Application of Big Data Technology in Computer System

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Abstract: In modern society, data and information are showing an explosive growth. People will use and generate a large amount of data in their lives and work, and these data have certain value. In order to analyze these data, people began to actively study big data technology. At present, big data technology has been widely used in computer systems, which enriches the functions of the system and improves the application effect of the technology. This article conducts an in-depth analysis of big data technology and discusses its application in computer systems.

Keywords: Big data, Technology, Computers, Systems

1. Introduction

As network technology gradually penetrates into people's study and life, people will generate many valuable data when they use network technology. Through real-time analysis of these data, valuable content can be extracted from it, which can provide people with life and work certain convenience. Big data technology is one of the new technologies that can quickly process massive data in real time. It can quickly organize various types of data in real time, and filter out valuable information and data after sorting. Since these data are used to create higher value [1]. The use of big data technology in a computer system can improve the operating efficiency and service level of the system, increase system functions, and promote the further improvement of people's life and work efficiency. Therefore, the current related fields must conduct in-depth research, apply it better in computer systems, and improve the degree of integration between the two [1].

2. Analysis of the connotation of big data

2.1 Concept

From a narrow perspective, big data refers to the integration of a large amount of data and information, and the information is summarized; from a broad perspective, big data refers to the use of corresponding technology to process the data after the data is integrated [2]. Analyzing and extracting important laws from data is a type of technology that has important differences from traditional computer technology, and it can process data in a variety of ways. Using big data technology can analyze a large amount of data technology will be more scientific and play the core role of big data technology [2]. The current academic world does not have an accurate definition of big data, and it can be regarded as a major type of technology that can optimize the workflow. If big data is regarded as an information asset, big data has the characteristics of a total amount of mass, and the growth rate of data is extremely high.

2.2 Characteristics of Big Data

First, big data is "big", and the data storage unit is TB level. In some special cases, the data volume of big data needs to be calculated by PB. In the development of modern society, people need to use information platforms or software in their work and life, and corresponding information will be generated in the process of using them [3]. With the continuous popularization of network technology, the amount of data people generate every day also begins Rapid growth. Second, the types of big data are diversified. Big data comes from multiple sources, and its specific manifestations are extremely diverse, but the main forms of existence are structured data and

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unstructured data [3]. Structured data is a data form that can be embodied in a two-dimensional table. The structure of unstructured data presents an irregular state, and the data model is random, such as common video data, audio data, image data, and table data. All of them belong to unstructured data, as shown in Figure 1. Finally, big data has the characteristics of fast and efficient processing of messages. The growth rate of data in the information age is extremely fast. Whenever people are in the process of communicating and socializing, there will be a large amount of data information. Big data can instantly complete the processing of information on different occasions, and transmission and exchange [3].



Fig.1 Big-Data-Powered Network Design Cycle

3. The importance of computer systems in the era of big data

In the context of big data, with people's increasing demand for data, the requirements for computer systems are more stringent [4]. Computer system technology is divided into software and implementation technologies, as well as software development methods and technologies, and software and implementation technologies are more detailed. Including programming language, compilation technology, operating system and utility programs, database technology, software tools and implementation technology, software development methods and technologies can be further divided into software engineering, programming methods, data structures and algorithms. No matter which branch it is, it is the focus of computer science. Since the 1950s, computer systems have achieved significant results in five aspects: programming language and language processing, operating systems, data settings and processing, software tools, and technology and regulations [4].

4. The application of big data technology in computer systems

4.1 Cloud Computing Technology and Its Application in Computer Systems

Cloud computing is a type of big data technology that people are currently generally familiar with, and people often apply it to cloud computing platforms in their lives, which can quickly extract and analyze data generated by the Internet. There are two main ways for cloud computing technology to analyze information, namely parallel and distributed computing, which can comprehensively integrate the generated data, find the laws among them, and sort out the data. If cloud-computing technology is applied to the computer system, the large amount of data resources contained in the system can be properly managed, and the calculation model can be constructed according to the law of the data to complete data processing. The emergence of cloud computing technology is gradually diversified, and the information that people publish on the network platform is also more diversified. Therefore, cloud-computing technology has emerged in this context. After the calculation is completed, the network can be accessed in real time according to the actual needs of the visitor, and resource sharing can be completed in the network [5]. At the same time, the cloud-computing platform can also enable users and suppliers to interact effectively, complete resource selection in a short time, and require low computing costs, which not only

reduces the application investment of big data technology, but also improves the efficiency of technology use. Taking China Telecom as an example, Figure 2 shows the concrete performance of the cloud computing technology architecture.



Fig.2 Application of Cloud Computing Technology in Computer System

Cloud computing technology has high application effects. It can perform calculations on various data or provide cloud services to users in combination with general requirements. The main key of this technology is that it can complete the model construction, and upload all the data generated during the use of the system to the cloud platform, which can control the cost used in the analysis and processing of the information, which can be improved to a certain extent. In using cloud computing, virtual computing will be used to complete the computing work [6]. There is no need to purchase additional equipment or software. Judging from the current market and industry development trends, the cloud-computing platform will be the main data processing used in the future. One of the means. When cloud computing is used, services will generate a variety of data through software, and a closed-loop feedback information processing model can be constructed through centralized integration of data. When the cloud computing technology completes the information processing, it will be displayed in the system according to the flow chart, and different groups and transmission channels will be generated. Cloud computing technology has a complex framework that can implement virtual experiments on data, thereby ensuring the effectiveness of data application in information systems and reducing the time required for data processing [6]. Cloud computing technology can also ensure that the system achieves the purpose of resource sharing, guarantees the efficiency of data utilization, and can avoid the phenomenon of repeated data processing.

4.2 Data Backup Technology and Its Application in Computer Systems

The connection between data backup technology and people is extremely close, which can help people back up their data and avoid the impact of data loss on their lives or work. Since the emergence of big data technology, the era of big data has taken shape. Today, as work efficiency continues to improve, people are also beginning to pay attention to whether their information is safe. For example, after entering the website, people will fill in some information to cause their own information to be stolen or tampered with, which seriously threatens the security of information [7]. For enterprises, once data is lost, it is likely enterprise and cause serious economic losses to the

enterprise. In this case, in order to avoid the impact of data loss or data damage on people, big data technology has developed data backup technology, which can no longer make people worry about this problem after backup. Once the data or information is lost, the data backup technology can be used to complete the restoration, as shown in Figure 3. However, in the process of using the technology, it is necessary to ensure that the data backup technology has a good match with the original system, so that the effectiveness of the data backup technology application can be guaranteed and the backup can be started in time after the information is damaged or lost [8].



Fig.3 Application of Data Backup Technology in Computer System

The application range of data backup technology is also relatively wide, whether it is personal information backup or enterprise information backup, it needs to be applied to this kind of technology. The role of a computer system is not only to store and manage information, but also to ensure the security of information, so that the information system can meet the needs of users [9]. Therefore, data backup technology will be applied in the information management system of many enterprises to ensure the safety of data in the system and avoid data loss that will bring certain losses to the enterprise. When applying backup technology, it can not only complete the backup processing and information recovery of information, but also build a disaster recovery system to provide important technical guarantees for the safety and use value of data. Data backup media that are often used in life include U disk and hard disk [8]. This method can not only complete data backup, but also can be stored off-site. Through this kind of media, the data can be browsed and used in any place with a computer [9].

4.3 Hadoop Technology and Its Application in Computer Systems

Hadoop technology may be a relatively unfamiliar term for people. In essence, it belongs to a software framework. Its main function can implement distributed processing of massive amounts of data and information, and has extremely high reliability. The working mode of the Hadoop platform is parallel. Parallel processing technology can be used to quickly process data [10]. At the same time, it has scalability, and can process PB-level data effectively in real time. The use of the Hadoop platform is more dependent on community services. This feature also determines the lower cost of the technology. Everyone can use the Hadoop platform. The Hadoop platform currently includes two major functions, a distributed database and a file system. It is one of the current mainstream application platforms. Figure 4 shows the architecture of Hadoop.



Fig.4 Hadoop Architecture

The Hadoop platform has the characteristics of high performance and low cost. It also has many applications in information systems. It cannot only complete data processing and storage, but also has good compatibility and can be matched with most databases. Although big data technology can complete data processing and analysis, the centralized management function of the Hadoop platform has more unique advantages. It can coordinate data when processing data and has extremely high application value. The Hadoop platform has greater advantages in processing unstructured data, such as video content, user behavior, etc., using the Hadoop platform to process better results, and it can read and analyze a large amount of data multiple times [10]. For example, Alibaba uses the Hadoop platform to analyze user behavior, and social software uses the Hadoop platform to analyze the role relationship between people.

5. Conclusion

In summary, as a large agricultural country, the current traditional agricultural development model has seriously affected the improvement of agricultural development. Family farms are an inevitable process for the development of the times. Under the background of the Internet era, with the help of advanced Internet technology, through the above five aspects of work, the innovation of family farms can be realized, the level of agricultural automation and the core competitiveness of the industry will be improved, and the core competitiveness of the industry will be improved.

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