Design and Algorithm Implementation of Visualization Platform to Promote Enterprise Listing Based on E-commerce Big Data Analysis Based on Quantum PageRank Algorithm

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Abstract:With the advent of the era of big data, in order to improve the core competitiveness of enterprises, it is first necessary to solve the problem in the field of e-commerce big data, promote the design and algorithm of visualization platform, study the design of data visualization analysis system based on the field of e-commerce big data, and analyze the main modules of the system. , background query module and page data request design, help enterprises through data visualization analysis system, PageRank algorithm and its application in technology impact evaluation system, innovatively consider patent timeliness, and improve enterprises based on patent citation relationship Citing the network's technology impact assessment method.

1. INTRODUCTION

Based on the purpose of innovation and strategic management, it is necessary for enterprises to effectively identify technology competitors in the industry [1], analyze their influence and status in industry technology, and infer their future technological innovation potential and technological development trends [2]. Only in this way can we accurately Only by grasping the direction of technological development can enterprises have a better foothold in the technological innovation and development of the industry [3]. The advent of the era of big data (BIGDATA) has also brought about the development of information technologies such as the Internet of Things [4], the Internet, and cloud computers, which combine human life with information processing to generate huge amounts of data [5].

Design the data visualization analysis system based on the field of e-commerce big data. With the rapid development of my country's market economy and the continuous improvement of people's living standards [6], more and more people accept the concept of advanced consumption, so many personal credit Consumer demand, various forms of lending have also rapidly increased, such as credit cards, Huabei, borrowing and so on. However [7], from an overall perspective, the personal credit business of banks still has the characteristics of small overall scale and low profit contribution [8]. The reform of my country's college entrance examination system is continuously deepening, and the large-scale expansion of colleges and universities has realized that most people can go to college [9]. wishes. Although colleges and universities are expanding their enrollment every year, the number of students is decreasing year by year, and the enrollment of many colleges and universities is not very optimistic, which has caused the competition among colleges and universities to become more intense [10].

The source of students in colleges and universities is closely related to the development, which determines the lifeblood of colleges and universities [11]. The registration rate of students is affected by many factors, so if you still rely on traditional publicity methods [12]. Big data is a new concept that has received extensive attention in recent years. It refers to a technical system or technical framework P1 that extracts its value in an economical way by capturing, discovering and analyzing a large amount of data with complex types and sources at high speed [13]. From the perspective of breadth, big data includes massive amounts of data, as well as methods for data processing, analysis, and application of data [14]. The domestic data warehouse was introduced later than foreign countries, and the concept of data warehouse appeared at the end of the 20th century [15].

Due to the fierce competition in the domestic market, the development of data warehouses is very rapid. Taking Alibaba as an example [16], Alibaba built a data warehouse "cloud ladder" through the Hive architecture in the early stage. Through this product developers can directly configure and modify the data warehouse on the web interface [17], reducing the learning cost of developers. In order to grasp the development trend of technology and choose technology reasonably, scholars at home and abroad have put forward some representative methods [18]. Huang Lucheng et al. proposed a technology development trend evaluation system based on patent analysis based on patent time series, patent citation and patent IPC classification analysis method, combined with technology life cycle [19], technology research hotspots and technology opportunities. As a new business model, e-commerce brings users a more efficient and convenient service experience [20]. To realize the development of traditional business services to the PC platform, this service trend can provide customers with more personalized services according to their purchasing characteristics [21], and it is of great significance to effectively analyze a large amount of e-commerce data.

In addition, since the logic of rough sets is the basis of uncertain reasoning about rough sets, developing the theoretical basis of this kind of logic is also an important topic of current rough set theory research [22]. However, there are a

large number of visual analysis systems built specifically for bank personal credit-related data. Moreover, the system also needs to have the ability of visual display analysis and visual data mining [23]. Visual display analysis needs to extract the functions of the data visualization platform. At present, the general data visualization platform has many functions and complicated operation methods. Some of these functions are not suitable for the characteristics of personal credit data. The process of extracting hidden, potentially valuable data from vague, fuzzy, and random data [24]. This process is called knowledge discovery from the database. Since the concept of data mining was first proposed in 1989, it has been widely promoted around the world. The subsequent international conference on data processing further promoted the further development of data mining, and after decades of development.

2. THE PROPOSED METHODOLOGY

2.1 The Quantum PageRank Algorithm

With the sharp increase in the number of patents, the importance of citing emerging patents to the research and development of independent patents has increased, making the limitations of this evaluation method more and more obvious. Examining the existing domestic and foreign enterprise technology impact evaluation methods, there is no method that takes into account that the old and new patents will have different effects on the invention of subsequent patents.

Data collection mainly includes two aspects: collecting customer data, providing analyzable raw data for subsequent e-commerce data, and collecting product information to provide detailed information for customer purchases; the data analysis process is mainly for the products purchased by customers, through the system Reorganize and analyze the data flow, establish a consumption event table for customers, and supplement the event table with the information database. The data warehouse established by hive is the core part of the system, and hive can directly obtain a large amount of user behavior data on HDFS To interact with business data, this system builds user behavior data warehouse and user business data warehouse respectively. The underlying mapreduce distributed computing framework of hive is suitable for ultra-large data that cannot be processed by traditional databases such as mysql and oracle.

Based on this consideration, this paper introduces the timeliness of patents in the original PageRank algorithm idea, and improves the evaluation algorithm of enterprise technology influence. The empirical analysis part of this paper takes the field of hydraulic braking system as an example, uses the information in the NBER patent citation data set of patents in this field to build a citation network of enterprises in the field of hydraulic braking system, and evaluates the technical influence of related companies in this field. After extracting and updating product information through web crawlers, it extracts customer information through deep packet inspection technology (DPI). In the data visualization analysis system based on the field of e-commerce big data, the product information database such as description corresponds to the DPI module. For the understanding of incomplete information, there are two semantic interpretation omissions and absences.

2.2 The Enterprise Listing E-Commerce Big Data Analysis

Different from Wang Shu et al., this paper believes that the weight W of an edge, that is, the citation intensity, should be considered as the weighted sum of the number of patent citations between enterprises and the time factor, and the shorter the time interval between patents being cited by other patents, the greater the time factor, and the greater the time factor. The weight W is the greater the citation strength. Again, this paper focuses on technology citations between firms. In order to ensure that the designed data visualization analysis system based on the e-commerce big data field can effectively visualize the data, 100 groups of data are processed, and the traditional method is compared with the processing results of the system in this paper. According to the parameters set in the above simulation and the environment settings, experiments are carried out, and the results are as follows.

The back-end mainly refers to the business layer. The business layer uses the Python language and the Flask framework. Users operate through the visual interface according to the functions they need, and then mobilize the relevant models and algorithms of the business layer, mainly including abnormal data detection, parallel coordinate optimization, feature importance evaluation and model DAG analysis, etc., to achieve the corresponding functions. The data layer refers to the place where data is stored. Based on the MVC model, the system designs a top-down three-layer architecture, which are the view layer, the data application layer and the data source layer. Since the system includes two core functions of massive data display and high-dimensional data visualization, each core function includes several sub-functions. Therefore, in order to achieve functional division and component isolation and reuse, multiple view sublayers are designed to deal with corresponding functional requirements respectively. A large number of tasks will be generated during big data analysis. This system automatically organizes and schedules the complex task execution process through the workflow task scheduler Azkaban.

Azkaban has a visual web interface that developers can quickly learn and get started with. Developers can create tasks, edit tasks, set logical relationships between tasks, and schedule tasks on Azkaban. And you can monitor the running status of the workflow through the web interface at any time, and you can quickly receive the execution result through the mailbox when the workflow execution completes or fails. The PageRank algorithm, proposed by Page et al., has been used by Google to identify the relative importance of web pages, thereby improving the relevance and quality of search results

3. CONCLUSIONS

This paper draws on the application of PageRank algorithm in the evaluation system of enterprise network technology influence, innovatively considers the timeliness of patents, and uses the patent citation relationship between enterprises to build a big data platform based on Hadoop, and stores the massive historical data collected through HDFS. . As the underlying computing framework of Hive, MapReduce is used for offline analysis of business indicators, and resource scheduling is performed through model to ensure the normal operation of the system.

4. REFERENCES

[1]Zhang Yang. Design and implementation of a general platform for big data visualization and statistical analysis [D]. Beijing Jiaotong University, 2019.

[2] Chen Hairui. Design of data visualization analysis system based on the field of e-commerce big data [J]. Science and Technology Innovation and Application, 2018(24):2.

[3] Lin Ting, Liang Xuejun. Design and implementation of big data visualization analysis system [J]. China Broadband, 2021(6):2.

[4] Guo Dan. Design and implementation of data visualization for consumption decision-making platform based on big data [J]. Automotive World, 2020.

[5] Sun Chaochen. Application analysis of big data technology in e-commerce platforms and enterprises [J]. 2020.

[6] Liu Quan, Jia Meimei, He Mengjia. Design and implementation of traditional clothing e-commerce platform based on big data technology [J]. Henan Science and Technology, 2019(5):3.

[7] Hao Jiawei. Design and implementation of Spark-based big data analysis and mining platform [D]. Xidian University, 2018.

[8] Wang Jing, Niu Rui. Design and implementation of smart grid visualization platform based on big data architecture [J]. 2022(4).

[9] He Wentao. Design and implementation of Spark-based industrial big data energy efficiency analysis platform [D]. Dalian University of Technology, 2018.

[10] Zhao Long. Design and implementation of e-commerce data analysis platform [D]. Hunan University, 2019.

[11] Chen Jiayan. Visual analysis of online education big data based on Tableau [J]. Jiangsu Business Review, 2018(2):3.

[12] Peng Yu. A Data Visualization Analysis Method Based on Big Data Platform: CN111444230A[P]. 2020.

[13] Standard Committee of Critical Care Medicine Branch of China Society for Health Information and Health Care Big Data, Specialized Committee of Critical Care Medicine of Beijing Cancer Society, China Severe Pulmonary Electrical Impedance Working Group. Chinese Expert Consensus on Clinical Application of Pulmonary Electrical Impedance Imaging Technology in Severe Respiratory Management [J]. Chinese Journal of Medicine, 2022, 102(09):615-628.

[14] Yin Liang, Luo Chunjiang, Liu Yin, et al. A business visualization method and system based on big data platform: CN112364086A[P]. 2021.

[15] Wei Nan, Chen Tao. Visual analysis of e-commerce research hotspots under the background of "Internet +" [J]. Science and Technology and Management, 2018, 20(1):9.

[16] Wang Yan. Design and implementation of e-commerce precision poverty alleviation platform based on big data [J]. Automation Technology and Application, 2021, 40(3):4.

[17] A Rong□, Wang Danqi. Design of customer precise service management method for e-commerce platform based on big data analysis [J]. Machine Tool and Hydraulics, 2019, 47(18):6.

[18] Cheng Pan, Luo Nianxue. Design and implementation of big data visualization platform for social management [J]. Surveying and Mapping Geographic Information, 2020, 45(3):3.

[19] Jia Hongjia. Design and implementation of technological innovation data visualization system [D]. Shijiazhuang Railway University, 2018.

[20] Feng Jianying. Application analysis of big data technology in e-commerce platforms and enterprises [J]. Digital Communication World, 2020(5):1.

[21] He Le, Cao Yongzhong. Design of Human Resource System Based on Big Data [J]. Computer Science and Application, 2022, 12(2):10.

[22] Tao Peng, Yang Junli. Design and implementation of a visual data analysis platform based on Python [J]. Information Recording Materials, 2021, 22(8):2.

[23] Chen Liping, Wu Qilin, Li Xiaorong. Case Design and Analysis of "Big Data Analysis" Course: Taking Network News Analysis Case Design as an Example [J]. Journal of Inner Mongolia University of Finance and Economics, 2021, 19(1):3.

[24] Zhang Liang. Design and Implementation of Visual Data Analysis Platform under Python [J]. Computer Fan, 2019, 000(002):51.