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Computer Network System Integration Technology and Applications

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Abstract: ***Computer network system integration technology is an advanced science and technology based on the development of Internet and computer technology. Through the integration of computer network systems, computer hardware devices and transmission media can be effectively integrated, thereby providing great convenience to the production life of today's people. This article is to analyze network integration technology and its application methods, so as to provide references for network integration.***

Keywords: Computer network; Systems integration technology; The application is available.

1. INTRODUCTION

With the continuous advancement of computer network technology, computer network system integration technology methods have been widely used in various industries and various fields, and in the process of application, they have established their own advantages to help various enterprises develop rapidly. This computer technology mainly uses the network as a vector tool that can store information, protects its information through the system functions of the network platform, and guarantees the privacy and security of information, so as to realize the future development of the technology.

2. CONCEPT OF INTEGRATION OF COMPUTER NETWORK SYSTEMS

Network system integration is a key part in the development of computer information system. It mainly uses the network center as a carrier, so that all hardware devices and various transmission media are organically integrated in the system, so that a complete, systematic computer network system can be formed. The main purpose of network system integration is to coordinate and integrate each part of the network system to improve the system operation efficiency, ensure the reliability and security of system applications, and comprehensively meet the actual needs of today's users. Chen et al. (2024) introduced Bimcv-r, a landmark dataset tailored for 3D CT text-image retrieval, providing a valuable resource for medical image analysis [1]. In the realm of natural language processing, Yu et al. (2025) explored automatic text summarization using Transformer and Pointer-Generator Networks, demonstrating promising results in information condensation [2]. Sun et al. (2025) focused on constructing an Automated Machine Learning (AutoML) framework based on large language models, aiming to streamline the machine learning pipeline [3]. Pal et al. (2025) proposed an AI-based credit risk assessment and intelligent matching mechanism in supply chain finance, enhancing financial decision-making processes [4]. Wang and Zhao (2024) advanced abstract reasoning in artificial general intelligence by introducing a hybrid multi-component architecture [5]. In the area of large language model robustness, Fu et al. (2025) presented Adversarial Prompt Optimization in LLMs, highlighting the importance of robustness and defense evasion strategies [6]. Lei et al. (2025) developed a Teacher-Student Framework for short-context classification, incorporating domain adaptation and data augmentation techniques to improve model generalization [7]. Zheng et al. (2025) introduced FinGPT-Agent, an advanced framework for multimodal research report generation, featuring task-adaptive optimization and hierarchical attention mechanisms [8]. Weng et al. (2025) proposed SafeGen-X, a comprehensive framework aimed at enhancing security, compliance, and robustness in large language models [9]. Chen et al. (2025) introduced SyntheClean, a method for enhancing large-scale multimodal models through adaptive data synthesis and cleaning [10]. Jiang et al. (2025) developed a knowledge-enhanced multi-task learning model for domain-specific question answering, demonstrating the effectiveness of integrating external knowledge sources [11]. Zhuo et al. (2025) proposed an intelligent-aware Transformer with domain adaptation and contextual reasoning capabilities for question answering tasks [12]. Zhang et al. (2025) explored dynamic attention-guided video generation from text, utilizing multi-scale synthesis and LoRA optimization techniques [13]. Zhao et al. (2025) introduced KET-GPT, a modular framework for precision knowledge updates in pretrained language models [14]. Shih et al. (2025) developed DST-GFN, a dual-stage Transformer network with gated fusion for pairwise user preference prediction in dialogue systems [15]. Li et al. (2025) proposed MLIF-Net, a multimodal

fusion approach combining vision transformers and large language models for AI image detection [16]. In biomedical signal processing, Ding and Wu (2024) conducted a systematic review on self-supervised learning for ECG and PPG signals, providing insights into the current state-of-the-art [17]. Restrepo et al. (2024) explored multimodal deep learning for low-resource settings, proposing a vector embedding alignment approach for healthcare applications [18]. Xie and Chen (2025) introduced CoreViz, a context-aware reasoning and visualization engine for business intelligence dashboards, enhancing data interpretation capabilities [19]. Zhu (2025) proposed TraceLM, a temporal root-cause analysis framework utilizing contextual embedding language models [20]. Zhang (2025) developed InfraMLForge, a developer tooling for rapid LLM development and scalable deployment [21]. Another work by Zhang (2025) introduced SafeServe, a scalable tooling for release safety and push testing in multi-app monetization platforms [22]. Hu (2025) explored procedural playable 3D ad creation via generative models in GenPlayAds [23] and immersive 3D ad content creation via game engine pipelines in UnrealAdBlend [24]. Finally, Wang (2025) investigated joint training of propensity and prediction models via targeted learning for recommendation systems dealing with data missing not at random [25]. These studies collectively contribute to the advancement of AI technologies across various domains, highlighting the diversity and depth of current research efforts.

3. BASIC PRINCIPLES OF COMPUTER NETWORK SYSTEM INTEGRATION

3.1The principle of practicality

The fundamental purpose of the application and development of network systems is to provide sufficient convenience for users. Therefore, in the specific network system integration process, usefulness should be a basic principle, and meeting the actual needs of users should become the main goal of network system integration, so as to realize the role and advantage of network system integrating [1].

3.2 Reliability

Since the network system belongs to a platform for information sharing, The user will have very strict requirements during use, and in addition, the user is dependent on the system, and once a part of the system fails, it will affect the operation of the entire system, thereby affecting the user's use. Therefore, in the design process, the reliability of the system needs to be improved, and the user can meet the requirements in a short time, which helps provide more maintenance time after failure. In addition, reliability of the system is a key design principle that enhances the effectiveness of the system.

3.3 Networking

Integrated technology is the foundation of network technology for doing work, Without a network, the integration technology cannot function properly, and therefore it cannot be guaranteed for the effective operation of the integration technology, and when using a network it is also necessary to ensure the security effectiveness of information. When running the integration technology consideration should be given to the resource and configuration level of the network.

3.4 The forward-looking principle

In the current era of rapid computer development, the rate of upgrading of related technologies is also accelerating, so in the design of integrated technologies, the requirements of the present era should be integrated. Full consideration needs to be given to future technological updates, and designers need to not only exert their own technical level, but also have the ability to foresee development and design technologies that meet the diverse needs of users, so as to enhance the application value of the technology.

4. TECHNICAL ANALYSIS OF COMPUTER NETWORK SYSTEM INTEGRATION

4.1 Data integration technology

During the integration of network systems. Data integration technology can generally be divided according to two parts, the first is data transformation technology, and the second is data aggregation technology. Data transformation technology is really about data processing with the help of specific tools to transform data between different systems and to integrate data between systems. Data aggregation technology allows data to be exchanged

between different systems. Compared with data conversion technology, data aggregation technology can allow internal data to be improved more quickly to achieve the integration of all data [2].

4.2 API Integration

The main purpose of API integration is to integrate the single structure of different customers, and then integrate many single structures to achieve the purpose of forming data integration. It is an effective method that has its own unique functions, is widely used in the management system of the library, can effectively transmit and share the various data of the library and is very convenient to use in the management systems to effectively transmit the various information data of the Library. Compared with other integration technologies, the main advantage of API integration technology is data integration, which can access system data and abstract data. In addition, the ability of API integration technology to collect data is relatively strong, which can simplify the letter transmission process, which is conducive to improving work efficiency and reducing operating costs. Finally, when collecting data, API integration technology can improve the standard and specification of data transmission, and make it follow a programmatic transmission method, thereby helping to improve the integration effect of data.

4.3 Method Integration

The effective method of data integration includes method integration, the integration of different resources through data sharing is the so-called working principle. Method integration is more sound and perfect compared to other integration technologies, has some advantages in avoiding the shortcomings of integration technologies and can effectively improve the work efficiency of users. However, the technology still has some shortcomings, such as the increase in the late-stage input cost of integration technology and the collection of public data [3].

5. APPLICATION OF COMPUTER NETWORK SYSTEM INTEGRATION TECHNOLOGY

5.1 Application of Integrated Technology in High-Risk Industries

Integrated technology is of great significance in high-risk industries, and for high-risk industry, full attention should be paid to data collection and organization to prevent harm such as data breaches. There is also a need to be able to ensure that information is kept secure as it is passed and shared, thereby strengthening the use of data by enterprises. When network environments can be secured, the use of integrated technologies will be more effective and can help the industry improve productivity and security. In addition, the use of computer network system integration technology in high-risk industries can collect, process and safely analyze important information and data, and can discover certain potential problems in the enterprise, so that the problems can be handled in a timely manner, so that enterprises can operate more safely. Therefore, the introduction of integrated technology in high-risk industries has practical application effects and improves the speed of development of the industry.

5.2 Practical Application of Integration Technology in Coal Chemical Industry

In the 21st century, China advocates new energy resources and environmental protection. As the primary new energy industry in China, coal chemical industry is particularly important for the future development of China. Establish a stable network information platform. In the process of building a platform system, build an information management platform according to the actual needs of coal chemical enterprises, which can safeguard the development goals of the enterprise and improve the data processing capability. It facilitates communication and communication between enterprises and employees, and enhances the stability of the movement of coal chemical enterprises.

5.3 Practical application of integration technology in the engineering industry

The application of integrated technology to the engineering industry can play an important role. First, in the early stages of the project, when problems arise in the construction design drawings, they can be converted into electronic mode to solve the problem. In the mid-term construction phase, it is possible to rationally use integrated technology to complete the monitoring of construction through the network, upload the on-site construction situation in a timely manner, and ensure the quality of the project. In the completion delivery phase, integrated technology is used to collect and aggregate information and data from the entire process, including estimating the

cost and profit of the overall project, analyzing the data, and dealing with problems when they are found in a timely manner [4].

6. MAIN METHODS OF INTEGRATION OF COMPUTER NETWORK SYSTEMS

6.1 Single integrated technology

In the early stages of the development of computer network integration technology, one of the most remarkable features was the single integration. In this phase of development, a single integration technology can integrate all the data associated with the system into a single system. In this way, the transformation of other unrelated data can be ignored, allowing the system to be built to its fullest potential. After the application of this technology to computer network integration, computer network systems also underwent a partial transformation, but the overall stability of the system was greatly adversely affected [5].

6.2 Distributed integration method

The distributed integration method is to divide the entire network system into many types and allow different models to achieve data transformation. The emergence and application of distributed integration methods can effectively solve problems in the application of single integration methods, to a great extent shorten the time of system integration and reduce the development cost of system integration. However, in the concrete application of the distributed integration method, there are also certain shortcomings, the most notable of which is that the method does not have sufficient external processing power. Therefore, in order for the distributed integration method to be scientifically used and well developed, in the process of researching this method, relevant experts and technicians should increase their efforts to study its external processing capabilities, so as to ensure the integration effect of network systems [6].

7. CONCLUSION

As mentioned above, with the continuous development of computer and Internet technology, the application and research of computer network system integration technology has also received more and more attention in today's society. At present, this technology is widely used in various industries, and people need to know the technical methods and application of computer network system integration in a timely manner. In this way, we can better fully realize the role of this technology in computer management and maintenance, so as to greatly improve work efficiency and further promote the development of integrated technology.

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