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The Integration of Modern Computer Information Technology and Artificial Intelligence

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Abstract: With the advent of the information age, people's production and life are more closely connected with the Internet. Internet technology not only improves the production efficiency, but also provides great convenience for people's life. At present, people's requirements for computer information technology are gradually increasing. When we look directly at the information transmission and storage capacity, computer information technology cannot meet the market demand. Due to rapid development, the integration of artificial intelligence (AI) can enable the development of computer information technology. In this paper, computer information technology and artificial intelligence integration act as a starting point, and the integration of the development of the two is analyzed for reference.

Keywords: Computer information technology; Artificial intelligence; Integrated development

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1. Introduction

At the dawn of the computer era, due to the immaturity of the technology, its functions were primarily limited to local area networks and stand-alone operations [1]. Internet technology and computer information technology influence each other, with Internet technology driving the gradual development of computer information technology [2]. With the advent of the modern information society, the application of Internet technology has established connections between people and things, as well as between things themselves. Artificial intelligence, as one of the most advanced technologies, enables computers to imitate human brain functions. Researchers only need to input predefined instructions, allowing specific operations to be performed within designated processes. This improves production efficiency and ensures that different devices can achieve intelligent operation. This paper explores the integration and development of current computer information technology and artificial intelligence, aiming to provide a theoretical foundation for their advancement.

2. Overview of artificial intelligence

Artificial intelligence, built upon the development of information technology, is a multidisciplinary field that enables computers to imitate human thought processes and behaviors. Its emergence has driven many industries toward intelligent operations, significantly improving efficiency [3,4].

Mechanical equipment, enhanced by the development of computer information technology and artificial intelligence, can significantly improve work efficiency and largely reduce the need for manual labor, minimizing reliance on extensive human operations. With the application of artificial intelligence, mechanical equipment is endowed with human-like thinking, enabling more intuitive processing methods that align with human production needs. In an increasingly intelligent working environment, many practical problems are easily resolved.

The advancement of artificial intelligence technology represents not just the progress of a single discipline but the integration of multiple interdisciplinary fields, supported by theories and technological achievements from various domains. Contemporary computer information technology serves as a primary application area for artificial intelligence. By integrating the two, many industries can achieve high-quality development and gain substantial technical support.

3. The integration of computer information technology and artificial intelligence significance

3.1. Accurate processing of information

With advancements in computer information technology and the integration of artificial intelligence, data has become a fundamental cornerstone of social development [5]. For many enterprises, mastering comprehensive data is essential to gaining an advantage in the competitive market. Within the vast amount of information available, much of it is unknown or ambiguous, making accurate identification challenging in a short period. The application of artificial intelligence technology enables the creation of efficient data models and facilitates faster, more accurate information processing.

With the widespread adoption of the Internet, the volume of ambiguous information continues to grow, driving the advancement of artificial intelligence in improving information processing capabilities. In handling ambiguous data, artificial intelligence demonstrates significant advantages through collaborative distributed thinking. By simulating human administrative management structures, it enables hierarchical management of computer networks, where tasks are delegated to responsible parties at different levels. This approach significantly enhances the efficiency of computer network management.

3.2. Improve the ability of computational learning

Computational learning ability is another remarkable feature of artificial intelligence technology. All information within a computer network system holds potential application value. Based on this, managers can deeply analyze the information, harness its value, and apply it to enhance production and daily life. Once the system gains a comprehensive understanding of the underlying data, it can accurately interpret this information, deduce logical patterns, and generate labeled datasets.

In general, the development of computer information technology and the enhancement of artificial intelligence capabilities are mutually reinforcing. Information technology serves as the foundation for continuous breakthroughs in artificial intelligence, enabling it to acquire stronger learning capabilities. Furthermore, improvements in computational learning not only allow artificial intelligence to process vast amounts of data with

greater accuracy but also enable the optimization of algorithms through deep learning and other technologies, thereby enhancing the level of intelligence of the system [6–8].

With the continuous advancement of computer information technology, the ability to acquire, process, and analyze information has been greatly enhanced, providing a broader scope for the application of artificial intelligence. In particular, within computer network systems, deep data mining and intelligent processing can effectively support accurate decision-making and personalized services, profoundly impacting various industries and aspects of daily life. By continually improving its computational learning capabilities, artificial intelligence can optimize itself, adapt to evolving needs, and drive ongoing innovation in technology and industry.

3.3. Reduce human resource costs

The application of artificial intelligence operating systems has liberated part of the workforce in traditional production [9]. At present, production and daily life cannot eliminate manual labor, but the application of new technologies, controlled by software, can free up human hands and improve production efficiency. Manual operations in the production process are prone to errors, and uncontrollable factors increase the risk. However, the integration of artificial intelligence (AI) can mitigate the impact of human error.

Generally speaking, the resources for artificial intelligence technology are still relatively limited, and many solutions rely on software to address real-world problems. This not only improves computer operation efficiency but also helps businesses save costs, aligning with the needs of social development. Moreover, the widespread application of AI reduces reliance on manual labor, significantly enhancing production efficiency and accuracy. Through automated systems, AI can handle tedious and repetitive tasks, such as data processing, quality inspection, and production line monitoring, reducing errors and safety hazards in manual operations.

As technology continues to advance, AI will become more capable of handling large volumes of data, adjusting production processes in real-time, and optimizing resource allocation, further lowering operating costs for businesses. In the long run, the efficient use of AI will drive industrial upgrades, promote labor structure transformation, and meet society's growing demand for more efficient and intelligent production methods [10].

4. The integration path of computer information technology and artificial intelligence

4.1. Improve detection efficiency

Artificial intelligence can enhance the detection of malicious access, hacking, and other harmful behaviors. Currently, the exchange of information on networks is more frequent, and various types of software and security protocols are continuously emerging. However, many criminals exploit these opportunities to commit crimes, modify computer programs, and cause data breaches [11]. Artificial intelligence can effectively address this problem.

Firstly, AI-based identity authentication can fully integrate with the computer programming system, storing relevant parameter data in an expert system. If a hacker attempts to invade or tamper with access rights, the expert system will quickly verify and compare the parameters to determine whether the modifications align with normal operational patterns. If there is a significant deviation, the intelligent identification system will promptly issue an alarm, notifying the user that unauthorized modifications have occurred, allowing them to understand the real situation of the computer promptly.

Secondly, when an issue is detected, the AI will automatically generate a fault report, listing the operational

status and any altered parameters. This provides reliable data to assist maintenance engineers, improving the efficiency of their work. Finally, the system's network detection capabilities can be used to identify the root cause of the error, preventing the recurrence of the same issue.

4.2. Improve the protection system

Firstly, artificial intelligence can optimize firewall technology in computer systems [12]. Currently, most computers use firewalls with the same specifications, which are not tailored to target specific hacker viruses, leading to ineffective protection. Artificial intelligence, with its strong reasoning capabilities, can adjust defense mechanisms in real-time based on the type of virus. It can modify software operation permissions, change Internet Protocol (IP) addresses, and use other techniques to prevent viruses from infiltrating the system's programming area. If a virus is unable to alter the programming instructions, it will not cause harm to the computer, only resulting in a simple coding inflow. This allows technical personnel to manage post-processing with ease.

Secondly, artificial intelligence enhances the security of cloud computing. When network fluctuations occur during uploads, conventional cloud storage systems cannot guarantee stable operation, leading to false positives in relevant data. The advantage of artificial intelligence lies in its high efficiency. It can transmit large volumes of complex information at millisecond speeds, effectively reducing the impact of network fluctuations on information security and improving overall security.

4.3. Strengthen network supervision

On the one hand, AI can promote the development of the entire network management system by enhancing the performance of computer systems, thus optimizing its logic and reasoning. In the complexity of network management, artificial intelligence can accurately retrieve emergency plans from the expert system, break down management processes, and reorganize and combine internal data to ensure an orderly management process. As a highly intelligent machine, AI can independently perform tasks based on the autonomous response of computer hardware and software, eliminating the need for human intervention.

For example, in library management, books need to be classified to help readers easily find the required information. Through the AGENT interface, artificial intelligence can improve the accuracy of message transmission, allowing managers to avoid modifying the operation interface. Instead, it can be segmented through program design, enhancing the convenience of information retrieval [13].

4.4. Improve the data system

The built-in database of the computer can collect information about commands and system operations issued by the user during use, store and share relevant data, and enhance the connection between the computer, establishing a stable network environment. Artificial intelligence technology can expand the database, improving the system's ability to learn independently. As a result, the relevant data no longer needs to be uploaded by the user, as it can be retrieved directly from the database. Additionally, AI can independently analyze program-related issues. The generation of new modular data enriches the database and expands access to information [14]. In addition, the highly accurate inference capabilities of artificial intelligence can optimize and classify intelligent algorithms, creating a relatively independent space, which improves the effectiveness and efficiency of problem-solving in computers. Furthermore, the integration of artificial intelligence with databases can enhance the relationships between data, making hidden logic clearer and establishing a new type of semantic network. The role of the semantic network is

to represent the connections between entities in the database, allowing relevant information to remain organized while helping users better understand the data content. This, in turn, improves the rationality and scientific accuracy of data reasoning.

4.5. Strengthen auxiliary management

The computer-aided management system plays an irreplaceable role in the application of artificial intelligence and is one of the most widely used systems [15]. It is a type of information system based on cognitive science, allowing for remote control operations. This system is not only free from spatial limitations but also enables the optimization and enhancement of monitoring systems. Through continuous innovation, the auxiliary management system has become widely used in the medical field. Medical personnel can use the system to create electronic medical records and accurately identify images to provide evidence for patients' conditions. Additionally, the system can manage patient health and utilize its analysis function to develop different medications.

However, due to the lack of theoretical support in traditional Computer-Aided Technology (CAT) systems, the data stored in the original database often becomes outdated and unsuitable for modern practical applications. Artificial intelligence technology addresses this issue effectively. Its built-in network management system allows for real-time updates, ensuring that the data in the database evolves with the times and aligns with current developmental needs.

5. Conclusion

To sum up, the integration and development of modern computer information technology and artificial intelligence have led to a clear trend toward the intelligent evolution of computer network systems. Artificial intelligence encompasses many technical theories, such as expert systems and machine learning. These, combined with current computer-aided management and database technologies, have achieved cross-integration, thereby promoting greater diversity in both production and daily life. Overall, when computer network systems handle fuzzy information processing, their processing capacity has significantly improved, and nonlinear problems have been effectively solved—both of which are key achievements of artificial intelligence. AI technology will not stagnate; it will continue to evolve through technological innovation, with its technical capabilities achieving further breakthroughs. In the future, people will become more closely connected with artificial intelligence. With the support of computer information technology, AI will have more room for development and its autonomous operation capabilities will be further enhanced.

Disclosure statement

The author declares no conflict of interest.

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