Establishment and Research on the Ideological and Cultural Education Platform in the Context of Big Data

Wenjun Li[1,a], Yuhang Li[2,b,*]

{wenjun.l@163.com[a], liyuhang202@163.com[b]}

[1]Changchun Humanities and Sciences College , No.1488 Boshuo Road, Jingyue National High-tech Industrial Development Zone, Changchun City,Jilin Province, China
[2]Jilin University of the Arts,No.695 Ziyou Road, Changchun City, Jilin Province , China

Abstract. Ideological and political education is a kind of social and practical activity, which is centered on the educated person and has the fundamental purpose of solving the person's thought, position and point of view. People are in a certain cultural environment and culture is a culture created by people, that is to say, everyone grows up in a certain culture and is influenced by a certain cultural environment. The central purpose and task of ideological and political education is to cultivate and educate people, and it is very necessary to complete the purpose of ideological and political education through cultural cultivation and inheritance. In fact, the biggest role and essence of culture is to give people a certain cultural inculcation to achieve the role of educating people, and ideological and political education is to educate people, cultural education is also to educate people, so the link between ideological and political education and culture is inseparable. That is why there is also a need to break away from the previous way of education in the part of the study of ideology and culture. Based on the background of the development of big data in today's era, this paper combines computer algorithms with the study of ideological and cultural education, and at the same time builds a big data education platform to better educate students on ideological and cultural education.

Keywords: Big Data Context; Platform building; Ideological and cultural education; depth algorithm

1 Introduction

On the one hand, culture has a great influence on ideological and political education, it affects the formation of human ideology and morality to determine the determination of human values, as well as human behavioral norms, so the culture has the function of ideological and political education; on the other hand, as a means of education, ideological and political education is also a certain form of culture, plays a certain cultural function, improve the quality of human ideology and morality at the same time, it will have a certain impact on human thought, lifestyle, behavior, so the ideological and political education is also inevitably affecting the culture [1]. The analysis of the connection between the two shows the role of ideological and political education of traditional thought and culture, and also highlights the cultural quality and cultural heritage of ideological and political education. To realize the cultural construction of modernization of socialism with Chinese characteristics and the modernization of ideological

and political education of socialism with Chinese characteristics requires that we must not forget history, but must be based on historical traditions, and must be based on the excellent traditional Chinese ideology and culture [2]. As long as we can creatively absorb the cultural traditions to serve the ideological and political education, and give full play to the excellent traditional thought and culture in the ideological education of the basic advantages, we can effectively carry out the ideological and political education work, to ensure that the country's political, economic and cultural work can be carried out healthily and smoothly [3].

2 Overall Design of Distance Education Network Technology Platform

2.1 ASP Fundamentals

ASP stands for Active Server Page, which is a server-side scripting environment.Commands and script statements in ASP are interpreted and executed through the server [4]. The process of ASP processing a Web page is shown in Figure 1.
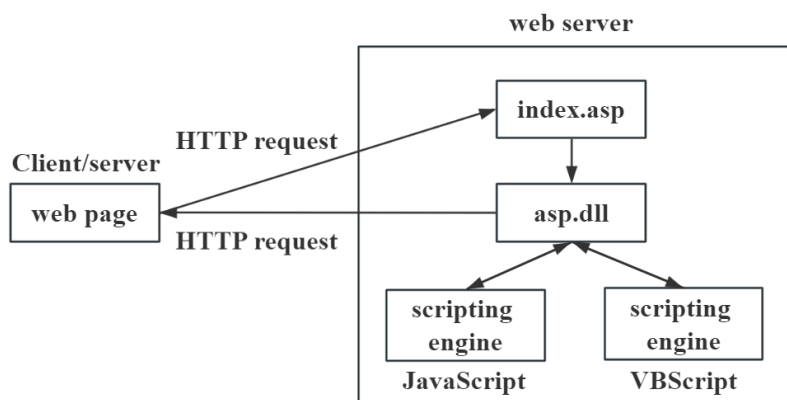

Fig. 1. ASP working principle diagram

When a client makes an ASP request, the browser (IE) passes this request to the web server (e.g., IIS) via HTTP [5]. The Web server takes out the corresponding asp file, and at the same time the ASP script host asp.dll, located on the Web server, calls the corresponding ASP script engine according to the scripting language in the asp file to interpret the ASP file. If the script command contains a request to access the database, it is connected to the backend database through ODBC, OLE DB, etc., and the database access component performs operations on the database. After interpreting these scripts, the script engine returns HTML strings to the script host. The script host then combines these returned HTML strings and returns them to the Web server, which in turn includes it in an HTTP response to the browser. The client's browser processes the returned HTML stream and displays the Web page [6].

The advantages of ASP are the ease of writing and compiling, and the security of the source program code. A text editor or other Web development tool is required to write page code; a Web server that supports ASP is required to publish pages; and a browser (IE, Netscape, etc.) is

required to view and test pages. In addition, because ASP is executed on the server side, the user's browser does not need to support it, as long as you use a browser that can interpret HTML code, so ASP technology has the added advantage of being browser-independent.

2.2 Design of the three-layer structure of the distance education network technology platform

(1) Introduction to the three-tier structure

The three-tier architecture is in contrast to the master-slave C/S (Client/Server) architecture. The Client side of the C/S structure is both numerical, not only to complete the user display interface, but also responsible for part of the data processing function, or business logic. It is the biggest problem is that resources can not be fully shared and software maintenance difficulties and other issues [7]. The Server side is the data storage place, which manages every connection coming from the client. When the number of people using the system is large, the maximum number of connections at the same time may be exceeded, resulting in the next person to open the system can not access the database, so this is the biggest weakness of the C / S structure. In addition, when changes need to be made to transaction processing or business logic, the client program is necessarily affected [8].
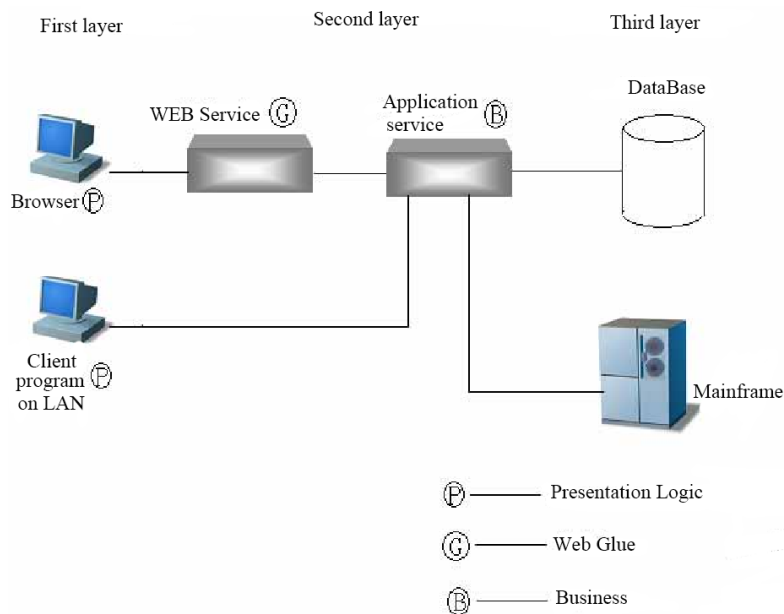

Fig. 2. Three-layer structure

As shown in Fig. 2, the three-layer structure, on the other hand, takes out the business logic part of the client and dedicates it to a running server, called the Business Logic Layer layer (BLL layer, for short). When a user submits a request, the BLL layer responds to the user request and completes the transaction process [9]. If access to the database is involved, the BLL layer then establishes a connection with the database server to access the data. The access to the database data is then called the Data Access Layer layer (DAL layer for short). Since the number of

connections in a database resource is the number of connections established by the BLL tier to the database, which can be shared, the number of users able to access the database is increased. The user's client is left with only the user interface part, which is called the Presentation Layer layer (PL layer for short, i.e., the presentation layer). In the case of a WWW environment, this layer provides the browser with an HTML/ASP file. The HTML file has only a few window fields for interaction with the Internet user, plus the necessary Client Script to verify the correctness of the data, while the ASP file is responsible for calling the packaged COM component, which contains the business logic [10].

3 K-means algorithm with initial centroid determination

3.1 The classical k-means algorithm

As the most classical division clustering algorithm, the k-mean algorithm is not complicated to implement and has high scalability, while the k-mean algorithm has good reliability and high efficiency, which is a widely used clustering algorithm. However, randomly selecting the centroids of the initial clusters seriously affects the accuracy and the number of iterations of the clustering algorithm. In this paper, we propose an improvement that can obtain better clustering results without increasing the time complexity of the algorithm [11]..

(1) Steps in the classical k-means algorithm

The basic idea of the k-means algorithm is to assume a dataset D containing n data objects, specify the number of k clusters, and cluster the objects in D into appropriate clusters $C_1, ..., C_k$ using a partitioning method so that each object belongs to only one cluster, i.e., $1 \le i, j \le k, C_i \in D, C_i \cap C_j = \emptyset$ at the same time all the distances E from the center of the cluster are minimized, i.e., $E = \sum_{i=1}^{k} \sum_{p \in C_i} dist(p, c_i)^2$. where E is the sum of squared errors of all data objects in the data set D to be clustered, p is a data object, and the center of mass of cluster C_i is C_i.

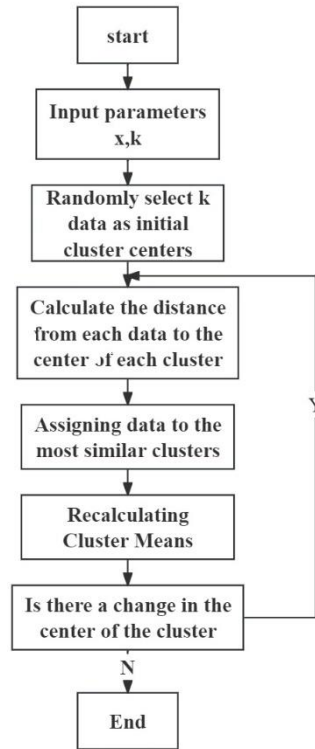The specific steps of the algorithm are described below in Figure 3:

Fig. 3. Flowchart of the k-means algorithm

(2) Shortcomings of the classical k-means algorithm

As can be seen from 3, the core step of the k-means algorithm is to update the clustering cluster centers to achieve the minimum distance within the clusters through continuous iteration. The time complexity of the algorithm is very low, so the algorithm is widely used, but the algorithm has many shortcomings, the main shortcomings are as follows:

The number of clusters for clustering needs to be specified by the user. The k-mean algorithm first requires the user to specify the number of clusters k value, the determination of the k value directly affects the clustering results, usually, the k value needs to be specified by the user based on their own experience and understanding of the dataset, so the specified value may not be ideal, and the results of the clustering can not be guaranteed.

The k-means algorithm is randomized in its initial centroid selection. The k-means algorithm relies heavily on the selection of the initial centroids: once the initial centroids are incorrectly selected, the subsequent clustering process will have a great impact, and it is very likely that we will not get the optimal clustering results, while the number of clustering iterations may also increase. The randomly selected initial center point has great uncertainty and also directly affects the clustering effect.

3.2 Initial centroid selection based on data variability

In this paper, we propose an improved method based on these problems, where the initial centroids are selected by calculating the differences between the data, but without doing unnecessary clustering process that affects the efficiency.

The improved initial centroid selection method is as follows: first, the entire data set is sorted in ascending order for the distance to the smallest data object, then different clusters are designated for the k data objects with the farthest distribution distance based on this, and the degree of difference of the entire cluster is calculated after each ungrouped data is merged into each cluster, and the smallest cluster is designated for it, and finally, a centroid is computed for each cluster with all the data objects in that cluster.

The classical k-means algorithm is to randomly select the initial centroids of clusters, and this selection method inevitably causes the instability of the clustering results. Therefore the ideal improved algorithm for initial center point selection should conform to the following principles:

(1) The initial clustering center avoids all random steps and makes the clustering results more reliable.

(2) The distance metric and smallness of the data objects to reach the clustering center ensures the dissimilarity between different clusters.

(3) The clustering centers are selected as evenly as possible so that the initial centroids are more representative of the data distribution and the number of iterations is reduced.

To satisfy these principles, the following is an improved process for initial clustering center selection:

Algorithm: k-mean initial centroids are selected; Input: non-empty dataset D, number of clusters k; Output: k initial centroids; Method:

(1) In the data set D containing n data objects, select the smallest data object min(D).

(2) Calculate the distance from all data objects to min(D) $Dis_1, \dots, Dis_n$ and use this distance to sort all data objects in ascending order from smallest to largest.

(3) Specify the $1 + (i - 1) \times (n - 2)/(k - 1), i \in 1, \dots, k$ th data object as the initial member of the corresponding grouping, respectively.

(4) For data objects that have not yet been assigned a grouping, the distance to all members within each grouping is calculated, and the data object is also categorized into the grouping with the smallest distance.

(5) The initial centroid is calculated based on the grouping using Eq.

Using the improved method of selecting the initial centroid of the k-mean algorithm, the initial centroid C_i of the cluster c_i is calculated in the d-dimension as follows:

$$c_{i_d} = \frac{1}{n_i} \sum_{j=1}^{n_i} P_{j_d}, P_j \in C_i \tag{1}$$

Where c_{i_j} represents the initial center point c_i in the d-dimension, P_j represents the data that is is part of cluster C_i, and n_i is the number of items for the data within cluster C_i.

4 Conclusion

Ideological and political education is developed on the basis of traditional culture, which is accumulated and transmitted by ideological and political education. Traditional culture is the crystallization of human history and civilization in the course of development; it is as alive as living things and is not like the exhibits in a museum. So we have to recognize its vital nature and use it for us. Also accepting tradition is not like taking the key to the housekeeping from your mother-in-law, keeping what you receive faithfully, and then keeping it unchanged and carefully and passing it on to future generations. Nor is it like the changes in nature, where everything is circumstantial and there is no innovative change, just a repetition of the past, always keeping its original rules, no progress, no change. The way of thinking, values, and rules of behavior embedded in traditional culture have strong traditional qualities inherited from history on the one hand, and live and innovative real-life contents on the other, which influence today's Chinese people at every moment and provide us with a solid foundation and a strong basis for the creation of a new culture. Traditional culture is formed by people's continuous accumulation and inheritance in the course of historical development.

References

[1] Chen Chao. Exploring the integration of party building culture and ideological and political education in colleges and universities in the era of big data[J]. PR World,2021(21):72-73.

[2] Feng Wenjing. Organic integration of party building culture and ideological and political education in colleges and universities in the era of big data[J]. Fujian Tea,2020,42(05):209-210.

[3] Sun Donghua. Research on the Value and Realization Path of Visual Culture in Ideological and Political Education in the Age of Big Data[J]. Computer products and circulation,2020(06):288.

[4] Guo Mingjing. Exploration of the path of local red culture into ideological and political education in colleges and universities in the field of big data[J]. Journal of Heilongjiang Engineering Institute,2020,34(01):71-75.DOI:10.19352/j.cnki.issn1671-4679.2020.01.016.

[5] Guo Kongsheng. Ideological and moral education of college students in the era of big data: micro-environment-micro-morphology-micro-path[J]. Journal of the Party School of the CPC Yunnan Provincial Committee,2020,21(01):115-119.DOI:10.13410/j.cnki.ypcscpc.2020.01.021.

[6] Yang Baoguo. Dilemma and path of ideological and political education of college students under the view of big data and microculture[J]. Journal of Guangxi Institute of Education,2020(01):100-105.

[7] Chen Xin, Wang Yifan. Research on new media construction of ideological and political education in colleges and universities under the background of big data--Taking the official weibo platform of a university in Shandong as an example[J]. Comparative Research on Cultural Innovation,2019,3(12):73-74.

[8]Wang Kingland. Discussion on the innovation of ideological and political education in colleges and universities based on the perspective of network culture[J]. Knowledge Economy,2019(10):139+141.DOI:10.15880/j.cnki.zsjj.2019.10.088.

[9]Muhand lisanna. Exploring the impact and response of microculture on ideological and political education in colleges and universities in the era of big data[J]. Economist,2019(01):202+204.

[10]Rizal M. Research on the innovation of students' ideological and political education in the era of big data[J]. Health Vocational Education,2018,36(10):12-13.

[11]David M. Research on the innovation of ideological and political education in higher vocational colleges and universities integrating tea culture thinking under the background of big data[J]. Fujian Tea,2018,40(06):207.