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**Research and application of identity authentication technology in digital campus card**

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With the deepening of people's understanding of school management modernization, based on cards

The computer system used has always been the focus of attention. With the continuous development of college information construction, campus card has been widely used, but by

In most campus application systems can not achieve interconnection, therefore, each student has more than one campus card, smart campus card display effectively solves this problem, provides a guarantee for the construction of digital campus.

**1 Features of digital campus**

Campus card integrates personal information, on-campus consumption, scholarship and on-campus deduction into one card, directly abolishing the traditional campus management of students' personal information files and payment methods with multiple functions. Above all

After integrating the banking system into the campus card, not only the identity identification and fee deduction can be realized in the school, but also the connection to the off-campus banking business, withdrawal, receipt and consumption, so as to realize the shared use of the card. The core of the campus card is the campus card, which means that in the school, any occasion with cash, tickets or identity proof is completed with the card. School affairs are complicated and the number of students is large, and manual management is difficult to meet the needs of students. Modern campus management should have fast information transmission speed and more meticulous management, so as to improve school education and education quality to a level

A new stage. The campus card reduces the need for labor, but it does not

It means that there is no need for manual management, and in the process of using the campus card, there will be a large amount of data, which is condensed behind the data

Whether to realize the value of this information and take effective ways to use it has become another challenge for the digital campus workers.

**2 Campus card functions**

From the user's point of view, the campus card system functions. Campus card

The system is usually implemented through the campus card and the corresponding bank card. Campus card has two basic functions: campus identity authentication and electronic consumption. one-card

The campus identity authentication functions of the system include: (1) multi-card integration: scanning the identity information of student cards, teacher work cards, medical cards, library cards, access cards and other campus cards, and a card can achieve various identity authentication functions. (2) Identity authentication public information management: Through the campus card center database, to achieve the digitalization and networking of teacher and student identity files. Through the management of campus public identity information, campus identity data sharing and comprehensive benefits are realized. Application management based on unified identity authentication: including enrollment management, examination management, student status management, cost management, book lending management, etc.; The faculty and staff campus card realizes identity authentication and related information on the enterprise financial settlement platform

Management of income and expenditure.

**2.1 Campus management**

Campus consumption accounting and identity identification are the two main functions of campus card, the so-called identity identification is to identify the identity of students, and consumption accounting

Is closely linked to student spending activities, the school provides campus cards through the campus wallet bill. Not only improves the transaction efficiency of offline consumption, but also supports offline consumption functions in campus consumption. File and control water control

Electronic identification functions also cover a variety of campus management functions, such as attendance, personal identification, book rental, language instruction, computer operations, etc.

**2.2 Financial Services**

Students need to eat and play, pay tuition and miscellaneous fees and deposit living expenses, and the school also needs to issue scholarships and grants

These activities are very frequent, some projects involve a large amount of money, only cash transactions will inevitably occur errors, resulting in disputes, the use of campus cards

It can be avoided. The payment shall be made at various shops with UnionPay logos on the campus

Easy activity, at the same time, you can also avoid the inconvenience of bringing cash, monthly deposit and withdrawal.

**2.3 Self-service Query**

In order to let students know the use of campus cards at any time, multimedia self-service terminals are set up at the school entrance, dormitory, library and other places with large flow of people to self-check the balance and details of campus card accounts. Transactions, scholarships, credit funds, etc. can complete comprehensive information such as book rental. 3. Identification technology system

If the application system reads and writes data on contactless media,

A contactless interface is generated when necessary. Radio wave data structure Key RF card itself is a passive card, and the signal sent by the reader when reading and writing the RF card consists of two parts: one is the power received from the RF card

Signal, which uses its L/C to generate instantaneous energy for the chip; The other part is.Read and write chip control and data signals. The controller mainly works on the data.Modify and store and return the signal to the card reader, complete the card operation can also be used to process the data has a powerful function. Almost all system terminals.Use a card reader, therefore, the card reader plays an important role in the application system.Yes. The card reader software mainly completes the identity verification function. Card reader RF display provides relevant information according to user needs. Card authentication key received one.A unified fixed read key, the write key is encoded by DES and stored in PSAM card. In order to ensure the security of the key, the system stores the key in the Sam module or the main key of the Sam card to complete the communication authentication and various encryption and decryption procedures with the user card, which is the same but different from the ordinary card

The main task of SOC is symmetric encryption and decryption as well as key storage and management. The key is written by the card display system into the Sam card, and then there is no way to read and change after the card reader has written the key stored in the Sam card.

**3.1 Fingerprint recognition system**

The working principle of the fingerprint recognition system is that the cardholder's fingerprint is first stored in the card, starting from reading the letters in the IC card, and then the fingerprint recognition system is installed in the card reader to read the cardholder's fingerprint, and finally the fingerprint of the cardholder is compared to determine whether the cardholder is the cardholder. This prescription

The method can capture more IC card memory and reduce the dependence on the network. All user fingerprint information is stored in the host system data library of the IC card, and only the fingerprint ID of the cardholder is stored. After reading the card, the card reader ends

The end collects the fingerprint information of the cardholder and connects the fingerprint ID with the back-end database

The corresponding fingerprint information is compared to confirm the identity of the cardholder, which occupies less IC card resources and has strong network dependence. With the improvement of system security, the basic fingerprint recognition system has some

Therefore, in view of the high recognition rate of the fingerprint recognition system, a new fingerprint recognition system digital rotating optical system is designed, and the functions of the digital optical identification system include: acquisition process, big data comparison and matching. (1) When the finger is dry, there will be many discontinuous lines in the fingerprint image. (2) Short grain: characterized by a short distance between two points, but not an isolated point grain pattern. (3) Hole shape: characterized by a small distance between two points, the distance between two points is very small, the direction of the line between them and their local field in the line

In roughly parallel directions. (4) Burr: It is characterized in that a pair of ends and forks are connected through grooves, and the distance between the two is relatively close. Yes, first of all, the fingerprint image is taken, that is, the fingerprint image, processed and labeled. The extraction of detailed features mainly depends on the position and direction of the image

The typical detail representation algorithm is to refine the image first, and then process the texture of the image to extract the mold features. The purpose of fingerprint enhancement is to improve the clarity of the lines, such as the connection of dotted lines, the smoothness of the edges, and so on.If the fingerprint image cannot be repaired, the traditional feature point extraction algorithm includes.A large number of pseudo-features, on the basis of eliminating the pseudo-features, the pseudo-features are studied.The causes and distribution of the results are presented, and the corresponding improved algorithm is proposed.

**3.2 Third-Party Access to the System**

**3.2.1 Access Control**

Incidents such as campus theft and vandalism by members of society after entering the campus

Have happened, remind people to stay alert to awareness, strengthen access control management. The door ban system is the core component of the campus card, which is mainly used to manage and control the access of personnel inside and outside the campus, etc., which can reduce the inaccurate and inefficient identification caused by manual monitoring of teachers and students, and can effectively protect the security of the campus. At present, many schools use the access control system.The system is also able to identify the residence hall where the student is located if the card swiped student does not belong.In this building, the campus card will not function.

**3.2.2 Campus Charges**

A large number of economic transactions take place on campus every day. These economic activities are of various types and involve a large amount of money due to the large number of students. They are mainly for the convenience of students' activities in libraries, small shops and other places. In order to protect the privacy of teachers and students, the data collected by the campus charging system is generally encrypted.

**3.2.3 Canteen Charge**

In the absence of cartoon support, the efficiency of canteen charge is low, especially in the peak period. Ensure the speed and accuracy of canteen charges.It is necessary to play the role of the food hall charging system to prevent the phenomenon of wrong payment amount and forgotten payment. The charging system in the canteen can make it easier for teachers, students and staff to eat and reduce the time people spend waiting in line for food. The single-chip controller of canteen accounting system mainly includes business computer and cashier. The main functions of the canteen consumption system include consumption, subsidies, renewal and so on.

**3.2.4 Library Management**

The library management system involves students' inquiry, borrowing, returning books, withholding fees, paying fees and other activities closely related to students' borrowing library books.

**3.2.5 Network Charging**

At present, the campus network has been popularized to various schools, and has become a tool for students to learn and leisure. The network billing system mainly includes self-payment and recording of students' use of the network. Students can recharge at the touch screen terminal and card center, and the campus network account is matched with the student's campus card number

Correspond.

**3.2.6 Guard Management**

The campus guard management system integrates technologies such as second-generation ID identification and image capture, which can realize sign-in, sign-off, visitor management, and emergency connection.Improve the safety factor of campus. Campus card system realized the information.Source digitization, transmission network, intelligent user terminal and system.

Automation of management maintenance. Can access the bank system, automatically transfer bank deposits to the campus. To meet the different campus consumption needs, you can also obtain personal identity documents, establish contact with the school management information system to meet the basic information needs of students, and realize the comprehensive inquiry management of students. 4 Conclusion

Campus map provides important data decision information for digital campus.The campus. There is the implementation of a general certification mechanism, the integration and exchange of data management, the campus card system as the core of the digital campus construction.The organic combination of some parts can avoid repeated investment and improve the construction progress.Resource exchange between systems and data linking between subsystems lay the foundation. Reference

[1] Meng Xiujin. Research on identity authentication technology in smart campus card

Application [J]. China Science and Technology, 2017, 000 (027) : 240-241. (in Chinese)

[2] Xu Huiying, Xu Minjie. Research and Application of Identity Authentication Technology in Digital Campus Card [J]. Computer Technology and Development, 2006, 16

[3] Jin Jiao, Zhang Mingyang, Yu Chuang, et al. Identity authentication in digital campus

Research and application of technology [J]. Science and Technology Innovation Review, 2007.

[4] Zhang Goli. Research and implementation of Unified Identity Authentication and Authorization System for Digital Campus [D]. Yunnan University, 2019.

[5] Liu Ying, Li Jianhua. Research and Implementation of Unified Identity Authentication and Data Synchronization in Digital Campus [J]. Information Security and Communication Security, 2008,