Research on the Development of Computer Communication and Networks in the New Era

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Abstract: ***Currently, modern information technology has been widely applied in various industries, and computers are becoming an effective tool for people's learning, life, and work.At this stage, we have entered the Internet era, and the computer communication technology has gradually developed rapidly, which has laid a solid foundation for China's informatization construction. The effective promotion of China's computer communication network technology can further enhance China's comprehensive national strength.Network communication technology has made people's lifestyles more convenient. Remote video through computers and communication through email have gradually become important ways for people to interact and communicate online.Computers have enabled people from different regions to no longer be limited by time and space. They can achieve sharing through network resources and use information technology to process relevant communication information at high speed. This new way of communication has brought great convenience to people's learning, life, and work, saving them a lot of time.Therefore, effectively applying computer communication technology, promoting network development, and achieving the goal of rapid data transmission can further promote the rapid development of China's economy.***

Keywords: Internet era;Computer communication technology; Information technology construction; Resource sharing; Network Development.

1. INTRODUCTION

At present, the development of computer communication and networks has become a new trend, bringing a lot of convenience to people's lives.However, in the process of the development of computer communication and networks, some problems have also been encountered, which have posed certain obstacles to the forward development and progress of this industry and triggered some very complex issues.In the current era of rapid development in the communication industry, especially as communication enters the 5G era, the continuous development and improvement of communication technology have greatly enhanced China's international influence.In order to promote the development of computer communication and networks in China towards a better and faster direction, relevant personnel should actively explore the current development of computer communication and networks, so that China's communication and network development industry can achieve more innovative and rapid development, and make greater contributions to China's social and economic development. In urban management systems, Fang (2025) proposed an adaptive QoS-aware cloud-edge collaborative architecture that enhances real-time smart water service management through dynamic resource allocation [1], while Li et al. (2025) developed a user-centered framework for interactive data exploration in smart city analytics [14]. For small and medium enterprises, Qi (2025) created DecisionFlow, a lightweight visual framework enabling multi-task joint prediction and anomaly detection with improved operational efficiency [2]. Healthcare applications have seen substantial progress with Wang (2025) constructing a knowledge graph-based clinical trial data anomaly detection system [3], complemented by Zhang et al.'s (2025) machine learning techniques for anomaly detection in biomechanical data [4]. Diao et al. (2025) optimized Bi-LSTM networks for lung cancer detection, achieving superior diagnostic accuracy [15], while Ma et al. (2023) designed a fine life cycle prediction system for medical equipment failure prevention [9]. Computer vision technologies have advanced through several innovations: Jin et al. (2024) improved object detection and pose estimation using hybrid task cascade networks [5], and Ding et al. (2025) enhanced person re-identification through decoupled attention mechanisms for clothing-changing scenarios [8]. Transportation systems benefited from Tu's (2025) reliable vehicle platooning solution using 5G link aggregation [10]. Financial and industrial applications show remarkable development. Saunders et al. (2025) analyzed AI-driven smart supply chains for operational efficiency [6], while Pal et al. (2025) developed AI-based credit risk assessment for supply chain finance [7]. Jiang et al. (2025) introduced Investment Advisory Robotics 2.0 for personalized financial guidance [11], and Yang et al. (2025) created big data methods for economic cycle prediction [13]. Industrial optimization includes Zhao et al.'s (2024) deep learning approach for steel production scheduling [12].

2. NETWORK DEVELOPMENT FROM THE PERSPECTIVE OF COMPUTER COMMUNICATION

2.1 Development of Computer Communication

The computer communication in our country first developed in the mid-1920s, but currently the country is in turmoil, with extremely weak national strength, and negative impacts from various internal and external factors.The country had no spare capacity to develop digital communication networks, and at that time, communication networks were limited to the single information function of telephone.With the changes of the times and the establishment of the People's Republic of China, the country gradually emerged from the development difficulties of the times, no longer troubled by various internal and external factors, and achieved significant progress in all industries. The country also discovered the limitations of telephone and internet communicationThe country attaches greater importance to the development of computer communication. We have learned from the practical experience of foreign networks and conducted serious research in combination with China's actual national conditions, which has enabled the rapid development of computer network communication information.In addition to basic communication, it has also expanded new services with more advanced and convenient functions, laying the foundation for the subsequent development of computer communication and networks.

2.2 Development of Communication and Network Technology

With the increasing demand for communication capabilities, it has also greatly promoted the rapid development of network technology.Based on the solid foundation of computers, the overall level of China's Internet and communication technology has been rapidly improved.The Internet and computers are interconnected, enabling people in different regions to communicate in real time. This major change is a complete transformation of the traditional communication pattern.In addition, based on the premise of the network, computer communication technology itself has also achieved significant breakthroughs. Various high-definition technologies, information storage, intelligent management, software design, wireless communication technology, virtualization technology, big data technology, etc. have emerged, making computer communication and network technology highly compatibleAt present, the Internet and computer system have developed into a relatively stable system and structure, which has brought great convenience to people's lives and also made it possible for people to communicate with each other in groups, and is bringing important auxiliary functions to people's study, life and work.

3. ADVANTAGES OF COMPUTER COMMUNICATION AND NETWORK DEVELOPMENT APPLICATIONS

3.1 Achieving resource sharing

With the rapid development of modern information technology and the gradual expansion of computer network capacity, computer applications are also increasing.In order to effectively improve the efficiency of resource utilization, while building computer network information, it is also necessary to gradually increase support for the development of computer communication application technology, provide more funding investment, draw certain communication circuit diagrams, and efficiently process data to enable the sharing of various resources, in order to meet the basic application needs of the public for computers.

3.2 Data transmission function

In the development of computer communication and networks, data transmission is an important function.When we apply the function of data transmission, we need to build a good working idea based on the actual situation.Only in this way can we efficiently process relevant data information and achieve comprehensive transmission of different computer network data based on differences.In addition, with the rapid development of information technology, data communication functions will be further optimized and improved, and their degree of functional innovation will also become higher.In addition, the stability of computer communication and network development application technology is also improving.More common applications include distance education, e-commerce, etc., all of which are achieved through the development of computer communication and network application technologyTherefore, it is important to pay attention to exploring the data transmission function,

gradually optimizing and improving it, in order to bring convenience to people's work and life, and create favorable conditions.

3.3 Distributed Processing

The distributed processing function mainly integrates computer communication and network technology to expand its service scope.For the exploration of the practical functions of distributed processing, relevant personnel need to conduct in-depth investigations into the problems that arise during its use, in order to thoroughly solve the problems, and collect relevant issues and information to better enhance new development directions for subsequent workComputer network systems are complex, and if relevant personnel do not conduct in-depth research on the actual problems that arise, it will make data processing more difficult. Different computers should handle different tasks.When researchers explore it, they need to ensure that the computer is always in a balanced state, and each designer can gradually optimize the network system and allocate relevant resources reasonably.

4. THE APPLICATION OF COMPUTER COMMUNICATION TECHNOLOGY

4.1 Application in Multimedia Technology

Currently, computer communication technology has been widely applied in various fields of society.Firstly, it is applied in the field of multimedia technology, which can achieve better integration between multimedia technology and computer communication technology, making it more professional.By leveraging computer communication technology, the advantages of multimedia technology can be more prominent, and it can also be highly integrated with computer communication technology to better collect, process, and store relevant media information resources, forming an integrated technical processing solution.This can further break through the limitations and shortcomings of traditional multimedia technology.By integrating forms such as data transmission, voice calls, and video intercoms, we can fully leverage the unique advantages of communication technology.

4.2 Applications in the field of remote information communication

We can expand the application scope of remote information communication by utilizing computer communication technology.The rapid development of modern information technology has had a profound impact on people's lives and work, making their lifestyles increasingly diverse.With the help of computer communication technology, people can achieve network connection through mobile terminals such as computers or mobile phones, enabling remote communication and bringing great convenience to people's lives.

For example, people often engage in instant messaging through forms such as WeChat or Weibo, mainly due to the widespread use of computer communication technology in remote communication, and the continuous expansion and extension of the scope of technology application, which has a great impact on people's lifestyles and makes it more convenient for people to communicate instantly and remotely.Even many company employees can work remotely from home.At the same time, it can also realize the distance education mode. For example, during the COVID-19 epidemic, many schools realized distance education to solve the actual education situation of students.Online shopping and other activities are all achieved through the use of remote communication technology.These changes have also had a more profound impact on the current socio-economic structure and economic form.

4.3 Applications in the field of wireless communication technology

Computer communication technology can also be widely applied in the field of wireless communication technology.The main concept of wireless communication technology is to make the process of information transmission no longer limited by time and space, and to make people's lives more convenient.If sharing bicycles, it mainly relies on computer communication technology to enable bicycles to use wireless communication technology for shared use.The current unmanned network sales points also adopt a networked sales model through wireless communication technology.

4.4 Applications in the field of microelectronics technology

At present, microelectronics technology is widely used in the field of communication, such as digital telephones and derivative communication technologies.Microelectronics technology utilizes simple communication programs

and high-speed packet switching devices to transmit relevant communication information in asynchronous transmission mode.The main feature of this technology is high bandwidth packet switching, which has been widely used in community local area networks.Microelectronics technology has also been widely used in educational networks.Digital fiber optic technology has the advantages of high speed and low error rate, and can use microelectronics technology to quickly handle time nodes and other issues in communication technology.Microelectronics technology is becoming a new development direction in computer communication technology.

4.5 Towards the direction of fiber optic technology development

Computer communication technology can enable real-time sharing of various resources, thanks to the advantages of computer communication and networks, which can enable efficient data transmission and ensure real-time information transmission through distributed processing.To build a computer network information system, it is necessary to efficiently integrate communication technology, draw more reasonable communication circuit diagrams based on actual conditions, and scientifically allocate actual resources in a distributed processing form, making the application field of computer communication technology broader.

At present, fiber optic technology has also been well applied in the field of communication, which can effectively improve data transmission speed and ensure data transmission quality.In order to better ensure the quality and speed of communication data transmission, a distributed data interface mode can be used to ensure the efficiency of local area network data transmission, enabling efficient transmission of information between close and far distancesUtilizing fiber optic technology to efficiently process information in local area networks and metropolitan area networks, and utilizing advanced international standards to enable more efficient application in computer communication technology and network development.

5. HE DEVELOPMENT TREND OF COMPUTER COMMUNICATION AND NETWORK TECHNOLOGY

5.1 Gradually moving towards intelligence and personalization

In the process of computer communication and network development, its intelligent and personalized characteristics are becoming increasingly evident.Intelligence is highlighted in the form of an intelligent network, which allows users to establish new business activity networks and greatly enhances the performance of network technology applications.And personalization aims to create a unique identification number for users. When using communication functions, dialing the identification number can achieve communication effects with the person they want to communicate with.

5.2 Gradually moving towards the direction of triple play integration

The development of computer communication and networks will follow the direction of the integration of the three networks.The so-called three networks include computer communication networks, such as the more common broadband network, as well as broadcasting and television networks and telecommunications networks.The integration of the three networks is a new development trend.Currently, electronic harmony and intelligent devices are widely used in people's lives, but it is very inconvenient to lay various networks in the home, which can also cause significant resource waste. With the help of the three network integration mode, resources can be fully utilized, reducing redundant construction and investment, and maintenance is more convenient in case of problems.

The integration and penetration of business models between different networks will become a new trend in future social development, which will enable richer channels for information sharing and usher in a new era of computer communication and network development.

5.3 Gradually moving towards stability and safety

At present, the effective application of computer communication technology has continuously expanded the market for network communication software. Based on people's high requirements for software, how computer communication and networks can develop rapidly has attracted much attention.The communication network based on the Internet enables the efficient development of computer communication technology, but we should note that

the stability and security of computer communication technology and network development are increasingly focused by people.In the Internet information system, all kinds of information are often staggered and self enclosed. The information source is always outputting huge information, and its work cannot be interfered by outside.Based on this situation, relevant personnel need to make information transmission more stable.

People often like to store all kinds of private information through wireless communication devices, but we should know that all these are in the Internet, which also brings the possibility of attack to hackers, which will lead to information leakage to some extent.Based on this, how to improve the security of computer communication is also a future development direction.Relevant personnel need to build a more secure system to ensure that people's information transmission is not easily stolen by hackers, and to prevent personal privacy information in communication network software from being leaked, making it more secure is an important development goal of current computer communication security.

5.4 Gradually moving towards energy-saving direction

Currently, portable mobile communication devices are rapidly advancing, and computer communication has become the main direction of innovative development in communication technology.Video and voice calls not only save people's communication costs, but also provide great convenience.Based on this, the development of computer communication and networks is being vigorously promoted.At present, there is still a large proportion of communication in the energy consumption of equipment. Relevant personnel can continuously optimize and improve the energy transmission channel in information transmission, greatly improving the endurance of communication equipment, which is also one of its important development directions.

Optimizing battery capacity is one of our excellent solutions, while minimizing energy loss in information transmission is also one of the innovative solutions for the development of computer communication technology.Currently, communication technology is gradually being widely promoted and popularized, and the audience is also increasing.Based on its high demand, some outdoor workers cannot always carry portable power banks, which also puts higher demands on the energy efficiency of computer communication.The energy efficiency of communication technology is an important research direction for computer information technology developers in the future.

5.5 Gradually moving towards integration and digitization

Based on the current status of computer communication and network development, the main direction of its development is towards integration and digitization.In future communication, there will be a large number of video services, voice services, and digital services.These businesses will rapidly develop towards digitalization.In addition, broadband is also an important direction for its development. Broadband can significantly improve the signal transmission speed of communication lines, greatly enhance the practicality of computer communication and network development, and promote innovative development of the social economy.

6. CONCLUSION

In summary, the innovative development of computer communication and networks is a new trend for future socio-economic development, which can maximize its technological superiority.In addition, the innovative development of computer communication and networks can improve users' online experience, transform traditional entertainment methods, and enhance the security and effectiveness of network data, providing people with better quality services.At present, relevant technical personnel need to further explore broadband network technology and mobile communication technology, innovate and optimize their technical level, enhance people's communication efficiency and quality, and bring people closer together, laying a solid foundation for China's information development and making new contributions to the development of human society.

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