

Research on the Training Framework of Data Science and Big Data Technology Professionals and the Cooperative Mode of School-Enterprise Cooperation

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Abstract. Data Science and Big Data Technology is a multidisciplinary field. The article analyzes the current situation and dilemma in the training of data science and big data technology professionals. Based on the demand for talents in the Northeast region and localities, combined with our school. The problems encountered in the talent training project have put forward a talent training framework for “big data + industry” and “big data + enterprise”. The school and enterprises jointly carry out the school-enterprise cooperation mode of talent order training, thus effectively improving the big data profession. The quality of employment for students.

Introduction

With the continuous development of information technology, there are more and more challenges and opportunities facing today's society. Big data has become a popular word in the current society, and big data has brought new changes and experiences to the development of society. The content of data science and big data technology research is not a single subject area, but a multidisciplinary field, which is a multidisciplinary comprehensive problem, which includes computer science, mathematics and management disciplines. According to McKinsey's data report, the current gap in big data talents is about 200,000. In China, the demand for talents in this area is even greater. In recent years, the gap in big data talents is still on the rise. In 2017, the state specially formulated the “Big Data Industry Development Plan” for the training of big data professionals, and encouraged universities to carry out big data research and application talent training. From the current point of view, data engineers, data analysts and data scientists have always been hot jobs. In response to the demand for jobs, the Ministry of Education has successively approved nearly 300 undergraduate majors in data science and big data technology in recent years, and the Ministry of Education in 2019. It will also review a large number of undergraduate majors. This is precisely because data science and big data technology have a good employment prospect. Students in the learning process, based on computer theory, combine software and hardware resources. Mathematical theory and management analysis principles can not only engage in data science research, big data technology related analysis and mining, but also engage in technical consulting and other management work. At present, China's big data technology is still in the stage of development, and the country has accelerated the progress of personnel training in this area. However, in the entire talent training process, a good training system has not yet been formed, which has resulted in many big data technologies cultivated by universities. Talents are somewhat out of touch with corporate needs and social needs. Therefore, how to cultivate big data technical talents that suit the needs of enterprises is a problem worthy of study in teaching management [1-3].

Status and Problems

In the era of rapid development of the Internet and big data, all walks of life need big data professionals related to their own industries and enterprises, not only require big data technology talents to master a solid theoretical foundation, but also to understand the industry and enterprise individualization. Demand, in-depth analysis and application of specialized big data for different

industries and enterprises, using the analyzed data to find its effective features, discovering the rules, and then discovering its value from the disordered data, and effective management and application. Therefore, “big data + industry” and “big data + enterprise” are the future development trends and research directions. However, in the face of the demand for new engineering talent training, there are many problems in the cultivation of big data talents at this stage. How to effectively recognize these problems is the key to improving personnel training.

Experimental Environment and Experimental Equipment are Scarce.

In the process of big data processing and analysis, it requires fast processing speed and timely response. High-performance computing is the foundation of big data research. By building a cloud platform and the Hadoop environment framework required by everyone's big data, data processing can be effectively improved. speed. However, at present, data science and big data technology are a new cross-disciplinary subject. Most colleges and universities have relatively backward laboratory and experimental environments, and hardware configuration is relatively low. New laboratories have not been able to update in time, leading to big data majors. Experiments in many of the courses cannot be opened normally and cannot effectively meet the needs of big data talent training.

The Faculty Team is not Updated in Time.

Data science and big data technology are a new profession. The content of the talent training system is relatively new and the update is relatively fast. Many colleges and many teachers are the first to contact the profession. No professional guidance teachers can carry out this. The study of the curriculum, how to develop talents, the lack of understanding and mastery of the entire data science and big data technology, the teachers' update of new knowledge and new technology is not timely, can not effectively adapt to data science and big data professionals Cultivating teaching tasks. Therefore, in order to be able to take care of teachers, some colleges and universities have problems in setting up courses, and there are problems in the setting of the syllabus. Theoretical knowledge and practice links cannot effectively adapt to the needs of talent cultivation. Under the talent training mode of the new engineering concept, it is not only required for the teacher to master the relevant technical knowledge of the subject and the research in this field, but also the system framework for the cultivation of cross-professional and cross-platform composite structure talents. On this issue, teachers face new challenges and the problems are more serious. At the same time, data science and big data technology are new professions. In 2016, they were just approved. Only by 2020 will the first big data graduates have no mature and successful school experience. All colleges and universities are exploring. Going forward, there is no mature teaching experience and teaching resources to learn from, nor a mature teaching resource system. There is no mature case for the orientation of talent training objectives, curriculum teaching mode and teaching methods, teaching content and curriculum settings. Therefore, the teaching staff of colleges and universities need to be updated in time, and the improvement of teachers' ability is facing severe challenges.

Talent Training and Enterprise Demand are not Connected Enough.

At present, the level of colleges and universities offering data science and big data is different. Among the nearly 300 undergraduate institutions that offer this major, there are 985 colleges, 211 engineering colleges, and ordinary undergraduate colleges. In the process of training, Some universities focus on the research of talents for big data, some universities focus on the cultivation of computing power, some universities focus on the training of mathematical analysis, and some universities focus on the training of data management. It is the difference of the faculty of the university. The application of the major is based on the computer or on the basis of mathematics. As a result, the training objectives of each university are also different. The big data profession is not well connected with the needs of enterprises and the industry. There is no in-depth cooperation with enterprises and industries. The school-enterprise cooperation and interaction mechanism cannot effectively adapt to the talent cultivation needs under the new industrial background. The big data professional cooperation and win-win cooperation between industry and university The model has not yet been formed. How to develop talented personnel for big data with enterprises and industries is an urgent problem to be solved. In terms of the demand for talents in big data, big data talents are

needed in all fields of China. How to train specialized big data talents for different industries and different enterprises, and put forward new requirements under the new engineering concept [4-6].

In March 2018, Heilongjiang Institute of Technology was approved by the Ministry of Education to open an undergraduate major in "Data Science and Big Data Technology". Enrollment began in September 2018. A total of 125 students were enrolled nationwide for the new "Data Science and Big Data Technology". Major, how to determine the goal of talent training, how to cultivate and adapt to the northeast region and adapt to the needs of the industry under the new engineering concept is a much-needed research topic.

Talent Cultivation Framework

The data science and big data majors focus on cultivating engineering-oriented talents for industry-oriented fields, highlighting the common training characteristics of "school-enterprise cooperation", strengthening engineering application practices, taking into account the intersection of various disciplines, and focusing on cultivating innovation consciousness and innovation. Practical ability, training data analysis and mining, and the talents of integrated application of big data [7].

Curriculum System and Discipline Construction.

The cultivation of talents must conform to the needs of society and be closely integrated with enterprises. Therefore, before the curriculum is set up, we must first conduct in-depth research to understand the regional demand for talents. Secondly, we must understand the demand situation of talent positions, clarify the skills required for each job, list the skills, and obtain the curriculum system according to the skill list. Furthermore, it clarifies the positioning of data science and big data technology professionals, and refines the curriculum system in talent training.

In the teaching process, combined with the needs of local and regional needs, concise professional characteristics and development direction. Based on the research of data science, this major combines with local related fields, through data analysis and mining, searching for information hidden by means of algorithm, and carrying out information services such as "big data + remote sensing image" and "big data + agriculture". (Information decision, information recommendation, etc.).

Disciplinary Team Building.

Since the big data technology major is an interdisciplinary subject, the knowledge system and framework contained in the discipline are more complicated, and the faculty is not substantial. Therefore, when constructing the faculty team, consider three aspects:

- (1) Research talents who implement big data technology require the teaching team to have strong research capabilities and have the ability to manage the big data platform and platform;
- (2) Talents who are proficient in big data analysis can effectively collect and analyze data in disordered data resources to understand the data needs of the industry;
- (3) Big data technology application talents can visually present the analyzed data results and provide support for data management in enterprises and industries.

Data science and big data technology need compound talents, and they must have a solid grasp of theoretical knowledge and a skilled practical operation ability. Therefore, according to the characteristics of different types of talents, the school can combine the needs of industry and enterprises for big data talents, take employment as the orientation, carry out an all-dimensional three-dimensional big data professional practice teaching system, and cultivate high-quality talents with equal emphasis on theory and skills. . In order to meet the needs of professional construction and development, the implementation of internal training and external introduction of the team building program, the young teachers stationed in the enterprise learning is an effective way to enhance the strength of the teaching staff, it is expected to send more than 20 people at home and abroad in 4 years, Big data companies conduct short-term training and post-employment training, and introduce 4 professional teachers of big data. In addition, they have in-depth cooperation with enterprises to introduce experienced engineers inside the company to the school as part-time teachers, enrich the teaching team, and propose to introduce them within 4 years. Enterprise big data engineer 4 [8].

Practice Platform and Scientific Research Construction.

Data science and big data technology require students to have strong practical ability. In the process of students' practice, they need to participate in real practice data to achieve the ability to exercise and how to obtain real data. Many colleges and universities based on the set talent training objectives, combined with their own software and hardware conditions, experimental environment, the construction of appropriate data science and big data technology practice platform, and the establishment of experimental training platform with enterprises to ensure the normal teaching links and teachers Scientific research.

Serving the Place for the Purpose.

The cultivation and positioning of talents should be combined with localities. According to the characteristic industry of Jixi area, combined with the demand of big data talents in Heilongjiang Province, the training system of big data talents with local characteristics of Jixi is concise, and it is initially defined as "Big Data + Green Agriculture". The "big data + remote sensing image" talent training, these two directions are centered around data mining and information services, thus realizing the demand for big data talents in Jixi, and helping the development of Jixi local economy.

School-Enterprise Cooperation Talent Training Mode

At present, most of the school-enterprise cooperation is limited to the traditional model. There is no deep cooperation model. The cooperation model still has problems such as imperfect cooperation mechanism and inadequate management. It is difficult for both schools and enterprises to establish a long-term, stable and mutually beneficial cooperation mechanism, which restricts the school. The in-depth, sustained and healthy development of the joint operation of enterprises. In order to thoroughly implement the State Council's spirit of adhering to the virtues of the people and serving the development of the service, focusing on cultivating students' professional ability and enhancing professional quality, we will cooperate with enterprises to integrate production and education, integrate resources, and complement each other's strengths. The development of industry and industry needs to carry out the talent training mode of deep integration of schools and enterprises, and better serve the local and industrial economic construction. Data science and big data technology professionals can not only give full play to the respective advantages of universities and enterprises, but also jointly cultivate the big data talents needed by society, industry and market through school-enterprise cooperation. It is a win-win model for universities and enterprises.

Schools and enterprises must work together for a win-win situation. Talent training to serve enterprises and industries, enhance professional practice ability, make the work process of the enterprise curriculum, promote the employment of students as the purpose, carry out all-round, in-depth, multi-form school-enterprise cooperation mode, form a combination of schools and enterprises on demand , mutual support, and common development, to achieve a win-win development model between schools and enterprises.

Schools and enterprises must adhere to the principle of mutual benefit. This is the basic condition for cooperation between schools and enterprises. First of all, enterprises and schools jointly build cooperation platforms and technical frameworks, which not only can meet the needs of enterprises, but also help students learn and carry out scientific research in schools, and can better accelerate the transformation of scientific research achievements in enterprises and improve their technological innovation capabilities. To promote the upgrading of industrial technology. Secondly, secondly, schools and enterprises can make use of their respective advantages and resources to complement each other, establish a training and teaching base integrating theory and practice, and establish an interactive platform in training and employment to promote the curriculum development of the company's work process. Finally, in the process of cooperation with enterprises, the school can obtain the management mode of the enterprise, improve the management level of the school, improve the students' practical ability and employability, and prioritize the selection of excellent suitable talents for enterprises [9-10].

Cooperative Implementation Plan

Through market research, the school initially established a cooperative relationship with Zhongke Remote Sensing Technology Limited. and Beijing Huaxing Education Technology Limited. Oracle Data Center. The cooperation with Beijing Xipu Education Group is in contact.

Promote Scientific Research Cooperation.

Schools can use the needs of enterprises and the technology of both schools and enterprises to carry out research on horizontal topics, gradually promote the transformation of scientific and technological achievements, and promote the teaching level.

Co-Construction Internship and Training Base.

After the student completes the teaching plan in the school and stipulates the third-grade course of the university, the school recommends the employer to conduct a one-year or half-year project internship, or accept short-term pre-job training, and then conduct project internship. Schools and employers participate in management and cooperative education, so that students become qualified technical personnel needed by enterprises.

In the process of cooperation between the school and Zhongke Remote Sensing, students can carry out the training of enterprise work tasks such as the comprehensive practice of ENVI project and the comprehensive practice of ARCGIS application development at the beginning of the third year of the university. The instructor of the enterprise guides the students to complete the training of the project. The grades are given by the company's tutor, and the credits are replaced with the courses offered by the school, which can meet the graduation requirements of the students and gain the experience of corporate training.

In cooperation with the Beijing Huaxing Education Technology Limited. Oracle Data Center, the school initially carried out a school-enterprise cooperation approach combining project internships and competency certificates, as follows:

(1) During the semester, the technical teachers of the company will carry out the training of the certificate ability course content (OCA, OCP) for the students. Through the course content training, the students will gradually grasp the technical and ability points of the enterprise work process, and can obtain Oracle. OCA and OCP's international qualifications enhance student employability.

(2) The enterprise and the school jointly build an experimental and practical training center. The company invested a total of 720,000 yuan in hardware platform in two batches. On the basis of the establishment of the hardware platform, the company once again introduced a software platform of 1.4 million yuan, and carried out enterprise order training. After the students participated in the training and passed the examination, they can For cooperative employment, companies can also recommend employment for students.

Co-Construction Service Platform.

(1) Teacher sharing, directed training. Enterprise engineering and technical personnel, management personnel and personnel with special skills come to the school as part-time teachers; the school professors to the company to train employees, teach basic knowledge, and improve the ability of teachers in the school.

(2) Corporate work process courses. The school and the enterprise jointly discuss the formulation of the talent training program, so that the technical content of the enterprise work process can be curriculumized. The students can acquire the ability of the enterprise post after learning the course, and complete the requirements for the talent demand and ability of the enterprise in the process of teaching. Cultivation.

Conclusion

Schools and enterprises have their own advantages. School-enterprise cooperation is an important path for applying technical universities to run schools and train talents. Schools must have corporate awareness, communicate with enterprises, pay attention to the employment trends and market demands of enterprises, and jointly develop teaching resources and cooperation. Only by cultivating talents can we cultivate qualified talents that enterprises need and meet market needs, and achieve

school-enterprise cooperation mode of school-enterprise common education, common development, and mutual benefit.

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