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Application of software engineering methods in computer software development

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Abstract: With the advent of the era of big data, accelerating economic and social development has become a new demand to match it, and it is imperative to carry out corresponding research on software engineering. Software engineering involves many specialized technical areas. To improve the efficiency of software, it is necessary to establish under the guidance of scientific theory and technology, especially the theory and technology of software engineering, in order to better solve the problems related to it and ensure its efficiency. Using the idea of "software engineering" can effectively improve the practicality of software.

1. Introduction

With the continuous development of national science and technology, software engineering methods have also been continuously innovated and upgraded, which plays a pivotal role in the process of computer software development. Modern technology also makes the process of software development simpler, shortens the time and personnel required for software development, and many operations can be simplified by using modern software engineering methods. And can improve the quality of software development, realize more intelligent engineering design. With the passage of time, all industries have higher development needs. No matter in the field of medical treatment, finance and tax, or education, they cannot do without the support of science and technology to realize their own innovative development. The application of modern software engineering methods to computer software development can make the system and software applied by all industries have more intelligence. It is of great practical significance to help the industry to carry on the transformation of information and promote the sustainable development of the industry.

2. Introduction to software engineering methods

2.1 Concepts of software engineering methods

Software engineering is a kind of engineering technology as the core, with strong application, is a kind of high quality software curriculum. Software engineering involves a lot of content, such as database technology, system platform design, programming language design, different design patterns will contain different standards. At present, with the progress of The Times, the range of use of software is also expanding, for example, can be used in office suite, man-machine interface, E-mail and so on. At present, the wide application of computer software in aerospace, agriculture, finance and industry has become an emerging research field. With the development of various industries and the application of software technology, the working efficiency of enterprises can be greatly improved, which plays a great role in promoting the development of enterprises. Since the 20th century, a large number of software engineering techniques have appeared at home and abroad, represented by the construction method. This structured way divides the whole life cycle of software into several parts, and determines the specific purpose through the corresponding technology. Each step can achieve a purpose, and in the realization of this purpose, the required data and specific operation mode are closely related to this, which is beneficial to the development of software.

At present, the software engineering method belongs to the software discipline, on this basis, using the engineering method, we can successfully build a new advanced software discipline, it contains a lot of content, including the following parts: programming language design field, database field, software development technology field, system platform design field, system design pattern and system design standards. At present, with the rapid development of information technology, office software, office operating system and embedded system are more and more widely involved, in the industrial field, agricultural field and financial field and other industries have been very good use, such development, not only can promote the industry work efficiency and production quality improvement, but also can inject new power for the development of social economy.

In the past 60 years, software engineering methods have been widely introduced, including structured methods, object-oriented methods, and formal methods. In this kind of software engineering methods, the structured method is also known as the life cycle method. This method can further divide the life cycle of the software into several different stages, and use the structured technology to achieve the expected setting goals of each stage. The object-oriented approach is to associate all operations with data to ensure a smooth transition in the process of software development. The formal method mainly realizes the development of the program through a mathematical transformation with formal characteristics, so as to ensure the correctness of the description of the program.

2.2 Advantages of software engineering methods

2.2.1 Improve the intelligence level of software

On the basis of software engineering method, proper application of it in software development can further improve the overall performance update rate of software and ensure its overall advancement, so as to achieve the purpose of improving the overall storage capacity of software. At the same time, in this process, users can avoid many complex debugging and change actions, so as to promote the intelligent development of software.

2.2.2 Relieve the operating pressure on network hardware

Software optimization can greatly reduce the pressure on network hardware generated by software itself. If software is not optimized, the pressure on network hardware will continue to increase, and it will occupy a large amount of system running space. At this time, the problem of network resource consumption will become very prominent. In addition, the final service life of hardware and user experience will be adversely affected, resulting in relatively serious consequences.

2.2.3 Improving software development Efficiency

In the computer software development work, if there is no engineering method cooperation, it will affect the overall performance of software development to some extent, therefore, it must be redeveloped other new software, which will lead to the increase of development costs, and the development efficiency of the software itself will be greatly reduced. Therefore, we must take the initiative to use software engineering means to provide overall performance guarantee for the subsequent computer development work, so as to achieve the goal of improving the efficiency of software development and testing[1].

2.2.4 Optimize the final experience effect of software products

In order to achieve a successful software use effect, it must be analyzed according to the user's use efficiency and quality. If the application performance of the software is good, it can quickly recognize the user's instructions, and follow the requirements of these instructions, then it can more effectively avoid the problem of system vulnerabilities. In addition, this project also requires strong anti-interference ability in daily work, so as to better meet the requirements of users and guarantee the research and development results of software under the premise of guaranteeing the quality of work.

3. The significance of software engineering methods applied in computer software development

3.1 Improve the efficiency of computer software development

In the development of computer software, because of its specific function, the number of interfaces and other factors, its development difficulty is different. Software with a wide range of applications requires more intensive collaboration between software engineers and requires more time to develop. If the development quality is not qualified, or cannot meet the needs of users, it is necessary to carry out the development of new software, the demand for manpower, economy, material resources, etc.

By using software engineering, development efficiency can be improved. During development, real-time detection of the developed things is carried out, and each port is effectively monitored. Once problems occur, they must be corrected to ensure the overall performance of the development and prevent duplicate maintenance. In the process of development, software engineering method provides an automated or semi-automated development environment for it. It can build a series of work framework, set the corresponding work in accordance with the development goals, divide the work into various stages, and then proceed step by step, and finally achieve the development of software, so as to improve the efficiency of software development [2].

3.2 Improve the experience effect of software products

The design and development of software is to satisfy certain groups of people, to let users have better experience, and to realize the sustainable development of software itself. For software developers, only by designing and developing popular software and making users have a good experience of using it, can the software have more value and embody their own value. The method of software engineering can help software engineers to design software products, so that the more data obtained in the design process, the better, and can be repeated automatic testing, so as to ensure the normal operation of software functions. For some applications with large user scale and high technical requirements, software engineering can divide complex programs into different programs according to certain goals and adopt structured technologies to complete different tasks. Make sure you do a good job at every step, get good feedback when the final application goes live, and make a good name for yourself as a programmer.

3.3 Reduce the pressure on computer hardware and network

Now, most of the computer software is based on the network for its application, some large computer software on the computer hardware and network demand is relatively high, if the network signal is not good, it will cause the computer software to appear lag, frame drop phenomenon, which will cause bad user experience. Therefore, in the development of computer software, network applications can be properly adjusted to make network capture more powerful and reduce the influence of network on software. The software engineering method can reduce the working pressure of computer hardware, make it adapt to more computers, so as to get more use[3].

4. Main Advantages of modern software engineering methods

The main method of modern software engineering is object-oriented, which can effectively avoid all kinds of complicated problems in traditional technology. On this basis, this paper divides it into five periods and divides it into different periods. In the analysis stage, the object-oriented method of modern software engineering is mainly aimed at the specific problems existing in practice, so its main characteristics and basic attributes can reflect the attributes of events. In the design stage, the method of modern software engineering is to study a certain period of the system, so as to completely change the spontaneous state of traditional software design, and generally adopt advanced computer technology and pattern technology to standardize and maintain the software[4].

4.1 Modern software engineering technology can improve the efficiency of software development

Some businesses have realized that their overall performance in the process of software application is not better than expected before using software engineering. In many cases, enterprises will choose to invest again in new software research, which will inevitably seriously affect the efficiency of software development and increase the investment in software. Applying the idea of software performance engineering to the design and development of software can not only greatly improve the efficiency of testing software, but also better display the performance of computer software.

4.2 Modern software engineering technology can improve the experience effect of software

The experience of using a computer software is to collect the feelings felt by the user when using

the computer software, and the performance presented by the computer software when performing the work. If the computer program is better, it can respond to the user's command faster and complete the user's command with the fastest speed, reducing the user's vulnerability [5].

5. Application practice of software engineering methods

5.1 Development of management information system software

In each industry, MIS requires all kinds of data collection and processing. In the design and development of MIS, the design and development of MIS must be analyzed comprehensively. At present, there are many defects in the construction of the system, which have a great impact on the overall operation of the system. During the system analysis, the collected data should be analyzed and modeled, the business processing process and data display to be presented to the user should be designed, and the flow chart of the whole system business should be drawn accordingly, the organizational structure should be clarified, and the corresponding system model should be established, laying the foundation for the realization of the system. In the establishment of the model, data dictionary, data flow chart and organization chart should be scientifically and reasonably used to simplify the process of business data processing by users and flexibly use the life cycle method to analyze the software structure.

5.2 Developing medical software

In the medical field, computer software has shown endless advantages and played a vital role in improving the efficiency of the medical industry. To a certain extent, there are certain industry procedures and standards for the application of computer software. If this requirement is exceeded, software errors will occur. The design and development of modern software must be guided by the theory of modern software engineering so that it can be developed successfully. Nowadays, in the field of medicine, in order to improve the modernization and standardization of medical treatment, a large number of operating software and management systems have been introduced, such as: System software for patient information management, software for information detection and software for medical information management. In the process of developing pathological information and data software of hospitals, the analysis of pathological reports should be combined with the system, so as to realize the long-term preservation of patient pathology[6].

5.3 Development of computer aided instruction software

In the development of computer aided instruction software, we should first choose the appropriate language and tools, and then through the development of tools and developers of professional ability and structured methods for design. If anything needs to be changed, then the original system needs to be tweaked and adjusted, so it is very easy to make mistakes. Because the needs of users change from time to time, developers must adapt to the needs of users and make changes in a timely manner. However, software obtained using the CAT method is relatively expensive to maintain and not easy to put much effort into using. For example, some functions of the CAT system developed before are difficult to be applied independently, so they must be applied together with the CAT system. Developers should strengthen the application and research of CAI to solve the problem of CAI[7].

6. Notes on the application of software engineering methods in computer software development

6.1 Software Configuration Management Process Analysis

(1) Selection and analysis of software configuration items, including program selection, file selection, data selection, etc., to ensure that the required software work product information is accurate, the software development environment is good, the software testing environment is stable, the required tools are complete, and the implementation standards are reliable.

(2) Configuration management analysis. Due to the various aspects involved in the research and development of the project, it is necessary to ensure that the configuration management can give full play to its functions. The configuration management is divided into two categories, and one management is carried out respectively. To ensure that each stage of the configuration work is correct. Secondly, software structure management adopts unified standards and specifications to ensure the rational use of multiple structures, and comprehensive feature confirmation of structural details to ensure that the predetermined structure can be achieved in the final process. In addition, it is also necessary to consider dynamic log information, data storage item information, and other factors that may change [8].

(3) The management objective must ensure that the overall configuration management throughout the entire development process is reasonable, that all work in the development process is controllable, that all development processes are controllable, and that all development processes are ensured.

(4) Process objectives, clarifying specific responsibilities of staff in different positions, including: project manager is responsible for formulating management and implementation norms, recording all information of supply chain management in detail, preparing and delivering special reports of supply chain management, etc. Configuration management committee is responsible for correctly marking software configuration items and approving the final software products; Among them, the work of the configuration manager includes: upload management scheme, effective control of configuration items, training of developers, and discovery of new problems that may occur; The primary responsibility of the system and its personnel is to effectively adjust important elements such as integration, system design, system version management, etc. According to the configuration project, it can be divided into two aspects, one is the technical configuration project, such as: code design work; The second type is to set the system project management, such as: routine maintenance of the system.

(5) In terms of process, first, a specific configuration management plan should be formulated. On the basis of this plan, the configuration items should be marked specifically, and the specific implementation of the configuration items should be explained in detail, and the corresponding modifications should be made to the configuration items according to the plan.

(6) Software baselines are divided into three types according to the sequence of functional baselines, distribution baselines and product baselines[9].

6.2 Computer software quality control

Optimize the centralized management and control platform software to realize intelligent control. According to the functional requirements of the centralized control of intelligent systems and the differences of various software usage scenarios on the functions of intelligent control, the use mode of the corresponding centralized control is set, so that the personnel on duty can achieve selective arbitrary control on the centralized control platform, without the need for special professionals to set complex parameters. According to the system equipment selection and circuit design, combined

with the functional requirements of the system, the main control program, fault control program and maintenance control program flow design, and based on this, to ensure that the control system has a higher control effect on the software[10].

6.3 Details of engineering methods in software development management

The intelligent information management module in the software must classify the overall business and process of the user, so as to let the customer roughly realize the actual operation of the software, and refine it into each independent service plate. Later, when the customer browsed the required function plate, the process to be carried out will be displayed. This enables a clear understanding of the specific business content. Finally, on this basis, further improve the system can realize the service function. So as to better serve users, and realize the interaction effect between the information management system and users, to ensure that the subsequent functional requirements services can be fully played. During this period of time, when the software is operated, it is necessary to operate the code, so as to ensure that the program will not produce bugs when working, so as to avoid adverse effects on the final operation effect of the software, so as to ensure the stability of the software function[11].

7. Conclusion

With the progress of science, technology and society, the traditional software engineering way cannot match it, it is gradually replaced by the modern software engineering way, and gradually used by more people. At the present stage, many problems arise in the research of software engineering due to its incompatibility with the practical application environment and the defects in people's understanding of its basic theory. The system developed in this subject can meet the needs of the comprehensive development of related industries in China, and expand the application field of the system. However, in the practical application, due to the influence of various external factors, the difficulties encountered in the practical application are greatly increased. Therefore, relevant development researchers should take the initiative to control the influence of external factors on computer system software development, and continue to improve the level of software development technology, so as to further improve and strengthen the application effect of computer system software development.

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