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EXPLORING THE PATH OF CULTIVATING HIGH-QUALITY APPLIED TALENTS IN THE CONTEXT OF NEW ENGINEERING BASED ON INTELLIGENT COMPUTING AND MACHINE LEARNING ASSISTANCE

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Abstract. Since the development of domestic research on applied talent cultivation model is slow and the related theories are not perfect, further exploration and research are needed.Therefore, this paper uses machine learning and data mining technology to establish a high-quality applied talents training path generation model, and it mainly analyzes the shortcomings of current universities in training talents and the differences between applied talents and other types of talents through data mining, and finally uses the training path generation model to establish the "one three-body Finally, the training path generation model is used to establish the "one three bodies" applied talents training model.

Key words: Machine learning; Applied talents; Cultivation path

1. Introduction. In 2010, the National Medium and Long-term Education Reform and Development Plan proposed that by 2020, China's education has basically achieved modernization, basically built a learning society, and stepped into the ranks of a strong talent country. This means that the number of higher education in China will continue to grow and higher education will flourish [1]. However, with the continuous development of China's economy, the contradiction between China's talent resources and social needs has become increasingly prominent, and the structure of talents is not compatible with social development, therefore, China should vigorously promote the cultivation of application-oriented talents [2, 3].

In a word, the new engineering is a major idea of China's economic and social development, and its fundamental goal is to adapt to the requirements of industrial development. To realize the continuous optimization of industry, it is necessary to continuously optimize the disciplines, expand their contents and coverage, accelerate the construction of new engineering in China, and create favorable conditions for cultivating high-quality application-oriented talents. The development of new engineering disciplines has promoted the process of China's education reform and opened up a new situation of education reform.

2. Introduction of related theories.

2.1. Significance of New Engineering Construction. At the time when the concept of "New Engineering" emerged, the relevant education departments conducted in-depth discussions and formulated three major focuses: "Fudan Consensus", "Tianda Action", and "Beijing Guide". "Beijing Guide", and a series of initiatives have been developed to adapt to China's own characteristics and needs, to establish an education system with Chinese characteristics, and to promote the rapid development of China's education [4, 5]. The "new engineering" is a discipline with a wide range of significance, and its implementation responds to the new requirements of education development, is an important beginning of education reform, promotes the strategic development of national education, and promotes the effective transformation of industry and economic development [6, 7].

2.2. Application-oriented talent concept. The concept of "application-oriented" is a relative concept, and its relativity has two meanings: firstly, it is compared with theory and technology; secondly, the relativity of application types at different education levels and different historical stages has different connotations. Applied

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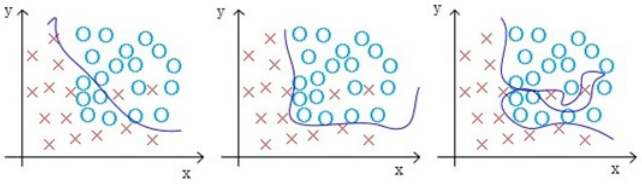

Fig. 3.1: Pre-processing simulation diagram.

talent refers to the application of the basic principles of science to create the most direct benefits for society. From the viewpoint of knowledge structure, applied talents are dominated by applied science. Theoretically speaking, applied science is a discipline corresponding to basic or theoretical science, which is closely related to people's production and life [8].

2.3. Principle of machine learning. In modern intelligence technology, data-based machine learning is an important research direction after expert system [9], which mainly studies to find out the rules that cannot be obtained by parsing method at present from a large number of observations, and use them to predict and analyze the future information. Currently, machine learning research focuses on task-oriented, cognitive models and theoretical analysis. Machine learning can be viewed as obtaining a certain output y for a given input x. Currently, many alternative machine learning algorithms are available. The first thing to do is to train the learning algorithm, that is, to learn how to classify it. In order to test the effectiveness of a machine learning algorithm, two training sets are generally needed: a training set and a test set [10, 11]. A set of training samples is used as input when the machine learning algorithm starts running, and then that sample is input again at the end of training. When the test samples are input, no classification of the samples is given and the program performs the identification.

3. Application method design.

3.1. Culture path data pre-processing. Data pre-processing is required before mining the cultivation path generation dataset, and its pre-processing simulation diagram is shown in Figure 3.1, which mainly includes the following parts.

1. Data collection: Data collection is the first link of data mining.
2. Data cleaning: It is mainly responsible for data vacancies, errors, data inconsistencies, etc.
3. Data conversion: Its main work is to convert continuous numerical attributes into discrete values.
4. Data selection: The research goal of this paper is to reduce the number of variables to be considered in the data mining process by minimizing the amount of data in data mining and finding useful feature attributes from it.

3.2. Cultivation path data mining. Once the pre-processing of the data set is completed, data mining can be performed. In order to combine the objectives and methods of the later research path exploration [12], the excavation process also addresses the current problems of our universities in the cultivation of applied talents and the differences with other types of talents. The architecture diagram of this training path data mining is shown in Figure 3.2, and the functions of the main modules are explained as follows.

1. Data collection: The correctness and validity of information collection are directly related to the determination of the cultivation program [13], the construction of indicators, and the determination of weights, which in turn affect the effectiveness of the assessment.
2. Data integration: Data from multiple files or multiple database run environments are combined and processed.
3. Data selection: The main purpose of data selection is to determine the data set to be performed and narrow down the scope of data processing so as to improve the quality of data mining.
4. Data cleaning: It solves the problems of semantic ambiguity, data loss, unclean cleaning, etc.

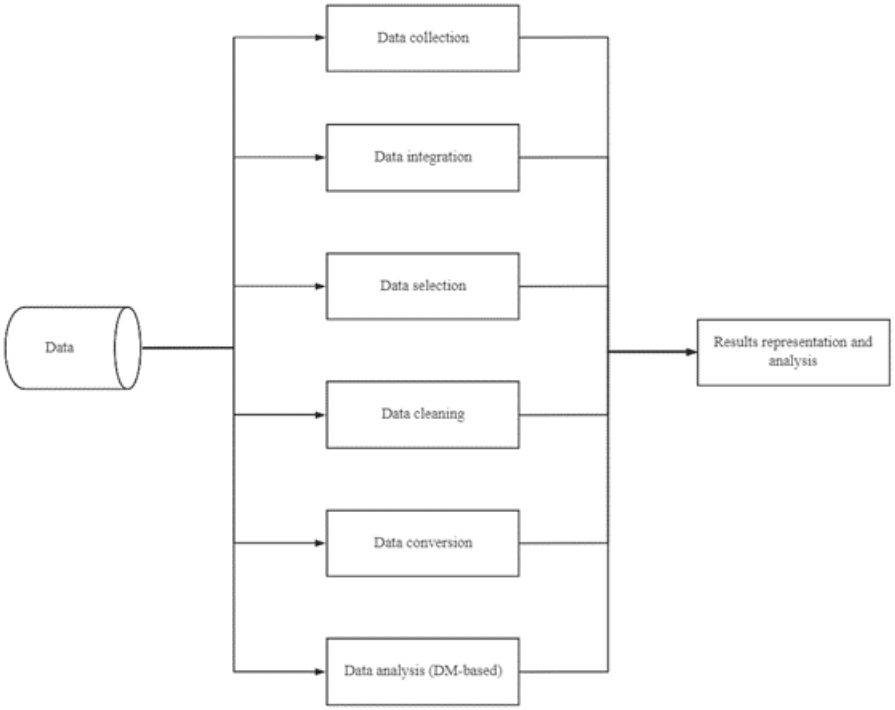

Fig. 3.2: Architecture diagram of culture path data mining.

5. Data conversion: In data coding, converting data types with different values in the database to digital format will help retrieval.
6. Data analysis: In the data analysis module, techniques and tools such as fuzzy sets, rough sets and genetic algorithms are combined to extract useful models or knowledge from the database.
7. Result Representation and Analysis: The extracted information is analyzed according to the end-user's decision making purpose and the extracted useful data is classified for the decision maker's reference.

3.3. Cultivate route generation model. The model for this road analysis includes data mining, data processing, data computation, analysis, and path analysis [14]. The core idea of the method is to use supervised learning in machine learning to achieve optimization of the model, while a hierarchical clustering method is used, which can improve the efficiency and accuracy of data mining.

1. Using supervised learning models. This time the machine learning method uses a method called supervised learning, which uses a set of labeled samples for training to obtain the best model, and then new samples are input to the model, which judges and classifies the input data, and finally the new data type is used as the basis for classification, so that the model can classify the unknown data. That is, supervised learning trains the input samples to obtain the best model results, and the model is used to analyze the test data.

2. Cultivating path generation models. In the supervised case, when the model loop is at its best, path analysis can be performed. Firstly, the original data is obtained through data mining, and based on this, the data is pre-processed and the hierarchical clustering method is used to classify the data hierarchically, and finally the best training path is obtained.

4. Application experimental analysis.

4.1. Experimental data. The data for this experiment comes from the data crawler, and data preprocessing is performed on three initial talent data sources, of which Data Source A has 5000 data, Data Source B has 3652 data, and Data Source C has 10256, whose data set source table is shown in Table 4.1.

Table 4.1: Table of data set sources.

Data Source	Time Period	Event	Number
A	2021.6-2022.6	Employment information	5000
B	2021.6-2022.6	Employment information	3652
C	2021.6-2022.6	Employment information	10256

Table 4.2: Experimental results.

Predictive Models	Classification Accuracy	Generation speed
Machine learning based culture path generation model	97.3%	500ms
BP neural network based culture path generation model	93.6%	785ms
SVM-based culture path generation model	95.5%	1500ms

4.2. Model application is experimented. After pre-processing the experimental data, we can conduct experiments to compare the analytical accuracy of the model and its analytical accuracy with that obtained by the currently used BP neural network algorithm and support vector machine (SVM) classifier model, and the results obtained from the experiments are shown in Table 4.2 below.

From the above results, it can be seen that the machine learning-based training path generation model is better than the other two models because the model uses data mining techniques to filter and classify the data before generation [15], resulting in a significant improvement in the accuracy and performance of the model.

4.3. Analysis of data mining results. After testing the generated model, data mining operation can be performed on the data set, which mainly analyzes the shortcomings of the current universities in cultivating talents and the difference between applied talents and other types of talents as reflected by the data set.

1. Problems in the cultivation of talents in China's universities. At present, China's universities are still stuck in the traditional cultivation mode, and many universities' education methods and education concepts are still in the primary stage of education. Some schools have some misunderstandings in the understanding of talents, thinking that cultivating talents is only to meet the basic needs of the society [16], while neglecting the combination of theory and practice, and Most of the traditional teaching in universities focus on theoretical teaching, thus neglecting the practical application and practical operation ability of students.

2. The difference between applied talents and other types of talents.

(1). The difference between applied talents and academic talents (as in Table 4.3).

(2). The difference between application-oriented talents and skilled talents (as in Table 4.4).

4.4. Application-oriented talent cultivation path generation. After data pre-processing and data mining, the final data set can be used for high-quality applied talent cultivation path generation operation, and finally a three-body applied talent cultivation model is generated through the model, whose structure diagram is shown in Figure 4.1.

The "One Body, Three Bodies" applied talent cultivation model mainly uses big data technology to strengthen the information exchange and collaboration among government, enterprises and universities to cultivate applied talents.

Under the "One Body, Three Bodies" applied talent cultivation model, the latest policies and information can be announced to the society through the big data platform, providing a reliable decision basis for the education and teaching work of the school. At the same time, the government can also use the big data platform to grasp the information about the training of applied talents announced by universities and enterprises, so as to better grasp the training process of practical talents, provide strong policy support for the development of applied talents in China, and promote the development of applied talents in China.

Under the "one body, three bodies" mode of training applied talents, the big data platform can maximize the information exchange between enterprises and schools, and achieve the common purpose through good communication, so that students can better apply and teachers can train. At the same time, through the big

Table 4.3: Difference between applied talents and academic talents.

Distinction Application-oriented talents	Academic	Talent
Main Tasks	Apply scientific principles or newly discovered knowledge directly to social practical fields closely related to social production life.	Dedicated to translating objective laws in the fields of natural and social sciences into scientific principles.
Knowledge Components	Consists of the knowledge system of applied science.	It mainly consists of the body of knowledge of basic sciences, such as mathematics, physics, chemistry, biology, linguistics, etc.
Job Functions	Use discovered scientific principles to serve social practice, engage in work closely related to specific social production labor and life, and create direct economic benefits and material wealth for society.	In order to explore the nature and laws of things, it is not directly related to specific social practices.

Table 4.4: Difference between application-oriented talents and skilled talents.

Distinction	Application-oriented talents	Skill-based talents
Training Objectives	Cultivating competent applied talents with innovative potential in technology and technology development is the main focus, which is reflected in technically applied talents based on general knowledge.	Cultivate practical talents who master the basic knowledge and specialized skills required by the occupation and have the comprehensive quality and professional ability to engage in a specific occupation.
Knowledge Structure	The requirement of mastering basic knowledge is high, emphasizing the comprehensiveness,systematization and scientificity of the knowledge system, requiring students to master profound professional theoretical knowledge, while also improving their scientific creativity.	The students should master the vocational skills and specialized business knowledge, and also pay attention to the improvement of their technical ability.
Competence development	The emphasis is on the cultivation of the application ability of knowledge and technology, and at the same time, the ability to apply knowledge for technological innovation and secondary development of technology should be constructed for students.	Based on mature technologies and specifications, students are trained to be competent in certain occupational positions with professional skills, techniques and application abilities, emphasizing the cultivation of students' professional abilities and professional qualities.

data platform, enterprises can be better integrated into the whole process of application-oriented talents and further deepen the cooperation of application-oriented talents, so as to achieve a seamless integration between on-campus and off-campus internship, thus improving the practicality and practicability of practical talents.

4.5. Characteristics of high-quality applied talent cultivation model. The analysis of the characteristics of the high-quality applied talents cultivation model was carried out by using the data tables fed by the data mining and generative model, and the following five aspects were derived to elaborate the characteristics of the high-quality applied talents cultivation model.

Using the information from the data mining and generative model, the characteristics of the cultivation model of high-quality applied talents are analyzed and the characteristics of high-quality applied talents are discussed in six aspects.

(1). Cultivation objectives highlighting application characteristics. Application-oriented talents with high social demands become the optimal and most necessary choice for our Applied University. Therefore, how to

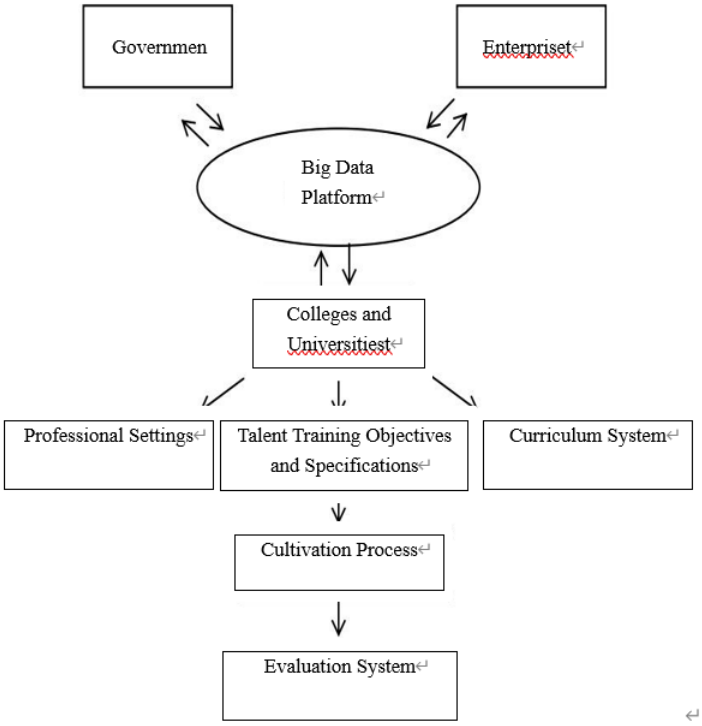

Fig. 4.1: Structure of One-Table-Three-Body Application-oriented Talent Cultivation Model.

build the cultivation mode of high quality practical talents? From the connotation of applied talents, the most fundamental characteristic of applied talents is application-oriented talents. Application is the basic feature that distinguishes applied talents from research-oriented, theoretical and technical talents. Therefore, no matter how to refine and expand the cultivation goals and standards of applied talents, the cultivation goals of applied talents should always reflect the characteristics of applied talents.

(2). Professional and curriculum settings are aligned with industry needs. The major and curriculum system is an important means to achieve the goal of talent training. Therefore, local undergraduate colleges and universities should not blindly make adequate preparation when setting up the major and curriculum system, but should fully consider the current social and economic situation, especially the development of various aspects involving the employment of talents. Local undergraduate colleges and universities should study the internal structure, demands and future development trends of different industries, and develop corresponding majors and curriculum systems according to their own schooling situation.

(3). The cultivation process highlights the theme of practice. The most fundamental characteristic of applied talents is to adapt to the needs of social and economic development. Therefore, in the whole process of implementing applied talents in local undergraduate institutions, internship is a compelling topic. Through internship, students' hands-on ability can be better cultivated, and the combination of theoretical knowledge and practical experience can be strengthened, so that they can flexibly apply theoretical knowledge to work and solve practical problems, thus reflecting the characteristics of applied talents distinct from scientific research and technology.

(4). The evaluation system presents diversification. From several aspects such as cultivation objectives, specialties, courses and cultivation procedures, the characteristics of cultivation of high-quality applied talents make its evaluation system present diversified characteristics. It includes diversification of assessment objects, diversification of assessment contents, diversification of assessment methods, etc.

(5). Dual-Teacher Teacher Team. The teacher team is an important guarantee of university education, and the cultivation of different professionals requires different requirements of knowledge, skills and experience. For example, teachers engaged in scientific research must have rich theoretical knowledge and abundant research experience, while those who are compatible with the cultivation of technical talents must have certain technical skills and abundant practical experience.

To comprehensively promote the construction of curriculum thinking and politics is a strategic measure to implement the fundamental task of establishing moral education. The construction of curriculum thinking and politics integrates value shaping, knowledge imparting and ability cultivation, integrates value guidance in knowledge imparting and ability cultivation, and helps students to shape correct world view, life view and value, which is an important task to comprehensively improve the quality of training applied talents.

5. Conclusion. With the development of society, the development of education has become necessary for a country to cultivate talents, while the new engineering has great advantages over the traditional engineering, which pays more attention to the innovation and practical ability of talents. Therefore, this paper constructs a research model of training pathways for applied talents based on artificial intelligence and machine learning. This paper introduces data mining and machine learning technology into the path analysis, so that the data talent information can be transparent, and uses the cultivation path generation model to build "one three-body" applied talent cultivation model, and analyzes the characteristics of high-quality applied talent cultivation model through the data feedback from data mining technology. In conclusion, the development of new engineering has injected new vitality and vigor to the rapid development of China, and high-quality applied talents are the key to economic development.

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

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