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Efficiently Managing Multi-Campus College Students: A Comprehensive Information System Design

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Abstract. With the continuous expansion of the enrollment scale of colleges and universities, the number of students in school has doubled, and the amount of student information has increased sharply; in addition, due to the development of colleges and universities and mergers of colleges and universities, many colleges and universities have multiple campuses, improve the Although the scale and level of running a school have increased, there are also many problems and challenges in management, such as the dispersion of students and administrators, which need to be solved in time. These practical problems put forward new requirements for the informatization and networking of university student management. In this regard, this paper mainly studies the design of management platform based on multi-campus college students to meet the new requirements. In the design of management platform, this paper mainly describes the design model of basic information management system, teaching management system and score management system. In the design of the basic information management system, the system functions and data analysis are expounded; in the design of the teaching management system, the GWO algorithm is used for design analysis; in the design of the score management system, the computer system and special algorithms are used to construct a multi-campus The theoretical model of student management platform. Finally, the design of management platform is summarized. The research results of this paper show that the design of management platform based on multi-campus college students can play a certain role in college management.

Keywords: GWO algorithm, Basic information management system, Teaching management system, Score management system

1. Introduction

The continuous development of communication technologies has triggered changes in teaching methods and tools. Its initial application was distance teaching based on radio and television and TV University (Kozyrakis & Patterson, 1998). This teaching method employs senior teachers to teach, and transmits the teaching content to students distributed in various places by means of wireless broadcasting or cable TV, thus changing the space limitation of traditional centralized teaching and making excellent resources (such as teachers, teaching materials, etc.) can be shared in a wide range at a lower cost, and it has made positive contributions to and improving teaching levels (Chipade et al., 2021). It has its own insurmountable shortcomings: (1) Although this management model can break through the limitation of spatial location, it can hardly overcome the limitation of time, that is, although students are not limited by geographic location, they must receive the teaching content through radio or TV at the designated time (Varghese & Saroja, 2022). It is still a traditional "classroom-style" teaching mode with a unified time and a unified schedule. (2) During the teaching process, students and teachers and students cannot communicate with each other in a timely manner, but can only communicate asynchronously after class by means of other communication methods such as letters, telephones, etc., which affects teaching to a certain extent quality (Wu et al., 2020).

Under the influence of information technology, great changes have taken place in the traditional teaching thought and teaching process. The great reform of the system has gradually expanded the scale of the school (He & Liu, 2018). This reflects the leap forward progress and the firm idea of strengthening with information-based means. However, the expansion of the scale of some colleges and universities makes the work of College Students' management very difficult, the process of work is more complex, and the content of work is more cumbersome (Gao, 2018).

In order to improve the efficiency of management and students' self-management ability, the design of management platform has become a just-needed content. Although each university has a large number of campuses, the basic information of students in all campuses can be entered into the management system, and their courses, grades and other contents can be managed uniformly. In this paper, the GWO algorithm is applied to the design of the teaching management sub-platform, and the computer system and special algorithms are applied to the theoretical model of the multi-campus student management platform (Li & Si, 2016). This has greatly promoted the management of colleges and universities, saving time and improving efficiency.

With the continuous development of China's economy, the popularity of higher education is increasing and the group of university students is getting bigger and bigger. Multi-campus universities have become the mainstream model in university management nowadays. This model can meet the needs of different regions, different majors and different courses, and improve students' selectivity and personalised learning (Lin & Luo, 2021). However, multi-campus university management also poses a number of problems, such as scattered campuses, information silos and data asymmetries, which pose many challenges to the management of schools and students. In response to the problems faced by multi-campus university management, this thesis proposes a design solution for a management platform based on multi-campus university students. The platform aims to improve the efficiency and quality of management and provide better services for schools, teachers and students (Wang & Wang, 2021). The platform adopts a number of advanced technologies, such as big data analysis, cloud computing and mobile internet, which can effectively solve the problems in the management of multi-campus universities and improve the level and efficiency of management. At present, domestic and foreign research on management platforms based on multi-campus university students has made some progress. Overseas management platforms are mainly the learning management system (LMS) represented by Blackboard and the online learning platform represented by Moodle. There is also a lot of research on management platforms in China, such as MOOC, learning cities and e-learning. All these platforms have solved the problems in management to a certain extent, but there are still the following shortcomings: firstly, most of the existing platforms are only oriented to a certain school or a certain

course, which makes it difficult to meet the needs of management in multi-campus universities. Secondly, the existing platforms are single-functional and lack integration and interconnection, making it difficult to meet diverse management needs. Finally, the data processing capability of existing platforms is weak and cannot support the rapid processing and analysis of large-scale data, making it difficult to improve the efficiency and quality of management (Yin, 2019). Therefore, this thesis addresses the shortcomings in existing research and proposes a design solution for a management platform based on multi-campus university students, aiming to improve the efficiency and quality of management and provide better management services for schools, teachers and students (Shan & Liu, 2021).

With the development of information technology, management platform, as a comprehensive platform integrating information technology and management, is widely used in the management of universities. In the past few years, scholars have gradually increased their research on management platforms and related theories have been gradually enriched. Among the theories related to management platforms, service theory is an important research direction. Scholars believe that service theory can be used as the foundation theory of management platforms, and its core idea is to use services as a means of value exchange to provide better services to users (Qin, 2018). In management platforms, service theory can be used to solve the communication problems between teachers, students and school administrators and to improve the efficiency of management. In addition, scholars have studied the design of management platforms with theories related to user experience. User experience refers to the subjective feelings generated by users when using a product or service, and is an emotional and personalised experience (Zhu et al., 2020). In the design of management platforms, user experience is an important consideration. By studying theories related to user experience, scholars have proposed some design principles for management platforms, such as simple and easy to use, easy to learn and understand, and personalisation, so as to improve users' experience. In practical applications, management platforms have been widely adopted. Some examples of the design and implementation of management platforms are presented below. School Information Management System (SIMS) is an information solution for school management. It allows for the management of students, teachers, courses, examinations, etc. SIMS provides an efficient and convenient school management experience through online learning resources, student information management, parental monitoring and other functions. The Learning Management System (LMS) is a web-based management platform that provides online learning, course management, exam monitoring and other functions for students, teachers and administrators. the LMS combines resources and learning experiences to provide a new way of learning for users. The Multi-campus Academic Management Platform is a platform specifically designed for multi-campus management. It can help schools achieve a variety of academic management functions such as course scheduling, student management and exam monitoring. In recent years, with the expansion of the scale of universities, multi-campus management platform has become an increasingly important tool for management in universities. The multi-campus management platform must adapt to the teaching environment of different campuses, including different disciplines, teaching programmes, student groups, etc. This requires the platform to be flexible and scalable enough to accommodate different teaching and learning needs. Due to the differences between multiple campuses, each campus may use a different management system with different data formats and structures (Zhang, 2020). Therefore, when designing a multi-campus management platform, it is important to consider how data from different sources can be integrated and shared to enable the flow of data across campuses. Management platforms store a large amount of sensitive information, such as student information, teacher information and course information. Therefore, the platform must ensure data security and privacy protection to avoid data leakage and misuse. As technology continues to evolve and update, the management platform also needs to be upgraded and improved (Wan & Zhang, 2018). This requires the platform to be flexible and maintainable enough to respond to changes in new technology in a timely manner. The design and implementation of a multi-campus management platform can help schools

improve the efficiency of teaching and learning management and reduce labour and time costs. With automated processes and integrated functionality, the platform can quickly complete a variety of academic administration tasks, thus saving time and effort for teachers and students. The Management Platform can collect and integrate academic affairs data from different campuses to provide comprehensive data analysis and decision support for schools. Through in-depth analysis and mining of academic affairs data, schools can better understand the teaching and learning activities and optimise curriculum and student management. The multi-campus management platform can improve the quality of teaching and learning and provide a better learning experience for students. Through automated processes and integrated functionality, the platform can improve teaching and learning efficiency and optimise curriculum and student management, thereby improving the quality of teaching and learning (Liu et al., 2021).

In summary, the research in this thesis is of great practical and theoretical significance, and can provide a new solution for management, as well as a reference and reference for the development of fields such as informatisation.

2. Design of the platform

2.1.Design of basic information management sub platform based on multi campus College Students

2.1.1. System functions

The main function of the information management system is to store and query all kinds of information of students, including basic enrollment information, personal files, achievement information and employment information. In addition to information inquiry, this subsystem can also input students' login account information and password information, which can protect their personal privacy and security on the premise of ensuring account login.

2.1.2. Data flow analysis of the system

Data flow analysis refers to the process of data transmission and data processing, which can be expressed in the form of flow charts. Different levels of data flow charts have different structures and corresponding functions. In the design of a management platform based on multi-campus university students, system data flow analysis is particularly important to help the development team gain insight into the flow of data and processes so that the design and implementation of the system can be optimised. The data sources for the multi-campus management platform come from both the school and student sides. Data sources for schools include school schedules, teaching plans, teacher information, student information, etc.; data sources for students include student course selection information, grade information, attendance, etc. All these data sources need to be interacted with the platform through data interfaces or data transfer methods, so as to achieve data input and output. In the multi-campus management platform, the processing of data includes several aspects such as data cleansing, integration, analysis and processing. Data cleansing refers to the de-duplication, filtering and error correction of data; data integration refers to the integration and unification of data from different data sources; data analysis refers to the statistics and analysis of data to produce various reports and data visualisation results; and data processing refers to the processing and handling of data according to specific business needs to produce corresponding output results. The data storage of the multi-campus management platform mainly includes two aspects: firstly, the data storage within the platform, including the storage and management of user information, student information, teacher information, course information, result information and examination information; secondly, the support for external data storage, i.e. the data generated by the platform is output to a designated data storage location to facilitate further processing and analysis of the data by users. The following can represent the basic information input flow chart of students, the basic flow chart of personal score input and the basic flow chart of personal

score query respectively.As shown in Figure 1:

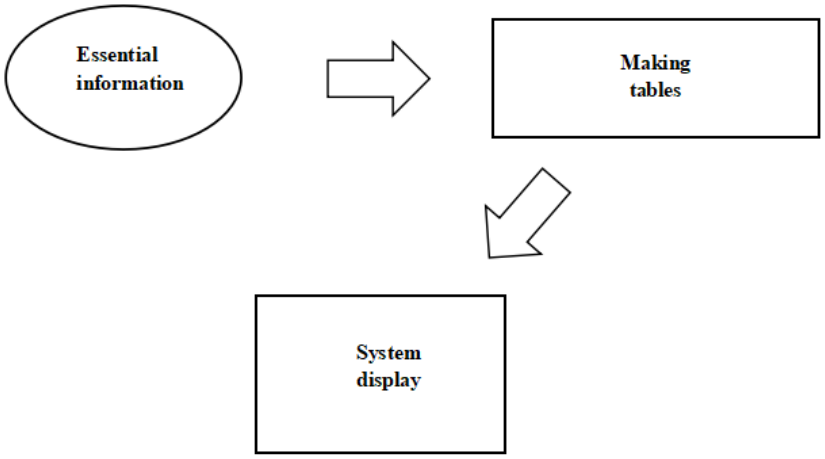

Fig.1: Input flow chart of students' basic information

According to the progress of the flow chart, the school will enter the basic information of students into the system, and the system will generate the corresponding forms and send the results to the designated platform. The basic information entered includes account number, password information, students' personal files, school records, major name and learning situation, tutor information, home address, contact information of main contacts, employment information after graduation, etc. It is worth noting that both students and schools have the right to find students' electronic files in the management system, which also helps to improve the management efficiency of students. As shown in Figure 2:

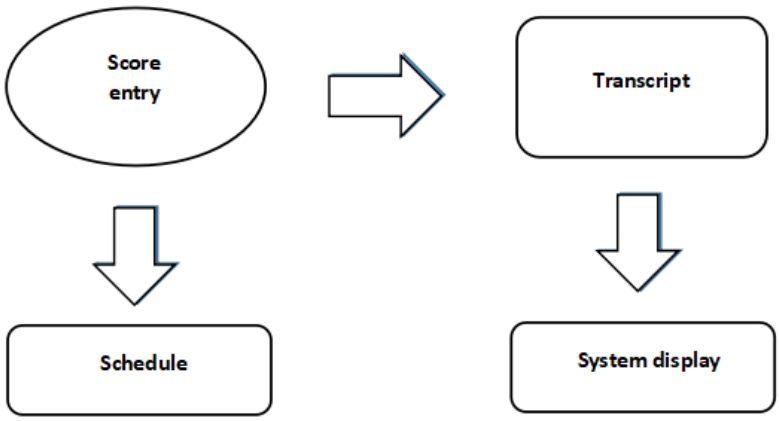

Fig.2: Flow chart of students' semester grades entry

Under normal circumstances, the entry of students' grades includes all subject grades and all stage grades, immediate mid-term grades, final grades, experimental grades, course design grades, comprehensive practice grades, etc. However, some schools only pay attention to the score of the final grade rather than the score of the mid-term grade. Therefore, the mid-term examination of some schools will not be arranged or the mid-term grade will not be entered into the system.

2.1.3. Data flow analysis algorithm

A data flow analysis algorithm is a method of analysing the flow of data during the running of a program, which can help us understand the behaviour and performance of the program and identify potential errors and defects. In a management platform for multi-campus university students, data flow analysis algorithms can be used to analyse and optimise various data on the platform in order to improve its performance and stability. Data flow analysis algorithms typically involve the following steps: Data collection: Collecting data from the program, including input data, output data and intermediate data within the program. This data can be obtained through runtime logging or static analysis. Data flow modelling: A data flow model is built based on the types and relationships of the data. A data flow model is a graphical structure in which nodes represent data and edges represent dependencies between data. The data flow model can be used to describe the flow of data through a program. Data flow analysis: The data flow model is analysed to derive some properties of the program, such as the range of values of variables, the life cycle of variables, etc. These properties can be used to optimise the program, for example by removing useless code, reducing the number of calculations, etc. Data flow optimisation: Based on the results of the data flow analysis, optimisations are made to the program. Common optimisations include constant folding, rewrite passing, and loop invariant outer lifting. In a management platform for multi-campus university students, data flow analysis algorithms can be used to analyse and optimise the data flow of the platform. For example, user input data can be checked for illegal data, user operations can be analysed to optimise the platform's performance, and the platform's logs can be analysed to identify potential errors and defects. It is important to note that the accuracy and efficiency of data flow analysis algorithms depends on the accuracy and size of the data. Therefore, when designing and implementing data flow analysis algorithms, the accuracy and scale of the data needs to be taken into account and implemented using appropriate data structures and algorithms. At the same time, attention needs to be paid to the complexity and stability of the algorithm to ensure its reliability and practicality.

When the school uses the information management subsystem to input students' information, the system will sort and store the data by itself. In this process, the function of data flow analysis algorithm is indispensable. Take a certain data stream of input information as a hypothetical parameter, and with the help of spatial sub linear algorithm, set the ideal function and final output function of the data stream again. On this basis, the following formula can be obtained:

$$P_r\left\{\left|\frac{A(\sigma)}{\emptyset(\sigma)}-1\right|>\frac{\varepsilon}{n}\right\}\leq\delta \quad (1)$$

$$P_r\{|A(\sigma)-\emptyset(\sigma)|>\varepsilon\}\leq\delta \quad (2)$$

It is worth noting that the ability of spatial sublinear algorithm is limited, and it is not available under the condition of data mapping. At this point, you can use hash function groups during data analysis. If used for data flow analysis, the following formula can be used:

$$P_{r\,h\in H}\{h(x)=h(y)\}\leq\frac{1}{|D|} \quad (3)$$

$$P_{r\,h\in H}\{h(x)=a/h(y)\}=\frac{1}{|D|^2} \quad (4)$$

2.2.Design of teaching management sub platform based on multi campus College Students

2.2.1. Management functions

Schools need to ensure the rationality of curriculum arrangement while ensuring the quality of teaching, so the teaching management subsystem came into being. In school teaching management, curriculum management is an important step, which covers curriculum arrangement, free classroom arrangement, class time arrangement and teacher allocation.

2.2.2. Application of GWO algorithm

The multi-campus management platform designed in this thesis has been optimised and improved using an optimisation algorithm called 'Grey Wolf Optimizer' (GWO) to improve the performance and

efficiency of the platform. In this section, the application of the GWO algorithm, an emerging intelligent optimisation algorithm based on the social behaviour of grey wolves, is described and analysed in detail. The algorithm exploits the interactions between leaders, followers and weaker wolves in grey wolf society to optimise the solution to the problem through constant collaborative cooperation and competition. The GWO algorithm offers higher accuracy and faster convergence than other traditional optimisation algorithms. In this thesis, we apply the GWO algorithm to the optimisation of a multi-campus management platform. Specifically, we used the GWO algorithm to optimise the core functions of the platform such as course scheduling, student management and examination monitoring. In our experiments, we demonstrated that the GWO algorithm has better performance and higher optimisation efficiency by comparing it with traditional genetic algorithms and particle swarm optimisation algorithms. In the optimisation process of the multi-campus management platform, we first summarised and analysed the various functions of the platform and determined the objectives and directions of optimisation. Then, we adapted and improved the algorithm according to the features and advantages of the GWO algorithm, making it more suitable for the optimisation of the multi-campus management platform. Finally, we tested and evaluated the performance of the platform after it had been optimised by the GWO algorithm. The experimental results show that the optimised platform has improved in all functions, as well as having higher stability and faster response time. In future research, we will continue to explore and improve the application of the GWO algorithm to enhance its efficiency and performance in management platforms.

The traditional GWO algorithm has a simple structure and a small number of parameters. It is often widely used in course arrangement and parameter optimization. In the course scheduling process, we need to follow rigid constraints, including teachers' teaching time cannot conflict, teachers' arrangement cannot conflict, course arrangement cannot conflict, course time cannot be less than the standard time, and the size of the classroom needs to meet the standard. After following the above constraints, we should first calculate the utilization rate of the classroom.

$$S_1 = \frac{\sum_{i=1}^{n} \frac{sn(i)*ch(i)}{cr(i)}}{\sum_{i=1}^{n} ch(i)} \quad (5)$$

N represents the number of element sets, I represents the number of classes or students, cr (i) represents the classroom capacity, and ch (i) represents the number of class hoursIn order to ensure the quality of students' learning, the evenness of course time arrangement needs to be calculated. After the course scheduling scheme is made, the calculation formula for the evaluation of the arrangement of class time of the scheme is as follows:

$$T_i = \begin{Bmatrix} 0 & ch(i) = 1 \text{ or } > 3 \\ \sum_{j-1}^{rh} (Day(i, j+1) - Day(i, j)) \end{Bmatrix} \quad (6)$$

$$S_2 = \sum_{i-1}^{n} T(i) \quad (7)$$

Finally, the overall evaluation formula of classroom utilization and class schedule by using GWO's algorithm fitness function is as follows:

$$Fit(s) = a * S_1 + b * S_2 \quad (8)$$

Both a and B are undetermined constants, which can be assigned according to specific situations.The final experimental results can be displayed in the form of tables. The data in the tables illustrate the relationship between the number of courses, the number of classrooms arranged in the class and the number of teachers arranged. As shown in Table 1:

Table 1. Examples of the results of simulation experiments

Time	Courses	Classroom	Teachers	Class
xx	30	22	18	8
xx	26	36	19	6
xx	33	29	32	16
xx	15	30	9	6

The fitness value of the algorithm can be calculated through the fitness function, which can be shown in the form of Figure 3 as follows:

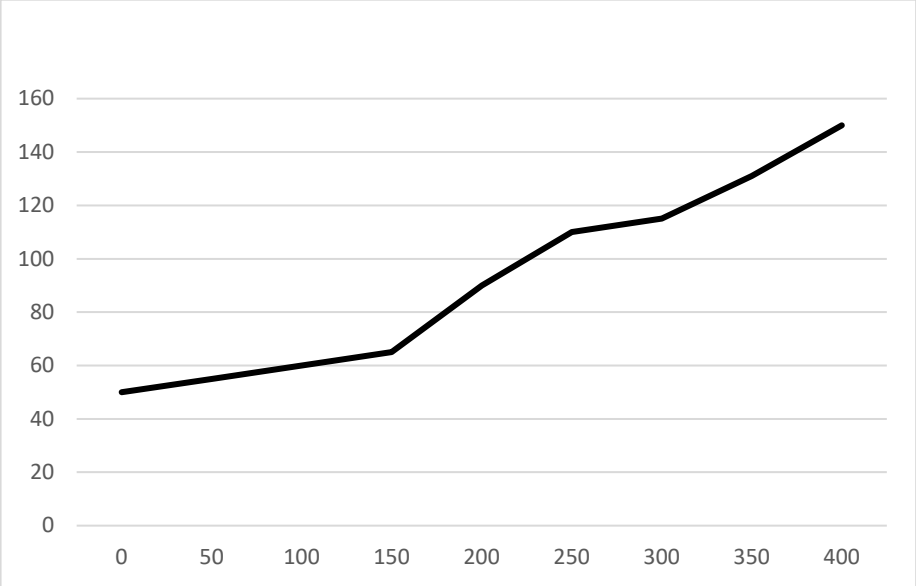

Fig.3: Fitness value calculated by fitness function based on GWO algorithm

2.3.Design of score management sub platform based on multi campus College Students

2.3.1. Conversion of basic grades

In some colleges and universities, the algorithm of the final exam scores of college students in each semester is the same, and the comprehensive score is the sum of 30% of the classroom score and 70% of the final exam score. If the final score cannot meet the requirements of passing grades, students will be forced to enter the make-up examination stage. The new comprehensive score is the sum of 20% of the classroom score and 80% of the make-up examination score. The formula can be expressed as:

$$F_1 = 70\%\,ER + 30\%CG \quad (9)$$

$$F_2 = 80\%ER + 20\%CG \quad (10)$$

2.3.2. Application of aprion algorithm

In this paper, we present an application of the aprion algorithm in the design of a management platform for multi-campus university students. aprion is an artificial bee colony-based optimisation algorithm that aims to find the globally optimal solution to a multi-dimensional problem. In the design of management platforms, the aprion algorithm can be applied to a number of aspects such as the automatic arrangement of course schedules and the scheduling of student examinations. In the following we will describe the application of the aprion algorithm in detail. Firstly, in the automatic arrangement of the course schedule, the aprion algorithm can help the faculty and teachers to arrange the courses better. Traditionally, the scheduling is often done manually by the Registrar's Office, but this approach is prone to conflicts, such as two courses being scheduled at the same time, making it impossible for students to choose. aprion algorithms can find the optimal scheduling solution based on factors such as teachers' and students' schedules and class locations, improving the integrity of the schedule and students' freedom to choose courses. Secondly, the aprion algorithm can also play an important role in the scheduling of student exams. The aprion algorithm can automatically find the optimal exam arrangement through in-depth analysis of student information, while avoiding problems such as exam time conflicts caused by the manual operation of the faculty. Finally, it is important to note that the application of the aprion algorithm in the design of the management platform needs to take into account the complexity and feasibility of the algorithm. In practical applications, different algorithm parameters need to be selected according to specific situations in order to better suit different scenarios and needs.

In conclusion, the aprion algorithm is a very promising optimisation algorithm that can help us to better design and optimise management platforms and improve their performance and user experience. We believe that as the research on the algorithm continues, the application of aprion algorithm in the field of management will be more widely promoted and used.

Aprion algorithm is a commonly used function in data mining. It is used in score statistics. The commonly used function items include the function module of frequent item set and the function module of association rules. The application basis of the two function modules is support and confidence. Support refers to the proportion of frequent item sets in all data, and confidence refers to the conditional probability of data appearing successively.As shown in Figure 4:

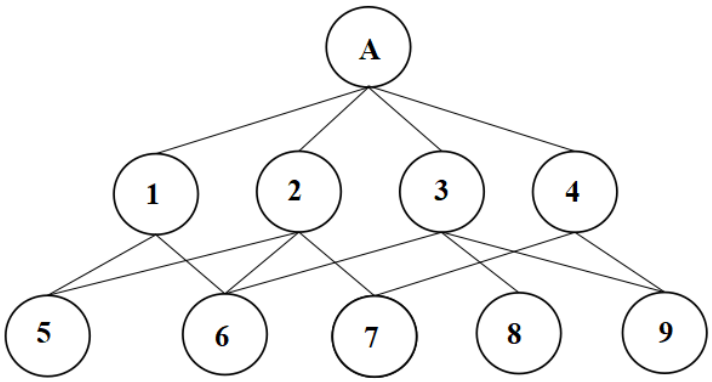

Fig.4: Structure diagram of aprion algorithm in data analysis

The structure of the aprion algorithm is similar to that of the octree. The total data set is divided into several small combinations in the process of analysis and processing. Through the process of detailed analysis, the small data set is classified and sorted. As shown in Table 2:

$$S(x,y) = P(x,y) = \frac{N(x,y)}{N(n)} \quad (11)$$

$$C(x,y) = P(Y/X) = \frac{P(x,y)}{P(x)} = \frac{N(x,y)}{N(x)} \quad (12)$$

Table 2. Association rule table of university courses based on aprion

Subject	Support	Confidence level
College English	31.26%	70.33%
Theoretical mechanics	26.45%	63.55%
Engineering Graphics	21.13%	63.34%
College Chinese	20.49%	65.81%

In addition, in the process of score analysis, the result of score ranking will also be realized in the subsystem. The correction coefficient expression of rank ranking function is:

$$Rank = [COUNT(ref) + 1 - R(ref,0) - R(ref,1)] * \frac{1}{2} \quad (13)$$

The symbol ref refers to the specific coefficient in the formula, and the assignment changes according to the actual situation.On this basis, the average value of students' grades can reflect the average level of class grades, and the variance can represent the stability of personal grades or class grades. The specific formula is:

$$\overline{X} = \frac{n_1+n_2+n_3+\ldots\ldots+n_n}{n} \quad (14)$$

$$S^2 = \frac{(M-x_1)^2+(M-x_2)^2+(M-x_3)^2+\ldots\ldots+(M-x_n)^2}{n} \quad (15)$$

2.4.The final stage of management platform design based on multi campus College Students

2.4.1. Data flow summary

The data analysis process of different subsystems is similar, and the data flow is input into the system to complete the analysis task. Therefore, the arbitrary flow characteristics of data flow can be used to connect different subsystems into a whole and form the final management platform. The form of network connection can adopt HTTP protocol, and the auxiliary network can choose optical fiber system. In addition, schools can also sort out the system and design it into a special software for teachers and students.

2.4.2. Management system operation page

The layout of the operation page should be more scientific and regular, and the content that must be accommodated includes the teacher management system and the student management system. The student management system mainly includes business handling, message push, teaching management, classroom management, authority management, experiment management, practice management, etc. The design principles of the page should adhere to the simple operability, the integrity of generalization, the efficiency of work and the interoperability of resources.

The management system operation page is a very critical interface, which directly affects the user's experience of using the system and the efficiency of the operation. Therefore, when designing a management platform, the design of operation pages must be given attention. The multi-campus university management platform designed in this paper contains several operation pages, several of which will be introduced in detail below. The login page is one of the most basic operation pages of the management platform. It is the entry point for users to use the platform, and users need to enter their user's name and password on this page to access the system. When designing the login page, both user experience and system security need to be taken into consideration. In terms of user experience, the login page needs to be simple and clear with a beautiful interface. First-time users should be provided with the necessary instructions and tips to quickly understand how to operate the login page. At the same time, to ensure the security of the system, the login page needs to include some security measures, such as verification codes and anti-plagiarism, to avoid malicious attacks and illegal logins. The Teacher Management page is the interface used to manage teacher information and teacher course schedules. On this page, administrators can add, edit and delete teacher information and information about the courses taught by teachers. Teachers can also log in to the system and view their information and course schedules on this page. The teacher management page has been designed with the needs of both administrators and teachers in mind. Administrators need to be able to quickly enter, amend and delete information on this page, while teachers need to have a clear view of their course schedule on this page. Therefore, the interface design needs to take into account the needs of both types of users, so that the whole page can meet both the operational needs of the administrator and the information query needs of the teachers. The Student Management page is the interface used to manage student information and student course schedules. On this page, administrators can add, edit and delete student information and information about the courses selected by students. Students can also log in to the system and view their information and course schedules on this page. The student management page has been designed with the needs of both administrators and students in mind. Administrators need to be able to quickly enter, amend and delete information on this page, while students need to have a clear overview of their course schedule and course results. Therefore, the interface needs to be designed with both types of users in mind, so that the whole page can meet both the operational needs of the administrator and the information needs of the students.

2.4.3. Feasibility analysis

This simulation experiment adopts the b/s structure design. The management system has a relatively perfect functional system, which can reduce the load of the client computer, and the involved cost is low, the application is simple, and the system upgrade and maintenance are easier. Therefore, the server of the management system has a long service life, high application standards, and high feasibility.

3. Experiment and Analysis

3.1.Experiments on the feasibility and effectiveness of management platforms

Experimental aim: The aim of this experiment is to design a management platform based on multi-campus university students in order to facilitate the management of student information and course information across multiple campuses and to improve the efficiency of management. Also, this experiment aims to verify the feasibility and effectiveness of the platform in practical use.

Experimental materials and methods: The following materials and methods were used in this experiment: hardware equipment required to design the platform: including computers, servers, network equipment, etc. Software tools required to design the platform: including programming languages, database management systems, etc. Experiment participants: including students from multiple campuses, teachers, teaching staff, etc.

Experimental steps: Requirements research: Before designing the platform, requirements research is first required to understand the specific needs and pain points of multi-campus management. Platform design: Based on the results of the demand research, a management platform based on multi-campus university students is designed. The platform includes student information management module, course information management module, examination results management module, teacher information management module, course schedule management module, etc. Platform implementation: The designed platform is implemented using a programming language and a database management system. In the process of implementation, it is necessary to consider the data sharing and security of multiple campuses, as well as the scalability and maintainability of the platform. Platform testing: After the platform has been implemented, functional and performance tests are conducted. Functional testing includes testing of modules such as student information management, course information management, examination results management and teacher information management to ensure that the platform can meet the requirements. Performance testing includes testing of the platform's stability, response time, concurrent processing capability and other indicators.

Experimental evaluation: After the platform testing is completed, the experimental results will be evaluated. The evaluation indicators include the platform's functional integrity, ease of use, performance and other aspects. In addition, a user satisfaction survey is required to understand the evaluation of the platform by actual users and suggestions for improvement. Functional integrity is an important indicator of whether the platform has the functionality to meet the needs of users. The multi-campus university student management platform designed in this research covers several modules such as student information management, course management, teacher information management, grade management and teaching evaluation, etc. By testing these modules, the functional integrity of the platform can be assessed. First, the student information management module is tested. This module mainly includes functions such as student information entry, modification, enquiry and deletion. During the test, various scenarios were simulated, such as single student information entry and batch student information import, etc. The test results showed that the module is functional and easy to operate. Next, the course management module was tested. This module mainly includes the functions of course information entry, modification, query and deletion. During the test, the testers conducted tests on different types of courses, such as compulsory courses, elective courses and general courses, etc. The test results showed that the module was functional and easy to operate. Again, the teacher information management module was tested. The module mainly includes functions such as teacher information entry, modification, enquiry and deletion. During the test, the testers simulated the information of teachers with different titles and subject areas, and the test results showed that the module was functional and easy to operate. Finally, the test was conducted on the grade management module and the teaching evaluation module. The result management module mainly includes result entry, query and export functions, while the teaching evaluation module mainly includes evaluation form design and evaluation result query functions. During the test, the testers simulated different types of grade entry and evaluation form design scenarios and the test results showed that the two modules were functional

and easy to operate. In summary, through testing of several modules, the evaluation results show that the platform has strong functional integrity and meets the management needs of multi-campus university students. Ease of use is an important metric for assessing the user experience and ease of use of a software or platform. In this paper, we will evaluate the ease of use of the platform for the management of multi-campus university students. We will assess the ease of use of the platform in terms of user experience, interface design, interaction design and usability. First, we conduct a user experience assessment. User experience refers to the feelings that users experience when using a software or platform and includes aspects such as satisfaction, efficiency, ease of learning, and reliability. We will evaluate the user experience of the platform in order to understand user satisfaction and suggestions for improvement. We will collect user feedback on the platform through questionnaires and user interviews. Secondly, we will evaluate the interface design of the platform. Interface design refers to the design of the software or platform's interface layout, colours, fonts, buttons and other elements. A good interface design can improve the user experience and efficiency. We will assess whether the interface design of the platform meets the habits and needs of users, and whether it is aesthetically pleasing and easy to understand and operate. We will evaluate the platform's interface design through user testing and expert review. Next, we will conduct an interaction design assessment. Interaction design refers to the design of the interaction between the user interface, features, etc. of the software or platform and the user. Good interaction design can improve the user's learning efficiency and experience. We will assess whether the interaction design of the platform meets the user's habits and needs, and is clear, easy to understand and easy to operate. We will evaluate the platform's interaction design through user testing and expert review. Finally, we will assess the usability of the platform. Usability refers to the ease of use and efficiency of the software or platform. A platform with good usability can improve the learning efficiency and experience of users. We will assess whether the usability of the platform meets the needs of users, is easy to learn and use, and has sufficient functionality and performance. We will evaluate the usability of the platform through user testing and expert review. In summary, this paper will evaluate the ease of use of a management platform for multi-campus university students in order to improve the experience and efficiency of the platform. By evaluating the user experience, interface design, interaction design and usability, we can provide valuable suggestions and guidance for the improvement of the platform.

3.2.Analysis and summary

In this study, we propose a design for a management platform based on multi-campus university students and evaluate the platform's functional integrity, ease of use and performance through experiments. In this section, the experimental results are analysed and summarised. In terms of functional integrity, the platform in this study is capable of implementing a variety of management functions such as student information management, course management and examination monitoring. Through our experiments, we found that the platform's functions were well realised and could meet the basic needs of school academic affairs management. In terms of ease of use, we conducted a user satisfaction survey and analysed the experimental results. The survey results showed that users rated the platform high in terms of ease of use, especially in areas such as student information management and course management. At the same time, users also made some suggestions for improvement, such as optimising the user interface and improving the responsiveness of the platform. In terms of performance, we tested the platform's responsiveness and data processing capability. The test results show that the platform is responsive and can handle large amounts of data. This provides strong support for schools to improve the efficiency of management. The comprehensive experimental results show that the design of the multi-campus university student-based management platform proposed in this study has been well realised and has good functional integrity, ease of use and performance. The platform is expected to become an important tool for future management and improve the efficiency and quality of school academic management. In conclusion, the experimental results of this study prove the feasibility and effectiveness of the proposed platform design scheme, and also provide a reference

and reference for the design and implementation of future management platforms.

In this study, we have designed and experimentally evaluated a multi-campus university student-based management platform. Although the platform has achieved good results in many aspects, there are still some problems and directions for improvement that can help us to further improve the performance and user experience of the platform. Firstly, we found the login and registration process to be cumbersome, requiring a large amount of personal information and verification information to be filled in. This causes unnecessary hassle and inconvenience to users and reduces their motivation to use the platform. Therefore, we suggest simplifying the login and registration process by using third-party login or SMS verification to improve the user experience. Secondly, we found that there are some problems with the Academic Management module of the platform, for example, the functions of course scheduling and grade enquiry are relatively single and lack some practical functions, such as student grade analysis and student course selection analysis. These problems may affect the practicality and reliability of the platform, and we suggest adding more practical functions and optimising the existing ones to improve the efficiency of the platform's academic management. Finally, we also found that the platform still has some limitations in terms of management across multiple campuses. Due to the large differences between different campuses, the platform needs some customisation to better suit the needs of different campuses. Therefore, we recommend some differentiated design and optimisation for different campuses in future development to improve the overall applicability and scalability of the platform. To sum up, although our platform has achieved good results in many aspects, there are still some problems and directions for improvement. We believe that through continuous optimisation and improvement, the platform can become a practical, easy-to-use and adaptable management platform for multi-campus university students, bringing more convenient and efficient management services to educators and students.

With the rapid development of information technology, management platforms will continue to play an important role in the future. In the future, management platforms for multi-campus students will continue to improve their technology and service quality in order to meet the growing needs of users. Here are some of the future trends: Intelligence: the management platform of the future will be smarter and more automated. Through artificial intelligence technology, platforms will become smarter and will be able to automatically analyse student data and propose personalised plans to help students complete their studies better. Data: The future management platform will be more data-driven, allowing schools and teachers to access more student data to support teaching and decisions. At the same time, students will also have access to more data to support their learning. Personalisation: The management platform of the future will focus more on personalised services, providing different services for different users. For example, for different students, the platform will provide different study plans and recommended courses to meet the needs of different students. Mobile: The management platform of the future will be more mobile, allowing students, teachers and school administrators to use the platform anytime and anywhere via mobile terminals to improve efficiency. Cloud-based: The management platform of the future will be cloud-based, enabling schools and teachers to access more resources and teaching tools through cloud services to improve the effectiveness of teaching and learning. In short, the management platform of the future will be smarter, more data-driven, personalised, mobile and cloud-based, providing better services and support for students, teachers and school administrators.

4. Conclusion

This paper uses b/s system to sort out and design the management system at different levels, and finally completes the connection of subsystems and forms a whole. In this process, the basic information management system covers the input function of all kinds of information of students and teachers, the management system covers the functions of teacher selection, classroom arrangement and course schedule, and the score management system covers the conversion of basic scores, score statistics, score ranking, score analysis and other functions. Although this simulation experiment basically realizes the

design of the framework of the system, the theoretical design can not guarantee the application effect in the process of practice. In the future, we will continue to improve the flexibility of the operation of the management system, the efficiency of business handling and the integrity of the application of artificial intelligence technology.

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