An Analysis of the Application of Computer Information Management Technology in Network Security

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Abstract: ***With the deepening development of network informatization, the network has become the infrastructure for various information technologies and applications.The internet not only brings convenience to people's lives, but also faces increasing security risks.Cybersecurity issues have become a focus of attention for people.The emergence of cybersecurity issues not only affects the security of individuals, organizations, and countries, but also brings difficulties to the protection of various information systems, network infrastructure, important equipment, and critical information.Therefore, ensuring network security has become an important task for social development.As an important technical means, computer information management technology can play a significant role in network security.This article explores the application of computer information management technology in network security, hoping to provide some research assistance for optimizing and innovating network security management work.***

Keywords: Computer Information Management Technology; Network security; Application inquiry.

1. INTRODUCTION

Computer information management technology uses computers as tools to effectively manage and utilize information through the collection, processing, storage, and utilization of information.Computer information management technology plays an important role in information management and is an indispensable part of the field of informatization.Computer information management technology can achieve rapid acquisition, storage, processing, analysis, and transmission of information, greatly improving the efficiency and value of information utilization.In summary, computer information management technology plays a crucial role in network security. It can manage and monitor network information, ensure the reliability and security of the network, and provide significant assistance for the development and optimization of network information security management.

2. FUNDAMENTALS OF COMPUTER INFORMATION MANAGEMENT TECHNOLOGY

2.1 Concept of Computer Information Management Technology

Computer information management technology refers to a technical system that utilizes computer technology and information management theory to manage, analyze, process, and apply information.The main task of computer information management technology is to provide comprehensive, accurate, and real-time information services to enterprises, organizations, and individuals to support their management decisions, business operations, and personal development.Computer information management technology mainly includes information collection, analysis, processing, storage, retrieval, and application.Through the application of computer information management technology, information can be more effectively managed and utilized, work efficiency and management level can be improved, and effective support can be provided for the development of enterprises and organizations. Zhao et al. (2025)[1] proposed a CNN-Bi-GRU model for short- and long-term electricity demand prediction, achieving notable accuracy through hybrid neural network architectures. For logistics optimization, Luo et al. (2024)[2] developed an innovative path planning algorithm combining Transformer and GCN networks, enhancing robotic navigation efficiency. Human resource management has also benefited from AI, as Li et al. (2025)[3] implemented a GPT-enhanced hierarchical graph neural network to improve resume-job matching accuracy. In medical imaging, Wang et al. (2025)[4] introduced CPLOYO, a pulmonary nodule detection model utilizing multi-scale feature fusion, demonstrating superior performance in early disease diagnosis. Empirical computer modeling has been applied to business analytics, where Xu and Lin (2024)[5] examined user-perceived value's impact on new energy vehicle enterprises through computational simulations. Cross-cultural AI applications were investigated by Shan et al. (2024)[6], who conducted comparative analyses of large language

models' cultural biases. Financial technology innovations were advanced by Yang and Duan (2025)[7], who constructed a knowledge graph for the US stock market using statistical learning techniques. Computer vision research by Lu et al. (2025)[8] (DeepSPG) improved low-light image enhancement through multimodal learning with semantic prior guidance. In intelligent transportation systems, Tu (2025)[9] enhanced vehicle platooning reliability via 5G link aggregation in smart road infrastructures. Medical research contributions include Ma et al. (2024)[10]'s investigation of metal exposure effects on fetal liver function, while Lu et al. (2024)[11] explored chemotherapy-induced immune cell plasticity in cancer treatment. Nanotechnology applications were demonstrated by Jiang et al. (2024)[12], who developed a bimetallic nanostimulator for combined radio-cuproptosis immunotherapy. Earlier work by Ma (2021)[13] laid groundwork for medical robotics through binocular vision-based positioning systems.

2.2 Classification and Characteristics of Computer Information Management Technology

Computer information management technology can be classified according to different classification standards.From the perspective of application fields, it can be divided into enterprise information management technology, government information management technology, personal information management technology, etc.From the perspective of technical tools, they can be divided into database technology, network technology, knowledge management technology, business intelligence technology, etc.From the perspective of application functions, it can be divided into information collection, information analysis, information processing, information storage, information retrieval, and information application.

The characteristics of computer information management technology mainly include the following aspects:

(1) Emphasize the comprehensiveness and accuracy of information.

(2) Pay attention to the real-time and timely nature of information.

(3) Emphasize the visualization and operability of information.

(4) Emphasize the sharing and circulation of information.

(5) Emphasize the security and confidentiality of information.

2.3 Application of Computer Information Management Technology in Network Security

Network security is an important field in the application of computer information management technology.In the field of network security, computer information management technology is mainly used in the following areas:

(1) Monitoring and early warning of network security incidents

By monitoring and analyzing abnormal traffic, access, and behavior in the network, timely warning of network security incidents can be provided.

(2) Tracking and tracing of network security incidents

By analyzing network logs and event records, the source and behavior of network security incidents can be traced and traced, further strengthening network security.

(3) Response and Handling of Cybersecurity Incidents

By analyzing and judging network security incidents, timely response measures can be taken to prevent further expansion of network security incidents and serious consequences.

(4) Network Security Situation Analysis and Prediction

By collecting and analyzing data in the network, one can understand the situation of network security, predict the likelihood and impact of network security incidents, and propose corresponding preventive measures.

(5) Development and implementation of network security strategies and plans

By analyzing and understanding the network security needs of enterprises, organizations, and individuals, formulate corresponding network security strategies and plans, and strengthen network security management and training.

3. THE CURRENT STATUS AND CHALLENGES OF CYBERSECURITY

3.1 Concept and Significance of Network Security

Network security refers to a technical and management measure that protects network systems, network devices, network applications, and network data from threats such as illegal intrusion, destruction, tampering, and theft, and ensures the normal and stable operation of network systems.With the continuous development and popularization of information technology, network security has become a global concern and important security field.The importance of cybersecurity is self-evident for businesses, governments, individuals, and organizations.In today's information age, network security has become a strategic priority for safeguarding national security, promoting economic development, and maintaining social stability, and is receiving increasing attention and importance.

3.2 Current Status and Challenges of Network Security

Cybersecurity faces many serious challenges, mainly reflected in the following aspects.

(1) The rapid development of the Internet

The rapid development of the Internet has provided convenient channels for network criminal gangs, which has increased the risks and threats of network security.The development of the Internet has brought a lot of network data, applications and services, but also brought network security threats such as viruses, trojans, worms, malware, phishing, online fraud and so on.

(2) Complex network security environment

With the continuous advancement and application of network technology, the network security environment has become increasingly complex.Cybersecurity threats are diverse, with a wide range of attack methods and attack surfaces.The complexity of network attack methods makes prevention and protection increasingly difficult.

(3) The growing demand for security

With the continuous development of network application scenarios and technologies, the demand for network security is also increasing.Not only should data security be protected, but also the availability and reliability of network systems should be ensured.In order to meet the needs of efficient, fast, secure, and reliable network services, the demand for network security is showing a growing trend.

(4) Human factors

In addition to technical aspects, human factors are also an important cause of network security issues.Issues such as social engineering, internal security incidents, employee quality, and management level can all have an impact on network security.

3.3 Main issues in network security

The main issues of network security can be summarized as follows:

(1) Data security issues

There is a large amount of sensitive data in the network, such as user information, bank account information, company secrets, etc.If these data are obtained and used by unauthorized personnel, it will cause significant economic losses and social impacts.Therefore, how to protect and manage data has become an important issue in the field of network security.

(2) Network attack issues

There are various attack methods for network attacks, such as viruses, trojans, worms, phishing, and online fraud, which can be seen everywhere in the online world.Network attacks not only cause losses to the information resources of enterprises and individuals, but also pose a threat to national security.

(3) Cybersecurity awareness issues

In the network, users' security awareness and quality are the key to preventing network security risks.Due to the lack of basic security awareness and knowledge among many users, they are prone to becoming victims of cyber attacks.The improvement of network security awareness is the foundation for the development of the network security industry.

(4) Security technical standard issues

The lack of network security technology standards has led to many problems of confusion and inconsistency in the field of network security, which has brought certain difficulties to the application and promotion of security technology.At the same time, it is also unable to achieve international data interconnection and lacks international network security technology standards to strengthen cooperation.The issue of network security is a complex systems engineering [4].The current situation and challenges of network security require us to carefully examine and consider, and take effective measures to strengthen network security.Only through technological innovation, strengthening management, enhancing user security awareness, improving laws and regulations, and establishing international cooperation mechanisms can we better safeguard network security and provide strong support for network development.

4. THE APPLICATION OF COMPUTER INFORMATION MANAGEMENT TECHNOLOGY IN NETWORK SECURITY

4.1 The main applications of computer information management technology in network security

The main applications of computer information management technology in network security include network security management, network security monitoring, network security assessment, and network security training.Among them, network security management refers to ensuring network security by formulating network security policies and regulations, implementing permission management and access control measures.Network security monitoring refers to discovering security threats by monitoring network traffic in real-time, identifying and intercepting malicious attacks.Network security assessment refers to the evaluation and analysis of the network environment, identifying security weaknesses and vulnerabilities, providing corresponding solutions, and monitoring and maintenance to ensure network security.Network security training refers to providing network security knowledge and skills training to network operation and maintenance personnel, improving their network security awareness and response capabilities.

4.2 Application of Computer Information Management Technology in Firewalls, Intrusion Detection, Vulnerability Scanning, and Other Aspects

Firewall is one of the most commonly used security technologies in computer information management, which can filter and control network traffic, and prevent most intrusion and attack behaviors.Intrusion detection is the process of identifying and reporting any abnormal activity by detecting network traffic and system logs.Vulnerability scanning is the process of detecting vulnerabilities and weaknesses in systems and applications, identifying and fixing potential security risks in advance.

4.3 Application of Computer Information Management Technology in Ensuring User Privacy and Identity Authentication

User privacy and identity authentication are important issues in network security. Computer information management technology can protect user privacy through encryption technology and confirm user identity through identity authentication technology.Cryptography technology can encrypt and decrypt user data and communication, preventing information from being stolen or tampered with.Identity authentication technology

can confirm user identity through passwords, biometric recognition, and other methods to prevent unauthorized users from accessing the system.

The application of computer information management technology in network security is very extensive, covering multiple aspects such as network security management, network security monitoring, network security assessment, network security training, firewall, intrusion detection, vulnerability scanning, user privacy protection, and identity authentication.In the future field of network security, computer information management technology will continue to play an important role and make greater contributions to ensuring network security.

5. THE DEVELOPMENT TREND OF COMPUTER INFORMATION MANAGEMENT TECHNOLOGY IN NETWORK SECURITY

5.1 Application of Artificial Intelligence Technology in Network Security

Artificial intelligence technology is one of the most popular technologies in the field of information technology, with strong self-learning and reasoning abilities, and has broad prospects for application in network security.Due to the ability of artificial intelligence technology to autonomously analyze and learn from large amounts of data, discover patterns and patterns of network threats and attacks, and respond to them in a timely manner.Artificial intelligence technology can play an important role in network intrusion detection, security incident response, vulnerability discovery and repair.For example, some enterprises have started using monitoring systems based on artificial intelligence technology to achieve network intrusion detection and timely response, making network security prevention more comprehensive and efficient.

5.2 Application of blockchain technology in network security

Blockchain technology is a decentralized distributed ledger technology that ensures the security and trustworthiness of network data through secure encryption algorithms and consensus mechanisms.The distributed nature of blockchain technology can prevent hacker attacks and data tampering, and its decentralized nature can also achieve data sharing, transparency, and immutability.In the field of network security, the application of blockchain technology can make network data more secure and trustworthy, and improve the overall level of network security.For example, blockchain technology can be used to ensure network authentication, data transmission, public logs, contract execution, and other aspects, providing more comprehensive protection for network security.

5.3 Application of Cloud Computing Technology in Network Security

Cloud computing technology is an Internet based computing method that can provide large-scale, efficient, flexible and secure computing services.Cloud computing technology places data and computing resources in the cloud and achieves multi tenant resource sharing through virtualization technology, improving the reliability and availability of network security.In terms of network security, cloud computing technology has become one of the important means of enterprise security protection.For example, cloud security controllers can achieve visual management and security protection of enterprise cloud computing environments, improving the efficiency and level of security protection for enterprises.

6. CONCLUSION

The application of computer information management technology in network security continues to innovate, providing strong support for network security, but also facing increasing challenges.In the future, with the continuous emergence of new technologies, the application of computer information management technology in network security will be more extensive and in-depth.

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