Discussion on the Application of Layering Technology in the Development of Computer Software

Aihua Wang
Infectious Disease Prevention and Treatment Hospital Chifeng, 024000, Inner Mongolia
200245843@dlvtc.edu.cn

Abstract: Computer software is an important way for computers to achieve various functions. With the popularization and application of computer technology, people also put forward new requirements for computer software development technology. Traditional single-level software development technology can no longer meet the actual needs of computer technology applications at this stage, so we must actively apply layered development technology. Computer software developers should strengthen their understanding and research on layering technology, and make full use of layering technology to improve the function, quality and speed of computer software. This will help newly developed computer software to better adapt to the requirements of the network information society in the new era, thereby promoting the modernization of China's social economy.

1. Introduction
As China gradually enters the age of network information, computers have been widely used in various fields of social production and life, profoundly changing people's traditional behavior. However, the various service functions of the computer and the improvement of its quality and speed all need to rely on computer software to achieve. Therefore, in the new era, people have put forward higher requirements for the development of computer software. Compared with single-layer development technology, layered technology can develop, optimize and upgrade computer software through two-layer, three-layer, four-layer, middle-layer or even five-layer technology, so that the functions and quality promotion of computer software can be comprehensive. Therefore, computer software development technicians should actively learn and master new software development technologies such as layered technology, and make full use of the layering characteristics of layered technology to expand the module functions of computer software, so that computers have more powerful and diversified service capabilities. Only in this way can we better meet the needs of national economic construction and social development, and provide an important impetus for China's development in the new era.

2. Overview of the Importance of Computer Software Development
The realization of computer functions and the operating efficiency of the computer are closely related to the computer software system. If the computer software system has powerful functions and performance, the operating speed, stability and processing capacity of the computer can be significantly improved. In consequence, we must attach great importance to the development of computer software. When developing computer software, layering technology is an important basic technology to ensure the layering and reasonable layout of software systems. Through the application...
of layered technology, computer software can be divided into multiple levels, so that related functional modules can be designed for each single level in software development, so that the quality of computer software development and development speed can be significantly improved[1]. With the development of China's network information technology, automation and intelligence have become an important direction for the development of computer technology. Hence, the development of computer software is also facing the innovation and development of new technologies, which requires us to continuously accelerate the application of new technologies in software development, so as to promote the modernization of China's national economic construction and social life.

3. Technical Analysis of Layered Development of Computer Software

3.1 Basic Meaning of Computer Software Layered Development Technology
Layering technology refers to the technical method of dividing the internal layers of the software used in the development of computer software. It is an important auxiliary technology for computer software development. Hierarchical technology can realize different software development schemes by using different hierarchical division modes, and make computer software functions more perfect. In computer software development, improving the quality and application functionality of software products is the goal pursued by software development. However, limited by the performance of computer hardware equipment and traditional software development technology, computer software often has problems such as large space required, low data processing and analysis efficiency, and many system security vulnerabilities. This not only increases the difficulty of maintenance and management of the computer software system, but also limits the further popularization and application of computer software. As a consequence, we must actively adopt layered technology to optimize and upgrade the single-level computer software development architecture, and achieve the stability, fluency, and processing power of computer software through the multi-layer structure.

3.2 Analysis of Technical Features of Layered Development of Computer Software
The application of layered technology in computer software development can effectively expand the computer software system. By reasonably decomposing the software system, it can not only better meet the individual needs of users, but also can modify the local functional layer and the related layer in the software system to achieve the purpose of optimizing computer software. The application of layered technology for computer software development can also upgrade the core area of each decomposition module in the computer software system, change the upper-level relationship of the module function or expand its function, and then realize the overall upgrade of the computer software system[2]. Layered development technology has the characteristics of shortening the development cycle of complex computer software. As a result, it can significantly improve development efficiency on the basis of ensuring the quality of computer software development. In addition, it can more fully and reasonably apply standard interfaces by defining interfaces of different functional levels, so that the hierarchical interfaces have stronger independent expansion capabilities and improve the cohesion between all levels.

4. Application Analysis of Layering Technology in Developing Computer Software
The layered development technology based on a single-level architecture not only effectively shortens the development cycle of computer software, improves the quality and efficiency of software development, and enriches the functions of computers, but also provides important information for the advancement of computer software development technology. Basic (layered software development structure can be seen in Figure 1). With the continuous development of layered technology, two-tier, three-tier, four-tier, five-tier, and middle-tier development technologies are currently more commonly used in computer software development. The application of these technologies has played an important role in improving the overall level of computer software development technology. This article will analyze and discuss the development technologies of two-layer, three-layer, four-layer,
five-layer and intermediate layer respectively.

![Figure 1: Schematic Diagram of the Basic Structure of Computer Software Development](image)

4.1 Application Analysis of Two-layer Technology in Developing Computer Software
In traditional computer software development, single-level development technology is mainly used. However, with the popularization of computer applications and the development of network information technology, this single-level development technology has been unable to adapt to the requirements of computer software quality and functions in the network information age. In the development of computer software, we must improve the level of development technology, increase capital investment, and develop a layered development technology with stronger development capabilities and better software quality. Therefore, scientists developed a two-layer software development technology based on a single-level development technology. Through the application of two-layer computer software development technology, the operating stability and operating speed of the computer software system have been greatly improved, and the functionality and reliability of the computer software have been significantly improved. At the same time, the application of two-layer technology for computer software development can also reduce the cost of manpower and material resources required for software development, reduce the capital investment in computer software development, and shorten the development cycle of computer software, which is conducive to the continuity of computer software development technology. The application of two-layer technology enables computer software to give full play to the functional advantages of the client and server, and improves the functionality and practicality of the computer software by upgrading the client [3]. The computer software developed by the two-tier technology has achieved significant improvement in the efficiency and quality of processing data and information compared with the computer software under the single-tier architecture, providing important technology for the modernization of China's social economy and the development of information technology support.

4.2 Application Analysis of Three-tier Technology in Developing Computer Software
As China gradually enters the network information society, computers have been used more and more widely in various fields of social production and life, and people's demand for computer software is also increasing. Objectively, people require that the quality and functions of computer software must be improved accordingly to meet the actual needs of modern society. Therefore, we must improve the
technological level of computer software development to meet the requirements of software development in the new era. We need to develop a three-tier software development technology based on a two-tier software development technology through technical upgrades. Compared with the two-layer computer software development technology, the application of the three-layer technology can effectively expand the three-dimensional space of software development. Meanwhile, it can further improve the adaptability of the software, enrich the functions of computer software, and comprehensively improve the ability and efficiency of the computer software system to collect, store and process data and information. It plays an important role in improving the quality of computer software development. The so-called three-layer computer software development technology mainly includes three main layers: business processing layer, interface layer and data layer [4]. Among them, the data layer is the core layer of computer software development, which is mainly responsible for reviewing and processing the data information transmitted by the business layer, and optimizing the software functions to adapt to the specific requirements of users. Simultaneously, the business layer is mainly responsible for processing various data information transmitted by the interface layer in time, and transmitting the processed data to the data layer. The interface layer is responsible for collecting various data information of the computer and transmitting the collected data to the business layer in time.

4.3 Application Analysis of Four-tier Technology in Developing Computer Software
The level of computer software development technology will have an important impact on the development of computer technology, and it is also the main way to promote the progress of network information technology. Thus, we must attach great importance to the promotion of computer layered development technology. In this context, a four-tier software development technology was developed based on the three-tier development technology. Compared with the three-tier computer software development technology, the four-tier development technology has more complete and powerful functions. The software developed by it can realize more complex functions, and the software system runs more stable and smoothly. Four-tier software development technology The main computer software development architecture is divided into four parts: data layer, web layer, logic layer and storage layer. Four-layer software development technology enables computer software to interact with external layers according to the individual needs of computer users, and re-analyze database data and re-integrate it, and then store the integrated data in the storage layer. The functions of computer software can be further optimized through the secondary analysis, integration and storage of data, which provides important support for the development of computer software. This will help improve development efficiency and improve computer software functions [5].

4.4 Application Analysis of Middle Layer Technology in Developing Computer Software
Compared with other layered technologies, the middle-tier computer software development technology has certain uniqueness. The middle layer is a technical method based on an independent software system that improves the efficiency of computer software development through the application of the middle layer development technology. Consequently, software development technicians should actively apply middle-layer development techniques to deal with more complex and software development issues when developing computer software. The middle layer technology can realize automatic and effective avoidance of hidden dangers such as software development, thereby making the development of computer software safer and more efficient. All at once, the application of the middle-layer technology in the computer software development process can also optimize the processing of data information, so that the running texture, stability and smoothness of the computer software are significantly improved, which is also a unique function of the middle-layer technology. This is of great significance to the development of computer software, and is an important technical support for the development of computer software in the new era.
4.5 Application Analysis of Five-layer Technology in Developing Computer Software
When using layered technology to develop computer software, if J2EE is used as the basic software development environment, then five-layer development technology can be used to develop computer software [5]. The five-tier development technology is also based on the three-tier development technology, and the development technology is further expanded and optimized while retaining its basic technical characteristics. Compared with the three-tier development technology that simply divides the client into a client layer and a web application layer, the five-tier development technology expands the computer software development architecture into five layers: web application layer, client layer, integration layer, resource layer, and business layer. This can solve the problem that computer software can only handle long-term access to computer database application data. The data layer can be further layered when the five-layer technology is used for computer software development to form a resource layer and an integration layer. The resource layer is the file system of computer software, and the integration layer is the database system of computer software. The application of five-layer development technology can also further refine the division of computer system modules and functions, which can improve the rationality of computer software layout, and effectively improve the data processing functions and overall performance of computer software. However, the five-tier technology is still immature, and its application in computer software development has great limitations. At present, the five-tier technology is mainly used for computer software development in a specific development environment. With the continuous improvement of the five-layer development technology, its application range will be further expanded. This is an important computer software development technology with high application value and broad development prospects.

5. Conclusion
In order to enable the functions and quality of computer software to meet people's requirements for computer functions in the new era, computer software development technicians must fully understand the layered development technology. In addition, computer software development technicians also need to combine the actual needs of computer software development to rationally use the corresponding layered development methods, expand the service functions of computer software, and improve the adaptability of computer software. This can make the computer software run more safely and smoothly, shorten the computer software development cycle, and reduce the computer software development cost. At the same time, computer software developers should also pay attention to accumulating experience and actively learn from successful cases of computer software development. Otherwise, computer software developers must boldly carry out technological innovations to develop computer software that can adapt to various types of mobile computer terminals such as smart wearable devices, and promote the development of China's network information computing technology.

References:
[1] Li Wei. The application of layering technology in computer software development[J]. Electronic Technology and Software Engineering, 2020(14):50-51.
[2] Wang Chun. Application of layering technology in computer software design[J]. Information and Computer (Theoretical Edition), 2020, 32(2): 83-84+87.
[3] Jiang Peng. Analysis of the application of layering technology in computer software development[J]. Journal of Science & Technology Economics, 2019, 27(32): 16+35.
[4] Dong Chaoxian. Discussion on the application of hierarchical technology in the development of computer software[J]. Information and Computers (Theoretical Edition), 2019(12): 109-110.
[5] Kong Lu. Discussion on the application of layered technology in computer software development[J]. Southern Agricultural Machinery, 2019, 50(8): 164.