Research on College Student Development Planning Platform Based on Intelligent Q&A Mechanism

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Abstract: *This paper proposed that education, science and technology, talents are the basic and strategic support for the comprehensive construction of a modern socialist country, and emphasized the organic connection between the three to jointly shape the new momentum and new advantages of development. However, many college students, as the reserve force of the country, do useless work, take detours, blindly involve, and are deeply troubled by academic life pressure, emotional crisis, career development planning and other problems due to lack of clear planning for the future, and do not give full play to their talents and values. Therefore, based on the analysis of the current situation of intelligent question answering platform, this paper will use Java, Python and other technologies to study a platform similar to campus assistant, optimize management on the basis of the original model, and provide planning consulting for more college students.*

Keywords: *intelligent Q&A, platform construction, knowledge base, development planning*

1. Introduction

Intelligent question-answering refers to the intelligent human-computer interaction to allow users to quickly obtain effective information from massive information, which originated from the concept of "intelligent machine" proposed by Turing [1] in the 50s of the 20th century. According to the data format processed by the question answering system, the development process can be divided into three stages: (1) the development stage based on structured data, which can be divided into the artificial intelligence stage and the computational linguistics stage. The artificial intelligence stage is also known as the AI period, which is mainly a question answering system that defines the domain and processes structural data, and is an attempt by researchers to establish an intelligent question-and-answer system in the 60s of the 20th century, representing systems such as BASEALL and LUNAR [2]. In the 70s and 80s of the 20th century, the rise of computational linguistics, the use of computational linguistics technology to reduce the cost and difficulty of building a question answering system began to become the research direction of the majority of scholars, the representative system of this period is Unix Consultant. (2) During 1990s, internet developed rapidly. Based on the development stage of free text data, the large number of electronic documents produced to provide objective conditions for the question answering system to enter the open field, text-based new era, especially the establishment of TREC (text retrieval conference) QA track, which greatly promoted the development of intelligent question answering system. (3) Based on the development stage of question-answer data, with the maturity and popularization of Internet technology, frequent asked questions (FAQ) data appeared on the Internet, and by 2005, the huge community-based question answering (CQA) data promoted the intelligent question answering system to the open field, question-based answer pair period.

Nowadays, mature Internet technology, advanced AI algorithms and huge databases allow knowledge sharing and information sharing to benefit the public. Intelligent Q&A platforms have sprung up, Zhihu, Xiaohongshu, Quora[3] and other applications developed quickly which met the needs of users to collect effective information on the platform. In 2017, the Notice of the State Council on Printing and Distributing a New Generation of Artificial Intelligence Development Plan clearly put forward the development direction of "intelligence + education"[4], of which the construction of intelligent question and answer platform is a typical application to achieve intelligent education, but so far, the intelligent question and answer application in colleges and universities is basically in a blank state. In addition, in the process of research, we found that the university information sharing platform mainly involves issues related to students' self-development, and scholars at home and abroad have also

studied the development planning of college students, such as: college students' life planning education based on career theory should pay attention to personalization and customization [5], put forward the important views of "super theory" [6], the concept of interest-professional consistency [7], etc. Therefore, this paper systematically analyzes the problems faced by college students and the difficulties faced by the intelligent question answering platform. We try to design and build a college student development planning platform based on the intelligent question and answer mechanism, and help more students make better plans for their future development through integration, optimization and improvement of management mode.

2. The problems faced by the development of college students

With the increasingly severe employment situation, it becomes more and more difficult for college students to go on to higher education or find a job, so it is important for college students to plan for future development in advance. However, there are still many blind spots in college students' personal planning, which are as follows:

2.1 Weak awareness and insufficient analysis

College students are in a transition period from campus to society, and many students still maintain student thinking, lack the ability to think and plan rationally, and lack the awareness of conscious career planning. Some students may have begun to prepare for their future, but it is easy to be unable to make a comprehensive and objective assessment of their own conditions due to unfamiliarity with the employment environment, strong preference for a certain profession, and shallow understanding of related industries.

2.2 The methods and the planning are not clear

Under the pressure of the current form of employment, colleges and universities are paying more attention to career planning guidance, such as opening career guidance courses, holding related lectures or campus job fairs. However, career planning is a long-term process, and short-term pre-employment training cannot meet students' needs for understanding the professional environment, determining career goals, and planning development strategies, but it is easy to lead students to blindly follow the crowd and rush to achieve results. In addition, college students also lack professional advice and guidance suitable for themselves on the pros and cons, difficulty, policy process, preparation time, methods and methods of entering graduate school, public entrance examination, and studying abroad, resulting in a sense of confusion and nervousness in learning.

2.3 Weak practice and unfamiliar with career environment

Although colleges and universities have actively publicized practical activities in recent years, and college students have actively participated, it is still a common phenomenon that the quantity of practice is insufficient and the quality of practice is not high. Most students are still in the theoretical part of the professional environment and work content, lack of practical operation opportunities, do not understand the industry links and economic forms, and are easy to overestimate their ability level.

3. Difficulties faced by intelligent Q&A platforms for universities

At present, although many universities have built campus networks, Q&A services, campus BBS forums and other platforms, most of them are in a state of idle and forgotten. There is a basic gap in the construction of knowledge sharing and exchange platforms, and few people ask questions or publish and share their scientific research results on them The platform activity is low and it is difficult to achieve the purpose of knowledge sharing and exchange. To summarize the reasons, there are mainly technical reasons such as hardware equipment, platform interaction and timeliness, as well as institutional reasons such as the organizational form of universities, the characteristics of knowledge itself, and the lack of incentive means.

3.1 Technical reasons

The university Q&A platform mainly has FAQ-based Q&A, which gives answers by matching the

similarity of the questioner's question and the question in the knowledge base, which is mostly suitable for one-on-one Q&A dialogue; There is also natural language-based question and answer, which is suitable for multi-round dialogue scenarios; and knowledge graph-based answers for inference scenarios. The technical difficulty of constructing such a multi-business scenario dialogue and the high cost of operation and maintenance are a challenge for many universities that lack financial support. In addition, the basis of the operation of the knowledge sharing and exchange platform is data, but the big data and modeling technology of many universities is not perfect, and the data collection is not standardized, which makes it difficult to manage and analyze the data of the platform later. Therefore, even if a knowledge-sharing platform is built, it is difficult for organizations and departments to obtain the effective data they want. In addition, the information circulation and sharing are poor, eventually forming a vicious circle. The poor interactivity of the platform is reflected in the service model and communication means, such as the library digital reference consulting services of universities, most of which use telephone, QQ, email, manual real-time or delayed answers, and can not be answered in time to the questioner's questions, when the user receives the answer through these methods, it may have already solved the problem from other channels. Besides, the retrieval system of the consulting service point still needs to be improved, and most information retrieval systems can only be fuzzy matching, which is unable to provide accurate answers. Even many questions cannot be retrieved by entering them. Additionally, the application of natural language processing technology in university question answering platforms also faces some challenges, such as the accuracy of semantic understanding and multilingual support. Especially in the face of complex academic field problems, platforms need to understand user questions more efficiently and accurately and give appropriate answers.

3.2 Institutional reasons

First, the cultural atmosphere and organizational system of colleges and universities affect the degree of knowledge sharing. Due to the different research directions of university teachers, the personnel of different units and departments also perform their own duties, there is little communication and cooperation between colleagues, and there is no convenient and efficient knowledge sharing platform, teachers, students and staffs often ignore the role of the platform or are unwilling to use its functions, resulting in the formation of an environmental atmosphere for knowledge sharing. Second, the unique attributes of knowledge, such as private and invisible knowledge, are highly personalized, which also hinders the dissemination and sharing of knowledge in universities. People generally have egoism, teachers' scientific research achievements, innovative thinking may affect their future promotion, awards and evaluation, it can be said that their own ideas and knowledge is an invisible property, once it is made public, the dominant position of teachers in their scientific research field may be challenged. Otherwise knowledge spillover will bring intellectual property disputes and competition, in the Internet era, knowledge sharing has greater risks. Invisible knowledge is different from explicit knowledge that can be clearly expressed in words, pictures, and mathematical formulas, they can be informal, difficult to express skills and experiences, or some unique values, cognition, etc. People fully understand that there are certain difficulties in understanding tacit knowledge, and knowledge holders are not easy to share with words. Third, there is a lack of incentive system, individuals do not obtain certain economic or social benefits after sharing original knowledge to the platform, knowledge sharing platforms cannot arouse the willingness and enthusiasm of knowledge owners to share knowledge, so that users lack enthusiasm.

4. System construction of the platform

The technical construction of the system is divided into three steps:

4.1 Front-end development

The web frontend, also known as the "client", is the content of the website that the user can see and experience, including everything that the web browser displays. Front-end development is responsible for the user's perception and preliminary experience, such as the display of special effects on the web page, the layout of various sections on the web page, the display of pictures and other projects. The technologies used in front-end development are: HTML, CSS, JavaScript, jQuery, Bootstrap, Node.js, Vue, etc.

4.2 Back-end development

The web backend is also known as the "server side", and users cannot directly view and touch in the browser, such as databases and servers. The web backend is mainly responsible for storing and organizing data to ensure that all content in the web front end can work properly. Back-end development is responsible for the design and implementation of the background logic of the website, as well as the storage and reading of user and website data. For example, when a user logs in to the website to prepare registration information, the information filled in by the registration will be sent to the backend through the front-end, and it will be stored in the back-end database for query. The next time a user logs in to the website, you can find out whether there is corresponding user information in the database to determine whether the user has the right to log in, which is a common function in the back-end data store.

The technologies used in back-end development include: servlets, operation database technology, background development technology, framework technology, data interface technology, server technology, and HTTP protocol, as shown in Figure 1.
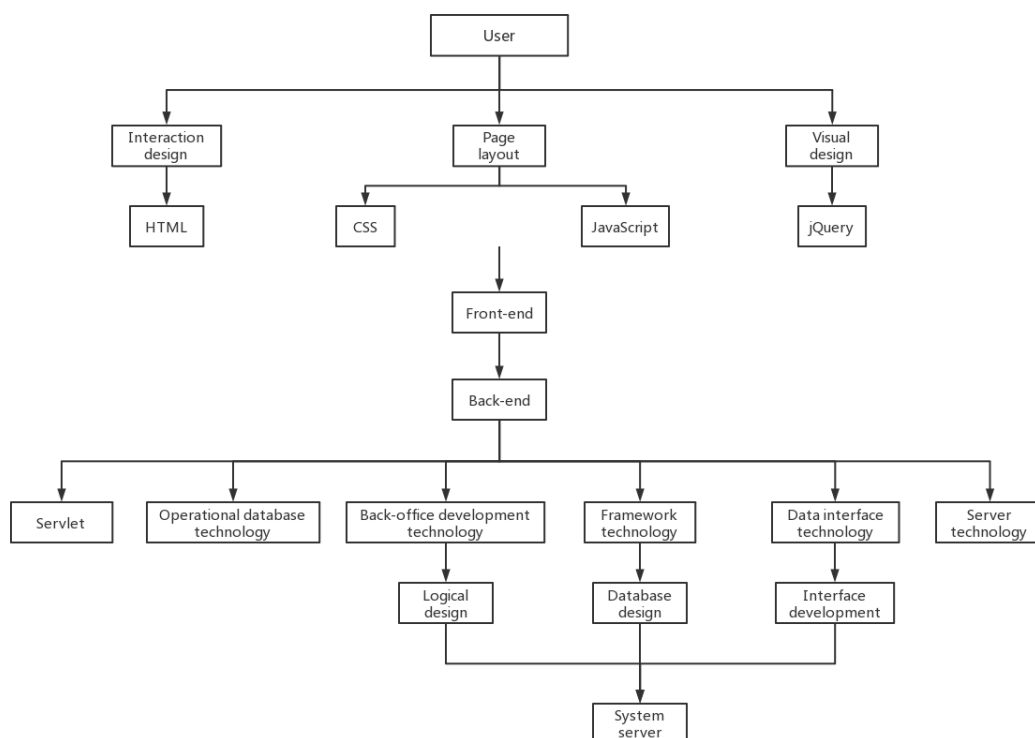

Figure 1: The framework

4.3 Functional design

The program's functions are mainly divided into a registration login page and a main menu.

4.3.1 Register the login screen

(1) Use node.js etc. to build a web server.

(2) Create a new file to store data.

(3) Use HTML+CSS to write the login interface and registration interface respectively.

(4) Add login verification function. Traverse the data, the website can find out the objects matched by the user, and return the successful login of the user; After traversing the data, no matching object can be found, and the user login failure is returned.

(5) Add the function of user registration. User queries the database for user registration data, and if so, return the user's existence; If not, the registration is returned to the user and the data is added to the

database.

4.3.2 Menu cards

Each menu card has a title and a "learn more" link button, and the menu card uses a specially styled <div>element to wrap the content, using HTML+CSS to design border size, shadow design, etc. We have five menu cards, namely "Postgraduate Planning", "Employment Push", "Overseas Consultation", "Competition Science Research Guide", and "Emotional Communication", all of which have their own submenus for users to inquire and browse.

(1) Tap or touch the submenu

Use HTML+CSS with jQuery or Bootstrap to implement the secondary menu under each menu card to complete the implementation of each module of the submenu. For example, "Postgraduate Entrance Examination Planning" contains modules such as information of major universities, online course recommendation and experience sharing.

(2) Responsive design

Through CSS media queries and flexible layout, this website can respond accordingly to changes in the device, providing users with a consistent user experience. This website uses the <div class= "menu-container" > element to implement the adaptive arrangement of menu cards, display: flex and flex-wrap: wrap to implement adaptive screens for menu cards, and so on. It brings a good look ,feeling and experience to users, as shown in Figure 2.
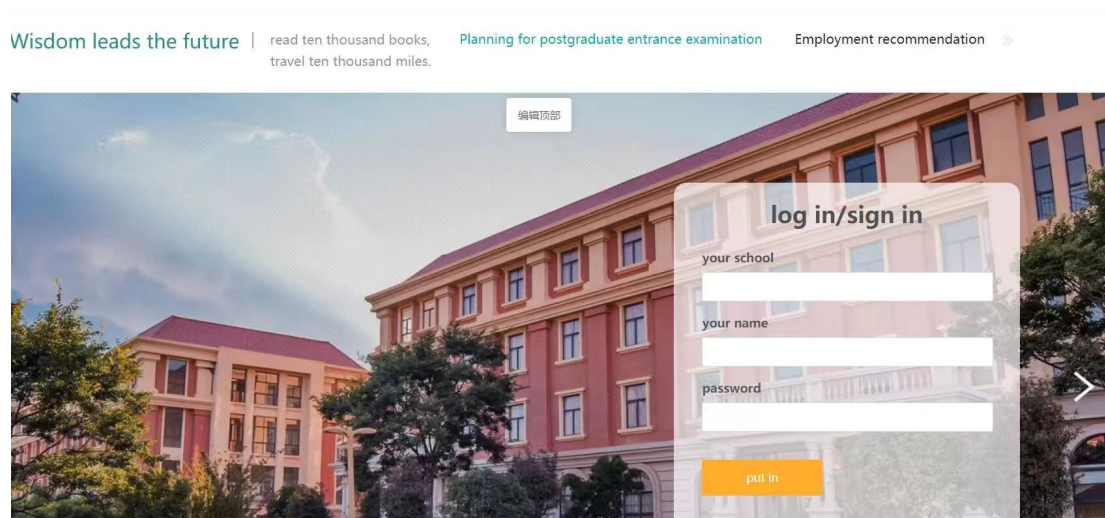

Figure 2: The login portal

Android [8] front-end is mainly used XML language to design the interface for users to see, user interface design and display mainly include user interaction, UI design and layout.

4.3.3 User interaction

User interaction refers to the user's operation interaction on the APP. For example, clicking a button, long pressing to identify the click and long press in the picture is achieved through user interaction. User interaction is realized by the event listener and the callback function, the main function of the event listener is to listen to the user's operation, and it can be recognized in time when the user clicks the button; The callback function executes the corresponding function for the user's operation after the event listener recognizes it.

(1) To set the listener, you need to first introduce the package for listening events, and then set the ID for the Button in the XML, and find the ID in the controller to set a listening event.

(2) The callback function means that the client program first calls a certain function in the server-side program, and then the server-side program calls another function in the client program in turn, and this other function receives the callback function of the client program. For example, the callback function for button click event listeners needs to define an interface first, then define a button function, and finally assign the interface object to the interface member of the button to implement the callback.

4.3.4 UI design

UI design refers to the design of colors, fonts, etc. of various interface elements that users see, similar to the functions of CSS in the web. UI design can be implemented separately by XML layout files or by Java code, but for performance reasons, it is usually implemented by both XML layout files and Java code. The former is used to complete the color, font size, and position arrangement of interface elements, such as designing a blue button to place in the middle of the screen, and the latter is mainly to control the behavior of interface elements, such as after the user clicks the blue button, Java code can respond to the user clicking the button.

4.3.5 Layout

Layout refers to the arrangement and layout of interface elements, including LinearLayout (linear layout: arranged in a linear direction, placing components vertically or horizontally), RelativeLayout (relative layout: arranged in relative positions, controlling the placement of components through relative positioning), TableLayout (table layout, arranged in a tabular form), AbsoluteLayout(Absolute layout: control the placement of components by absolute positioning coordinates), FrameLayout (frame layout: no positioning method, default placement in the upper left corner), ConstraintLayout (constraint layout: control the placement layout of components by setting constraints). The LinearLayout is generally used, which includes both vertical and landscape layouts, as shown in Figure 3.

Figure 3: The layouts

The Android interface we want to design includes five functions: postgraduate planning, employment planning, overseas consultation, competition scientific research guidance, and emotional communication. It is necessary to create a new XML subpage based on the above code, and repeatedly use the processing to realize the layout of the page.

The Android backend mainly manages the interaction between the server and the client, stores the client's information on the server, and processes the requests sent by the client on the server side and responds. It mainly includes data interaction, data storage, interface design and development.

4.3.6 Data Interaction

Data interaction refers to the interaction between Android and the server, for example, Android obtains user information and needs to be stored on the server; The Android client makes a request and sends it to the server to respond.

You can use native sockets to achieve data interaction between the server and the client, first listen to the client request through the front-end method, and then define a thread class, read the data sent by the client, and write information to send to the client to realize the interaction between the server and the client. The advantage of this method is that the transmitted data can be customized, it is byte-level, the consumption is small, and the time is short, it can be encrypted, and it is safe and convenient. This function is also needed in our future APP, such as user login and registration, which needs to store

information to the server; When users click our function buttons such as "Postgraduate Planning", they need to jump to the sub-interface of Postgraduate Planning through the server-side response.

4.3.7 Data Storage

Data storage is to store data on the server side, which is convenient for querying and calling. There are many storage methods, usually depending on the specific requirements such as data type, data volume, etc., including file storage (internal and external storage), Shared Preferences storage, Content Provider storage, network storage, SQLite database storage, etc.

Our platform will use the internal storage method in the file storage to store the private data in the APP in the private storage space of the current device APP in the form of a file, and only the application itself can access the data information. With this method, when the APP is uninstalled and deleted, the corresponding internal storage files are also deleted. The internal storage includes functions such as writing, reading, viewing the list of files, deleting files, creating cache files, deleting cache files, saving pictures, etc., here we will introduce the writing of data.

4.3.8 Interface design and development

Interface design and development is to design the corresponding API interface, allow communication and interaction between different components, and provide a bridge for data interaction and communication between Android and the server. Android itself also provides many interfaces, including interface, serialization interface, callback interface, event interface, etc. The interface is used to draw the view of the interface elements and realize the monitoring of events. The serialization interface is used to convert information into a byte stream and cooperate with the transmission of information to the server. The callback interface is used to set the trigger callback, and by sending an HTTP request, the callback is implemented when the request is successful, which improves the flexibility of the code. The event interface is used to cooperate with the listener to respond to various requests and react to the user, which is particularly important in APP design. The interface serves as a bridge connecting the front and back ends, and the design specification is required when designing the interface to ensure security.

5. Optimal management of the platform

5.1 Incentive mechanism

In marketing, the concept of consumer satisfaction [9] was first proposed by Cardozo [10] and others, who believed that satisfaction is the desired result and that customer satisfaction can prompt customers to buy again. In the knowledge sharing platform, the user's satisfaction is reflected in the fact that the platform can solve the user's problems well, making users willing to use this function when encountering problems in the future. Therefore, in order to improve user satisfaction, we will make the following improvements based on existing model:

Improve the discussion board function of the learning platform, such as strengthening the ability to find Q&A data of the third-party Q&A platform Pizza [11], and organically integrate it with the online course platform Open edX. The previous discussion area of MOOCs was confusing and inefficient. Pizza can separate the posts and answers from students and teachers, and tag each post to facilitate the filtering of exchange data.

Improve the quality of Q&A and establish an incentive mechanism [12]. When people can continuously generate value-added knowledge in communication, interaction and collision of ideas, absorb group wisdom, and get the respect and praise from others in the process of Q&A discussion, individuals will be more willing to share and form habits. These are good motivations for knowledge holders to share, motivating them to use their initiative to share. Therefore, when the quality of questions and answers improves, people are more willing to participate in the discussion of topics, so as to better realize their self-worth and acquire knowledge to sublimate themselves.

Open interfaces and data sharing are key measures to promote the openness and collaboration of university Q&A platforms. By providing open interface to developers, allowing third-party applications and developers to use the platform's data and features, it can attract more innovation and application development. At the same time, encouraging user collaboration is also an important optimization direction. Collaboration between users facilitates knowledge sharing and exchange, improving the efficiency and quality of responses. Through open and collaborative optimization measures, the

university Q&A platform can realize the integration and sharing of more resources, increase the functions and services of the platform, and improve user satisfaction and loyalty. At the same time, collaboration and cooperation between users also helps to establish a closer community atmosphere, promote communication and mutual assistance between users, and increase the activity of the platform and user retention rate

5.2 Problem integration

The interactive question and answering platform will be a variety of questions for topic classification management, provide classified browsing function, because the interactive question and answer platform is mostly a comprehensive open service program, so the scope of questions is wide. The classification settings of domestic interactive Q&A programs are basically similar, and there are many program users, so it is necessary to establish a perfect classification system to efficiently solve the key points of questions raised by users and accurately give concise and clear answers. In this regard, we will take the following measures:

(1) Provide a clear classification of problems

In order to better subdivide and categorize the questioner's questions, the platform sets up a label system to do a good job of functions, catalogs at a glance, clear layout, and improve the visual experience. When the questioner enters a question on the platform, the system searches the database using the database language and automatically filter the keywords to help categorize the questions, such as academic problems, life problems, career planning, etc. Questioners need to select the appropriate category when submitting questions so that administrators and other users can better understand and answer the questions and help provide initial guidance.

(2) Set up a special audit team

Establish teams to review newly submitted issues to ensure compliance. As needed, they make necessary adjustments or improvements to the questions, ensure the quality of the questions, and ensure that users receive accurate, useful answers. The questions and answers on this job assurance procedure meet high quality standards. Platform regulations need to be strictly adhered to to ensure a fair and transparent review process. Through this team's review, we are able to improve the reliability and accuracy of issues on the platform, which in turn increases user trust and satisfaction with the platform. The platform strengthens the management and screening of questions, and provides users with better services, so that they can better enjoy the resources and answers provided by the platform.

5.3 Optimization and innovation

(1) Introduce expert identity authentication

Online Q&A platforms for college students can enhance their service model by providing more comprehensive and professional information. The platform can gather more experts and knowledge-sharing people in the industry field to ensure that users get accurate and useful answers. Certified experts receive additional benefits and special identification, increasing their credibility and influence on the platform.

(2) Intelligent recommendation system

Online Q&A platforms for college students can improve their service model by introducing personalized recommendation algorithms. It improves user experience and satisfaction by analyzing users' history, interests, and behavior patterns to recommend relevant questions and answers to users. With the help of artificial intelligence technology, automatic question recognition and answering can be realized in the online Q&A platform for college students, and user questions can be quickly matched to experts in the corresponding fields or existing solutions. This can not only improve the efficiency of problem solving, but also ensure the quality of answers.

(3) Introduce campus features and practical functions

In order to better meet the needs of college students, some campus characteristics and practical functions can be introduced into the online Q&A platform for college students. For example, setting up a recommendation section for campus activities to provide information on campus activities and how to participate; Setting up a second-hand trading section to facilitate college students to buy and sell idle items; Setting up a course selection guidance section to provide course selection suggestions and

professor evaluation. At the same time, the platform can also consider expanding the scope of services to provide more functions related to the study and life of college students to meet the diversified needs of users.

6. Conclusion

College students' career development needs guidance and planning. Career development planner platform uses the Q&A platform or knowledge sharing platform to leverage the advantages of informatization, integrating multi-party data on postgraduate entrance examinations, public entrance examinations, study abroad, and job search, and concentrate on the knowledge base of the Q&A platform to meet the needs of college students to obtain effective information immediately , so as to realize the integrated management and use of time-saving and efficient information. In addition, the college student career development planner platform has a question and answer data analysis function, through data classification and manual labeling to increase its added value, when college students understand the relevant information for life planning, the system will also automatically analyze and screen out the problems with high consultation enthusiasm and high user concern, to help college students better combine their own abilities and social status quo, and develop a more reasonable career development path.

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References

[1] Turing A M. Computing machinery and intelligence[J]. Mind, 1950, (236):433-460.

[2] Zettlemoyer L S, Collins M. Learning to map sentences to logical form: Structured classification with probabilistic categorial grammars[A]. Conference on Uncertainty in Artificial Intelligence. NL: Elsevier B.V, 2005:658-666.

[3] Jiang Yixuan, Hu Jie. College students' self-development planning education and curriculum construction [J]. Chinese Journal of Higher Education Research, 2020(3): 104-108.

[4] Per, D. E., & Bohn, M. J. The individual in the changing world of work[J]. Journal of Counseling Psychology, 1970, 17(6), 404-411.

[5] Tracey, T. J. G., & Robbins, S. B. The interest-major congruence and college success relation: A longitudinal study[J]. Journal of Vocational Behavior, 2006, 69(1), 64-89.

[6] Jin X. L, Zhou Z. Y., Lee M. K. O., et al.Why Users Keep Answering Questions in Online Question Answering Communities: A Theoretical and Empirical Investigation[J]. International Journal of Information Management, 2013, 33(1): 93-104.

[7] Cardozo R.N. An Experimental Study of Customer Effort, Expectation, and Satisfaction[J]. Journal of Marketing Research, 1965, 2(3): 244-249.

[8] Chen C. X., Williamson M. G., Zhou F. H. Reward System Design and Group Creativity: An Experimental Investigation[J].Accounting Review, 2012, 87(6): 1885-1911.

[9] Feng Changli, Li Tianpeng, Lan Ying. An Empirical Study on the Impact of Willingness on Knowledge Sharing in Supply Chain[J]. Management Review, 2013, 25(3): 126-134.

[10] Zhan Lin. Research on the application of knowledge map in cooperative digital reference consulting services[J]. Library and Information Knowledge,2005,(4):105-108.

[11] Zhang Yanni, Lu Huimei, Xiang Yong. Integration of the Piazza Q&A platform with the Open edX platform [J]. Computer Engineering and Science, 2018, 40(5):813-820.

[12] Shi Yanhui, Ma Xiufeng. Design and Application of Internal Knowledge Sharing Platform Based on Social Q&A[J]. Business Research.2016.3:12-16.