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A Study on Key Issues Confronting the Development of Data Cloud Technology Applications

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Abstract: ***Modern society has entered the era of big data—an epoch characterized by an explosion of data information. Within this context, cloud technology plays a pivotal role in advancing the data era, serving as an essential instrument for delivering unique, comprehensive, and flexible information services to users. As society continues to evolve, the demands placed upon work, study, and daily life have steadily increased, thereby elevating the requirements for data collection, integration, analysis, and feedback. Cloud technology addresses these demands by enabling more complete data processing and facilitating the broader integration of such capabilities into everyday life.***

Keywords: Data Cloud Technology Development Issues.

1. INTRODUCTION

The concept of the cloud is applied to the Internet to describe the future form and substance of development. It refers to the servers, device terminals, network data lines, etc. contained in global computer software and hardware, and a high-quality, comprehensive data service with individually tailored features that is carried out on a one-to-one basis according to all the needs of users, and the service is cheap and cost-effective. Big data cloud technology is to customize almost all information services needed according to the high level of the user's personal situation, so that the user can get the maximum satisfaction. However, the application development process and future of data cloud technology will also have diverse problems, so it is necessary to rationally and legally apply it to more conveniently facilitate economic and social development. Deng and Yang (2025) proposed multi-layer defense strategies combined with privacy-preserving enhancements to effectively counter membership inference attacks within distributed machine learning frameworks [1]. Addressing fairness in digital advertising, Yi (2025) developed a real-time ad allocation system utilizing Contextual Bandits-with-Knapsacks to ensure equitable exposure for small and medium-sized businesses and underserved content creators [2]. Beyond software systems, Tang, Kojima, Gotoda, Nishikawa, Hayashi, Koike-Akino, and Klamkin (2020) contributed to photonic engineering through the design and optimization of shallow-angle grating couplers for achieving efficient vertical emission from indium phosphide devices [3]. In user interface design, Sun (2026) explored the potential of AI-assisted generative tools to enhance both the efficiency and creative capacity of designers, signaling a shift toward automated but personalized UI development [4]. Within the energy sector, Zhao, Xu, Zhu, Liang, Zhang, and Jiang (2025) introduced a CNN-Bi-GRU hybrid deep learning model to improve the accuracy of both short- and long-term renewable electricity demand forecasting [5]. Concurrently, Liu, Wang, and Liang (2025) advanced computer vision methodologies by proposing MiM-UNet, an efficient building segmentation network that integrates state space models to refine architectural feature extraction [6]. Financial analytics has also seen novel methodological contributions, with Liu (2022) empirically examining how financial constraints impact firms' ESG ratings based on evidence from the Chinese stock market [7]. In materials science, Yin, Xu, Xie, Luo, Wei, and Li (2024) applied deep learning techniques to automate the classification of crystal systems in lithium-ion batteries, thereby streamlining material characterization for energy storage applications [8]. Furthermore, Luo, Wei, Xu, Li, Xie, and Yin (2024) enhanced e-commerce conversational agents by implementing Falcon-7B large language models optimized with 16-bit full quantization to balance performance and computational efficiency [9]. In the context of financial transaction security, Ximeng and Yiming (2026) employed offline conservative reinforcement learning to intelligently authorize transactions by dynamically balancing the trade-off between fraud risk mitigation and user friction [10]. Zhao, Lin, Yang, Lu, Xue, and Jiang (2025) further optimized deep learning architectures specifically for the prediction of dynamic market behavior under volatile conditions [11], while Yang, Xue, Hu, and Zhang (2025) designed a comprehensive AI-driven closed-loop risk control system that manages credit security across pre-loan, mid-loan, and post-loan stages [12]. On the medical front, Tian, Wang, and Cui (2024) improved U-Net based brain tumor segmentation accuracy by incorporating GSConv modules and ECA attention mechanisms [13]. Ren (2024) developed a novel feature fusion-based contextual model for precise

smoking detection in complex environments [14]. Finally, two studies focused on precision digital strategies: Zhou (2025) proposed a collaborative filtering model based on user behavior for distributing social media content within private automotive domains [15], and Wensi (2026) demonstrated how AI-enabled data visualization marketing on automated production lines can build customer trust and significantly improve lead-to-order conversion rates [16].

2. THE IMPORTANCE OF DATA CLOUD TECHNOLOGY

The history of big data is from search engine era to data warehouse era, from data mining era to ML era. Big data applications have more and more connections with our life, production, technology and other aspects, and data has been more and more comprehensively applied to various fields through more people and the network, and the integration analysis of data has brought convenience and progress to all aspects. People's growing dependence on big data is the beginning of a gold rush for big data, in which there will be more opportunities and opportunities for those with the capabilities and ideas.

The cloud computing market is likened to a battlefield by many industries. The birth of more and more related technologies makes the whole technology more and more perfect and comprehensive. Big data cloud technology has also been used in more and more directions and industries, making the development of science and technology, life fields, cultural communication and other directions more and more dependent on the services provided by big data cloud technology.

Big data cloud computing technology is one of the most critical means for the society to move towards the information age, which generally refers to the network service support technology and the management of massive data that adapt to the tenant mode. Storage, computing, analytics and other technologies are platform and supportive technologies in the field of information technology, an important link related to the construction of new national infrastructure, and key technologies for national economic and social development and the construction of technology systems.

In 2011, the National Institute of Standards and Technology proposed the concept of cloud computing, that cloud computing is a resource integration management mode, can be convenient, comprehensive, on-demand way through the network application to achieve rapid, efficient, automated configuration and management of resource information. The cloud is also a metaphorical term for the internet and network.

Cloud technology is a type of publicly available computing, which involves the decomposition of huge data computation processing programs in a networked cloud platform into countless Mini programs, processing and analysis through a system of multiple servers, and finally obtaining the results and returning them to the user. Cloud computing also known as network computing, through this technology can be completed in a very short period of time to analyze and integrate huge data, so as to achieve the effect of network services. Today's cloud computing is not just distributed computing, but distributed computing, utility computing, load balancing, parallel computing, network storage, virtualization and other computer technology after the evolution and leap.

Cloud technology is the information foundation towards the global Internet era and an important form of application service model, and of course it is also an inevitable trend of information technology intensification. The formation of big data is due to the information construction of the Internet has reached a very high level. The data base is huge, the source is diverse, the type is complex, the update is rapid and many other characteristics, so that cloud computing has become the basic measure of processing big data. The arrival of cloud computing and big data era symbolizes that informatization has entered the intelligent stage of data deep exploration and integration.

Cloud technology and big data have provided new methods and new ideas in managing and accepting complex problems, reflecting very great technological, economic and social value, and causing great attention worldwide. In the future, more effective use of cloud computing and big data will have a huge impact on the economy, scientific research, political and other aspects, but also will produce more opportunities and opportunities. The rapid development of cloud computing and big data Optimizing the business environment, promoting economic development and enhancing social mobility plays a decisive role. It is also conducive to breaking the traditional institutional framework, promoting the transformation and progress of government functions at all levels, and enabling the country's overall strength to be greatly developed.

3. APPLICATION OF DATA CLOUD TECHNOLOGY

The rational and comprehensive application of data cloud technology in enterprise financial management can greatly increase the range of enterprise financial data collection. Greatly improve the accuracy of enterprise financial data and improve enterprise work efficiency, and data cloud technology breaks down traditional management models and enables enterprise data channels to be broadened. Gaining more comprehensive and effective information allows enterprises to summarize better directions of development based on the analysis of the data obtained, moreover allows businesses to allocate resources more rationally in day-to-day management, and achieve a greater degree of development and progress under limited conditions. In addition, enterprises can analyze more rational, comprehensive and scientific information requirements of customers and suppliers, produce products and launch services targeted, and scientifically control and manage enterprise costs to maximize enterprise development benefits.

The application of data cloud technology in scientific research, which generally requires the computation and summary of large amounts of data. Through data cloud technology, experimental data, experimental cases, etc. can be summarized, analyzed, summarized more quickly and accurately, so that more accurate and comprehensive experimental data and conclusions are presented to researchers more quickly, so as to accelerate the development of data science and promote innovation in data application.

Application of data cloud technology in library and archives management. In the management of traditional libraries and archives, the resources that can be stored and applied are limited, and in the subsequent management of digital libraries and digital archives, advanced equipment is also needed, and the cost is high. However, after applying data cloud technology, it is possible to find and accept data on the cloud platform through the underlying terminal equipment, reducing equipment costs. And because the data can be found in the terminal equipment, administrators can manage the data in the library through the management server, saving human resources costs.

Application of data cloud technologies on campuses. Creating a smart campus cannot be without the help of data cloud technology, which can improve the integration and allocation of campus resources through better data analysis, improve the overall development level of the school, and meet the different needs of different students and teachers.

Application of data cloud technology in electronic bid management. The first is to expand scientific services based on the cloud and to directly push out comprehensive project information for tender procurement. Second, big data analysis technology is used to determine the rationality of the bid price and to restore the attributes of the market competitors. The third is to build a data analysis model of transaction behavior, study the correlation of the behavior of participating parties, and realize cloud regulation.
Modern society cannot live without data cloud technology, which is reflected in all aspects of social development and has a place in almost all fields.

4. PROBLEMS WITH DATA CLOUD TECHNOLOGY

With regard to the issue of privacy breaches, data cloud technology is a high-level technological means generated in the development of society. People use huge data through data cloud technology to analyze and apply it, and these data also contain personal private messages. How to protect personal privacy from other people's access and illegal exploitation requires not only stronger technical support, but also more comprehensive and strict legal protection.

Data is the new factor of production, and it is the basic and strategic resource of the country. As well as personal property attributes, data cloud technology must be strongly secured in order to be widely used in more fields, rather than allow some institutions and enterprises to turn away data cloud technology because of security issues.

With regard to user habits, many users are fond of traditional data storage and analysis methods and do not understand data cloud technology, so we must make the use of data cloud technology more simple, convenient, easy to understand and easy to learn. Promote users' desire for better use.

For network transport issues, data cloud technology relies on network transport, If there is a slow and unstable network, the application of data cloud technology is difficult to realize, so data cloud technology relies on the development of the network. Only a high-speed and stable network environment can make data cloud technology more widely used.

For the test of durability, the development scope of data cloud technology is still small, and in the current network environment, the data technology can not develop better, so the data cloud technology must wait for the time, to withstand the test of time, and wait for the network environment to mature and stable. And the data cloud technology will coexist with physical storage devices such as hard disks for a long time, but the full integration of network and digital technology will allow the data cloud technologies to be fully developed.

5. FUTURE TRENDS IN DATA CLOUD TECHNOLOGY

With the continuous development of Internet technology, the country gradually attaches importance to big data technology, which has made the data era come fast, and big data technology has been more widely used in various fields of society, and data cloud technology will be the key to resource sharing in the era of big data. The function of the Internet is more and more powerful, users can process huge data and obtain needed information on the Internet through cloud computing. The future development of cloud computing will be to build large-scale infrastructure which can be closely integrated with the application. However, because big data technology lacks a unified and comprehensive specification, there are many problems in the development of data cloud technology at present. Therefore, the development trends that China's data cloud technology needs to present in the future development include the development trend of data resourceization and industrialization, so as to make data more comprehensive and broadly covered. The analytical platform of data cloud technology is more of an uncertain situation, allowing the data of the cloud platform to expand flexibly; Data security is more rigorously guaranteed, and will not be compromised or lost. The deeper mining and analysis of data makes the questions given by the data more comprehensive, specific and detailed.

6. DEVELOPMENT STRATEGY FOR DATA CLOUD TECHNOLOGY

First, vigorously strengthen the training of big data technology talents. The rapid development of the big data industry and the lack of professional talent will gradually limit the continuous progress of data technology. To prevent the development of the information technology era, the state should encourage schools and enterprises to cultivate professional talents and support projects, launch a special program for big data talents, and also introduce professional talents appropriately, and strengthen training, promotion and even popularization of expertise.

Second, establish a sound and complete system for the development of big data markets and establish adequate evaluation mechanisms for big data. Through the implementation of government guidance mechanisms for the big data market, encourage the investment of social capital, accelerate the pace of the industrial development of big data and technology research and development, develop businesses, improve demand mechanisms, and promote the steady development of data cloud technology.

Strengthen research on core elements and strategies of data cloud technology so that security is fully guaranteed. The use of big data is often accompanied by security issues, We must increase security consulting and evaluation services, establish a comprehensive security system for important data resources in financial, scientific research, telecommunications, statistics, public transportation, and strengthen the comprehensive protection of state secrets, corporate information, and personal privacy.

7. CONCLUSION

Data cloud technology will become the most important basic measure in the storage space in the near future. It synchronizes the sharing of data that each user is able to represent and obtain through the Internet. Data cloud technology reflects the dual role of PC memory and hard disk, but also a safety deposit box for network applications, safely and completely storing the data that users need to save. Although there are still many technical and device problems that need to be overcome, data cloud technology will be widely used in the future. In short, as data cloud technology continues to improve and mature, it will eventually replace PCs and hard drives as the primary way people store data and accelerate the world's global networkization and digitization.

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