

# Research on Innovation strategy of curriculum system construction of Big Data Management and Application Major in the new era

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**Abstract:** With the continuous progress of big data industry, there is an urgent need for a large number of talents with advanced skills to cope with this opportunity and challenge. Therefore, in order to strengthen the cultivation of practical talents of big data, a special major of big data management and application has been set up. From the perspective of practical application and practice, this study conducted in-depth research and discussion on the current teaching system of big Data management and application major, and proposed a combination of business driven education model, aimed at improving the education level of big data talents to meet the needs of society for practical talents of big data.

**Key words:** Big data management and application major; Curriculum construction; Paths

As big data continues to advance and its reach expands, the field of data management and application is in urgent need of a large number of professionals. It is estimated that by 2025, the vacancy of big data technical talents in China may reach a staggering 2.3 million. Therefore, the question that higher education institutions must face is how to fill this huge demand for applied talents. To deal with the problem, the Ministry of Education created a major called “Big Data Management and Application” in 2018. However, due to the relatively short history of the major and limited teacher resources, schools are still in the initial stage of building a curriculum framework for the major of Big Data management and application, with no complete or consistent curriculum framework. It is necessary to further explore how to effectively implement the curriculum framework design, and conduct in-depth research on related curriculum Settings, teaching content and curriculum structure, so as to create an application-oriented curriculum system that meets the professional needs, closely combines the actual situation and focuses on improving the ability.

## 1. Background analysis of new major construction of Big Data Management and application

With the rapid progress and popularization of information, “big things move to the cloud” refers to this era: It includes large-scale data processing power (such as big data), smart device networks (Internet of Things) and the ability of virtualization-based computer systems to provide services (cloud computing), but also covers the impact of widely used wireless communication tools such as mobile phones (mobile Internet). The national data strategy has been incorporated into the country’s 14th Five-Year Plan; And the development guidelines promulgated and implemented by the government have clearly identified key projects related to digital technology and their industrial sectors. All this heralds the birth of a new era dominated by the massive use of digital data to support the decision-making process. This also raises new demands on higher education -- how to effectively train and deliver the required professionals? Faced with such a huge challenge, universities are in a difficult state. According to the latest figures, there are only 460,000 people with such expertise in the country, and the demand for such people could reach 1.5 million in the next three to five years. In addition, research shows that the job category with the lowest supply is “data analysts”, whose demand is only 105 percent, so it can be said that there is a shortage. The shortage is so severe that companies have to pay huge salaries to recruit these expert level employees. We are in the early stages of a new data-driven era, and as the possibilities for more digitally enabled decision-making increase, there is no doubt that the market for data scientists is set to expand even more in the coming years. In order to meet the changing demand for specialized talent in this emerging career field, the Department of Academic Affairs has decided to add two new subjects related to big Data, namely, the curriculum of ‘Data Science’ and Big Data Management.

## 2. The innovation strategy of big Data management and application professional curriculum system

### 1. Actively cultivate “technology and management” interdisciplinary talents

It is one of the educational concepts to build talents with comprehensive quality of skills and management. The application of big data management work and related practice is a new curriculum project. These all form a series of cross-boundary integration and mutually reinforcing education systems that currently focus on solving problems through the use of advanced information technology. This allows the school to provide high quality teaching services while also gaining a broad sense of social identity. The new study subjects related to data processing will undoubtedly build on the existing knowledge structure and strengthen its “skill” + “governance” characteristics according to the working ability and experience requirements of practitioners in the field of large numbers. Therefore, the orientation of this new course of study is to focus on students’ grasp of practical technology, but also focus on their deep thinking ability to understand large-scale digital information. This is the result of a mixture of theoretical and practical innovative thinking. This major is characterized by its emphasis on the application of information technology and the ability to analyze big data, so as to cope with various complex management decision-making challenges. Through the use of the characteristics of big data, information technology tools and the relevant theoretical basis of management decision-making to make a reasonable assessment, evaluation of management decision-making strategy. After graduation in this discipline,

graduates will be proficient in the use of information technology and the ability of big data analysis, and can work as big data analysis or practical work in various industries involving big data.

## 2. Building a cross-integrated curriculum system

Teachers need to create a cross-integration teaching system to meet the classroom teaching goal: to produce cross-boundary experts with strong skills and understanding of language patterns. They are both technologically savvy and good at business strategy development, and to achieve this, “hybrid” learning programs will be designed to meet the specific needs of the profession. It includes a stage of basic literacy training for college students. It consists of four levels: the general literacy course, the basic research in the core field and the in-depth exploration in the specialized field. To be specific, under the current background, it is required to have the following main content sections: first, public cultural cultivation subjects such as humanities and social sciences; Second, it is the main professional courses; Third, the in-depth understanding of related technologies; Fourth, the study of various computing methods; Fifth, it is to further improve their practical operation ability and innovative thinking on these bases; Sixth, form your own unique thinking framework on the basis of all the previous steps and be able to complete some project tasks or subject work independently.

In addition to the prescribed basic generic subjects, the rest of the modules build a coherent and self-contained learning path and content chain through one or more major professional subjects. For example, teachers use the basic principles of management as a core teaching element, and combine them with the overall business strategy of the company, including such things as pricing rules for similar products, to form a new area called “Business Strategy”. Similarly, the “fundamentals of Information technology” (e.g., “Programming skills”) became the focus of another new field (which also included related knowledge such as assembling computer hardware) and this new topic was further extended to the broader information sciences (e.g., advanced topics related to software development). For those who prefer to work with numbers, the focus may be on probability theory and the computational tools that derive from it. This covers a wide range of problems in mathematical logic, which often involve a lot of complex formulae. (Others may choose to learn more about how sensors on electronic devices collect data from the world around them and organize it for further research.)

## 3. A strong emphasis on cultivating models of collaborative practice

For students majoring in Big Data management and application, they must master how to use information technology tools and large number analysis skills to deal with complex management decisions. These challenges often stem from the actual situation of the enterprise, and the most cutting-edge and practical big data management solutions also originate from the enterprise. Therefore, deepening the talent cultivation partnership of companies related to data analysis, that is, through a “collaborative” approach, is undoubtedly an efficient way to improve the quality and effectiveness of education. In 2018, the university and enterprise cooperated with SAS China to establish a joint laboratory for data analysis talent training, which provides a solid foundation for teachers to build a major in big data management and application. On the other hand, students are also required to have the knowledge and ability to apply big data technology, including data collection, cleaning, storage and other steps, and be skilled in data mining, model building and data analysis to solve problems. To achieve this goal, it is necessary for teachers to implement a “strong practice” strategy in the teaching process, which is embodied in increasing the proportion of practical courses and building a complete and systematic practical curriculum structure, so as to highlight the importance of “use”. In order to enhance the effect of “strong practice”, the school has set up a big data experimental teaching platform in 2017, and will continue to update and optimize the experimental teaching conditions according to the latest technological progress and social needs in the future to further improve the level of talent training.

## 4. The following issues should be emphasized in the construction of the curriculum system

### (1) Dynamically update the curriculum content

Due to the rapid technological changes in the big data industry, its wide range of applications and diverse business models, teachers need to always maintain a focus on the market, industry understanding and support for local economic construction. At the same time, they should closely track the research progress of professional construction at home and abroad, and keep abreast of the latest professional theories and technical developments. In addition, new phenomena and characteristics of big data in the process of new economic development need to be deeply explored and studied, so as to adjust and enrich teaching content in real time and adapt to the pace of big data development. In the setting of teaching content, emphasis should be placed on the application of new ideas, technologies and advanced tools.

### (2) Carefully design practical teaching links

To plan the actual teaching process according to the standard steps of big data analysis, teachers have established a progressive and innovative practical education framework consisting of four parts: basic operation exercises, specialized technical training, comprehensive abilities and post combat effectiveness improvement, and compiled textbooks such as “Project Practice Guide”. All the experimental projects are taken from the real working environment, using real business information, and the teaching tools used are consistent with the internal company, and the team task allocation is in line with the requirements of professional roles, ensuring that the teaching activities can be directly connected with the actual situation, thus laying a solid foundation for the successful implementation of practical education. In order to achieve the goal of improving the curriculum structure and content of the major.

### (3) Attach great importance to “double master” team training

High-quality educators are critical to curriculum implementation and a core factor affecting educational outcomes. First of all, teachers need to break through professional boundaries and let experts from various fields form teaching groups to achieve interdisciplinary integration and innovation. Secondly, teachers should be arranged to participate in the relevant training of the big data industry, so that

they can grasp the latest development trends in real time and effectively use these new ideas, skills and materials to keep their knowledge structure updated. Finally, we need to motivate teachers to continue their research, and we also need to send some teachers to intern in companies, so as to build a diverse faculty.

#### (4) Build big data experiment and training platform

Building a high-tech and fully functional big data experimental training platform is crucial to establishing a sound course structure, and it is also a key step to improve students' practical skills. According to the concept of realizing functional integration, optimizing resource utilization, strengthening service provision and implementing streamlined management, teachers need to build a database of practice cases covering various major industries, and introduce educational materials such as textbook videos and training guides into the system. In this way, students can experience the complete numerical analysis process, including data preparation and data fusion. To model creation and prediction evaluation, the entire data processing process is open and transparent, which helps students better understand the economic benefits of big data.

### 3. Concluding Remarks

To sum up, there is still a long way to go to establish a practical education system for big data technology. The data analysts and experts of the future will be the key practical skills, so schools must enhance the value of their hands-on education. Because practical ability is an important evaluation index for technical professionals, their training cannot be neglected. Only by strengthening its construction, it is possible to effectively arrange a suitable talent cultivation plan.

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