Teaching System Structure in Financial College Based on Big Data

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Abstract. With the advent of the era of big data, the surge in data volume has brought unprecedented opportunities and challenges to data mining. The complexity of big data has made data mining talents have stronger data organization, analysis capabilities and higher comprehensive quality. The university's data mining profession assumes the responsibility of cultivating data analysis talents, and is able to cultivate talents that meet the needs of the big data era, and master the skills of big data analysis technology, big data platform design, and big data platform maintenance. This paper proposes several innovations in the talent training mode by studying the data mining professional talent training mode under the background of big data, and finally gives a summary and outlook.

Introduction

The construction of practical teaching system is the key to ensuring students' ability of innovation and practice. Based on the characteristics of business talent training and relying on the advantages of economic management, the practical teaching system of business talent training with the aim of cultivating students' innovative practice ability is established. After years of teaching practice, the effect is good.

This major cultivates the basic thinking, methods and tools of software engineering, masters the business knowledge, the analysis and design theory and method of big data information system, and has the ability of information system analysis, design, implementation and maintenance, and can be applied in business applications. Software development companies, IT companies such as business information systems providers engaged in the analysis, design and implementation of big data, or in the IT departments of banks, securities, insurance and other commercial organizations engaged in data analysis, database design, and large Data platform implementation, maintenance and management capabilities, solid professional foundation, broad knowledge, and information technology composite software talents that can meet the needs of future information technology development.

The comprehensive practical teaching system for business senior talents aims at cultivating applied and compound senior professional talents, guided by collaborative innovation teaching concepts, highlights the coherence and integrity of practical teaching links, perfects practical teaching content, and enhances students' ability to innovate and innovate. Cultivate students' comprehensive professional ability to meet the needs of professionals for economic development. The goal of the three-dimensional practical teaching system of business talents has broken through the research perspective of traditional economic management professional practice teaching system, focusing on solving the bottleneck problem of market demand and talent supply contradiction, and exploring new talent training mechanism for the development of business education.

Curriculum Structure

(1) Establish a model project of school-enterprise cooperation in the field of big data-related professional fields, and combine the advantages of business schools (especially financial majors) with big data technology.
(2) Accelerate the training of qualified and even excellent big data engineering talents to meet the talent needs of the industry and expand the professional reputation of the institutions.
(3) Quickly improve the technical ability, project experience, teaching and research level of the teachers in the field of big data.
(4) Building a more advanced and perfect big data laboratory to meet the requirements of professional practice teaching and scientific research.
(5) Improve and develop online teaching resources to provide courses, courseware and case bases based on the demonstration role of the school and the radiation area.

**Curriculum Analysis Objective**

Accelerate the training of qualified and excellent big data engineering talents, meet the talent needs of the industry, expand the professional reputation of colleges and universities to open financial big data application and development, from three aspects: talent cultivation, laboratory construction, online education platform and content construction. Cooperation involves training services, employment services, hardware construction, platform construction, content construction and other fields. The time spans from student enrollment to employment.

This major trains the basic thinking, methods and tools of software engineering, masters the financial business knowledge, the analysis and design theory and methods of financial information systems, and has the ability to analyze, design, implement and maintain financial information systems, and can be used in financial applications. IT companies such as development companies and financial information system providers engage in the analysis, design and implementation of software, or engage in the analysis, design, implementation, maintenance and management of financial information systems in the IT departments of various financial institutions such as banks, securities and insurance. A financial information-based composite software talent with a solid professional foundation, broad knowledge, and the ability to adapt to the future development of information technology.

Professional skill Database system management and development: MySQL, MongoDB, Redis, HBase, etc. Big data application development language: Java as the core, supplemented by Python, Scala, R, etc. The construction, configuration, development and deployment of big data processing frameworks: Hadoop, Storm, Spark, etc. Use of data analysis and presentation tools: reporting tools, D3.js, etc. Familiar with enterprise software project life cycle, development process, specifications, etc. Understand and implement software quality requirements: performance, security, scalability, maintainability, reliability, etc. Understand the financial industry: industry background, business model, market characteristics, and how data and IT systems are used in the financial industry, the program includes the following sections:

1. Cloud training and learning platform
2. Innovation and entrepreneurship base
3. 2.5+0.5+1 mode joint talent training
4. Big Data and Business Intelligence Lab

Features are as follows:
1. Support multi-field cooperation such as personnel training, laboratory construction, and curriculum resource construction.
2. In the talent training cooperation, there is a full-time joint training mechanism from student enrollment to employment;
3. The demand for cloud computing and big data junior talent is relatively strong.

**Data Analysis and Processing**

Different data analysis and processing modules are provided for different industry applications. Through data analysis and processing, enterprises can clarify the scope of their intelligence and service capabilities, as well as the requirements and solutions implied by the data, and can meet different requirements. In-depth data mining and analysis needs of the industry.
(1) Establishing “cross-border thinking”, that is, not sticking to the majors studied, but taking a more macro-level thinking to boldly get involved in the relevant industries, so that all conclusions are based on empirical analysis. It not only requires talents to have a broader perspective and the ability to solve practical problems, but also has the ability to collect data, analyze data, apply data, and mine data. It is necessary to cultivate financial talents with both macroscopic vision and financial market practical problem analysis ability, financial basic theory learning and data application ability parallel, comprehensive and professional, both intellectual and moral.

(2) Curriculum setting is the core link in talent training and an important carrier for talent training. With the core of cultivating students' professional application ability, information application ability, problem solving ability and post (social) adaptability, the proportion of public basic courses, subject basic courses, professional courses and practical teaching courses should be reasonably set to guide students to make full use of network teaching resources, such as Excellent courses and teaching videos, etc., enable students to extensively access a large number of course information, cultivate "cross-border" thinking and awareness, and continuously improve the ability to identify information, analyze information and comprehensively apply information.

(3) In the process of cultivating financial talents, we should focus on the teaching methods that focus on stimulating students' interest in learning and the reform of examination methods based on the application of students' ability to ensure students' knowledge and use of knowledge. Teachers should not only pay attention to students' understanding of theoretical knowledge, the operation of practical skills, the interpretation of practical problems, but also the flexible use of layered teaching, peer interaction, teamwork and other means to create high-performance teaching modes, in many complicated Construct a three-dimensional, diverse and complete knowledge system in information and problems.

**Hadoop Big Data Integrated Experiment System**

This experimental system is designed to provide students with a complete set of Hadoop and its environment, design, development, monitoring, maintenance tools, software and services. With this experimental system, the experimental and training environment requirements of the core technology courses of this major can be met.

This experimental system is divided into two major components:

A. *virtual lab environment for students to learn big data*: The environment is carried out by means of the aforementioned virtualized desktop teaching system, and the network administrator configures the big data learning virtual machine in advance for the students to use.

B. *The real environment for research or large-scale case presentations*: This environment is carried out through several servers.

Basic platform: The basic platform for big data storage and processing, which can realize the storage and management of massive data, support common components of platforms such as Hive, Impala, Pig, Spark, and Yarn, and provide support for data analysis services on the platform. These common components increase the ease of use of platform data, making data manipulation and data analysis easier to use, saving labor and reducing labor time.

C. *Data integration*: support the unified storage of massive structured data, semi-structured data, and unstructured data, deepen the expansion of enterprise intelligence and service capabilities, and improve the decision-making level of enterprises. We can use enterprise-level data ETL tools or open source ETL tools. For example, Flume, Sqoop, Kafka, etc., integrate externally structured, semi-structured and unstructured data into big data platforms. Through this platform, faster and more convenient data integration can be achieved.

D. *Data analysis and processing*: Provide different data analysis and processing modules for different industry applications. Through data analysis and processing, enterprises can clarify the scope of their intelligence and service capabilities, as well as the requirements and solutions implied by the data. Solutions and the ability to meet the deep data mining and analysis needs of different industries.


**E. Data Access:** An application built on a platform. A variety of data access modes are used, both for applications on the platform and for quickly responding to data on the platform for rapid data integration and data analysis. The platform data access adopts the graph data engine, SQL engine, stream data engine, machine learning and other methods to ensure the stability of the data entry and exit platform.

**F. Platform operation and maintenance:** real-time and uninterrupted monitoring and management of the services and data resources involved in the platform through the visual management terminal, reasonable setting of early warning thresholds, ensuring timely notification and display of abnormal resource status, and timely notification via SMS and email Managers discover and deal with problems. In the case that the cluster is uncontrollable, you can use the platform to perform data backup after the disaster, version upgrade of the cluster, or rollback of the version. At the same time, with the advantage of the big data platform, the trend of the internal service running status of the platform can be predicted.

**System Architecture Diagram**

The system is a comprehensive product that includes data storage, data integration, data analysis and processing, and application API services. Supports enterprise-level data integration and processing, and integrates multiple open source ETL and data processing and analysis tools; it includes both in-memory data analysis (Spark) engine and Ad Hoc. Query; provides both a real-time search engine and deep analysis and mining tools. The composition is shown in the figure below.

![Figure 1. System architecture diagram.](image)

**Summary**

This paper applies the big data application technology to the network recruitment data analysis, the current training of data science and big data technology professionals in university is accurate and consistent with the current big data application industry standards and norms, and matches the knowledge structure and skills of the big data application professionals with the curriculum system design. The talent training mode enables students to be systematically trained in data analysis, data management, data storage, etc., to discover, analyze and solve practical engineering and technical problems. The professional practice link has a sound practice teaching system, and the proportion is set appropriately. The teaching team has formed a team of teachers with reasonable structure, stable personnel, high academic level and good teaching effect, the data science and big data technology professionals training program has reached the national standards.

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