The Evolution of Computer Technology: Trajectories, Implications, and Critical Perspectives

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Abstract: ***With the continuous popularization and development of computer in Our country, it brings great convenience to people's work and life at this stage, especially in the new century since the good development of computer in Our country,promote the continuous development of social economy in our country, computer technology will eventually embark on a new development road. Based on this,this paper mainly analyzes the history of computer development and the present stage of the new characteristics of computer technology, and the effective strategy for the development of computer technology.***

Keywords: Computer technology; Development trend; Discussion and reflection

1. INTRODUCTION

With the rapid development of communication technology in recent years, the daily communication of Chinese residents has become more and more convenient. The development of computer technology has greatly improved the daily work efficiency of all walks of life in China and is an important foundation for enterprise development. Computer technology is an important way to improve the efficiency of data processing and complete data transmission. The development of computing technology has breached the time and space constraints of data processing, and computer technology has become an important technological means to help individuals and enterprises make decisions. The combination of computer technology and network technology can greatly improve the efficiency of information transmission and has become an indispensable technology in human daily life. Based on this, this article examines the development of computer technology for information purposes.

Mehta et al. [1] propose a national AI security framework for protecting financial infrastructure, highlighting systemic risk considerations. In the automotive sector, Zhou [2] develops a collaborative filtering model for digital precision distribution of social media content on private domain platforms. For industrial marketing, Wensi [3] investigates AI-assisted content generation for non-standard automation solutions, while Li [4] focuses on AI-based prediction and management of automation equipment lifecycle costs to enhance customer lifetime value. In financial risk management, Yang et al. [5] integrate large language models for cross-asset real-time monitoring across equity, fixed income, and currency markets. Tang et al. [6] provide a qualitative analysis of regional housing supply and demand imbalances in the U.S. using big data. For large-scale advertising systems, Zhu [7] introduces RAID for reliability automation through intelligent detection, and Zhu [8] presents TraceLM for temporal root-cause analysis using contextual embedding language models. In advertising optimization, Zhang [9] proposes AdOptimizer, a self-supervised framework for efficient ad delivery in low-resource markets, while Zhang [10] explores reinforcement learning for automated ad campaign optimization for small businesses. For network testing, Tu [11] develops ProtoMind for smart regression detection based on message sequence modeling, Tu [12] introduces AutoNetTest for intelligent 5G network test automation, and Tu [13] further elaborates on ProtoMind for regression detection. In manufacturing and business intelligence, Xie and Chen [14] present Maestro, a multi-agent system for task recognition and optimization in manufacturing lines, while Xie and Chen [15] develop CoreViz for context-aware reasoning and visualization in business intelligence dashboards. Chen and Xie [16] augment advertiser decision support with generative AI and interactive analytics. In logistics, Wang [17] applies predictive modeling for sortation and delivery optimization in e-commerce, Wang [18] employs Bayesian optimization for adaptive network reconfiguration in urban delivery systems, and Meng et al. [19] research green warehousing site selection and path planning using deep learning. Wu [20] examines cloud infrastructure for large-scale parallel computing in genetic disease research, and Wu [21] focuses on the construction and optimization of an intelligent gateway software management platform under cloud-edge integration for the Industrial Internet of Things. Chen [22] addresses design optimization of data pipelines in gig economy platforms, and Chen [23] introduces geospatial neural networks to enhance smart city planning through location intelligence.

Xu [24] presents UrbanMod for text-to-3D modeling in accelerated city architecture planning. Yuan [25] exploits GPT-4 for multimodal medical data processing in electronic health record systems. Li et al. [26] explore gamifying data visualization to foster citizen engagement in smart cities, and Li et al. [27] apply named entity recognition to smart city data streams for enhanced visualization and interaction.

2. THE HISTORY OF COMPUTER DEVELOPMENT

Mainframe stage: With the birth of the first computer, through the tube digital computer, transistor digital computer and the development of large-scale integrated circuit computer, computer technology is becoming more and more mature.

Minicomputer stage: the sixties and seventies of the last century, the first large-scale mainframe equipment to shrink, to meet the requirements of China's public service unit of the relevant information data processing, the cost is relatively low, the price is accepted by the community.

Microcomputer phase: In the 1970s and 1980s, a second reduction of large mainframes was made. Since then, it has mainly undergone many generations of evolution, occupying the computer market and making computers popular.

Client, server: In 1964, IBM and American Airlines created the first worldwide online booking service, which represented the beginning of a computer as a client and server. The server is the core of the network, but the client is the foundation of the network. It relies mainly on the server to get the data it needs, but the server mainly provides the resources the client needs for the network. In this way, you can play the host PC processing power, to minimize their own pressure.

Internet phase: the Internet is the local area network, wide area network and stand-alone, according to specific communication protocols constitute a computer network. Internet technology began in 1969, and from the first stages of text to pictures to the present stage of video and voice, it became more powerful as broadband became more widespread. In the phase of the Internet, people can learn about world events without going outside the home, and the Internet can gradually narrow the distance between people.

Cloud computing era: cloud computing in 2008 in China slowly popular. It makes it possible to smoothly and freely circulate its own computing power through modern information technology. Mainly based on Web services, modern information technology as the core, for individuals and companies to provide very large convenience and benefits.

3. NEW FEATURES EXHIBITED BY COMPUTER TECHNOLOGY AT THIS STAGE

3.1 Increasing degree of intelligence

Advances in hardware and software in computer technology have improved the computing power of computers and laid the technical conditions for the rise of artificial intelligence technology. Thanks to the new developments and breakthroughs in other disciplines, artificial intelligence technology has realized the combination of computer technology, social science, mechanics, fuzzy mathematics, sensor technology and other technologies. It has vigorously promoted the development of artificial intelligence technology, making the intelligent degree of artificial intelligence technology higher and higher, and major achievements such as bionic robots, AI intelligent technology, automatic engineering, and pattern recognition have emerged, profoundly affecting and changing contemporary society. The continuous improvement of the intelligent level of computer technology will enable computer technology to be used in more fields with better results. For example, applying AI intelligent technology to image and text recognition can greatly improve people's work efficiency, improve the level of security, and build a more orderly and stable social order. In addition, the improvement of intelligence has also enriched people's entertainment methods, helping to break the boundaries of current entertainment development, enrich the stage results of entertainment programs, and bring people a higher level of audiovisual entertainment. For example, the application of artificial intelligence technology to performance events is increasingly becoming one of the main technological methods for spring evenings and major festival celebrations.

3.2 Cross-border integration and information sharing become the trend

First, thanks to the advancement of computer technology, and strongly promoted by computer technology, previously unrelated disciplines and industries have gradually established contacts among themselves, laying the foundation for cross-border integration. Driven by the "Internet Plus" initiative, cross-border integration is increasingly becoming a major trend. The economic structure, geographical structure and cultural structure will undergo tremendous changes.

Secondly, under the digital information age, the sharing economy has gradually emerged. The sharing economy is based on information sharing. Relying on computer technology, it can standardize and standardize all kinds of information, which facilitates the realization of information sharing. At present, information sharing system can be established among departments, industries, enterprises and subjects, which greatly improves the utilization of information resources, reduces the time of collecting, sorting and classifying information, and helps to create more social wealth. After the trend of cross-border integration and information sharing, computer technology can be applied in a broader range of fields, not only to industrial production and scientific research, but also to people's lives. The smart home is an expression of the progress of computer technology.

3.3 Faster data processing speed

In the digital era, the rapid development of big data and cloud computing technologies has increasingly integrated data originally scattered in various aspects into a huge database. Thanks to the powerful computing power of cloud computing technology, data retrieval can be realized in a shorter time. At present, big data technology is becoming an important technology for governments to govern the country, enterprises to manage employees, and people to regulate their lives. Driven by big data technology, knowledge is developed from fragmentation to holistic, helping to break down information barriers between industries, disciplines, and people, greatly promoting data processing efficiency, and providing greater convenience for people's life and work. With the help of cloud computing, it can effectively cooperate with big data technology to achieve effective filtering, classification and processing of information, and fully meet the needs of people for large amounts of data.

4. AN EFFECTIVE STRATEGY FOR THE DEVELOPMENT OF COMPUTER TECHNOLOGY AT THIS STAGE

4.1 Effective integration of computer technology and communication technology

Bluetooth technology has been used in China for a long time, and it has also been rapidly developed in recent years as an early expression of the integration of communication technology and computer technology. Bluetooth technology has a low cost, has a good effect on short-distance transmission, can achieve two-way transmission of information, and has high efficiency. With the development of Bluetooth technology, the integrity of information transmission has also become increasingly high. The most significant manifestation is that previous Bluetooth technology advocated one-on-one, peer-to-peer information interaction, and with the further development of Bluetooth technology, it has been possible to achieve one-to-many information interaction. Baseband processing modules and radio frequency modules are the foundation of Bluetooth technology, which builds musical channels and platforms for information transmission, and can identify and analyze time information. Bluetooth technology is a short-range communication technology, so with the development of communication technology, Bluetooth technology is mostly used in specific scenarios. When we compare Bluetooth with several common wireless technologies, we can discover the characteristics of Bluetooth technology, as shown in Table 1.

Table 1: Comparison of Bluetooth technology with other common wireless technologies

Name	Wifi	Bluetooth	Radio frequency identification technology
Communication distance	20-200m	10-150m	＜ 3m
Frequency band	2.4ghz/5ghz	2.4ghz	2.4ghz
Safety	Low	High	Medium
Electric consumption	10-15ma	20ma	Low
Cost	20$	2-5$	0.5$
Areas of application	Wireless network, pc, pda	Multimedia, automotive,	Data reading

		medical	

In recent years, Bluetooth technology has undergone iterations of more than 4.2, 5.0, 5.1 to the latest version 5.2, and it is not difficult to find that Bluetooth technology, as the longest-used communication and computer fusion technology, has been developed in a variety of features in the new period. Bluetooth technology is an important carrier of communication technology, which utilizes computer technology to achieve cross-platform information transmission of different device types, thanks to the strong compatibility of Bluetooth, which is widely used in wireless devices such as smartphones, tablets, computers, etc. Security products such as identity authentication, billing management, etc.; Consumer entertainment, such as headsets, games, etc.; Automotive field, such as GPS, ABS, etc.; Domestic appliances, such as refrigerators, microwave ovens, televisions, influences, etc., have been widely used in the medical field, the construction field, and the toy field. Bluetooth 5.2 As the latest Bluetooth transmission protocol and version at this stage, it has the advantages of longer transmission distance, faster transmission speed and lower transmission power characteristics. Among them, the most significant advantage is the application of LE synchronous channel, enhanced ATT, LE power control technology. LE Isochronous Channels (LE Isochronous Channels), which can realize the interaction between audio devices, reduce the conflict between Bluetooth and other wireless devices in the 2.4Ghz frequency, and optimize the user experience. Enhanced ATT (Enhancedattribute Protocol), or Fast Service Discovery, enables fast switching of audio frequency devices. LE Power Control can effectively reduce the power of Bluetooth, optimize the power of the transmitter, and improve the stability and reliability of the connection.

4.2 Development of Artificial Intelligence Technology in Computer Network Management

The application of artificial intelligence technology in computer network management brings into play the function of expert system to collect, analyze and sum up the experience of experts and related knowledge. Afterwards, resources are incorporated into the system to make full use of logical processing techniques. Diagnostic evaluation systems are built to quickly address complex problems in a variety of fields. Expert system is a computer program with intelligent characteristics. By running the system and storing data, it can manage a large amount of data produced in the computer network management, which makes the network management ability to be improved. In the application of artificial neural network technology, problems that are difficult to handle by computer technology can be effectively solved, such as identifying language patterns, automating control, predicting estimates, etc., and also involves biology, economics, and medicine, and its intelligent properties are very good. In the application of artificial neural network technology, it is mainly to simulate the way the human brain works, and has good fault tolerance and acceptance.

4.3 Increasing R D efforts to enhance information support capabilities

In order to effectively deal with information security issues and enhance the capacity of computer technology in information security, First of all, we should intensify the research and development of computer security software. It has been proved that through the research and development of computer security software, we can improve the protection performance of computer and make the computer have the ability to deal with the information security problems caused by computer viruses and vulnerabilities. There are a lot of free security software on the market today, but there is a large gap between them. To better address vulnerabilities in computer technology, operating system-based security software should be developed that is more compatible with operating systems. For example, on top of the Windows Security Center in the Windows operating system, Develop computer technology anti-virus and threat, firewall and network protection capabilities that are compatible with the Windows operating system to enhance the security protection performance of the Windows operative system, better protect personal private messages and prevent their leakage.

Secondly, for issues related to the breach of private message because of a database vulnerability or failure, It is necessary to strengthen the research and development of database software, utilize algorithms such as AES, 3DES, SM4 and other algorithms, and implement the update of database encryption algorithms to effectively cope with the information leakage that may occur in the event of a database failure or vulnerability, so that the information of the people can be more effectively safeguarded.

Finally, in the face of the problem of information leakage caused by internal employees for the purpose of obtaining excessive profits, the management of internal employees should be strengthened. In particular, computer technology tracks employees' rights and IP addresses, so that when employees have abnormal actions, they can promptly alert the enterprise, allowing the enterprise to effectively manage the employees.

5. CONCLUSIONS

In summary, with the continuous progress of our society and the continuous innovation of information technology, China's computer technology will surely embark on a new development path. In order to meet the relevant needs of people's life and work, all sectors of society should pay some attention to computer technology, so that computer technology has a good development prospect.

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