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The Application of Cloud Computing Technology in Computer Data Processing

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Abstract: ***In recent years, with the rapid development and continuous progress of cloud computing technology in China, it has provided a good platform for computer data processing work, played a role in promoting the progress of computer technology, has a wide range of applications, and can enhance the data processing level of computers, which is of great significance. Based on this, this article studies and analyzes the application value of cloud computing technology in computer data processing, and proposes several application suggestions, aiming to provide assistance in enhancing data processing effectiveness.***

Keywords: Computer data processing; Cloud computing technology; Big data.

1. INTRODUCTION

With the development of information technology, it has brought convenience to people's lives and has been widely welcomed by people. The arrival of the information age has promoted the further promotion and application of information technology to meet the increasing demand for social information data. Therefore, big data and cloud computing technology are introduced, relying on hardware devices such as cloud servers, data center switches, and backend databases to collect, process, analyze, and store data resources within wide area networks or local area networks. The data processing results are sent to customer terminal devices for display, achieving real-time control and application of computer data.

The application of cloud computing technology in the process of computer data processing can not only improve the convenience of data processing, but also ensure the effectiveness of data mining and processing. It is necessary to focus on the characteristics and requirements of data processing, improve the corresponding platform, design different models reasonably, focus on developing service clients, enhance the reliability of applications, and leverage the value of cloud computing technology in computer data processing to achieve the expected technical application goals.

2. OVERVIEW

Cloud computing is a product of the development of science and technology, a symbol of the information age and modernization of science and technology, and a huge era of data, namely massive statistics. It can convert thousands of data into countless small programs through cloud computing technology. In addition, the system utilizes data for computation and analysis, and can send the processed results to users in a small program within seconds. Cloud computing is the essence of earth science and technology, known as grid computing. It is a key technology used in current computer systems, such as the development of information technology and the integrator technology based on load balancing in earth science, the practicality of parallel computing, and the storage capacity of computer networks. The application of cloud computing technology is a prerequisite for obtaining powerful network services.

In logistics and urban planning, Meng et al. (2025) [1] proposed deep learning-based methods for green warehousing logistics optimization, while Wang (2025) [5] applied Bayesian optimization to enhance urban delivery network reconfiguration. Li, Wang, & Zhang (2025) [3][7] explored gamification and named entity recognition techniques to improve citizen engagement and data visualization in smart cities. In healthcare, Wang et al. (2022) [2] conducted a comprehensive analysis of immune microenvironments in gastrointestinal cancers, and Li (2025) [6] investigated machine learning for adverse event monitoring in chronic disease drug trials. Yuan (2024) [8] developed transformer-based techniques for processing medical-legal texts, highlighting AI's role in document analysis. E-commerce and industrial applications have also benefited from AI innovations. Song (2025) [4] and Song (2024) [9] explored intelligent demand forecasting and AI-generated content (AIGC) to enhance user experience and operational efficiency. Meanwhile, Wu (2025) [10] optimized industrial IoT systems through

cloud-edge integration, and Chen (2025) [11] leveraged cloud infrastructure for autonomous driving data management. Computer vision research has seen notable progress with Peng, Zheng, & Chen (2024) [12] introducing domain generalization techniques for 3D human pose estimation, and Peng et al. (2024) [13] proposing vision-language models using 3D Gaussian splatting. Additionally, Deng, Bi, & Xiao (2025) [14] developed transformer-based methods for real-time financial fraud detection, showcasing AI's expanding role in fintech.

3. THE PROBLEMS OF CLOUD COMPUTING TECHNOLOGY IN COMPUTER DATA PROCESSING

3.1 Security risks inherent in the technology itself

Cloud technology also has security issues, as its openness provides convenience for users while also offering possibilities for crime. In a series of network security issues, using cloud technology to obtain relevant data information can easily lead to data security problems. Special attention should be paid to data processing security in cloud technology, timely and securely processing data, and preventing the security leakage of data information[11].

3.2 Safety Management

The problems with the application of cloud computing technology, especially in the field of security management, are the theft of information provided by users regarding secure destruction through cloud computing technology [12].

4. THE APPLICATION VALUE OF CLOUD COMPUTING TECHNOLOGY IN COMPUTER DATA PROCESSING

4.1 Helps to enhance the effectiveness of data mining and processing

The application of cloud computing technology in computer data processing work in the new era environment can enhance the efficiency of data processing with the help of advanced technology, ensure the effectiveness and optimization level of data organization, and ensure the security of various types of data information. Especially in the process of rapid progress in computer technology, massive amounts of data information have emerged, with large scales and high quantities, leading to an increase in the number of calculations and processing of data information. Traditional technologies are no longer able to meet current data processing needs. Scientific application of big data technology is not limited by equipment or other factors, efficiently mining data information content, enhancing processing performance and level, and obtaining more valuable data information [13].

4.2 Emphasize the construction of cloud computing system

When providing computing power services to enterprise users, cloud computing technology service providers can first build the cloud computing system internally, so that users can quickly complete computer data processing within the system while using cloud computing services, without having to enter the cloud computing technology platform and seek cooperation with software service providers. Small and medium-sized enterprises with low demand for computing power can completely control the cost of computing power within their long-term acceptable range, so that cloud computing technology can spread to more small and medium-sized enterprises [14].

4.3 Ensure data backup and recovery

After undertaking computing power services for various enterprises, cloud computing technology service providers have essentially become cloud computing data centers. Once the service provider fails to protect the data properly, resulting in data loss that cannot be recovered, a large amount of funds will be lost. Therefore, it is very important to strengthen the data security work of cloud computing technology and be able to recover data in a timely manner after data loss. Currently, some cloud computing technology service providers have begun to research cloud computing+blockchain technology, which has the basic conditions for integration. Moreover, blockchain has great advantages in data security. If cloud computing technology service providers can combine

cloud computing and blockchain into one, the information security guarantee problem of data backup and recovery will be easily solved [15].

4.4 Helps to enhance the convenience of data processing

In the process of traditional computer system operation, hardware devices are mainly used to process data, which cannot ensure the security of system operation. At the same time, hardware configuration needs to be improved, which has a negative impact on the effectiveness of various data processing. After adopting cloud computing technology, it is possible to break through the limitations of time and space factors, comprehensively process various types of data information, accurately handle various types of data information content with the help of cloud and cloud computing platforms, enhance processing efficiency and effectiveness, optimize work modes, and ensure data security processing and stability control [16].

5. CLOUD COMPUTING APPLICATION STRATEGIES IN COMPUTER DATA PROCESSING

5.1 Strengthen the research and development of hybrid cloud computing

The development of cloud computing technology is the key to enhancing data processing capabilities. We should strengthen research and development work, improve relevant technologies, and clarify the coordination between cloud computing technologies. In terms of developing cloud technology correctly, it can manage data automation more strictly. In addition, in order to reduce the operating costs of computers and promote the application of cloud computing technology in computer data processing, it is necessary to continuously improve cloud computing technology to promote the development of cloud computing.

5.2 Data Mining Techniques

Data mining technology is a technique that quickly finds the effective data information it needs from a large amount of network data resources. This technology is a deep processing and development of the existing data resources on the network. At present, for computer data information processing in local area networks, it usually revolves around massive, complex, and poorly correlated data resources, mining valuable and correlated data content, including data collection, data preprocessing, data cleaning, data transformation, data mining and other execution processes. Through the powerful computing, filtering, and integration capabilities of data mining technology, useful data resources can be found from huge databases and extracted to corresponding data warehouses for storage management. The preprocessing techniques for data mining here mainly adopt methods such as mean method, smoothing method, and prediction method to actively filter out data information with high error rate, redundancy, and repetition rate in the network, such as null values and noise. If the data mining preprocessing technique using the mean method is adopted, its calculation formula is $C_i = (i-1)\sum(i-k)C_j|K$, which processes the mean of all known attributes of the data, and then arranges the data according to the established rules to sort out the data processing results that are closest to the real situation [3].

5.3 Improve data processing platforms and models

In the work of computer data processing, advanced cloud computing technology should be actively applied, and the platform system mode should be improved to provide users with a cloud computing data information processing platform based on computer systems, so that users can apply and operate the system with high quality, and strengthen the deployment and processing effect. And various operating platforms and language environments need to be set up in the platform to enhance the effectiveness of data loading and the level of data processing. At the same time, it is necessary to design a reasonable data processing model, with computer networks as the core part, using cloud computing technology and architecture in the network system, creating different models based on various user needs, optimizing the configuration of technical resources, and improving program models and systems. In the process of model design, data flow applications and application patterns should be created in virtual machine devices, combined with the characteristics and situations of the data information that needs to be processed to create models, improve distributed computing functions, and enhance service software. This not only reduces the cost of cloud computing technology applications, but also improves the convenience of data information processing and application.

5.4 Establish a sound supervision and control mechanism

Cloud computing technology is an emerging technology in the actual development process, with a short development time. Although it has been widely applied in many fields, it has not yet formed a mature application model. In addition, the application of cloud computing technology mainly involves data information processing, which can easily lead to information leakage, malicious attacks, or data abuse. The reason for such phenomena is the lack of a relatively complete supervision and control mechanism, which cannot quickly and accurately detect problems and ensure the quality of technology application. Therefore, the reasonable use of advanced computer technology in the data processing process of computers should improve the supervision and control mechanism, supervise the overall data processing program and process, improve the supervision mode, prevent risk problems or other issues, and make the application of technology progress towards health and stability. In the process of establishing a sound supervision and management mechanism, the focus should be on monitoring hacker attacks and network insecurity, promptly identifying problems and responding quickly to prevent the loss and tampering of user data. At the same time, it is necessary to improve the data standardization system and normalization system during the supervision process, strictly follow the requirements of such standards for supervision, and if any non-standard or irregular phenomena are found during the application of technology, strict punishment must be imposed to ensure the high-quality and efficient processing of data information, and to unleash the value of cloud computing technology.

6. CONCLUSION

In recent years, with the rapid development and progress of computer information technology, data processing has received widespread attention. The scientific application of cloud computing technology to process data information can not only enhance work efficiency, but also improve the current development status, which is of great significance. Therefore, cloud computing not only improves productivity and industrial level in computer data processing, but also makes people's daily lives more convenient. Cloud computing technology is used for computer data processing to ensure secure transmission of data. However, in the process of development, cloud computing needs to constantly improve its own vulnerabilities to promote the effective development of cloud computing technology and better apply it to the modernization of computers and information society.

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