The Application of Big Data in Electronic Information Engineering

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Abstract. With the development of Internet of things, more and more people pay attention to big data. Electronic information engineering is mainly about the acquisition and analysis of information. In this information age with explosive growth, a large number of data need to be correctly and reasonably analyzed by electronic information engineering combined with big data technology. Therefore, this paper proposes the application research of big data in electronic information engineering. Through in-depth study of big data related technologies, this paper constructs NoSQL data aggregation model, analyzes the importance of big data technology and the application of big data technology in electronic information engineering technology, and draws a conclusion that about 60% of people think big data technology is very important, and the application of big data in electronic information engineering technology accounts for 40%. The research in this paper is helpful to promote the progress and development of electronic information engineering and improve the profitability of enterprises.

Keyword: Big Data; Electronic Information Engineering; Bulon Filter; Nosql Model

1. Introduction

1.1. Background and Significance
The world is undergoing a revolution. The information technology and information technology revolutions that have taken place in the world have played a decisive role in the direction of social change with unprecedented methods, and the result will inevitably lead to the formation of the world's information society [1]. The most important feature of the development of information socialization is the era of big data information [2]. In the era of big data, the development of all social groups requires data sorting and information processing. Therefore, big data is very important for electronic information engineering, and it can boost the development of electronic information engineering [3-4].

In the process of social sustainable development, electronic information technology has always been an advanced technology that combines modern electronic technology, information technology, and communication technology, showing great development potential [5]. With the deepening of social informatization and the expansion of the application scope of electronic information technology, its technology is also constantly improving, especially in order to adapt to the development needs of
various fields, combined with big data information technology, to bring high profits and high development to enterprises. It also promotes the rapid development of the national economy [6-7]. The advent of industrial informatization has also made social competitiveness pay more attention to data. How to better use data to collect data and analyze and process can stand in the era of informatization big data [8].

1.2. Related Work
Due to the importance of electronic information engineering technology and the characteristics of the era of big data, more and more scholars have conducted related research on this. For example: Wang G generates and exchanges data volume through the Internet, conducts big data business analysis, and proposes a mature SCA framework based on strategy and operation, but it is too cumbersome in actual use [9-10]. Therefore, this article proposes the application research of big data in electronic information engineering.

1.3. Main Content
In order to solve the data problems in electronic information engineering, this paper puts forward the application research of big data in electronic information engineering, fully combining the characteristics of the times, and promoting the development of electronic information engineering technology development of.

2. Electronic Information Engineering Application Method Based on Big Data

2.1. Electronic Information Engineering Technology Optimization Method Based on Big Data
(1) Combination of qualitative analysis and quantitative analysis
   In the research process, this article uses a combination of qualitative and quantitative methods to learn a variety of big data analysis technologies, including Hadoop HDFS, NoSQL technology, MapReduce technology, etc., and summarizes the difficulties and difficulties of big data in electronic information engineering, And carried out actual analysis to get the feasibility of big data in the application of electronic information engineering.

   (2) Research direction
   Through reading and summarizing the research results of many domestic and foreign researchers, I understand the current status of big data exploration and the problems of electronic information engineering applications, and put forward my own characteristic research direction.

   (3) Research methods
   In this article, by issuing questionnaires and other archive-related topics to relevant university staff and students, and conducting on-site inspections to relevant archive managers, we can gain insight into the current development of universities and existing problems, comments and suggestions And make a summary.

   (4) Comparative induction
   This article analyzes the research results of domestic and foreign staff on big data, compares different data analysis methods, summarizes the shortcomings and problems in practical applications, and demonstrates the advantages of combining electronic information engineering and big data.

2.2. Bloom Filter Algorithm
Bloom filter is a filter system that can perform information selection, such as black and white lists, website spam concerns, etc. It is mainly used to retrieve the existence of an element in the collection.

Bloom Filter (BF) is a random data structure with very high spatial performance. The use of bit sequence can be easily expressed, and can determine whether the item belongs to the set. This is a fast probability algorithm used to determine whether there are elements in the set. Bloom cards may cause false episodes, but they will not lose episodes. In other words, if the Bloom filter determines that the item is not included in the collection, it will definitely not be included. If the crisis factors exist as a
whole, the crisis may be wrong. That is: I would rather kill three thousand by mistake than miss one. Therefore, these applications are not suitable for zero error situations. In applications that allow low error rates, Bloom filters save space compared to other commonly used algorithms (segmentation, semi-search, etc.).

The advantage is that the space efficiency and questioning time are better than the general algorithm, but the disadvantage is that some false recognition rates are difficult to delete. If there are too many elements, that is to say, n/m is too large (n is the number of elements and m is the number of Bloom filter bits), it will lead to excessive judgment of wrong decisions. Now the filter needs to be rebuilt, but this situation is relatively rare.

Suppose the total element is n and the misjudgment rate is P, then the size of BT is:

\[ m = \frac{n \cdot \ln p}{(\ln 2)^3} \]  

(1)

The number of hash functions:

\[ k = \ln 2 \cdot \frac{m}{n} = 0.7 \cdot \frac{m}{n} \]  

(2)

The relationship between the misjudgment rate P and m and n:

\[ P = \left(1 - e^{-\frac{mk}{n}}\right)^k \]  

(3)

For example, when the error rate is P=0.01, m is approximately 13 times n and k is approximately 8. The unit m here is different from n, m is the unit bit, and n is the unit of the number of elements (to be precise, the number of different elements). Usually, because the length of an element has many bits, it can usually save the memory usage of the filter.

3. Application Research Experiment of Big Data in Electronic Information Engineering

3.1. Data Mining Model Under Big Data Architecture

Convert big data into big data system. This is a mathematical model of consumers, analyzing a large amount of data stored by companies, looking for various customers or market departments for analysis. The method of hobby and action is also called "discovering knowledge in the database". By extracting data and comprehensively understanding data, companies can understand and understand the characteristics of customer needs more comprehensively, in more detail, and more accurately. Enterprises have also increased the interests of potential customers, consumer preferences, and opportunities to understand consumer psychology, which will help enterprises improve their management functions and efficiency. Commonly used models in data mining are: cross-selling model, association recommendation matching model, Internet credit model, e-commerce dynamic pricing model, and information aggregation classification model.

3.2. NoSQL Aggregate Data Model

NoSQL data collection models usually refer to unrelated databases. NoSQL database is created specifically to solve the problems caused by the large amount of data collection in the application. NoSQL is just an idea. Unlike related databases, it cannot guarantee the acidic nature of related data. NoSQL is a new innovative database movement. That supporter supports the use of unrelated data
storage. Compared with the large-scale use of relative databases, this is undoubtedly an injection of new ideas.

NoSQL has the following advantages: easy to extend, there are many types of NoSQL databases, but the common function is to delete related functions of the related database. Because there is no relationship between the data, it can be simply expanded. The refuge also promotes the expansion of the building level. The performance of reading data is very high. Especially in the case of a large amount of data, the performance is also very good. This is due to the non-relativity and simple structure of the database.

NoSQL database is suitable for the following situations: 1. The data model is relatively simple; 2. It requires a more flexible IT system; 3. It requires higher database performance; 4. does not require a high degree of data integration; 5. For a given key, it is easier to map the environment of complex values.

4. Application Research and Analysis of Big Data in Electronic Information Engineering

4.1. Analysis of the Emphasis on Big Data
Big data is very important in this era. This is also the key to realizing the commercial value of big data. Only by doing a good job of data analysis can we manage the development of the industry in advance and achieve success. Market initiative will generate more value. In the information age, data has become an important factor in production. All social companies will collect a large amount of data analysis results to reduce costs as much as possible, improve product quality, increase production efficiency, and improve the production of new products.

This article interviewed an Electronic Information Engineering Technology Co., Ltd., conducted interviews with employees at different levels of the company and issued questionnaires to show the importance of big data in the eyes of modern people in the form of percentages. The survey results are shown in the following table:

|                | take seriously | Value | General | disregard |
|----------------|----------------|-------|---------|-----------|
| Directors      | 10             | 5     | 2       | 1         |
| Departmental Manager | 25             | 3     | 6       | 4         |
| Departmental staff | 60             | 35    | 20      | 13        |
It can be clearly seen from Figure 1 that the management of the electronic information engineering company is very concerned about the application of major data, and attaches great importance to the development of big data in its industry; and the employees of the company also have the awareness of attaching importance to big data, and they are all in Actively learn big data-related technologies to improve their ability level, and at the same time bring greater benefits to the company, and provide first-hand data analysis materials.

4.2. Analysis of the Application Status of Big Data in Electronic Information Engineering

The rapid growth of information data and the bombardment of information input have brought severe challenges to all walks of life, but at the same time it has also brought precious opportunities. This article explains in detail the current application of big data products and big data technology from four areas of education, industry, medical care, and construction. As shown in table 2:

| Table 2. Application of four major fields in big data |
|-----------------------------------------------------|
| Big data products                      | 5.2 | 8.6 | 7.3 | 9.4 |
| Big data technology                    | 10.2| 5.8 | 7.9 | 8.9 |
| Application degree of big data         | 29.8| 35.6| 45.5| 42.3|

Figure 1. Company members' attention to big data
Big data products mainly include big data search engines, image recognition, advertisement push, etc. Big data technologies include data mining, data sorting, data analysis, etc. As can be seen from Figure 2, the overall level of big data application in the industry is not high, the coverage rate is not high. The medical and construction industries have performed well in the application of data products and big data technology, showing a trend of continued development.

5. Conclusions
This article mainly studies the application of big data in electronic information engineering. The purpose is to promote the development of electronic information engineering technology, fully integrate the characteristics of the era of big data, and improve data processing efficiency. Methods The Bloom filter algorithm was used for data screening, the NoSQL model was used for data aggregation, and finally the data was analyzed. The advantage of this article is to fully combine big data with electronic information engineering technology to solve practical application problems. There are still some shortcomings in this article. Big data technology still has some technical shortcomings, as well as technical cost issues.

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