Development and Study on Ideological and Political Education Management System Based on Big Data

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Abstract

Ideological and political education refers to, by utilizing the talent commissioner or educational commissioner selected according to national political direction, transmitting the contents including national ideology and morality, and basic political view, etc. into the important shaping phase of college students' three outlooks within the unified thought transmission period specified by the country. Its target is to plant the correct, directional and valuable ideology and morality in the brains of contemporary college students, making the positive and efficient content related to ideology and morality play the role in macro guidance and thought correction of the next generation in China. The target of ideological and political management lies in the utilization and reasonable allocation of all applicable resources till the utilization within applicable scope is upgraded to the optimization. In consideration of the importance of ideological and political education and the increasing quantity of information during management, traditional management means can't meet the actual demands of undergraduates on education resources any longer, at the same time, the situation of degraded efficiency in specific work aspects, including ideological and political education resource allocation and education information management, etc. also emerges. At present, the era of big data technology is flourishing, and the actual content of centralized processing and efficient operation possessed by big data may offer the best solution for the above-mentioned negative management state. Therefore, this Paper, with the establishment of college ideological and political education management system based on big data as the core purpose, with such data technology content as Java EE, MVC and integrated SSH2 frame, etc. as the core technical content, and with the functional demands on college ideological and political management system as the major reference content, separately presents the architecture pattern and major functions, etc. of the system. It's looking forward that the actual value output of software content may conform to the demands on information processing with regard to current college internal ideological and political education management.

Keywords: Era of Big Data, Ideological and Political Education Management, Development of Management System, Java EE.

1. BACKGROUND

1.1 Literature review

At present, the unification process of ideology and politics in our country is at the important shaping stage, and as the important cultivable talents in R&D, education and innovation industry in our country, in order to guarantee the students be able to accept the most correct political and ideological education during the stage of the shaping of their values, all colleges and universities are required to strengthen the management of ideological and political education. During the allocation of ideological and political education and the management of resources, it will surely involve in the management of ideological and political teaching resources (Wei, 2016). Physical teaching resources include ideological and political teaching materials, teaching-purpose PPT, classroom teaching tools, teaching classroom and faculty and other necessary allocated content. The management content involves class hour arrangement, course content arrangement, teaching progress and outline arrangement. During the specific teaching resource management, no matter the physical level or the awareness level, for reaching the guidance of teaching thoughts and the standardization of ideological and political education management, relevant management personnel are required to record the information data related to resource control in details for the arrangement and acquisition of teaching resources. The information recording methods traditionally-applied by domestic colleges and universities are mostly the text-style or computer tables, which fell behind in the aspects of standardization, security and regularity, etc. of the search and recording (Wang, 2017). The new pattern for processing the information featuring unusual form of big data may, on the basis of featuring stronger decision-
making, information positioning capability and processing procedure optimal capability, improve the processing quality of education management by taking the optimal information processing mode. Therefore, the extension and development of management system based on big data processing technology on the basis of fixed management foundation features the property of value in improving the information processing, recording and reading with regard to college ideological and political education management (Liu, 2017). With the purpose of balancing the ideological and political education management and realizing the open-access of ideological and political management procedure, the development and study on ideological and political management system will surely contribute a lot to the relevant work.

1.2 Objective of the study

With the ultimate aim of improving the efficiency of college ideological and political education management, this Paper, with efficiency improvement as the train of thought, narrates the regular procedures and further action trend of ideological and political education management, and further fixes the function contents required by R&D of ideological and political education management. At the same time, in order to guarantee the technical value and update property of management system, this Paper, taking the technical branch (Java EE, MVC, integrated SSH2 frame) featuring relative mature technical capability and relative frequent technical application among big data processing techniques as the direction, integrates them into the functional mode adaptable to the demands of college ideological and political management, and establishes the functional module corresponding to management demands. Then, according to the major demand on ideological and political education resource management, sets up the database with various decomposed content areas, with the hope of being able to play a valuable role in efficiency improvement, quality stability and security maintenance, etc. during the college ideological and political management through the actual shaping of the demands on ideological and political management by the system in various aspects.

2. TECHNIQUES RELATED TO BIG DATA

2.1 Java EE

Java EE is a kind of technique with good robustness among optional big data processing techniques in colleges and universities. During the establishment of web service environment, it may offer built-in function featuring big capacity and easy operation, and from the perspective of technical mastery and actual operation, Java EE is adaptable to the low requirement on technical capability and however it requires the collective office with programmed data processing to be used as development framework, which is also the direct cause of the wide application of Java EE in recent years (Zhang, 2017).

![Diagram of Java EE Specific Version Feature](image)

**Figure 1.** Java EE Specific Version Feature Diagram

Java EE is an ascending framework based on J2EE technique, wherein, its "ascending" content is actually an anti-sense upgrade by reducing the difficulty and complexity of software debugging (Van, 2017). In Java EE 5 version, related teams upgraded the business component and Web service techniques, and enhanced the persistence of framework model. In Java EE 6 version, development team also addressed the technical needs of users light-weight development. And in Java EE7 version, while improving development efficiency, the World Wide Web
Support Language was also launched. By now, the existing technologies of Java EE has effectively reduced the need for technicians to write code and provided a more convenient feature tool for software support for big data processing. The specific version features of Java EE are as shown as Figure 1.

2.2 MVC

In model design software, MVC is the typical system consisting of model, view and controllers, the characters of which lie in the efficient exfoliation of imagery control and built-in logic plate. Specifically speaking, program input/output and processing process needn't be associated binding. All components may run independently (Zhu, 2017). MVC's view plate is mostly constituted of HTML, Adobe Flash and WML; during the operation of the model, database access operation mainly applies the object of EJBs component to process, and return the processed one to superior page after finishing the processing procedure; controller supports the users' input, and basic form and state of the plate may be conducted with fine tuning according to the users' intention (Zhou, 2014). "JSP + servlet + javabeans" belongs to the optimal development mode of MVC in existing technical capability.

2.3 Integrated SSH2 framework

J2EE's model feature makes it be more adaptable to the processing mode of big data state, and with its core technology as the extension, applicable integrated frameworks mainly consist of the following 7 kinds: Struts, Struts 2, JSF, Spring, Web Work, Hibernate and Ibatis. Struts framework contains three layers, i.e. view, model and controller, the three of which lie in association disconnection, and disconnection may reduce its difficulty in operation (Zhi and Ding, 2016). Struts 2 is the degree raising version of Struts, it features obvious properties in expression language, data check and Servlet dependence. As the integration of Stuts and Hibernate, Spring may carry the model basis on the upper-end of MVC framework, establishing the level framework with business logic, domain module, expression and data persistence as the base point. For SSH2 integrates various technical contents, and its arrangement process and molding content of configuration file are more complex.

2.4 Web crawler

Web crawler belongs to automatic program, and its business content lies in the autonomous acquisition of internet information. At the same time, due to the particularity of its automation, it requires constant rules and algorithm to activate the program calculation (Wu and Chen, 2014). The conventional techniques for applying web crawler are as follows: (1) acquiring URL; (2) request data from fixed web server; (3) acquiring webpage content; (4) making the inventory of webpage content, positioning and scrawling the resource locator link; (5) comparing the scrawled contents and wrong storage area, and maintaining the effective content; (6) dealing with and connecting the effective link; (7) recording the data content in effective link. All above flows may be repeated until the processed locator area is blank or exceeds the limit of data processing.

Judgment algorithm based on text content

Among web crawler algorithms, the most basic category is "Best First Search" algorithm, and most algorithms known currently are originated from this one. The algorithm procedure standard is only based on similarity, through which measure and search the link content in webpage with highest similarity with key words. The independent link and weak association link should be eliminated as much as possible, and the one with highest association enters crawling program, and in case of overqueue, eliminate the links one by one (Hu and Deng, 2015). The following is the direct formula of "Best First Search" algorithm:

$$SIM(M, N) = \frac{F_{DM} F_{ON}}{\sqrt{\sum_{OEM} F_{DM}^2} \sqrt{\sum_{DEN} F_{ON}^2}}$$

In above formula, the searched key word is "O", assuming the content of the webpage as "M", key word set as "N", the frequency of occurrence of key word "O" in "M" is represented with "F_{DM}" in the formula, and the frequency of occurrence of key word "O" in "N" is represented with "F_{ON}".

2.5 My SQL

My SQL is a kind of RDBMS, i.e. Relational Database Management System, and by applying the most universal database language SQL (Structured Query Language), it may manage the database. My SQL is the selection of
database by most general web applications, for its open source and free-of-charge characters greatly reduce the operation cost of web application, and it features abundant and strong function (Lin and Hong, 2017). The application of MySQL is convenient, and the management may be fulfilled through dedicated or third party tools; it generally runs under Linux environment, featuring fast running speed and good security.

3. DEMANDS ON COLLEGE IDEOLOGICAL AND POLITICAL EDUCATION SYSTEM

3.1 System overview

At present, management direction of ideological and political education is developing towards multiple and modern direction, and most long-existing issues in ideological and political education management focus on resource record, resource update and resource relocation, etc (Chen, 2017). Therefore, the system must be developed by centering on the ideas of serving resource management and teaching management, etc. The subitem content of the system is required to coordinate with the work thought of ideological and political education management personnel. The application of the system contains multi-level management, and for maintenance work is undertaken by the researcher of the institute, the system maintenance operation must be simplified with optimal state, and on the basis of MVC module design, realize the uttermost man-machine operation and communication.

3.2 Functional demands

The subitems of college ideological and political education resources are diversified, and both physical resources and knowledge resources possess a certain pertinence and confidentiality. With regard to protective level, the system is required to take the administrators as the major service objects, and set different secret key protection at user right hierarchy. The administrators with different authorities on the relocation of resources differ obviously. When important resources are checked and applied, the system is required to record timely, and the recording should be accurate and detailed to the user and browsing content (Qian, 2017). The system need organize and maintain the resource content timely according to the setting. With regard to pertinence level, the teaching resources contained in the system are required to be classified according to the courses, and the search interface should be easily understood. During the management of necessary supporting resources including teaching materials and teachers, etc., the system may realize the basic functions, e.g. information input, automatic classification, data statistics and data screening, etc. Different resources should be separately displayed. Figure 2 shows the content of user rights.

![Diagram of User Rights Content]

**Figure 2. User Rights Content**

3.3 Data demand analysis

Organizational structure analysis
System establishment basically focuses on the management direction of ideological and political education, therefore, the users served by the system focus on ideological and political education administrators and ideological and political education teachers, with the leaders of branches and colleges and universities as the fixed objects. The system should not only guarantee the independence of ideological and political education, but also coordinate with the overall management system of the colleges and universities. (Cheng, 2014) Meanwhile, it is required to indicate the base configuration and basic function of the system, such as function category, specific service contents of the module, etc., with details as shown as Figure 3.

![Figure 3. The Basic Structure and Function of the System](image)

### 4. SYSTEM DESIGN

#### 4.1 Database design

4.1.1 Design of logic data model

![Figure 4. Logical Pattern Fiagram](image)
The database stores the user information and system management configuration data, serving the data retrieval and the statistic analysis, and for seeking the safety and security of application process, logic model focuses on the communication process between users and software, with the specific logic model as shown as Figure 4.

4.1.2 Access frequency function

If access frequency function is required to be established during the design of database, the first step is to set the variable content, meanwhile declaring the precondition set by the function.

1. Setting \( F \) as the access frequency of database column field; (2) setting \( R \) as the hit rate of "cache"; (3) setting \( T \) as the threshold value of database column field access frequency; (4) setting \( \Delta \) as the correction constant of hit rate; (5) setting \( W \) as the importance of data column field; (6) setting \( P \) as the threshold value of access frequency; (7) setting \( \lambda \) as the changed average frequency.

If within time quantum "\( T \)" , "\( X \)" times of change values are acquired by some column field of the database, the sum of access completed by the users during this time quantum is "\( Y \)". Then the estimation value of the frequency "\( \lambda \)" of this column field is "\( \bar{\lambda} = \frac{X}{T} \)" , and accordingly conclude the formula as follows:

\[
F = F + W \times \bar{\lambda}/Y
\]

Then assuming within time quantum "\( T \)" , the access frequency of some column field of the database is "\( F_r \)" , and after fixed the value of time quantum "\( S \)" , the access frequency of this column field is "\( F_{r-S} \)" , then, the formula of hit rate is required to be corrected according to the following formula, and however, if the result equal the threshold value, the correction doesn't need.

1. When \( |F_{r+S} - F_r|/S < p_l \), the modification variable of hit rate is the reduction of original rate of hit, i.e. \( F_{r+S} = F_{r+S} - \Delta \). Meanwhile, "\( F_{r+S} \)" represents access frequency after the modification of this column field after the time quantum "\( S \)".

2. When \( |F_{r+S} - F_r|/S > p_l \), the modification variable of hit rate is the increment of original rate of hit, i.e. \( F_{r+S} = F_{r+S} + \Delta \). Meanwhile, "\( F_{r+S} \)" represents access frequency after the modification of this column field after the time quantum "\( S \)".

4.2 Design of functional mmodule

The design thought of the plate aims at simplifying workload of personnel application and reducing application difficulty, and takes the abstract independent function as the basis set by the plate (Ye, 2016). 1. System Management Module (SMM). SMM mainly processes the work related to system environment setting. Wherein, other module will be set for processing user and authority management. 2. User Right Management Module (URMM). URMM is based on user's role to set various functions of the user group. The system may flexibly set user group (user's role) according to the demands of management, and set the management authority of various user groups. 3. Basic Data Management Module (BDMM). BDMM mainly focuses on the basic management function and data audit function for teacher resource, student resource and teaching tool resource. 4. Statistic Analysis Module (SAM). SAM mainly adopts index contrast analysis methods to analyze the difference and change of scientific research in quantity from longitudinal and transverse perspective. From longitudinal perspective, it may conduct statistics and analysis on the difference of some category (class, grade) of school (or college) in quantity; from transverse perspective, it may compare the teaching effect and data comparison situation of teaching resource padding data in different time quantum by category. 5. Comprehensive Retrieval Module (CRM). CRM retrieves the important information content of teachers' information or related to internal teaching resources as per key words according to the demands of teachers on teaching or the demands on resource allocation by administrators.

5. CONCLUSION

Under the pushing of the era of big data, college ideology and politics related management work must respond to the call of the era, develop the management system focusing on modern computer technology, only through this way, may we utilize the modern technology to improve the actual efficiency of college ideological and political
education management work to the optimal space position. This Paper starts from the selection of technology for system development, gradually narrates the characters and upgrading status of the technology applied during system development, and then through the narrating of system functions, exhibits the design of plate in ideological and political education management system. Through the analysis on system management module, realize the demands on systematization and programming of college ideological and political management.

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