Development Trend Layered Technology Optimization Strategy in Computer Software Development

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Abstract. With the development of society and the rapid progress of science and technology, computer software development technology has brought new development trends, among which layering technology is a relatively common technology in software development. This article has conducted a series of research and discussion on the development trend of layered technology in the development of computer software. In modern society, the application of computer technology is more and more extensive, the technology used in computer software development is more and more diversified, and the traditional single-layer software system is more and more difficult to meet people's requirements. As the actual requirements of users continue to increase, the application of layered technology in computer software development is becoming more and more common. The globalization of information technology has not only changed people's production and lifestyle, but also improved people's quality of life, and promoted the continuous progress of society and the times. As an important development field in the information age, software technology plays an important role. The situation of globalization is becoming more and more obvious. As one of the main means of cultural communication, information globalization depends to a large extent on the development and popularization of the Internet, and determines the speed of globalization. The computer is the external outlet of the Internet. The upgrading of computers is getting more and more attention. The development of network technology provides opportunities for the development of computers. In the process of computer software development, layering technology has improved the computer's operational capabilities and data processing capabilities. These two improvements provide effective protection and bring us a better user experience. This article is based on the particle swarm algorithm to carry out research and discussion. The experimental research results show that the development trend of layering technology in computer software development has shown a trend of vigorous development. Under this trend, we should follow this pace and keep going.

Keywords: Layered Technology, Optimization Strategy, Computer Software Development, Development Trend
1. Introduction
With the continuous development of modern computer technology and software technology, the actual requirements of users are also increasing, and higher requirements are put forward for the structure and diversity of computer software development [1]. Traditional software development mainly uses single-level technology, so the overall structure of the software developed is relatively simple and slow. More and more user data is difficult to process, which seriously affects the actual experience of users. With the continuous exposure of fault structure technical defects, a stable, flexible and clear software layering technology has emerged [2]. The main theoretical basis of layering technology is the use of multiple levels of interrelationships in the computer software structure. In the process of computer software development, the problems that occur in the software development process are handled hierarchically, and each level includes corresponding problem solutions to form a vertical and phased software development system [3]. In computer software development, the most important aspect of layering technology should be the concept of layering. Only by understanding the meaning of superposition can we distinguish the concept of layering in computers [4].

Generally speaking, the meaning of stratification can be summarized in four words, that is, prescribe the right medicine, because various problems will be encountered in the process of computer software development, and we can only classify and summarize various problems. And put them on different levels for understanding and analysis, forming a clear frame structure, the layered technology has proved to be a very feasible method of computer software development in practice [5]. At the same time, as time goes by, layering technology is also constantly evolving. In the early days of computers, it only existed in one-way connections. This method does not require layered technology to solve simple, clear, and complex connection problems [6]. However, with the passage of time, the fault structure of computers cannot meet the requirements of social development. With the development of the times, more complex and complete two-tier structures have emerged. Therefore, the server and the computer began to set up the connection [7]. At present, the layered technology is mature, which solves many major problems of computer software development and has decisive advantages. Greatly improve the quality and efficiency of software development, and meet people's requirements for complex computer structure systems [8].

The layering technology has the characteristics of stability and independence. Stability is mainly to improve the efficiency of software development and greatly shorten the time required for software development; independence is like a parallel circuit in a circuit, when only one conceptual layer has problems, therefore, the independence of layered technology can guarantee the computer Continuous and efficient operation in the software development process [9]. At present, computer networks have penetrated into all aspects of our lives. The higher the complexity of the computer network, the greater the challenges and difficulties faced by software developers. The emergence of hierarchical technology optimization strategy perfectly solved this problem and innovated a new round of vigorous development of computer software development. It is believed that in the near future, layering technology can play an irreplaceable role in the current era [10].

2. Method

2.1. Particle Swarm Algorithm
Suppose that in the D-dimensional space, the population contains N particles, and the current position of particle i is:

\[ X_i = (x_{i,1}, x_{i,2}, \ldots, x_{i,D}) \]  

The current optimal position is:

\[ p_i = (p_{i,1}, p_{i,2}, \ldots, p_{i,D}) \]  

The velocity vector is:
\[
V_i = (v_{i,1}, v_{i,2}, \ldots, v_{i,D})
\]  (3)

Thus the update strategy of particle position is:

\[
v_{i,j}(t+1) = \omega \cdot v_{i,j}(t) + c_1 \cdot r_1 \cdot (p_{i,j} - x_{i,j}(t)) + c_2 \cdot r_2 \cdot (p_{g,j} - x_{i,j}(t))
\]  (4)

\[
x_{i,j}(t+1) = x_{i,j}(t) + v_{i,j}(t+1)
\]  (5)

Where: \(t\) is the number of iterations, \(c_1\) and \(c_2\) are learning factors, \(r_1\) and \(r_2\) are uniformly distributed random graphs in the interval \([0,1]\), \(\omega\) is the inertia weight, and \(p_{g,j}\) is the global minimum of the population Excellent unit.

2.2. The Application of Two-Layer Technology in Layered Technology Should Be Strengthened

In the current period, when the computer software development process is in progress, the two-layer technology in the layered technology is an extremely common technology. However, relevant personnel also need to pay strict attention to the client and server of the two-layer technology to avoid actual problems occurred in the process, which affected the overall operation of the computer; in the actual research and development process, relevant units and personnel need to first transfer data information from the client to the server, and perform sufficient analysis and processing of the information, and then return it in the client, to ensure that the utilization rate of this information is maximized, and to lay the foundation for the healthy development of the overall field of computer in our country.

2.3. The Application of Three-Tier Technology in Layered Technology Should Be Strengthened

At the same time, in order to solve the defects in the application of two-layer technology to computer software development, and to improve the functions of computer software, relevant units and personnel can also strengthen the application of three-layer technology in the layered technology to improve the computer. The efficiency and speed of visiting the website ensure that the computer can complete the corresponding work more scientifically and efficiently; at the same time, by strengthening the application of the three-layer technology in the layered technology, it can also strengthen the realization of human-computer interaction, and further strengthen the computer's own efficacy and performance. Improve, and on the other hand, expand the overall scope of application of computers, thereby promoting the overall progress and development of modern computers.

2.4. The Application of Four-Layer Technology in Layered Technology Should Be Strengthened

With the rapid development of modern computers, the Internet and other technologies, the operating environment of computer software systems has gradually become more complicated. Only relying on the application of two-layer or three-layer technology of layered technology cannot improve the level of software development. At the same time, it affects the improvement of the overall level of modern computers; in order to solve these problems, relevant units and personnel can add an encapsulation layer structure to the data layer and logic layer on the basis of the application of the three-tier technology to achieve the basis. The actual needs of relevant customers make a reasonable choice of computer operation methods, prompt relevant personnel to carry out targeted software research and development, ensure that certain problems can be dealt with through the application of the software, and promote the healthy and stable operation of the overall field of modern computers and development.

3. Experiment

3.1. Subject

Based on the use of particle swarm algorithm, this article explores the application of layering technology in computer software development. After understanding these applications, a series of research and discussion will be carried out, and the effect of other technologies and the development trend will be obtained.
3.2. Experimental Method

(1) Literature research method
First, use the literature research method to clarify the concept, type, and characteristics of the layered technology, use a variety of computer software development technology integration methods to summarize and summarize the theoretical resources of the layered technology, and especially adhere to the multi-layered technology foundation in the layered technology as a guide.

(2) Qualitative research method
The organic combination of qualitative research and quantitative research is adopted. It focuses on analyzing how to apply data-related technology to layered technology in the optimization strategy of computer software development, and how it affects computer software development.

(3) Investigation and research method
Through the design of related questionnaires, the computer software developers use hierarchical technology to investigate, and then integrate and analyze the obtained data, and conduct scientific analysis on the basis of this practice to obtain scientific conclusions.

4. Results

By analyzing and integrating the layering technology in computer software development and the degree of stability of ordinary technology in software development, we can know that the stability of layering technology and other ordinary technologies in computer software development must be different. After collecting data, such as Table 1 shows:

| System stability of computer software development and application technology |
|---------------------------------------------------------------|
| Stable | Unstable |
| Layered technology development system | 95% | 5% |
| JAVA technology development system | 90% | 10% |
| Database technology development system | 80% | 20% |

It can be seen from Table 1 that integrating layered technology into software development can effectively improve the efficiency and level of computer software development, ensure the overall upgrade of software, and improve the quality of software development. Computer layering technology has many advantages, which can greatly shorten the software development cycle, ensure the software development level, and ensure the normal operation of the software.

Some computer software development engineers must consider the goal of increasing user satisfaction and select application layering technology to implement software development work, which not only promotes the development and application of other software functions, but also promotes the development and application of other software functions. The most important thing is to make the software system more flexible.

Then analyze how to conduct research on the efficiency of various technologies in the process of computer software development, compare the results by sorting out, and then analyze the results and draw charts, as shown in Figure 1:
Figure 1. Technical efficiency of computer software development

As shown in Figure 1, hierarchical technology has the highest efficiency in software development. Therefore, the development trend of hierarchical technology optimization strategies in computer software development shows an increasing development direction. Hierarchical technology is to divide actual problems and user needs into layers according to different content levels in the software development process. This not only makes the overall thinking of computer software developers clearer, but also makes it easier to solve a certain level of problems in the future software operations. Subsequent modification and maintenance have greatly saved manpower and financial resources, and layered technology is expanded and developed in the software system. Building a computer software system platform for computer software developers has reduced the difficulty of software development to a certain extent. Therefore, it is very effective and convenient to adopt hierarchical technology for system development in the process of computer software development.

This article uses questionnaires to investigate whether computer software developers’ optimization strategies for layered technology are suitable for use in computer software development, and distributes questionnaires to carry out research. The views of computer software developers are sorted and summarized, as shown in Figure 2:

Figure 2. Computer software developers' views on layered technology

It can be seen from Figure 2 that the computer software developers are very satisfied with the application of layered technology to computer software development. The layered technology can greatly improve the speed and quality of software development. The technical advantages can be exerted by focusing on the key content of each part. Analyze and apply in accordance with certain
measures and regulations. Layered technology can give full play to its advantages in computer software development, and establish a close connection between the server and the calculator, so as to rapidly develop our country's computer software development projects. Only a few people are dissatisfied with the layering technology, thinking that it is not as simple as other traditional technologies, such as JAVA technology and database technology.

5. Conclusion
With the continuous progress of society and the continuous improvement and development of my country's scientific and technological level, the overall computer software development environment will become more and more complex. The development of multi-layer technology of layered technology can provide a certain degree for current and future computer software development. To a certain extent, stability and security, and can enhance its scalability and other functional characteristics. The more mature the technology used for computer software development, the higher and higher the research requirements of the computer team in the whole world for layered technology. The hierarchical technology optimization strategy has also been extremely widely used in people's daily work and life, and to a large extent affects the overall operation of the society; the application of computers is also inseparable from the support of software. Therefore, relevant units and Personnel need to strengthen the application of modern technologies such as layering to ensure that the development of computer software is completed more scientifically, efficiently and quickly. At the same time, the quality and accuracy of the software itself are guaranteed, and the normal operation of the computer field promotes the further development of our society as a whole.

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