Journal of Computing and Electronic Information Management

ISSN: 2413-1660

Research on talent demand analysis of IoT major in higher vocational colleges based on big data technology

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Abstract: The structural contradiction between talent supply and demand has always been a major problem in China's higher vocational education. Although the development prospect of the Internet of things (IoT) is very good, the employment of students majoring in IoT in higher vocational colleges has not been ideal. One of the most important reasons is that the professionals trained in most colleges are out of touch with the social needs, and the setting of professional curriculum training system is unreasonable. Recruitment website is the most direct way to understand the demand of talent market, which can reflect the characteristics of talent market demand from all aspects. Based on this, this paper designs and implements the talent demand analysis system of IoT major based on big data technology, realizes the talent supply side reform and improves the quality of talent training.

Keywords: Big data, talent demand, IoT major, Skill analysis, Talent supply side reform, Spark platform, Distributed crawler.

1. Introduction

Under the period of new infrastructure in China, the Internet of things (IoT) will be everywhere. Stimulated by the huge investment amount and the irreplaceable role of the Internet of things during the epidemic, the Internet of things will continue to flow with the new infrastructure policy in the next few years. Under the new development opportunities, the Internet of things major will usher in development opportunities, but also accompanied by great challenges.

The national vocational education reform implementation plan (20 items of vocational education) puts forward that occupation education should adapt to the development demand of Internet + occupation education, and improves teaching methods by using modern information technology. The new generation of information technology,

especially the deep integration of big data, IoT, artificial intelligence and education, makes it possible to deeply track and quantify the learning process, collect and gather all kinds of data in the educational scene and even other cross-border data. The development and reform of China education field are facing unprecedented opportunities and challenges. The integrated application of big data and education has become an inevitable requirement of the development of the times. As the contact point of the new generation of information technology integration application, the application of big data technology to the Internet of things major is the actual demand and future trend of professional development. It has practical significance and can effectively promote the training of Internet of things professionals to develop in the direction of personalization, scientization and intelligence.

The structural contradiction between talent supply and demand has always been a major problem in higher education. From the supply side, many college graduates face employment difficulties every year. From the demand side, a large number of companies are facing the dilemma of failing to recruit talents to meet their needs. The coexistence of job search talent and talent search job reflects the imbalance between professional counterpart ratio and professional supply-demand ratio. Therefore, following the development of the industry, it is of great significance to actively grasp the talent demand dynamics of the tourism market, and then cultivate students' post skills and abilities.

Smith. D [1] collected the recruitment information of program developers from the recruitment website, and analyzed the demand trend of several programming languages in recent years by using keyword index technology, so as to provide reference for the curriculum of computer specialty. Zhan [2] analyzed the needs of e-commerce posts, the overall needs of skills and the skills that each post pays close attention to by building e-commerce post system, skill index system and professional skill dictionary and using the 66925 recruitment information of e-commerce industry collected. Liu [3] captured and analyzed recruitment data through web crawler technology, and analyzed the characteristics of post demand, salary level and other influencing factors. Wei [4] investigated and analyzed the actual demand situation of accounting talent market in Hunan Province from the aspects of enterprise talent demand and enterprise basic situation by using the relevant data of online recruitment of Hunan recruitment network. Through Chinese word segmentation and text clustering of recruitment information on Zhilian recruitment website, Tang et al. found that there are differences between the career types of required talents and professional fields [5]. It can be seen that big data mining based on massive recruitment information has become an effective method to understand the talent positions and skill needs of enterprises. Especially with the maturity of web-based text

mining technology, more and more educators at home and abroad apply it to the education industry.

2. Significance of talent supply side reform

With the expansion of college enrollment, the number of fresh graduates is increasing year by year, and the employment pressure cannot be underestimated. In recent years, the employment of college students is still one of the focuses of the state and society. The university has also introduced a large number of companies to recruit, but it has not solved the problem of difficult employment. Students are not unwilling to find employment, but cannot find suitable jobs. Some recruitment websites, such as 51job and Zhilian recruitment, find jobs through mechanization, and cannot intelligently recommend jobs according to students' skills. As a result, students read countless recruitment information but failed to find a satisfactory job. Therefore, if we can measure students' skills by analyzing students' achievements in school, and then dig out the skills required for the post, and compare the two, we can well recommend suitable jobs to students.

The post analysis and recommendation analysis method based on big data technology has important practical significance for teaching managers, teachers and students.

For professional leaders, the system can track students' achievements and employment in time, and adjust professional talent training programs according to relevant data. The talent training of the Internet of things specialty should closely follow the market demand, follow the development of industry technology, and improve the professional quality of the trained Internet of things talents.

For teachers, through the analysis results of the system and referring to the skills required by the company when recruiting posts, they can update their own knowledge system and participate in relevant social training, so as to adjust the curriculum standards of the courses and update the teaching content in time, so that students can accept new knowledge faster and keep pace with the times.

For students, especially those who are about to graduate and are looking for a job, they can get relevant employment information through the system. By comparing the professional course scores at school with the employment information that has graduated, they can know what work they are suitable for, what units they go to find a job, and what professional knowledge they need to learn. For freshmen and sophomores, they can make a learning plan through the skills corresponding to the enterprise position obtained by the system, so as to understand the skills and knowledge required for the position earlier than others.

3. IoT post analysis system based on spark platform

In order to realize the data automatic process from data acquisition to visualization, the platform is divided into four modules as shown in Figure 1. Each module is executed regularly and interacts with each other through data storage [6]. The acquisition data by web crawler is stored in the HBase database. After data cleaning is completed from the HBase database, the results are stored in the Hive data warehouse. Data analysis is implemented based on Spark platform, and the analysis results are stored in the MySQL database. The front-end and back-end are separated through the Flask framework, the back-end reads data, the front-end obtains data through Ajax, and the chart is displayed by Echarts by library.

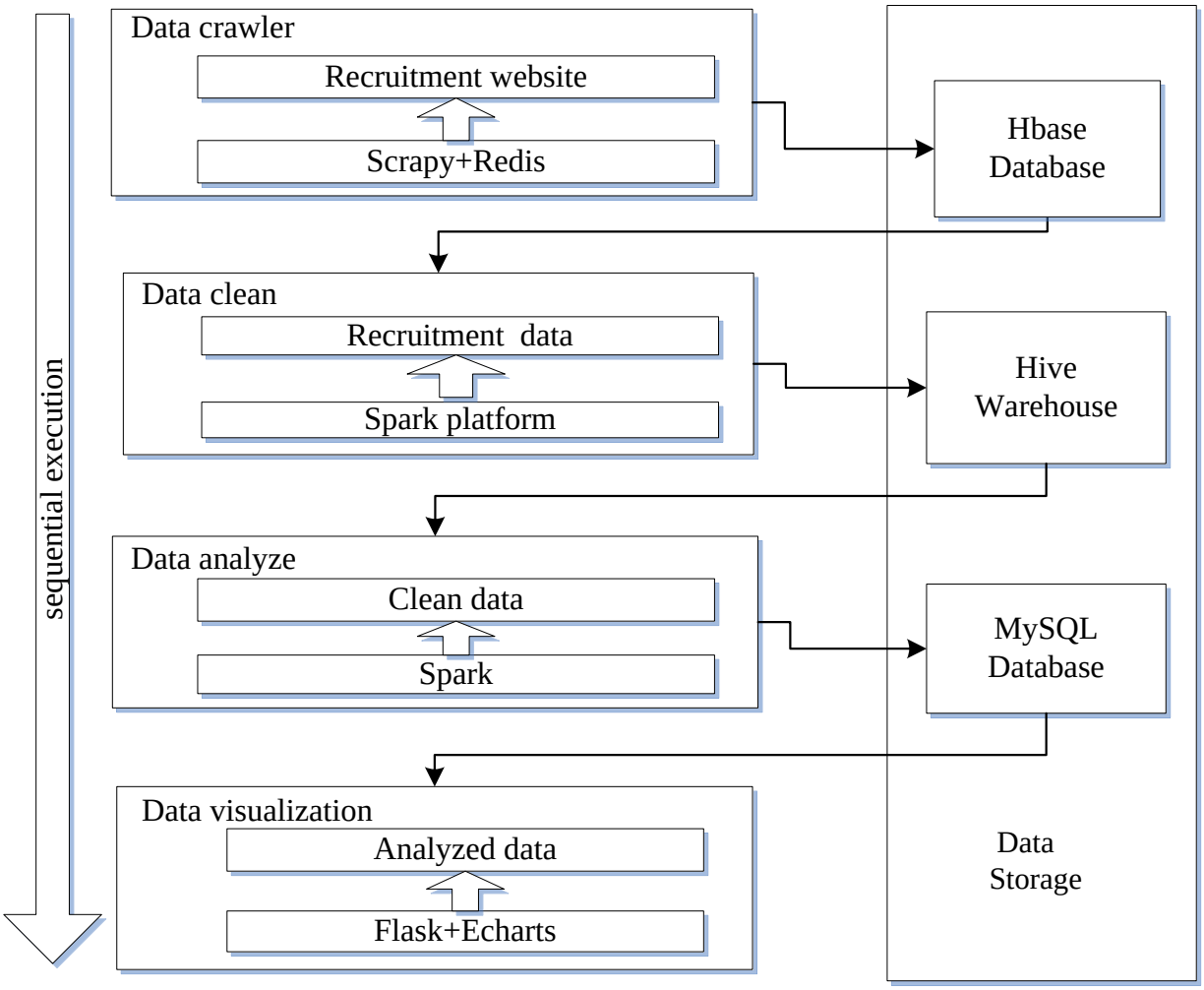

Fig. 1 The system architecture of IoT talent analysis platform

3.1 Analysis flow based on spark

This process is strictly followed in the system, which is implemented in the order of data acquisition, data processing, analysis and recommendation and data display. The business process is shown in Figure 2.

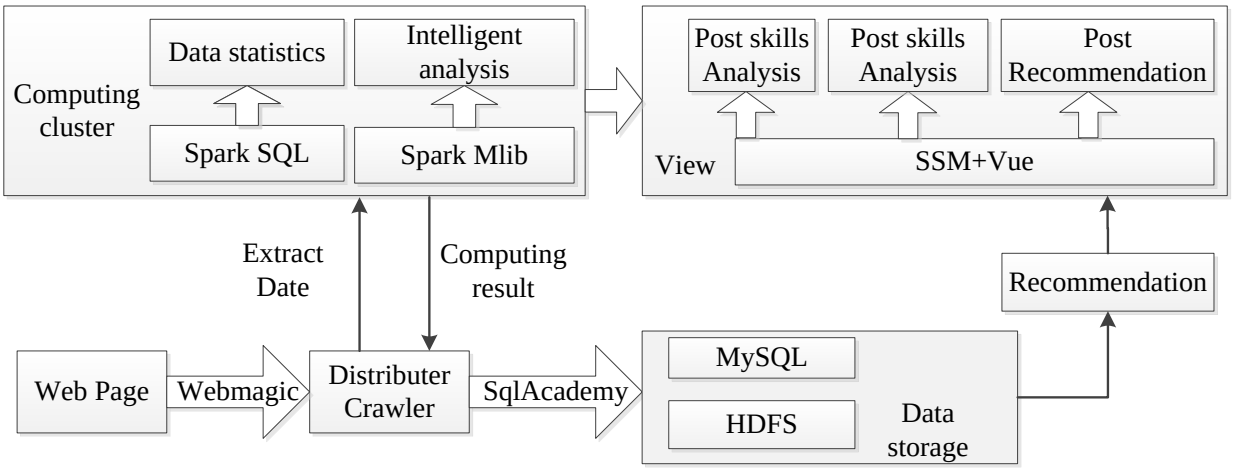

Fig 2. The flowchart of the post analysis processing

3.2 Data dictionary definition

Taking the IoT major in higher vocational colleges as an example, this paper collects and preprocesses the Internet of things recruitment information, and creates a professional skill dictionary. Firstly, on the basis of analyzing the recruitment information of large recruitment websites, refine the common and individual contents of recruitment information, including the main key fields, the characteristics of expression and the differences between websites, and study the possible hidden knowledge, so as to provide the basis for demand analysis, model construction and data capture; Secondly, from the recruitment sample data, combined with the domain expert knowledge, the core skill words corresponding to the indicators in the skill structure model are extracted to build an extensible skill dictionary.

3.3 Distributed data crawler

The distributed crawler system adopts the master-slave structure. One master server is used to manage the Redis cache, control the URL distribution in the URL library, and monitor and protect the whole crawler system. Set up multiple slave servers to execute crawlers. The data capture module is mainly composed of five functional modules: Browser scheduling, page download, data extraction, anti-crawler and data storage.

3.4 Data analysis

It analyzes the talent market demand related to the IoT major in higher vocational colleges from multiple angles. Use statistical analysis, correlation analysis, correlation analysis and other technologies and algorithms to analyze the distribution of job category, salary and other talent market demand; Job experience and other basic conditions of talent market demand; Correlation analysis between skill requirements such as communication ability and business ability and job category. According to the analysis data of different time stages, the market demand of Internet of things professionals in higher vocational colleges is predicted based on bootstrap integration

algorithm and hybrid model.

The post analysis and recommendation method based on big data technology needs to express the text content from the recruitment website into the format required for subsequent processing through the content analyzer, so as to call it in the subsequent stage. The application of collaborative filtering recommendation strategy in job recommendation overcomes some limitations of content-based recommendation strategy and has no dependence on its content attributes. In the collaborative filtering algorithm, the calculation of similarity plays a very important role. In the post-based recommendation strategy, the user's nearest neighbors are determined by similarity, and different weight values can be given to different nearest neighbors according to their similarity.

3.5 Application of teaching reform

With the help of the skill dictionary constructed and the predicted data of job classification, skill demand and talent market demand mined, taking tourism management major in Higher Vocational Colleges as an example, this paper discusses its ways and methods in talent training objectives, curriculum system, teaching design, teaching staff, school enterprise cooperation, social services and other aspects in the era of big data, Improve and enrich the empirical research on the reform and innovation of talent training mode for Internet of things majors in Higher Vocational Colleges in the era of big data. Through the post analysis of big data technology, complete the adaptation of professional training objectives to industry needs, timely grasp the talent needs and changes of enterprises, and take this as the starting point to establish and dynamically adjust talent training objectives. We should be employment oriented, ability-based, and based on job needs and career standards.

4. Conclusion

In the era of big data, the construction and reform of various majors are facing new challenges. It is imperative for higher vocational Internet of things majors to adapt to the market demand for talents and adjust to meet the reform and innovation of talent training mode at this stage. The research on job classification and skill demand provides a reference for this reform. The relevant research on the job classification and skill needs of employers mostly relies on manual methods such as questionnaire survey and interview. However, this method has a series of problems such as limited sample size and laborious. Big data mining technologies such as web text analysis based on job recruitment information provide the best way to solve this problem. The application of big data mining technology based on massive data is an effective and efficient means to comprehensively understand the market posts and skill needs of Internet of things specialty in higher vocational colleges. Relevant research is

conducive to the construction of Higher Vocational Internet of things curriculum system and the cultivation of Higher Vocational Internet of things students' professional ability, and plays a positive role in meeting the needs of tourism talents under the background of big data. The talent training goal of vocational Internet of things specialty is the decisive factor in its talent training mode, and the research on post and skill demand can fully understand the vacancy of social tourism talents, so as to determine the talent training goal more pertinently, and then carry out relevant teaching practice and reform.

Acknowledgements

This work was financially supported by the funding of teaching research project of computer basic education of national institute of computer basic education of colleges and universities (2020-AFCEC-053), Qianfan science and technology team of Jiangsu Maritime Institute (Big data analysis and application research team), young academic leaders of Jiangsu colleges and universities QingLan project, excellent teaching team of Jiangsu colleges and universities QingLan project (Innovative teaching team of software technology specialty) , and the big data collaborative innovation center of Jiangsu Maritime Institute.

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