networking know-how, Wan et al. proposed a novel conceptualisation of collective networks for a more flexible industrial environment through the introduction of the software-defined industrial IoT. The authors analyse the industrial IoT architecture, including IWN. The authors then propose a software-defined industrial IoT to provide an infrastructure to manage digital devices and offer interfaces for message sharing. Finally, the authors select a smart manufacturing setting as an evaluation testbed and perform a basic laboratory investigation; new research lines are opened up for the industrial IoT, and the implementation of Industry 4.0 is accelerated [5]. Ozdemir et al. presented a model proposal to determine student participation rates in synchronous courses in a knowledge-based managerial system (LMS). Particularly where equal access is not available or is limited, distance education, supported by educational technology, offers the benefits of learning anywhere and anytime (ubiquitous learning). Based on the survey data, it is clear that distance education provides a very favourable teaching location. However, in analysing the literature, it was found that the learning management systems used in distance education were problematic in determining the level of student engagement and participation rates. Students use text-based user information and passwords to access activities or courses in the LMS [6]. The Ashraf M.A. aims to identify the factors associated with the choice of universities in China that are favourable or unfavourable to students' access to the tertiary-level study. China has undertaken many changes over the past 20 years and has quickly enlarged its HE system. The shift from an ordinal to a concurrent student selection mechanism at the university level is a significant shift in the recruitment and enrolment process [7]. Nyirenda presented a report on a project to develop a web-based Radio Admin and Management System (RAMS). The Zermelo–Fraenkel normative space has been used to work closely with potential users evaluating its usability to formally specify the requirements of the RAMS [8]. Although these theories have explored the IoT technology and student attendance management to a certain extent, there is a little combination between the two and cannot be used in real life.

This article provides a new student attendance control system based on an object network and realises functions such as user management and attendance query. The IoT technology can also be used to satisfy real-time online queries of class teachers, which can perform attendance at any time, improve attendance efficiency, save resources, and make the attendance work of colleges and universities more scientific and reasonable, so as to realize the intelligence of student attendance management and achieve the purpose of efficient management.

2. Design Method of Student Attendance Control Based on the Web of Objects System

2.1. Web of Objects Skills. The Web of Objects is an integrated piece of data processing technology based on and serving the Web. It has made a quantum leap not only in the way people communicate with each other, but also in the way people and things communicate with each other. In short, the IoT has converted the whole world into a monolith [9, 10]. Judging from the progress of ongoing research, the IoT can be categorised into a sensing layer, an applied layer, and a network layer, as illustrated in Figure 1.

As can be seen from the figure, students and teachers can enter the IoT platform through devices such as mobile phones and computers, input data into the control system, communication system, and other systems of the IoT platform, query various data through these systems, and send the question to the system administrator.

The Internet of things technology is adopted because it is more intelligent, more convenient to use, and better in delivery than the ordinary Internet. The IoT is a consequence of the ongoing evolution of IT. In the realm of the IoT, different kinds of factors can talk to each other and only need to share information needs through the IoT language technology [11, 12], which has the following characteristics:

(1) Transmissibility.
(2) Total perceptibility.
(3) Automatic controllability.
(4) Intelligent processing.

Radiofrequency identification is an easy-to-operate, simple, and practical application technology, and the external environment can be ignored during its use. The radiofrequency identification technology first appeared in aircraft radar detection technology, mainly for military operations [13, 14]. With the continuous deepening of scientific research and technology, radiofrequency identification has gradually been applied from the military field to the Internet of things field. Generally speaking, a complete radiofrequency identification system includes four parts: tags, antennas, management systems, and readers [15, 16], as shown in Figure 2.

The antenna when the radiofrequency identification system is working is responsible for receiving and transmitting radiofrequency information, and the role of the antenna in this process is to convert the received electromagnetic wave information into electric current signals, or to convert electric current signals into electromagnetic waves and send out. In this process, the energy emitted by the antenna will form an electromagnetic field, which has a certain effect on the identification of the electronic tag. The formed electromagnetic field is the scale range of the reader, but the number of antennas in the radiofrequency identification system requires specific analysis of specific issues [17, 18].

The electronic tag in the radiofrequency identification system is composed of a chip and an antenna. The data information of the target object exists in the electronic tag, and its existence form can be read-only or compatible. In the operation process, the tag receives the signal after the reader sends a signal, and the electronic tag converts electromagnetic wave information into a DC power source [19]. The specific situation is shown in Figure 3.

The main function of the RFID reader is to "communicate" with the electronic tag and receive the control commands issued by the system. The transmission frequency of the RFID system is controlled by the reader, and the range of information communication is also limited by the reader [20]. From the structure of the reader, it can be divided into a reading device and a writing device. The specific situation is shown in Figure 4.

The reader first supplies power to the modulator and demodulator through a voltage generator, and the data are sent to the modulator and demodulator through a wireless signal, then to the logic control unit driven by the driver, and finally to the control unit, which processes the data and returns the processed data.

2.2. Monitoring and Positioning. Although GPS technology can accurately locate, the GPS system has certain shortcomings in locating students' movement status. Influenced by the state of the sky satellites, GPS is often unable to accurately locate when students are exercising, and even cannot locate the situation. In order to make up for this shortcoming, in this experiment, GPS is combined with the Kalman filter theory to achieve a full range of dynamic monitoring requirements.

The Kalman filter is an estimation algorithm. Compared with other estimation algorithms, noise factors need to be included. The information involved is more comprehensive, but the positioning effect is better. The advantage of using the Kalman filter is not that its estimated deviation is much smaller, but that it skillfully integrates the observation data and estimated data, closes the loop management of the error, and limits the error to a certain range.

$$p_{c+1} = Qp_c + Td_c + l_c. \tag{1}$$

Formula (1) is the functional expression of a linear discrete system, Q and T are the parameters of the system, representing the state transition matrix and the control input matrix, and l_c represents the process noise of the system.

$$y_{c+1} = Rp_{c+1} + n_{c+1}. \tag{2}$$

The function expression is a linear time-varying system, where y_{c+1} represents the measurement result of the system, R represents the vector matrix, and n_{c+1} represents the measurement noise.

$$\widehat{P}_c^- = Q\widetilde{P}_{c-1} + TD_{c-1}, \tag{3}$$

$$F_c^- = QF_{c-1}Q^D + U. \tag{4}$$

In this process, the noise variance matrix of the system may change, but this change has no effect on the actual operation process; formulas (3) and (4) are matrix variance function expressions.

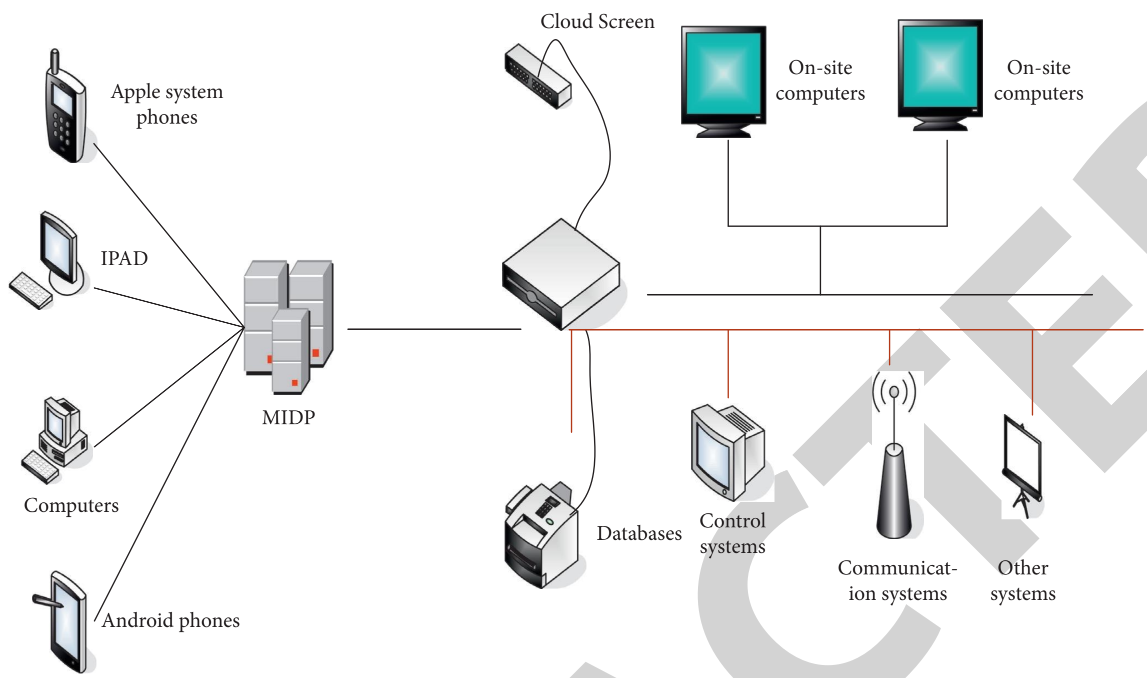

Figure 1: IoT platform architecture diagram.

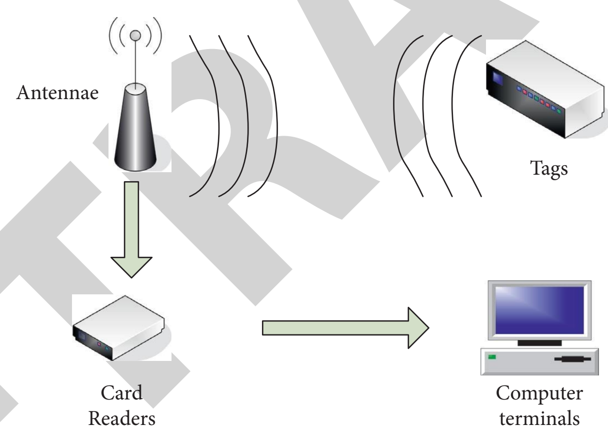

Figure 2: RFID system architecture.

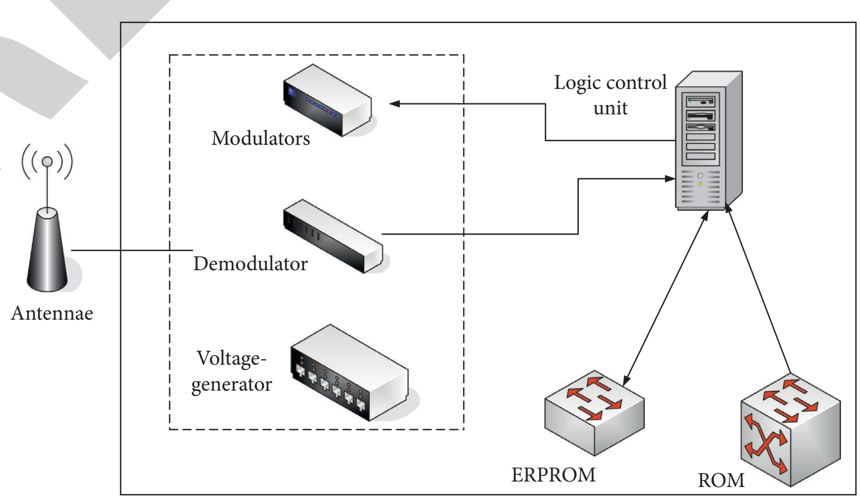

Figure 3: Electronic tagging.

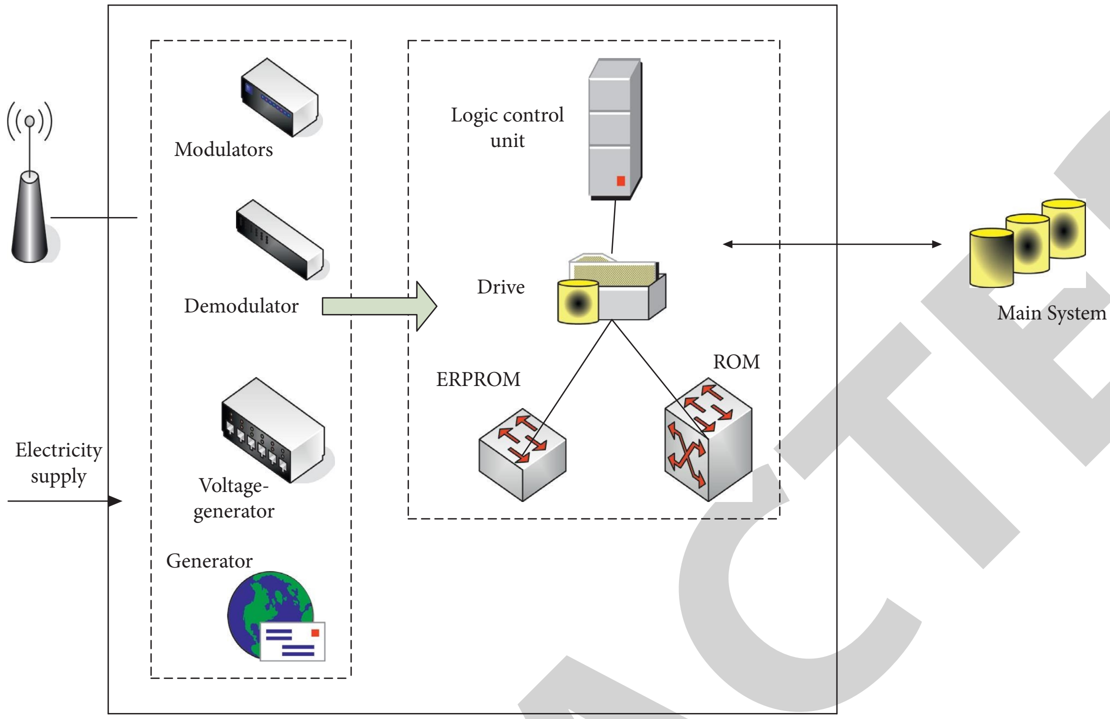

Figure 4: Structure of the reader.

$$C_c = Q_c^- R^D \left(R Q_c^- R^D + W\right)^{-1}. \quad (5)$$

C_c represents the system gain value.

$$\widehat{Q}_c = \widehat{Q}_c^- + C_c\left(E_c - R\left(\widehat{Q}_c^-\right)\right), \quad (6)$$

$$Q_c = (G - C_c R) Q_c^-. \quad (7)$$

Formula (6) represents the estimated value of the system gain, and formula (7) represents the error variance of the system.

$$b_c = g(b_c) + T_c * b_c^T, \quad (8)$$

$$Y_c = s(b_c) + U_c * b_c * b. \quad (9)$$

Formulas (8) and (9) represent nonlinear system models, where T_c represents process noise, and U_c represents measurement noise. In fact, the noise value cannot be obtained arbitrarily, so it is regarded as zero in the operation.

$$\begin{aligned} \widetilde{A}_c &= g\left(\widehat{A}_{\widehat{C}}, e\widehat{c}, 0\right), \\ \widehat{S}_C &= p\left(\widehat{A}_c, 0\right). \end{aligned} \quad (10)$$

Among them, $\widehat{A}_c$ represents the state vector, and $\widehat{S}_c$ represents the observation vector.

$$\begin{aligned} b_c &= \widehat{b}_c + F\left(b_{c-1} - \widehat{b}_{c-1}\right) + U_{U_{c-1}}, \\ E_c &= \widehat{E}_c + r\left(E_c - \widehat{E}_C\right) + X_{X_c}. \end{aligned} \quad (11)$$

Among them, b_c represents the real state vector, $\widehat{b}_c$ is the approximate state vector obtained through estimation, U_{c-1} represents the model noise; E_c represents the real observation vector, $\widehat{E}_c$ is the approximate observation vector obtained through the estimation, and X_c represents the observation noise.

$$\begin{aligned} W_{[a,b]} &= \frac{\alpha f_{[a]}}{\alpha s_{[b]}}\left(\widehat{s}_{c-1}, t_{c-1}, 0\right), \\ R_{[a,b]} &= \frac{\alpha g_{[a]}}{\alpha r_{[b]}}\left(\widehat{s}_{c-1}, r_{c-1}, 0\right), \\ Y_{[a,b]} &= \frac{\alpha y_{[a]}}{\alpha s_{[b]}}\left(\widehat{s}_c, 0\right), \\ U_{[a,b]} &= \frac{\alpha y_{[a]}}{\alpha u_{[b]}}\left(\widehat{s}_c, 0\right), \end{aligned} \quad (12)$$

where W represents the Jacobian matrix of s, R represents the Jacobian matrix of r, Y represents the Jacobian matrix of h, and U represents the Jacobian matrix of u.

$$\widehat{d}_{sc} = s_c - \widehat{s}_c * sc, \quad (13)$$

where $\widehat{d}_{sc}$ represents the definition of prediction error.

$$\widehat{d}_{bc} = b_c - \widehat{b}_c * bc. \quad (14)$$

Among them, $\widehat{d}_{bc}$ represents the definition of observation error.

$$\widehat{U}_c^- = H U_{c-1} H_C^D + Y R_{c-1} Y_c^D. \quad (15)$$

Among them, $\widehat{U}_c^-$ represents Kalman's time update formula.

2.3. Attendance Management. Attendance management is a management system for enterprises and institutions to inspect and manage employees' attendance, including whether they are late or leave early, and whether there is absenteeism or leave. In the same way, student attendance management is a way of assessing students' attendance based on the situation of colleges and universities. Generally speaking, the school's attendance work is the responsibility of the Academic Affairs Office. Class teachers register students during class, mainly when class committees roll the names of classmates, and students who ask for leave need to note good information. In fact, in order to motivate students to actively attend classes, most colleges and universities regard attendance as one of their usual grades. And in the usual registration process, there may be some modern situations, and the result is not particularly true. If the attendance can be designed as a system, the efficiency will be greatly improved; Figure 5 is a schematic diagram of the attendance process.

The system combines the attendance server and attendance information using the Web of Objects enabled by the system, which allows class teachers and lecturers to view specific attendance information. Students can refer to personal attendance information through the attendance system. The network structure of the system is shown in Figure 6.

After entering the IoT system, the user can access the server front desk. In the attendance system, the entire framework can be divided into the presentation layer, business layer, and volume data layer. The presentation layer is the range of operation requests sent by users. For example, the class teacher can select the courses that require attendance and the starting time of the course in the presentation layer, and the head teacher can also view the attendance of students in each course through the presentation layer. The business layer mainly accepts the information of the presentation layer, and performs logical analysis and processing on it while receiving the information. For example, when the class teacher selects the operation information, the business layer will display the starting time of the course, the number of attendees, and other requirements. The data layer consists of a database server and a database. Simply put, the main function of the database is to manage the data in the system. For example, when the data layer receives the operation request of the teacher, the database will query the attendance information and get the corresponding information. The structure of the student attendance system is shown in Figure 7.

3. Design Experiment of Student Attendance Management Web of Objects-Based Systems

3.1. Experimental Hardware. The attendance management discussed in this paper needs to be run in the system, especially with the help of the IoT technology. Different specifications of the system hardware will also have different effects on the experiment. Table 1 shows the hardware parameters of this experiment.

3.2. Hardware Design of the Attendance Management System. During the design of the time and attendance system, it is essential to clarify the operating conditions of the various parts of the server. If it does not match during the operation, then the installation fails and cannot run. The hardware requirements for this experiment are shown in Table 2.

3.3. Class Absences of College Students. In current university classrooms, absenteeism seems to have become a very common thing. In order to explore the reasons for student absenteeism, we first conducted a survey on the gender of students. The specific situation is shown in Table 3.

According to the data in Table 3, in the entire survey data, girls should attend 80 people, 72 people actually attend, and the attendance rate is 90%; boys should attend 100 people, 68 people actually attend, and the attendance rate is 68%. The attendance rate of girls is much higher than that of boys, which may be related to the personality of the boys and girls, and it also shows that the attendance rate is related to the gender to a certain extent.

As mentioned above, attendance is closely related to personality, which is actually the way of handling things. Undergraduates are large in size, and their personalities are naturally varied, but we can roughly divide them into the following types, utilitarian types, nonmotivated types, and helpless types. Students with different personalities have different attitudes towards the classroom. Table 4 shows the attendance of students with different personalities.

According to the situation in Table 4, the student version of the utilitarian personality has the highest attendance rate, which is as high as 70%, the attendance rate of helpless personality students accounted for 13%, the attendance rate of students with large-flow personality accounted for 10%, and the attendance rate of nonmotivated students accounted for 7%. From the data, it can be seen that students with goals can be strict with themselves, and their attendance rate is also higher.

The low attendance rate of college students has become a common problem in universities all over the world. In order to improve student attendance, Western universities even set up government funding and bonuses. In China, not only the attendance rate of elective courses is very low, but even some public courses and professional courses are also very unsatisfactory. In order to understand the actual situation, we conducted a questionnaire survey on the attendance of students. The specific situation is explained as follows.

According to the data in Figure 8, there are 30 students with 10% absenteeism, accounting for 16.6%, 43 students have a 30% absenteeism rate, accounting for 23.8%, there are 50 students whose absenteeism rate is 50%, accounting for 27.7%; there are 72 students with an absenteeism rate of 70%, accounting for 40%; and 45 students have a 100% absenteeism rate, accounting for 25%. These data show that the current enrolment rate in higher education is very poor.

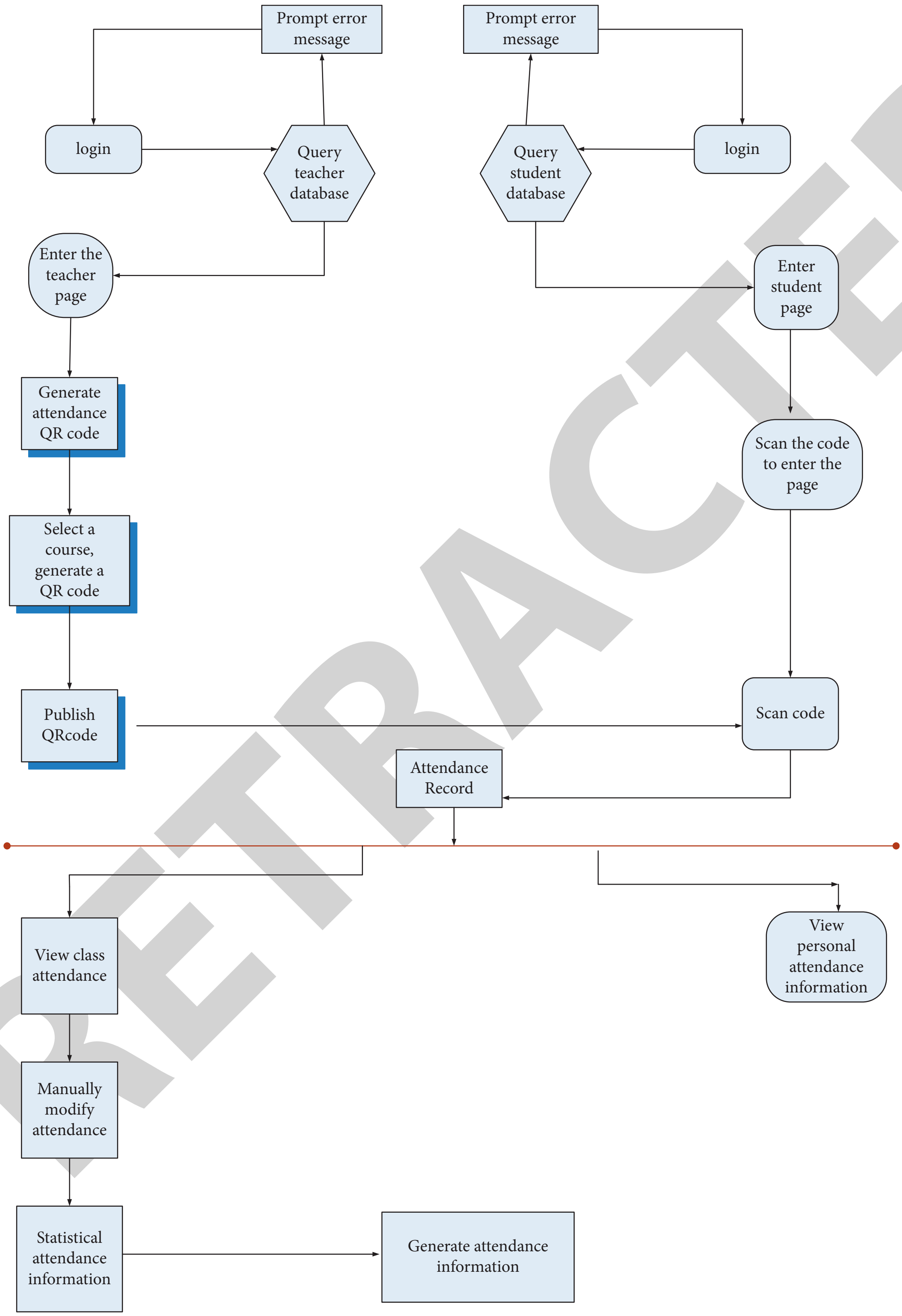

FIGURE 5: Attendance business process.

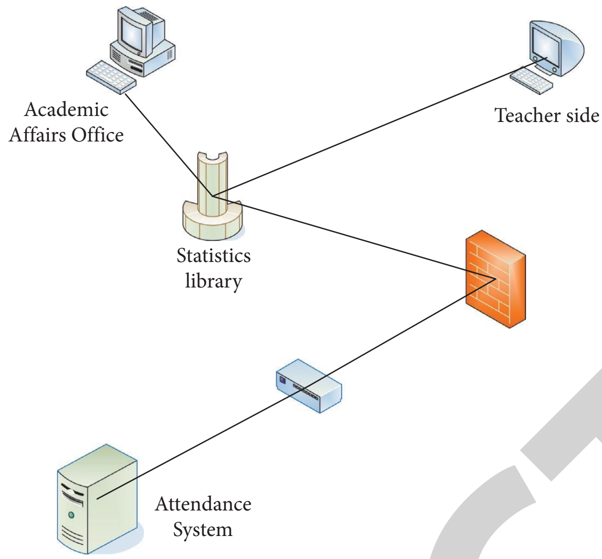

FIGURE 6: System network structure.

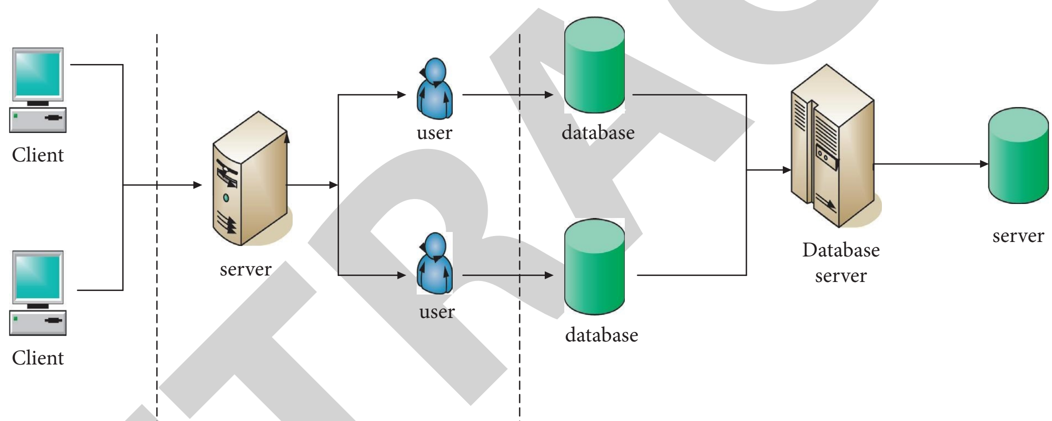

FIGURE 7: Student attendance system structure.

TABLE 1: System parameters.

Systems	Memory (G)	Hard disk (G)	Mainframe
Domain controller	3	30	2 cores
Attendance system operating environment	3	30	1 core
vCenter Server	6	30	2 cores
Database Server	3	30	2 cores
ESXI Server	3	30	2 cores

TABLE 2: Server hardware requirements.

Servers	Hard disk (G)	Memory (G)	Active memory (G)	Mainframe
vCenter Server	40	3	1	2 cores
Composer Server	40	3	1	2 cores
SQL Server	30	2	1	2 cores
Connection Server	40	3	2	2 cores
Template	20	3	2	1 core

Table 3: Absence statistics for men and women.

Gender	Girls	Boys
Ideal attendance	80	100
Actual attendance	72	68
Attendance rate	90%	68%

Table 4: Attendance of students with different personalities.

Characteristics	Attendance	Proportion (%)
Follow the crowd	18	10
Utilitarian	126	70
Unmotivated	13	7
Hopeless	23	13

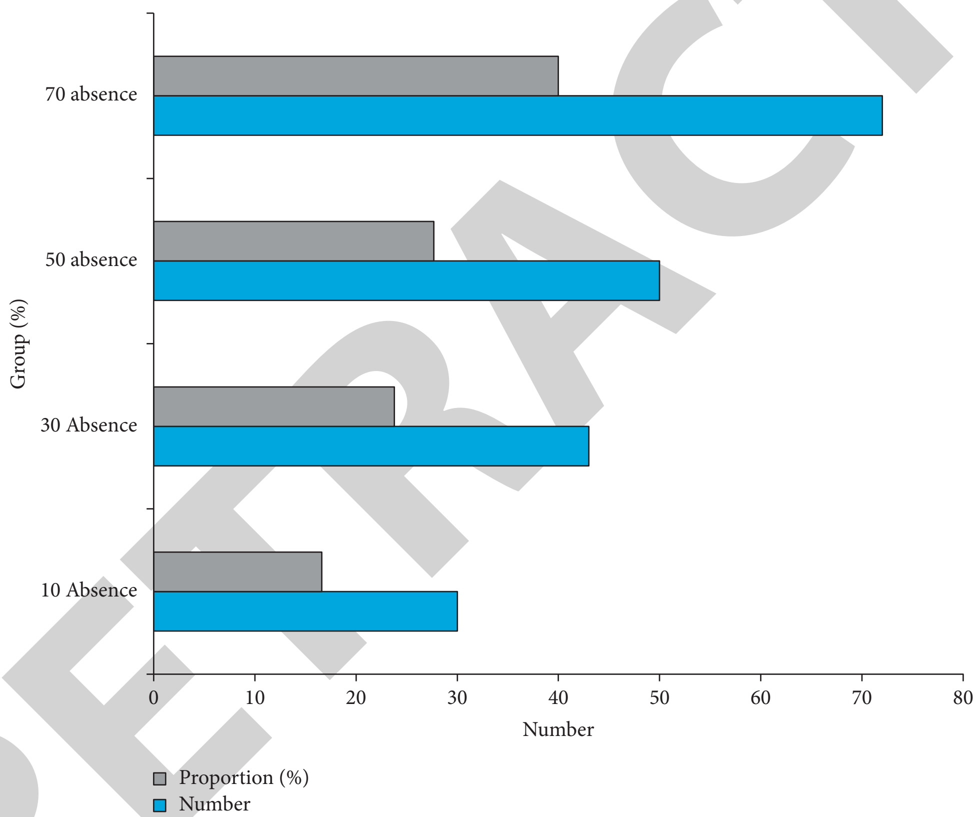

Figure 8: Student attendance.

4. Design of Student Attendance Management Systems Based on Web of Objects Legislations

4.1. Student Attendance Factors. There are many cases of student absences in class, and we cannot shirk all responsibilities to students. According to the author's survey, the attendance rates of teachers and students are closely related. The teacher's personality charm, academic qualifications, teaching methods, and knowledge reserves will all affect the student's attendance rate.

According to the data in Figure 9, there is a certain relationship between the professional title of the teacher and the attendance of the students. The number of students who should attend the classroom of the teaching assistant is 120, and the actual number of attendance is 80, accounting for 66.7%. The number of students who should attend the lecturer's class is 230, and the actual number of attendance is 180, accounting for 78%. The number of students who should attend the associate professor's class is 150, and the actual number of attendance is 130, accounting for 86.7%. The number of students who should attend the professor's class is 100, and the actual number of attendance is 90, accounting for 90%. The age of the teacher is also related to the student attendance rate. For teachers under 30, the number of students who should attend is 120, and the actual number of attendance is 90, accounting for 75%. For

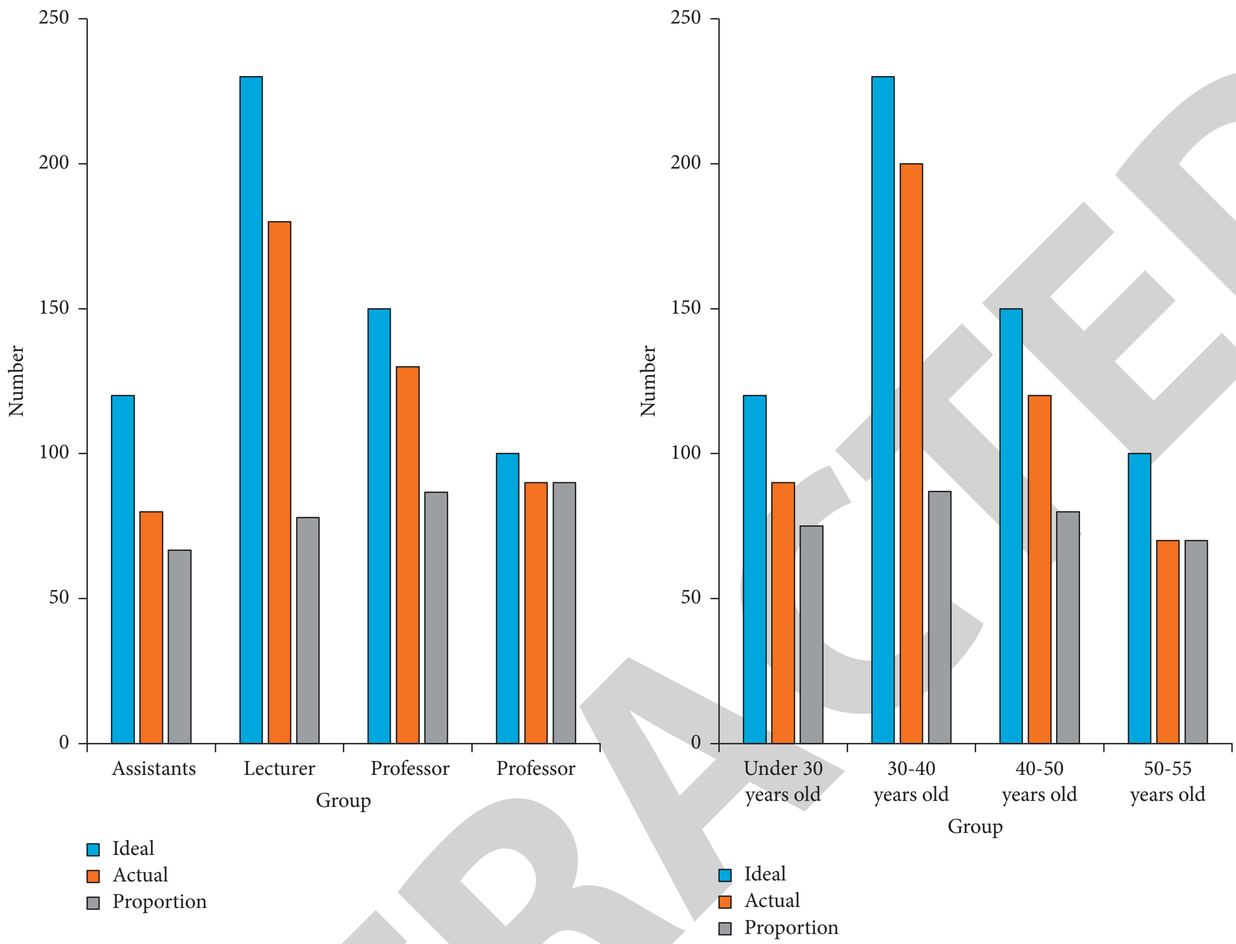

Figure 9: Relationship between teachers and student attendance.

teachers aged 30–40, the number of students who should attend is 230, and the actual number of attendance is 200, accounting for 86.9%. For teachers aged 40–50, the number of students who should attend is 150, and the actual attendance is 120, accounting for 80%. For teachers aged 50–55, the number of students who should attend is 100, and the actual number of attendance is 70, accounting for 70%. Therefore, schools should try to hire younger teachers.

4.2. Reasons for Student Absence. In many cases, the absence of a student is not due to the influence of the teacher, but is related to the personal family. Some students think that their family conditions are superior and that there is no need to worry about their employment, so they do not pay much attention to attendance. Some students' family conditions are not particularly wealthy, or they use their time to do part-time jobs, which can also lead to absenteeism. Yet, there is another very important reason: Chinese students have gone through the college entrance examination and hope to relax at the university. Moreover, at the university, they do not need to retake courses with a score of 60 points. This also gives students the opportunity to be absent. Reasons for absenteeism are roughly library, part-time job, sleeping, Internet access, and entertainment. The following is the absence survey.

According to the data in Figure 10, among the absent students with better family conditions, 5 are online, accounting for 7%; 4 are sleeping, accounting for 3%; and the number of people going out for entertainment is 10, accounting for 14%. Among the absentees of students with poor family conditions, the number of people surfing the Internet is 6, accounting for 36%; the number of people going out part-time is 10, accounting for 58%; and the number of people sleeping is 1, accounting for 6%.

4.3. The Relationship Between Grade and Absenteeism. Although the age difference between the four grades of the university is relatively small, the time in school and the length of understanding are different, so the class attendance rate of the four grades is also different.

According to the data in Figure 11, the number of freshman students who never absent from work is 32, the number of students who are rarely absent is 15, the number of people who are generally absent is 7, and the number of people who are frequently absent is 4. The number of sophomores who never absent from work is 23, the number of students who are rarely absent is 28, the number of students who are generally absent is 8, and the number of people who are frequently absent is 11. The number of juniors who never absent from work is 10, the number of students who are rarely

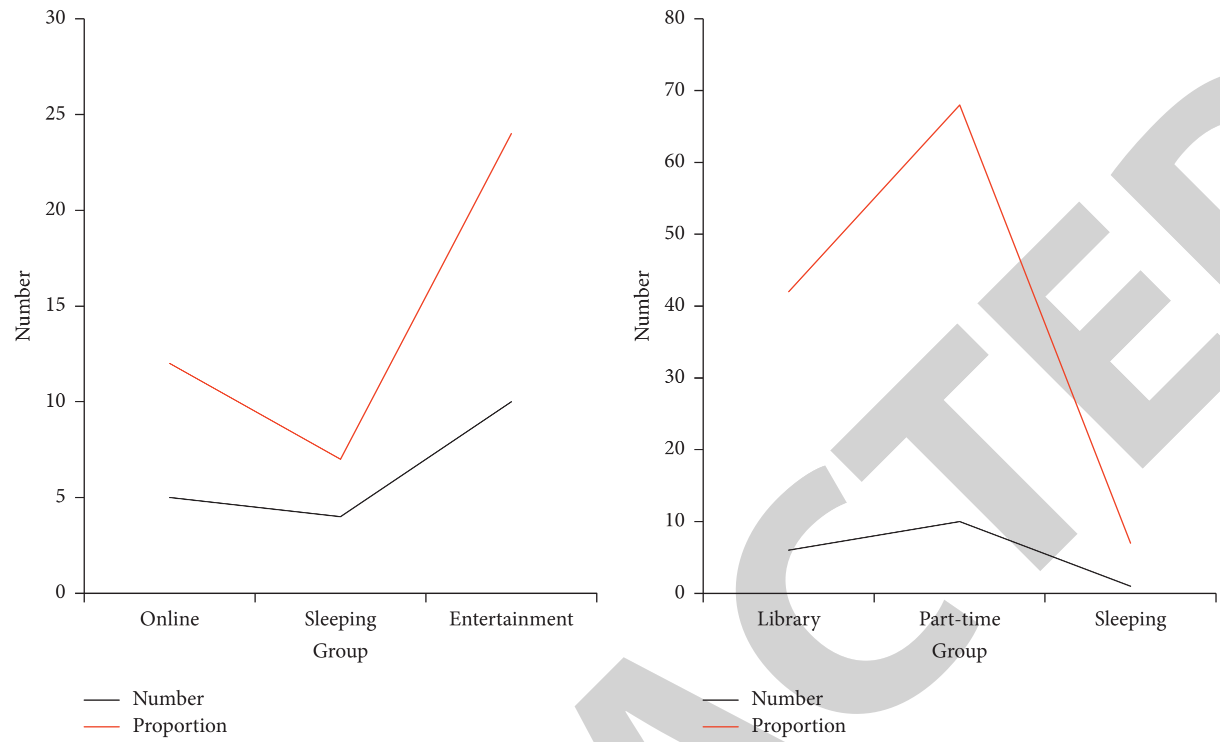

Figure 10: Reasons for student absence.

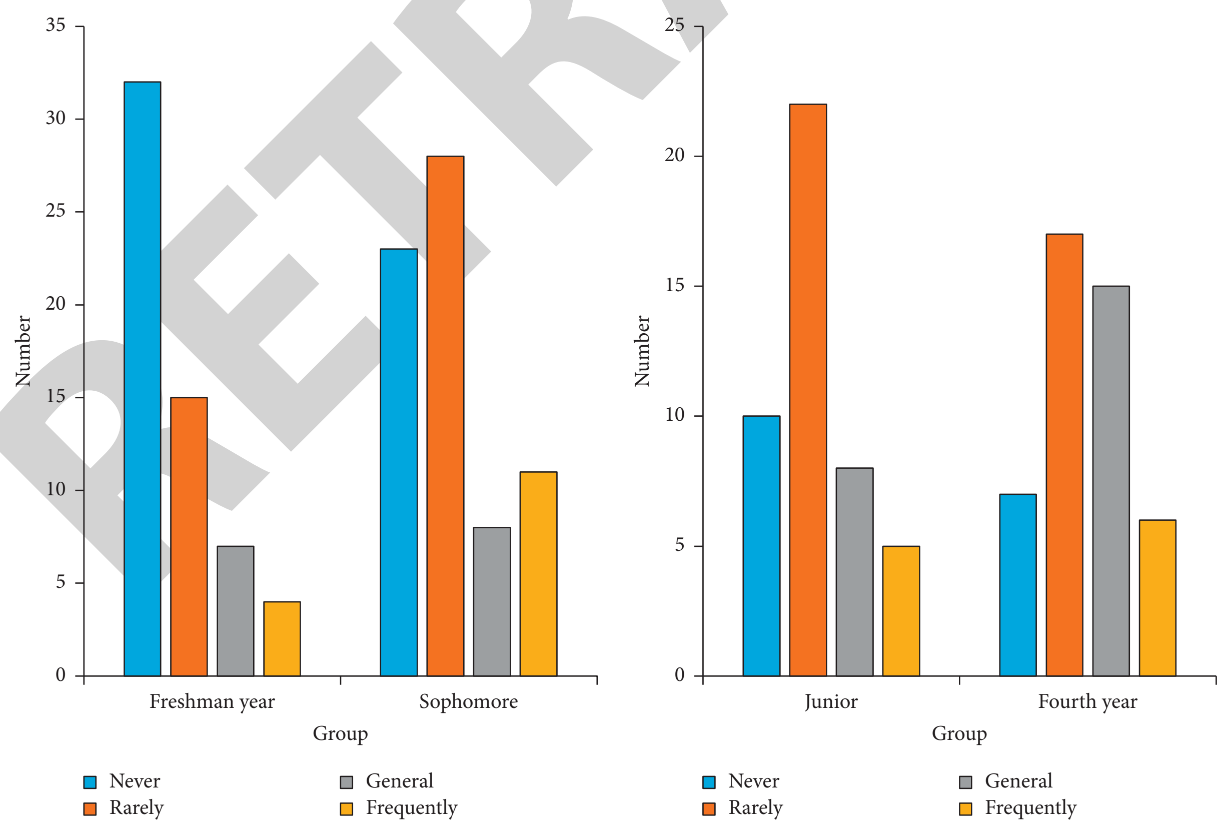

Figure 11: Grade level in relation to absenteeism.

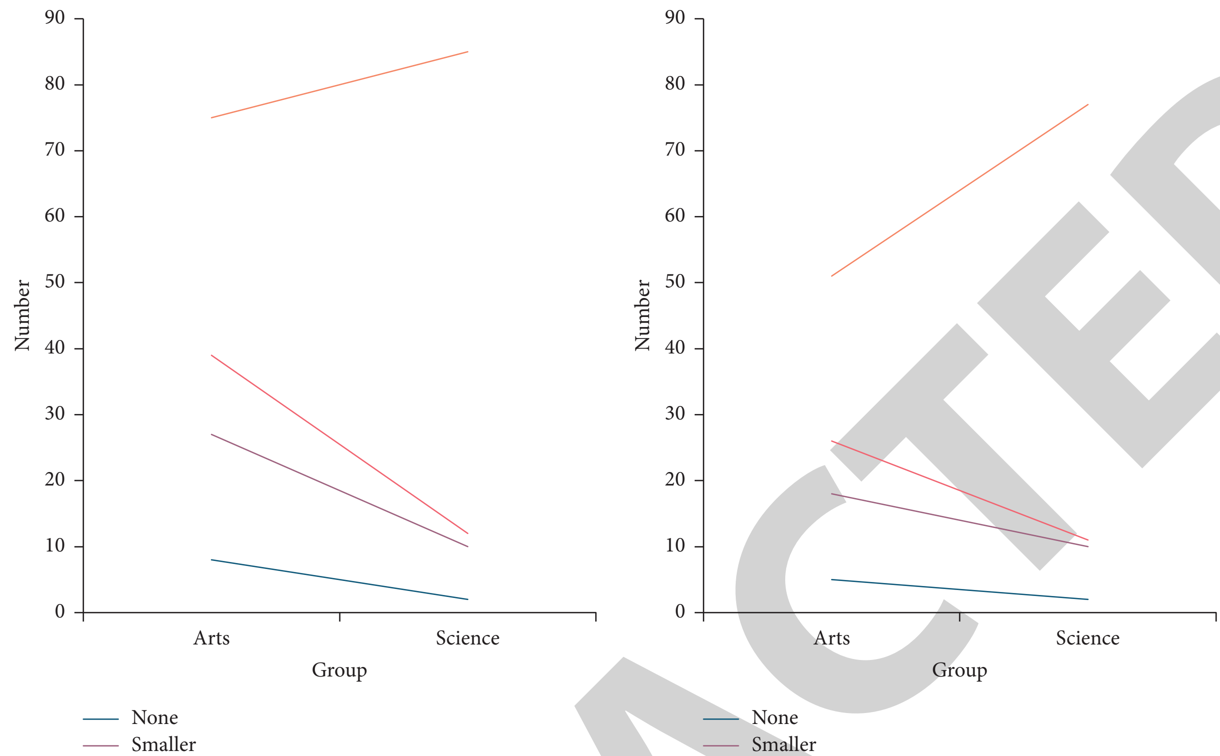

Figure 12: Impact of arts and sciences.

absent is 22, the number of students who are generally absent is 8, and the number of students who are frequently absent is 5. The number of seniors who never absent from work is 7, the number of students who are rarely absent is 17, the number of students who are generally absent is 15, and the number of students who are frequently absent is 6. According to the data, in the four grades of the university, the number of people who never absent from work shows a downward trend, and it is very obvious. The number of people who rarely absent from work shows the overall decline, although the fluctuations are not particularly obvious. The number of people who are generally absent from work gradually increases, and the number of people who are frequently absent does not fluctuate significantly.

According to the data in Figure 12, it can be seen that the impact of students in liberal arts and sciences on absenteeism is different. For liberal arts students, 8 people believe that absenteeism has no effect on professional courses, accounting for 5%; 27 people think that the impact is small, accounting for 18%; 39 people think that the impact is general, accounting for 26%; and 75 people think that the impact is very large, accounting for 51%. For science students, 2 people think that absenteeism has no effect on professional courses, accounting for 2%; 10 people think that the impact is small, accounting for 10%; 12 people think that the impact is general, accounting for 11%; and 85 people think that the impact is very large, accounting for 77%. It can be seen that although the absenteeism of science has a greater impact on professional courses, on the whole, no matter the absence of liberal arts or science students, it will have a great impact on professional courses.

5. Conclusions

With the ongoing evolution of scientific and artistic developments, coupled with the advocacy of the strategy of rejuvenating the country through science and education, various high and new technologies are being continuously promoted in the education field. The subject of this article is the study and analysis of the design and analysis of the student attendance management system based on the Internet of things technology. It is hoped that the Internet of things technology will be applied to the attendance system to improve the attendance rate of students. The real-time data of students' attendance are obtained through the attendance platform based on radiofrequency identification technology, which partially realises the informatization monitoring of students' attendance, changes the traditional method of manually recording attendance by the head teacher at any time, and greatly reduces the daily work of the head teacher. Attendance is monitored for work intensity. Reducing the intensity of the work of the class teacher is one of the purposes of developing the student management system for the class teacher based on the Internet of things technology. We can see the records of students' attendance information, without using traditional manual methods, directly using radiofrequency identification technology, and directly completing the attendance records of students through attendance machines and databases. This is the most satisfying thing reflected in the process of trial operation.

In this investigation, the following tasks were mainly completed: (1) through the research on the attendance system in literature and other fields, the system has completed the selection of topics and the selection of development tools; (2) the automatic collection of student attendance log information is realized. Radiofrequency identification (RFID) technology through the Web of Objects, the process of collecting student attendance log information, can be more convenient and very user-friendly; and (3) explaining the basic structure and performance system demands, and with the help of the Internet of things system operation, the attendance management has realized multiple functions such as user management and attendance. The emergence of new hardware, compatible with IC card and biometric technology, including fingerprint recognition and face recognition, and its own wireless transmission function, makes the way of attendance more flexible. The digital terminal equipment in the hands of faculty, staff, and students is also constantly being updated. The emergence of new practical work requirements and the emergence of a large number of digital teaching resources make online sharing of resources and paperless testing become increasingly urgent needs.

Data Availability

No data were used to support this study.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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