

Retraction

Retracted: Construction of Student Mental Health Education Expert Platform Based on Cloud Native Model

Security and Communication Networks

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This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

Wiley and Hindawi regret 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 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] S. Jin, "Construction of Student Mental Health Education Expert Platform Based on Cloud Native Model," *Security and Communication Networks*, vol. 2022, Article ID 5301723, 15 pages, 2022.

Research Article

Construction of Student Mental Health Education Expert Platform Based on Cloud Native Model

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After completing the function and performance requirements of the system, the architecture design of the college students' mental health expert platform is carried out. The overall design of the platform is introduced as a whole, including the logical architecture, topology architecture, and functional architecture of the system. Due to the particularity of the college student's mental health expert platform, the framework design of the server and the client is made from the system framework level. Then, it introduces the logical design and physical design of the system database, and finally introduces the detailed design of the core function modules in detail. The corresponding weights of each index in the index system are obtained through AHP, and the evaluation model of the mental health expert platform based on AHP is obtained. After testing, it proved that the platform construction was successful. After investigation, more and more students come to the platform for help, and the students believe that functions such as appointment consultation and online consultation should be added.

1. Introduction

Modern students are prone to emotional and psychological changes such as inferiority complex, anxiety, and tension due to various pressures. Under the pressure of various aspects of studies, family, and society, students have autism, Internet addiction, running away from home, and other consequences [1–3]. Therefore, it is necessary to carry out the correct psychological education of students to effectively avoid this situation. Many adolescents' psychological problems are not fully recognized by schools and families. Therefore, it is very important to vigorously carry out the work of youth mental health education. According to the World Health Organization, nearly half of the world's population suffers from mental illness that affects their self-esteem, relationships, and ability to function in everyday social life. Individual mental health problems can also affect physical health and lead to poor mental state [4]. A series of social problems have thus occurred. Psychological problems such as depression, anxiety, and schizophrenia are prevalent among young people and college students. With the development and progress of modern education, colleges and

universities pay more and more attention to the mental health of college students. College students have more problems of mental health. The reason is that after entering the university, great changes take place in their living environment, interpersonal relationships, personal roles, and learning methods. If the adjustment is not in place or the adjustment is wrong, it is easy to have problems in some aspects. If these problems cannot be solved in time, it will bring in other psychological problems. It will also directly affect the students' future university life and life in general [5].

For example, the Yao Jiaxin and Ma Jiajue incidents that shocked the whole country have aroused everyone's attention to the mental health of college students. The mental health of college students is not only closely related to the healthy growth of the students themselves but also to the future development of the whole country and society. Therefore, it should pay attention to the mental health development of college students [6, 7]. Timely discovery of students' mental illness and timely and correct guidance of students help to overcome psychological obstacles. Early prevention and treatment of mental illness is one of the most

important tasks of higher education. Mental health refers to a person having a healthy mind. This is affected by many aspects such as culture, family, social atmosphere, education level, and physical health. Every year, October 10th is celebrated as World Mental Health Day. The day is devoted to raise awareness of mental health issues by the UN's mental health and WHO initiative.

With the increasingly prominent mental health problems of college students, the student mental health education and management institutions, such as student mental health education and counseling centers in colleges and universities, have extensively carried out mental health knowledge publicity and education. The school also patiently counsels students with psychological problems and establishes a psychological crisis prevention mechanism to avoid the occurrence of psychological crisis events for students. The main forms are surveys and statistical analysis of mental health problems. By carrying out a series of publicity and education activities such as the Mental Health Festival and devising mental health education courses, a four-level work network will be established to pay attention to students with psychological abnormalities and provide timely feedback. Although college management and institutions have begun to pay attention to the mental health of college students, the following problems still exist [8, 9].

- (1) The proportion of college students who actively seek help is very small. According to a survey report by a consulting agency, among the college students, 23% have mental illnesses requiring psychological treatment, and 26% have minor psychological problems requiring psychological counseling. However, only 3% of students actively seek psychological counseling and help in mental health counseling institutions for college students. From these statistics, it can be seen that the hidden dangers of college students' mental health are particularly prominent.

Figure 1 shows the proportion of students with mental illnesses who need psychological treatment and minor psychological problems who need psychological counseling in the past ten years.

Figure 2 shows the change pattern of students who actively and passive seek psychological counseling and help from college students' mental health counseling institutions in the past ten years.

- (2) There are few information system platforms.

There is no single channel for effective documentation and communication. At present, most psychological counseling institutions set up in colleges and universities do not have effective information-based means to provide psychological counseling to college students, and schools often maintain a face-to-face counseling model. Although some colleges and universities also use some psychological counseling software, the school is only used as a psychological file preservation and psychological counseling record tool. It is used for preliminary psychological assessment and by counselors to

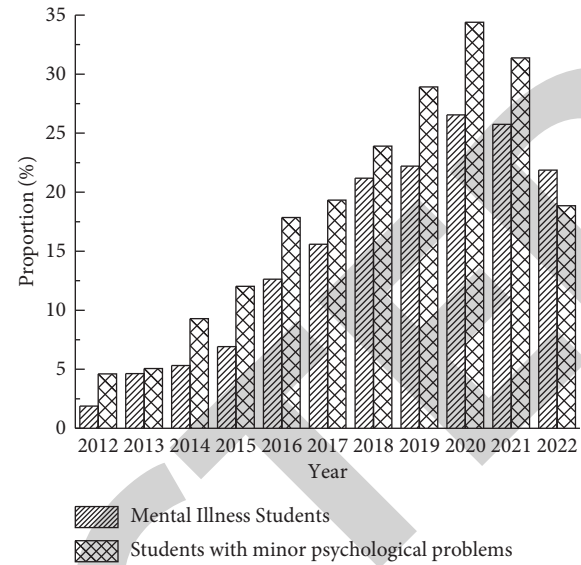


FIGURE 1: Percentage of students requiring psychotherapy and counseling.

record the psychological counseling records of college students. Irrespective of the configuration of software and hardware or the utilization rate of psychological counselors in colleges and universities, it cannot be effectively used. This greatly reduces the role of psychological counseling institutions in colleges and universities.

- (3) There is a lack of effective counseling tracking for college students who receive psychological counseling. It is a step-by-step process for college students to receive psychological counseling, and it is necessary to establish an effective file for each student who receives psychological counseling. If there is no information system to store the psychological counseling cases of college students, it will often lead to serious bias in the results of psychological counseling.

Such problems can be solved by means of information technology. Through the construction of an information system, the mental health counseling of college students is brought into online management. At the same time, through the use of mobile Internet technology, college students' mental health consultation can be conveniently conducted anytime and anywhere through mobile phones, pads, and other mobile devices.

The construction of student mental health education expert platform mainly has the following research significance and purpose [10].

By building an expert platform for students' mental health education, teachers can better understand the psychological problems of college students. Teachers can understand college students' personality, psychological characteristics, values, social adaptation, and other attributes. This is beneficial for teachers to better guide college students, so as to achieve the effect of teaching students in accordance with their aptitude. At present, college students

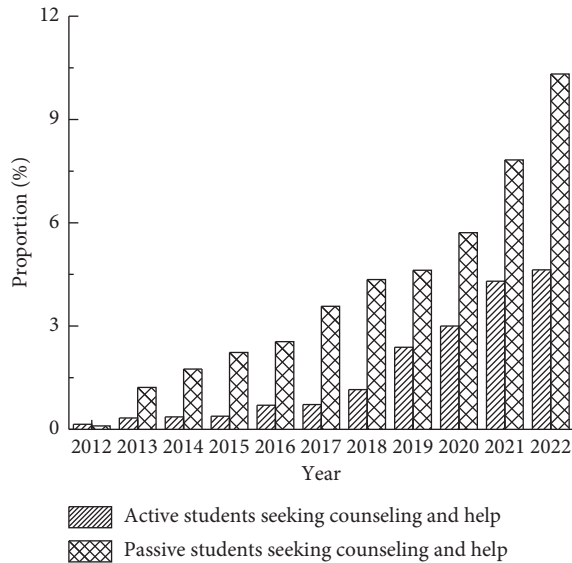


FIGURE 2: Active and passive students seeking counseling and help.

are in a special period of development. Especially, this year's students are born after 1995; their psychology is relatively fragile. Even the post-00 students who are more vulnerable are about to usher in. The changes in physical and psychological activities are rapid, and among them, only children account for a large proportion. They have not experienced tempering since childhood, and their psychological endurance is relatively fragile. The psychological problems exposed in school, interpersonal communication, and life are also increasing day by day. It is very common in daily life for students to escape when they are frustrated.

In recent years, the student mental health education expert platform has been widely used in colleges and universities, and it mainly plays four roles. It is used to comprehensively grasp and understand the mental health status of students. Students who need timely detection of psychological abnormalities provide effective guidance and treatment. It has played a role in promoting mental health, helping students to understand the manifestations of mental problems and enhancing their awareness of mental health care. Mental health education-related research can be conducted using mental health tests.

The platform can assess the psychological development of students. Only through scientific and information-based psychological assessment can schools accurately and timely identify some high-risk groups or individuals with psychological problems among students. Obtain relevant psychological information and mental health data through the platform, so as to carry out guidance on these psychological problems and timely correct prevention of these psychological crises. The prevention of psychological problems or psychological disorders can lead to the occurrence of emergencies. The process of testing students' psychology and feeding back the results of the evaluation, as well as the process of returning to the students who showed abnormality in the psychological test, is also to publicize and popularize the knowledge of mental health among the students. Students need to be actively concerned about their

own mental health issues. The mental health test system is beneficial to guide students to face various psychological troubles correctly and effectively enhance their ability to resist pressure and adapt to society.

2. Related Theories

2.1. Cloud Native. Cloud-native technologies represented by containers, microservices, and integration of development, operation, and maintenance have reconstructed software development and operation and maintenance models.

Users can build fault-tolerant, easy-to-manage, and observable applications. Cloud native is a set of technology systems and methodologies, a method of building and running applications. Cloud native is a compound word. Cloud means that the application is in the cloud. Native means that the application runs on the cloud. This technology breaks through the shackles of the data center, makes full use of the elasticity and distributed advantages of the cloud platform, and runs in the best posture. Cloud native includes four elements: microservices, containerization, DevOps, and continuous interaction [11–13].

- (1) Microservices are an architectural solution for building application services. Microservices can split application services into multiple core functions. The monolithic solution and the microservice architecture model are shown in Figure 3. Each service corresponds to a function, which can be deployed and built separately, and different services will not affect each other in the event of work or failure. When things go wrong with a service-oriented architecture, just tweaking the microservices used for deployment can fix the problem. Just a little tweaking will do the trick. The advantages of microservice architecture are service decoupling, stronger cohesion, and easier change. The division of services is based on domain-driven design.
- (2) Virtualization technology provides system administrators with great flexibility, but there are problems such as poor performance and low resource utilization. Containers are a new type of virtualization technology that breaks through the bottleneck of traditional virtualization technologies. Docker is the most widely used container engine and is widely used in the infrastructure of companies such as Cisco and Google. Based on LXC technology, containerization provides implementation guarantees for microservices and plays a role in application isolation. Kubernetes is a container orchestration system for container management and load balancing between containers.
- (3) DevOps is a methodology for the integration of development operations and maintenance.

In the life cycle of system applications and services, system developers develop operation and maintenance tools. For example, a large part of the development tools of Google SRE is for operation and maintenance,

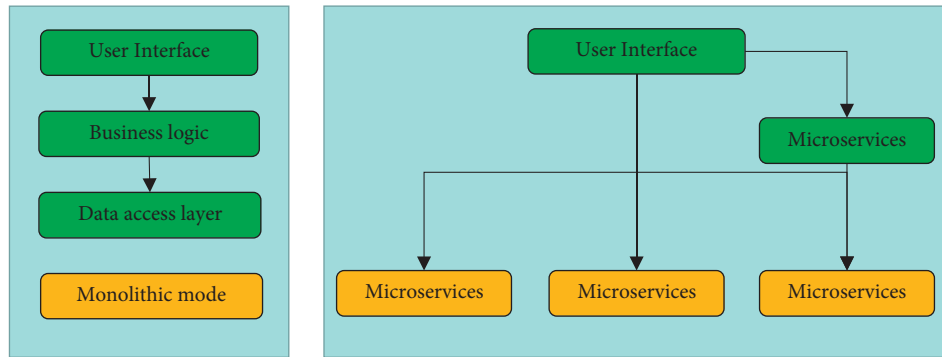


FIGURE 3: Monolithic solution and microservice architecture model.

which makes the operation and maintenance process highly automated and intelligent, and improves the operation and maintenance efficiency. DevOps promotes a change in the way of thinking at work. DevOps pays attention to the diversity of business and people, and provides support for the rapid increase of business value. DevOps emphasizes common goals and takes user value as the only evaluation criterion. It is conducive for the integration of communication and collaboration between technical development, technical operation and maintenance, quality assurance, and other departments. This in turn ensures the timely realization of product functions and ensures successful deployment and stable use.

- (4) Continuous Delivery refers to the software development process, i.e., from the original requirements to the final product development process. It actually refers to the process of testing in a production-like environment after integration and providing timely feedback. Continuous delivery ensures that software is stable and continuously maintained in a state of being released at any time. It allows software to be built, tested, and released faster and more frequently. It can shorten the development time, reduce the development cost, and reduce the risk.

The IT world is undergoing a transformation in order to adapt to rapidly changing IT business needs. Through the cloud native technology system and methodology, users can develop, test, and deploy applications in various fields. Improvements and enhancements are made in each link. Enterprise applications go live faster and ideas come to life faster. It makes it easier to improve business efficiency. Based on the microservice architecture, the cloud native architecture adopts the open source stack for containerized design. With the help of the agile development management model, DevOps supports continuous iteration and intelligent operation and maintenance. The elastic scaling and dynamic scheduling functions of the cloud platform can be used to optimize resource utilization. The cloud native architecture system is shown in Figure 4.

2.2. Mental Health Concept. Mental health is a modern civilization concept expanded and sublimated from the connotation of human "health." Mental health refers to the ability of

the subject to adapt well and to fully develop his or her physical and mental potential. Maintaining the mental health of college students is actually a systematic mental health work. In other words, maintaining the mental health of college students is the ultimate goal, and effective psychological counseling is the way and means to achieve mental health. Regarding mental health, at present, there is no consensus in the academic circles at home and abroad, and there is no generally accepted definition [14].

In 1946, the Third International Congress of Mental Health defined mental health as follows. The so-called mental health refers to the development of the individual's state of mind to the best state within the range that does not contradict the mental health of others physically, intellectually, and emotionally. In 1958, the psychologist Inglis proposed that mental health refers to an ongoing psychological condition. Under that circumstance, the person concerned can make a good adaptation, has the vitality of life, and can give full play to his or her physical and mental potential. It is a positive, rich situation that goes beyond being free from mental illness. College is an important stage of development from adolescence to adulthood. The psychological characteristics of contemporary college students mainly include the following four aspects.

- (1) Students have a strong sense of respect and self-realization

Today's college students are too much loved by their parents. The social environment of reform and opening up has created favorable conditions for it. Many college students have experienced the trials of life, like greenhouse flowers. Students of this type have high self-evaluation. This awareness can make it stand out and inflate confidence. They only want to socialize and play with their peers, and they tend to stay away from people of different generations.

- (2) Strong self-esteem, sensitive to interpersonal relationships

Contemporary college students have very strong self-esteem and do not want to be ignored. They want to be respected and trusted by others, but they tend to be resistant to others' education. The strongest feeling in the psychological counseling of college students is that more than 80% of the psychological problems are related to interpersonal relationships

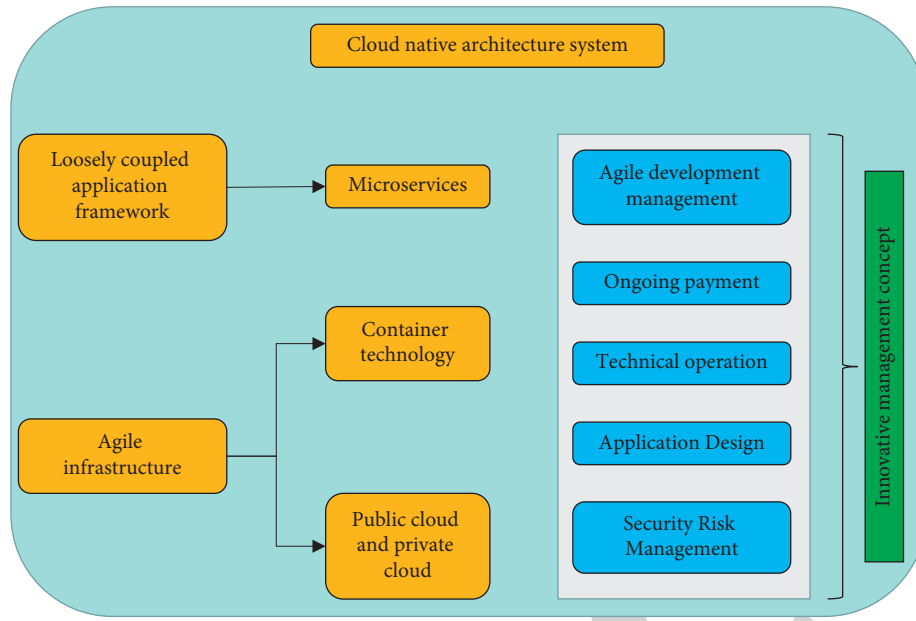


FIGURE 4: The cloud native architecture system.

(including making friends, love, etc.). Modern college students explore their own way of life and values by themselves without “infringing” the unspoken rules of each other’s fields.

(3) Lack of willpower

The age of college students determines that they are in an important period of willpower formation. College students generally lack strong willpower, and they can easily face the general study and daily life. But in the face of key issues, it is possible to show indecision and conformity.

(4) Students have strong creativity but lack the spirit of hard work

There are many ways for modern college students to obtain information. Guided by a variety of information, students are very creative. Modern college students generally lack the ability of self-reliance and the spirit of bearing hardships and standing hard work. All psychological phenomena and mental states related to college students may be problems that affect college students’ mental health. In a word, all psychological phenomena and mental states related to college students may be problems that affect college students’ mental health. Therefore, it is urgent to strengthen the mental health education of college students. This is not only related to the normal study, life, and success of individual college students but also affects the overall quality of a group of talents in the new century in China.

practice. This statement is actually a scientific summary and generalization of the psychological nature of human beings. Psychology first came from Greek. It represents the universal law of spirit or the soul of science. Modern psychology defines psychology as a discipline that mainly studies the laws of the occurrence and development of human psychology [15].

As a new discipline, psychology has a very short history, but this does not mean that the process of psychological development is also very short. In fact, psychology has a very long past. The study of psychology can be traced back to ancient philosophical thought. Religion and philosophy have long ago engaged in in-depth discussions about the relationship between mind and body and how human knowledge arises. Many famous philosophers in ancient times have a lot of expositions on the mind. These philosophers mainly include Aristotle, Wang Chong, Plato, and so on. Modern psychology was born in 1879. In the same year, the world’s first psychology laboratory was established in Leiby by the German psychologist Wundt, and psychology was officially born as an independent discipline. Since then, psychology has been freed from the shackles of philosophy and has become a truly independent discipline, beginning the real history of psychology. Wundt’s Psychology Laboratory focuses on perceptual psychological processes. Because Wundt is also a well-known physiologist, he mainly uses the experimental techniques of physiology in his research. So he called his research “physiological psychology.” The study of psychology in China originates in the late Qing Dynasty. At that time, it is popular to set up new schools and reform the education system, so it is the first to offer psychology courses in normal colleges and universities. The textbooks used at the time were translated Japanese and Western works. In 1907, “Introduction to Psychology” was translated from English to Chinese by Wang Guowei. In 1917, Peking University established the first psychology laboratory in

2.3. *Psychology and the Concept of Psychology.* In dialectical materialism, psychology is the active reflection of the objective reality produced by the brain in the process of

China. In 1918, China published the earliest psychology book, "The Outline of Psychology." In 1920, China established its first psychology department at Nanjing Higher Normal School.

With the continuous progress of science and technology and the needs of practical life, psychology has developed rapidly in the world, and it mainly has the following characteristics.

- (1) There are too many schools. Shortly after the emergence of psychology, various schools have sprung up like mushrooms after rain, such as schizophrenia, behaviorism, and so on. Although these schools have more or less certain limitations, they also have certain rationality. They carried out in-depth research on psychological phenomena from different aspects and promoted the development of psychology. There were many schools of great influence at that time, such as the humanistic school, the neo-behaviorism school, and so on. Compared with traditional schools, these schools have been greatly improved. For example, they no longer confront each other, but infiltrate and integrate with each other. The emergence of these schools marks the continuous maturation of psychological science and is developing in a unified direction.
- (2) The subdisciplines of psychology have grown dramatically. Compared with traditional psychology, contemporary psychology has a particularly obvious change. That is, the scope of contemporary psychological research is getting wider and wider, and the categories of research are also becoming numerous. If psychology is a big tree that is thriving, then reflexology and reflectionism are the two big branches of this big tree. Reflexology mainly studies social psychology, while reflectionism is the study of individual psychology. There are many small branches growing on these two large branches. For example, in the large branch of individual psychology, child psychology, juvenile psychology, youth psychology, geriatric psychology, military psychology, labor psychology, and so on have emerged. According to incomplete statistics, there are more than 100 branches of psychology at this stage. Different branches study different psychological phenomena in different fields. They, respectively, discussed the laws of people's mental activities in their fields to a certain extent.
- (3) The fields in which psychology can be applied are very broad. In modern society, many psychological research results have certain applications in all walks of life, such as education, military, medical, and other industries. Moreover, psychology can also be applied to many cutting-edge science and technology departments, such as artificial intelligence, bionics, which can fully demonstrate the vitality and true value of psychology.

2.4. Mental Health Concept. Mental health is a modern civilization that is sublimated and expanded from human physical health. The traditional understanding of health only refers to physical health, which is one-sided. WHO expanded the concept of health in 1989. Health includes a person's physical, psychological, and social well-being and moral character. More and more people are coming to accept the idea that mental health represents half or more of a person's health. From the above discussion of health, it can be seen that in order to achieve good health, not only should we pay attention to hygiene but also pay attention to psychological hygiene [16, 17].

Mental health is a concept derived from mental health. Mental health refers to a very optimistic state of mind. Mental health generally refers to all the maintenance of mental health activities and the study of mental health as a discipline. In the early twentieth century, American Bills advocated the modern mental health movement. The systematic mental health work is actually to maintain the mental health of college students.

The psychological characteristics of Chinese college students mainly include the following aspects.

- (1) College students in modern society can no longer be confined by certain fixed philosophical thoughts or values and ideologies like those in early society. Modern college students pay great attention to their own feelings and judgments, as well as their experience of reality. They gradually form their own unique value orientation in these feelings and judgments. Although college students in modern society have more information and knowledge than previous college students, their feelings and experiences in real life are far less experienced than those of previous college students.
- (2) The most common phenomenon in the process of psychological counseling for college students is that most of the psychological problems are inextricably linked with interpersonal relationships. Moreover, among college students, there is an unspoken rule of not infringing on each other's fields, and they are exploring their own way of life and values under this unspoken rule.
- (3) Many college students want to be more unrestrained in college, and they try every way to get rid of their troubles. Only after experiencing distress, pain, and anxiety can people overcome the psychological crisis deep in their hearts, so that people can truly grow up. Although, on the surface, modern college students seem to live very casually, without any troubles at all, in fact, their hearts are full of troubles. In this way, there is a big difference between the deep inside of the college students and their external performance. Generally, on the surface, they appear to be carefree, but students are actually troubled inside. All mental transitions and psychological

phenomena related to college students may have an impact on the mental health of college students to a certain extent.

3. Construction of College Students' Mental Health Expert Platform

3.1. The Overall Structure of College Students' Mental Health Expert Platform

3.1.1. The Logical Structure of College Students' Mental Health Expert Platform. According to the actual business needs of the college student mental health education expert platform, combined with the existing technology accumulation, after analyzing the logical architecture, the logical architecture of this platform construction is obtained, as shown in Figure 5 [18].

(1) *Data Storage Layer.* The data in the mental health management system of college students include structured data and text data. Structured data are stored in the relational database MySQL. All other storage, such as text files, is on the SAN. Since there are many relational queries and transaction processing involved in the system, it is necessary to choose a relational database to better meet the requirements.

(2) *Data Access Layer.* This layer is the middle layer between the processing business logic layer and the data storage layer. The database access layer needs to meet the requirements of accessing relational databases and file storage. Accessing the relational database requires JDBC, and the upper layer maps business logic entities to the database table structure through the mybatis framework. Access to disk storage requires disk read and write operations through the FileUtil framework.

(3) *Business Logic Layer.* It is necessary to use Spring and SpringMVC to implement the business logic layer, and all business logic is processed in this layer. The business logic layer obtains data through the data access layer, and then operates on the data in combination with business logic. At the same time, the operation results are stored in the data storage using the data access layer, and the business processing results are transmitted to the presentation layer through the interface layer.

(4) *Interface Layer.* The role of the interface layer is to directly transmit data in the presentation layer and the business logic layer. The interface layer encapsulates the data results of the business logic layer and then transmits them. The client obtains the data of the business layer by calling the interface of the interface layer for presentation.

(5) *Presentation Layer.* The platform adopts a cloud-native framework. For some pages, the webview is used to load html5 for display, and the hybrid development mode of hybrid can ensure that the operating efficiency of the platform is greatly improved.

3.1.2. Topological Structure of College Students' Mental Health Expert Platform. The college students' mental health management system uses two servers as application server clusters. Load balancing is done by nginx on these two servers. When the traffic volume is too large, the requests can be divided into two servers, which can ensure the high availability of the system.

The SMS and e-mail server is a single server that handles all requests to send SMS and emails. The SMS server needs to be externally connected to the SMS gateway provided by the supplier. Therefore, a specific network route needs to be opened to ensure that the external network can be accessed.

Since both the application server and the database server are deployed on the intranet of Qilu Normal University, the network environment is not necessarily the intranet when college students access the college students' mental health management system through mobile phones. Therefore, it is necessary to do internal and external network mapping on the firewall. When college students are on the external network, they can access the internal network system through firewall mapping. When college students are in the intranet, they can directly access the system.

3.1.3. The Functional Structure of College Students' Mental Health Expert Platform. After a detailed demand analysis of the college students' mental health management system, it can be understood that the functional modules of the system can be analyzed from two aspects. It is analyzed from the role of college students and the role of psychological counseling teachers. The functions of college students' roles in the mental health management system mainly include psychological assessment, online consultation, appointment, and viewing related articles. The main functions used by psychological counselors in the system are evaluation management, questionnaire management, online consultation, and appointment management. At the same time, it must have the ability to publish mental health-related articles.

3.2. Framework Design of College Students' Mental Health Expert Platform. Since the server and client are separate architectures, both the server and the client can interact with data through interfaces. Therefore, the server and client need to be architected separately [19].

From the perspective of logical architecture, the server-side covers the data access layer, business logic layer, and interface service layer. Therefore, J2EE's Spring, SpringMVC, and myBatis frameworks can be used as the technical framework of the server when selecting the server-side architecture. The specific operation logic is that myBatis is responsible for the data access layer. Spring is responsible for the management of all beans, and SpringMVC implements the business logic layer.

Each entity must have a corresponding Model object. The return result of each interface must have a corresponding DTO object, and the Model object corresponds to the table structure of the database. The DTO object corresponds to the JSON object returned by the data interface.

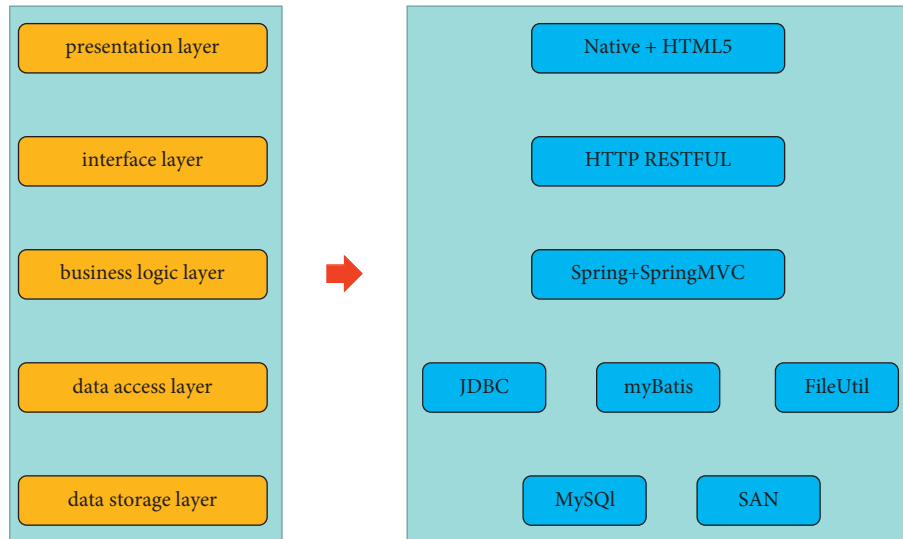


FIGURE 5: Logical architecture of platform construction.

When the data access layer performs database operations, all parameter transfer and return result objects are transmitted by the Model object.

Since SpringMVC is used as the implementation of the business logic layer, according to the characteristics of SpringMVC, the business processing process can be standardized. The steps for the business layer to process client requests are described below.

- (1) The platform sends requests to the Controller layer, and the request methods can be divided into GET and POST. PUT and DELETE operations can be ignored here. Need to follow RESTFUL style architecture. All parameters must be able to be data bound so that the controller in the background can receive the parameter data passed by the platform client.
- (2) After the controller receives the client request, it first parses the parameters. The request is forwarded to the corresponding Service layer for processing according to the actual business logic.
- (3) Service is the core class for processing business, and all business logic implementations are done by Service. If the service's business processing logic needs to interact with the database, the service will access and request database data through DAO.
- (4) The DAO layer utilizes the functionality provided by myBatis for database access. The data returned by the database need to be wrapped into a Model entity.
- (5) The data returned by DAO needs to be encapsulated in the format required by the Service.
- (6) After the Service layer receives the data returned by DAO, it performs operations according to the actual business logic, and then extracts the data from the Model.
- (7) The Service encapsulates the data into the required DTO and returns it to the Controller.

- (8) If the data returned by the Controller requires the cooperation of multiple Services, the Controller can also encapsulate multiple DTO objects into the final required DTO objects.

- (9) The Controller will return the data to the platform client according to the DTO format finally required by the client.

After the server-side framework is determined, all functional modules must follow this step to complete the code development. The entire project can maintain a consistent style, which greatly improves the readability of the code and future scalability.

3.3. Network Layer Design. The network layer mainly implements the client's network request through the Volley network transmission framework. The Volley framework can handle both synchronous and asynchronous network requests. Volley is said to possess the advantages of AsyncHttpClient and Universal-Image-Loader in one. It can perform HTTP communication as easily as AsyncHttpClient, or load pictures on the network as easily as Universal-Image-Loader. In addition to being simple and easy to use, Volley has also undergone significant adjustments in performance. Its design goal is to be very suitable for network operations with a small amount of data but frequent communication. Since the network transmission of the college students' mental health management system does not involve a large number of file download operations, it is appropriate to choose Volley as the network layer transmission framework [20–22].

Combined with the specific needs of college students' mental health management system, college students and psychological counselors have different functions when using the platform. And the number of first-level functional modules is limited, so it can be implemented by ViewPager. This time we introduce the solution of using ViewPager to implement Tab because the Views of all Tab pages of ViewPager are generated in MainActivity.

3.4. Database Design of College Students' Mental Health Expert Platform. When designing a database, it must first analyze the entities in the system. The simplest and most convenient entity extraction method is to discover the noun method. The nouns involved in the requirements are extracted for further analysis. The nouns obtained from the demand include college students, psychological counseling teachers, psychological assessment questions, psychological assessment records, questionnaires, questionnaire records, consultation messages, appointment records, message records, announcement information, article information, personal information, etc. By extracting these nouns and analyzing the relationship between entities, the E-R entity relationship of the system can be obtained.

After completing the logical design of the database, and knowing the table structure of the database, it is necessary to determine the naming conventions of the database, tables, and fields to be used in the physical design stage to choose the appropriate storage engine, and choose the appropriate data type for the fields in the table. Only in this way can a complete database structure design be established.

4. Functional Design of College Students' Mental Health Education Expert Platform

The platform function design mainly includes the following parts, as shown in Figure 6.

4.1. Forum Module. The forum module of the college student's mental health education expert platform includes four areas: chatting, sharing skills, asking for help, and forum construction [23].

- (1) The chatting area contains three sub-modules. Focus on the current news, policies, and hotspots of college students' mental health education.
- (2) In the face of college students' mental health education teaching and case processing, it is necessary to collect more opinions and ideas of the student group.
- (3) Strategies, methods, suggestions, etc., of college students' mental health education knowledge sharing, no matter how simple or complex, whether they are operable or not, as long as they are their own words, they can be published here.

The Qiao Shared Area contains two sub-modules.

- (1) Explicit knowledge of college students' mental health education
Theoretical knowledge about college students' mental health education and teaching, the use methods and rules of testing instruments, etc., can be informed to other college students' mental health education teachers and experts in the current module to share knowledge.
- (2) Teaching tips and tricky questions.
This module focuses on the sharing of tacit knowledge of college students' mental health education teachers and experts. Experience or method

guidance can be given to some new teachers who do not know how to explain the theoretical knowledge or specific cases that they do not know how to deal with.

The Helpdesk area contains two sub-modules.

- (1) Explicit Knowledge of College Students' Mental Health Education
If you do not understand the theoretical knowledge of college students' mental health education and teaching, the use of methods and rules of testing instruments, etc., you can ask for help in the current module.
- (2) Teaching Tips and Tough Issues
This module focuses on the sharing of tacit knowledge of college students' mental health education teachers and experts. Students can seek help for some theoretical knowledge that they do not know how to explain in teaching or specific cases that they do not know how to deal with.

4.2. Expert Tree Module. The expert information not only introduces the names, genders, and contact information of experts and scholars but also collects the learning experiences, research results, and participation in scientific research projects of experts and teachers from an objective perspective. This module page contains five sub-modules: keyword search, expert category, expert personal information, expert experience learning, and expert talks. Expert maps store expert description documents. Experts are classified according to their professional knowledge. Teachers and experts of mental health education for college students can get in touch with experts in the field through the expert map. For example, when college students' mental health education teachers encounter problems in practice, they can find experts in this field to communicate with them through the expert map. Topic and expert association maps can locate the connections between knowledge and experts.

4.3. The Resource Area Module. The resource area module of the knowledge sharing platform for college students' mental health education mainly includes five submodules: teaching cases, teaching videos, teaching reflection, experience skills, and intractable diseases.

4.3.1. Teaching Sample. It can display excellent teaching cases of college students' mental health education.

4.3.2. Teaching Video. It can display excellent teaching videos of college students' mental health education.

4.3.3. Teaching Reflection. Excellent college students' mental health education teachers and experts make daily reflections on their own teaching methods and methods of dealing with college students' mental health cases.

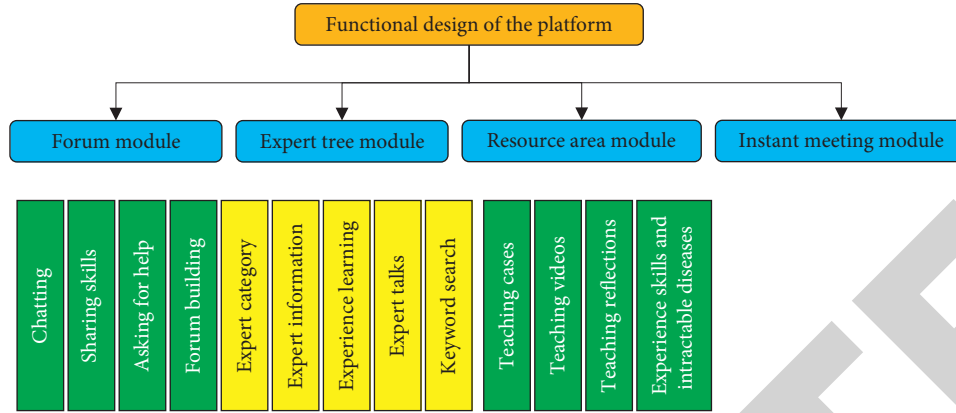


FIGURE 6: Platform functional design framework.

4.3.4. Experience Skills and Difficulties. It mainly includes excellent college students' mental health education teachers, experts' daily teaching experience, case analysis and processing experience, skills, and methods of communicating with students.

4.4. Message Board Module. The message board module of the knowledge sharing platform for college students' mental health education is a section that provides a platform for members and non-members to communicate with each other. It can enhance mutual communication, trust, and promote sharing. In this section, every member and expert can leave messages to each other. It can be a blessing to others, a promise, a greeting to everyone, and so on. It can not only enhance mutual trust but also create a good environment for sharing and lay a firm foundation.

4.5. Instant Meeting Module. When college students encounter problems and difficulties in mental health education, they can invite other teachers and experts on the platform to talk, analyze, and summarize, and come up with favorable treatment methods and approaches. In this module, experts can also be selected. Students can choose and appoint experts for the problems in teaching and cases that you encounter. In this way, the difficulties in reality can be better solved, and the problems in teaching and cases can be better solved.

After investigation, schools that adopted the platform in the follow-up achieved better results in helping students' mental health. More and more students have come to the platform to seek help. However, the students believed that they should also combine the school's own resources and the needs of the students to develop special functional sections. After research, the students believe that functions such as appointment consultation and online consultation should also be added. The student support rate for each function is shown in Figure 7.

5. Construction of Evaluation Index System of Mental Health Expert Platform

On the basis of literature research and actual investigation, establish the first-level indicators for evaluation of the mental health expert platform. The constituent

elements under the first-level index category are summarized and refined to form the second-level index. Then, the hierarchical structure of the evaluation indicators can be completed and the construction of the evaluation system of the mental health expert platform can be realized [24].

The first-level indicator to be determined is the mental health expert platform (A1). The other three first-level indicators are defined as user experience (A2), content construction (A3), and service functions (A4). From the first-level indicators of the mental health expert platform, five elements of developer identity (b1), related platforms (b2), release year (b3), platform developed technology (b4), and update frequency (b5) can be extracted as second-level indicators. Six indicators of frequency of use (b6), total usage platform rating (b7), operational convenience (b8), total number of students (b9), number of registrants (b10), and functional pertinence (b11) are selected as the secondary indicators under user experience. Five indicators of overall style (b12), typesetting layout (b13), content timeliness (b14), content division (b15) and content diversity (b16) are extracted as secondary indicators under content construction. Four indicators of online consultation (b17), expert services (b18), health records (b19), and extended functions (b20) are extracted as secondary indicators under the service function.

First, the judgment matrix A is established as follows:

$$A = \begin{bmatrix} 1 & 3 & 5 & 7 \\ 1/3 & 1 & 2 & 5 \\ 1/5 & 1/2 & 1 & 3 \\ 1/7 & 1/5 & 1/3 & 1 \end{bmatrix}. \quad (1)$$

The feature vector W can be expressed as

$$W = \begin{bmatrix} 0.4729 \\ 0.2844 \\ 0.1699 \\ 0.0729 \end{bmatrix}. \quad (2)$$

Equation (3) can be obtained by multiplying the judgment matrix and the eigenvector W .

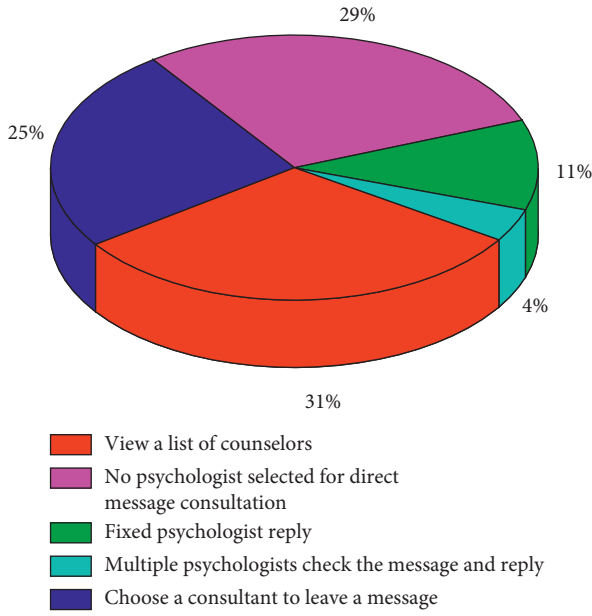


FIGURE 7: The student support rate for each function.

$$AW = \begin{bmatrix} 1 & 3 & 5 & 7 \\ \frac{1}{3} & 1 & 2 & 5 \\ \frac{1}{5} & \frac{1}{2} & 1 & 3 \\ \frac{1}{7} & \frac{1}{5} & \frac{1}{3} & 1 \end{bmatrix} \begin{bmatrix} 0.4729 \\ 0.2844 \\ 0.1699 \\ 0.0729 \end{bmatrix} = \begin{bmatrix} 2.6859 \\ 1.1463 \\ 0.6254 \\ 0.2540 \end{bmatrix} \quad (3)$$

The maximum eigenvalue λ_{\max} and CI value can be obtained.

$$\begin{aligned} \lambda_{\max} &= 4.1289, \\ CI &= 0.0729. \end{aligned} \quad (4)$$

By looking up the table, when $n = 4$, $RI = 0.89$. Therefore, equation (5) can be obtained.

$$CR = 0.0191 < 0.1. \quad (5)$$

Therefore, the judgment matrix has good consistency.

The calculation steps of the maximum eigenroot λ_{\max} of the judgment matrix are as follows [25].

$$M_i = \prod_{i=j}^n c_{ij}. \quad (6)$$

The n th root of M_i can be calculated as

$$\bar{W}_i = \sqrt[n]{M_i}. \quad (7)$$

By normalizing the vector $W(-)$, we can get

$$W_i = \frac{\bar{W}_i}{\sum_{j=1}^n \bar{W}_j}. \quad (8)$$

The maximum eigenroot of the judgment matrix can be calculated as

$$\lambda_{\max} = \sum_{i=1}^n \frac{(CW)_i}{nW_i}, \quad (9)$$

where $(CW)_i$ is the i th element of the vector CW .

Similarly, the judgment matrix of the first-level index layer can be obtained as

$$B_1 = \begin{bmatrix} 1 & 2 & \frac{1}{7} & \frac{1}{5} & \frac{1}{3} \\ \frac{1}{2} & 1 & \frac{1}{9} & \frac{1}{7} & \frac{1}{7} \\ 7 & 9 & 1 & 3 & 5 \\ 5 & 7 & \frac{1}{3} & 1 & 2 \\ 3 & 5 & \frac{1}{7} & \frac{1}{2} & 1 \end{bmatrix},$$

$$W_1 = \begin{bmatrix} 0.0585 \\ 0.0362 \\ 0.5227 \\ 0.2419 \\ 0.1406 \end{bmatrix},$$

$$B_2 = \begin{bmatrix} 1 & 3 & 7 & 2 & 5 & 5 \\ \frac{1}{3} & 1 & 5 & \frac{1}{2} & 3 & 3 \\ \frac{1}{7} & \frac{1}{5} & 1 & \frac{1}{5} & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{2} & 2 & 5 & 1 & 3 & 3 \\ \frac{1}{5} & \frac{1}{3} & 3 & \frac{1}{3} & 1 & 1 \\ \frac{1}{5} & \frac{1}{3} & 3 & \frac{1}{3} & 1 & 1 \end{bmatrix},$$

$$\begin{aligned}
 W_1 &= \begin{bmatrix} 0.3959 \\ 0.1757 \\ 0.037 \\ 0.234 \\ 0.0787 \\ 0.0787 \end{bmatrix}, \\
 B_3 &= \begin{bmatrix} 1 & \frac{1}{5} & \frac{1}{7} & 3 & 2 \\ 5 & 1 & \frac{1}{7} & 5 & 3 \\ 7 & 3 & 1 & 9 & 8 \\ \frac{1}{3} & \frac{1}{5} & \frac{1}{3} & 1 & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{3} & \frac{1}{5} & 2 & 1 \end{bmatrix}, \\
 W_1 &= \begin{bmatrix} 0.0922 \\ 0.2504 \\ 0.5488 \\ 0.0417 \\ 0.067 \end{bmatrix}, \\
 B_4 &= \begin{bmatrix} 1 & \frac{1}{5} & \frac{1}{3} & \frac{1}{7} \\ 5 & 1 & 2 & \frac{1}{3} \\ 3 & \frac{1}{2} & 1 & \frac{1}{5} \\ 7 & 3 & 5 & 1 \end{bmatrix}, \\
 W_1 &= \begin{bmatrix} 0.0563 \\ 0.2388 \\ 0.131 \\ 0.5738 \end{bmatrix}. \tag{10}
 \end{aligned}$$

The maximum eigenvalue of the second index is shown in Figure 8.

After calculation, the CR values of the first-level index layer matrix are all less than 0.1. Therefore, all judgment matrices have good consistency. Through the calculation of the weights of all levels of the index system relative to the total target weight, the composite weight of the index system is finally obtained, as shown in Figure 9.

In general, the weight of mental health expert platform indicators is relatively heavy. When designing and developing a relevant mental health professional platform, the risk of possible personal information leakage should be considered. Through the establishment of a reasonable identification and identification mechanism, access control and communication technology encryption processing and ensuring the user's mental health needs are realized. At the same time, it realizes basic information security protection and reduces the

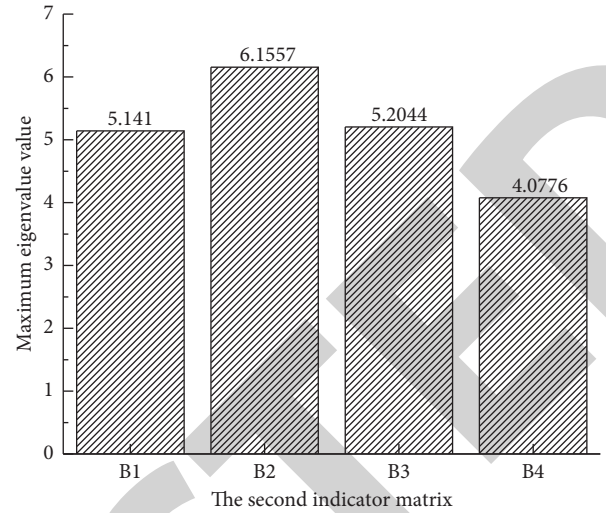


FIGURE 8: The maximum eigenvalue of the second index.

concerns of users with mental health needs in terms of information security. Overall, the build of the platform is a success.

6. Suggestions for Improving the Platform

6.1. Pay Attention to Student Experience and Improve Content Construction. User experience and content construction appear as two independent first-level indicators, but in practice, the elements of user experience and content construction overlap. User experience and content creation are actually two sides of the same problem. One problem is that of quality management. The two aspects are the quality management problem from the user's point of view and the quality management problem from the design developer's point of view. The needs of users are changing, and whether a platform builder can follow-up or even lead to the needs of users in a timely manner is an important criterion for judging a platform builder. As far as mental health services are concerned, the current development of the mental health expert platform is facing a dilemma because the mental health expert platform is seriously homogenized in terms of service methods and service content. In the actual survey, the basic service mode of most mental health expert platforms provides users with basic mental health knowledge science, online tests, and mental health questions and answers.

6.2. Develop Social Features. From the user's point of view, when individual users seek mental health knowledge services through the platform, it is easy to get feedback and experiences from other users on related psychological issues. The feedback and experience of this kind of related psychological problems have positive effects on patients with the same disease. Mental health services are services that value speaking and communication. Faced with emotional problems, anxiety, social pressure, and other mental health problems and diseases, finding a way to communicate freely with people is often a good medicine to solve their psychological problems.

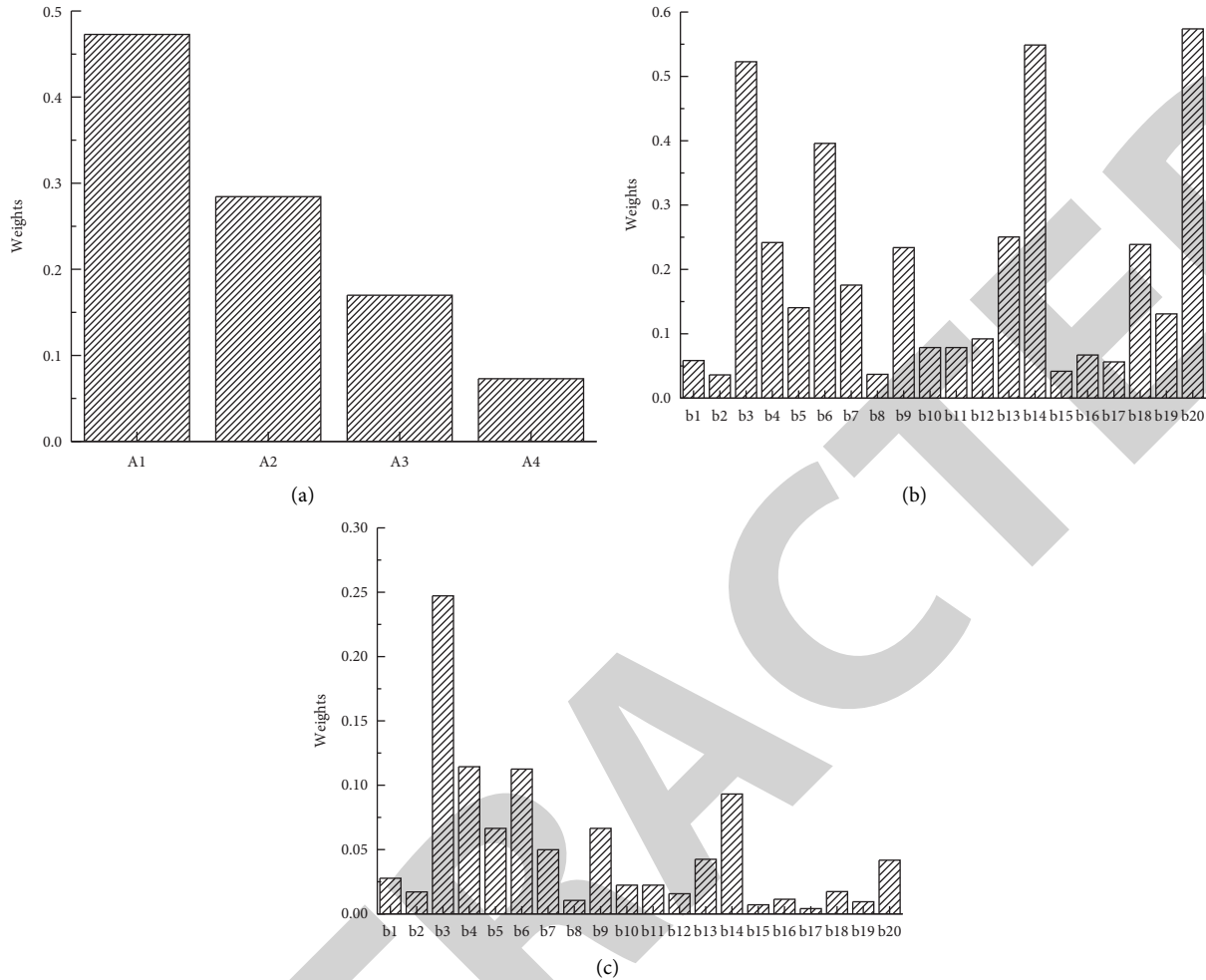


FIGURE 9: Weights of primary indicators, secondary indicators, and composite weights (a) The weight of the first-level indicator. (b) The weight of the secondary-level indicator. (c) Composite weights.

From the perspective of developers, while improving content construction and optimizing user experience, they should seek innovation in service functions. Adding social functions is a feasible attempt to extend the functions of the platform. Excellent community building and user management can significantly improve user stickiness and usage habits. The construction of good social functions can help mental health service agencies retain a group of loyal users with mental health needs.

6.3. Pay Attention to the Safety of the Mental Health Expert Platform. Different from the previous understanding, after the evaluation and research on the mental health expert platform, it is found that there are hidden dangers in the confidentiality of communication and the security of content in the mental health category in the mobile environment. The establishment of the security mechanism here is the same as the requirements for the construction of the Xinlu Health Knowledge Service website. When designing and developing a related mental health platform, the risk of possible medical information leakage should be taken into consideration. It is necessary to establish a reasonable

identification and identification mechanism, realize access control and encryption processing of communication technology, to ensure the mental health needs of users. At the same time, it realizes basic information security protection and reduces the concerns of users with mental health needs in terms of information security.

7. Conclusion

Around the platform design, firstly, the overall design of the system is introduced as a whole. It includes the logical architecture, topological architecture, and functional architecture of the system. Due to the particularity of the mental health management system for college students, the server and Android client are designed from the system framework level. Then, the logical design and physical design of the system database are introduced. Finally, the detailed design of the core functional modules is introduced in detail, and the design of the mental health management system for college students has been completed.

The server-side technology of the platform adopts the J2EE open source framework, which ensures that the college student mental health expert platform has scalability and

easy maintenance. Although as a platform for colleges and universities, due to the consideration of distributed deployment in the system design, the performance has also reached the level of Internet applications. It is guaranteed that the system does not need to expand hardware to improve system performance within five years.

After investigation, schools that adopted the platform in the follow-up achieved better results in helping students' mental health. More and more students have come to the platform to seek help. However, the students believed that they should also combine the school's own resources and the needs of the students to develop special functional sections. Overall, the build of the platform is a success.

Data Availability

The data used to support the findings of this study are available from the author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest or personal relationships that could have appeared to influence the work reported in this paper.

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