Application of System Engineering Method in Computer Software Design

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Abstract: With the rapid development of computer science and technology, the increasing popularity of computer applications, people need to grasp more and more computer programming languages; however, the stronger the software features, the more convenient they are, and the software development process will be more complicated, the quality of the software is more difficult to be guaranteed. At present, there are related professional papers on the theory of large-scale software project development. By analyzing the methods of system engineering and the design of computer software, this paper explores and studies how to utilize non-computer professionals in the design of small and medium-sized software projects systems engineering methods to improve the efficiency and quality of software design.

1. Introduction

Computer software is the general term for programs, rules and any related documents and data relating to the operation of a computer system. It consists of two parts: one is the machine executable program and related data; two is the machine can not be implemented, and software development, operation, maintenance, use and training related documents.

System engineering is a systematic study of engineering technology, which spans the natural sciences and social sciences, is a general term for a variety of categories of engineering and technology. The traditional concept of "engineering" is to indicate the production technology experiment, and often the hardware as the target and object, so the systematic project to discuss the "project" refers to all the people involved, to change a feature as the goal from the column to the results of the work process [1].

If we in the system engineering computer software as the research objectives and objects. For the computer software design process to establish a system model, and then use the probability, statistics, operations research, simulation and other methods, through the "engineering" processing to construct computer software systems related to the process, methods and techniques. In order to give a quantitative optimization results, make each component of the system coordinate with each other, in order to obtain the most savings in design time, the most technologically advanced, economically the most cost-effective and the most reliable operation of the effect.

2. The System Engineering Methods

Systematic engineering approach can be regarded as a scientific decision-making method in the new era. With reference to the nature of the relevant problems, it can be scientifically planned and clearly defined. The emphasis is on strengthening the inter-relationship between different problems so as to achieve the goal of maintaining the effectiveness of solutions which is to systematically study the key issues and the overall operation status with the help of the holistic and the sports viewpoint. It is always based on the overall system as a starting point, the preparation of scientific work planning and procedures to ensure the quality of system design work.

3. The Value of System Engineering Methods

Systematic engineering method is a basic decision-making technique and also a modern science decision-making method. It mainly classifies the related problems and situations that need to be

dealt with, draws a clear boundary, analyzes the internal relations among various types and various internal factors The connection and integrity are more important. It is to adopt a more comprehensive view and measure of movement to analyze the problems and the whole process. Systematic engineering method involves a kind of scientific method of dealing with problems in different fields such as natural science and social science. Its main characteristic is practicality, comprehensiveness, integrity and coordination. The basic content of systematic engineering methods includes scientific concept, holistic concept, comprehensive concept, innovative ideas and so on [2].

Scientific concept refers to the analysis of the problem requires the establishment of a scientific concept, is the use of scientific laws to complete the software development. In analyzing the problem, we must correctly recognize the relationship between the whole and the part of the problem because the whole is relatively speaking, it is an organic whole with a certain level and structure, is an integral part of a larger system and is also a system Therefore, it is necessary to first analyze the relationship between the whole and the part in order to analyze the issue more scientifically. The so-called overall concept is to study the system of objects to use the system approach to the overall foothold, the issue of a comprehensive planning and processing, so that the system as a whole and part of a truly unified situation. In general, the part is used to form a system, so the role of the whole will be greater than the part, because the whole is the synthesis of the various parts of the function, so not only in the study of the problem of scientific analysis of each part, but also The overall system for a comprehensive analysis, we must have the overall concept. The concept of synthesis is to ask the analysis of the problem to be clear when the overall goal of the system, combined with a variety of relevant experience and knowledge, to develop a new concept of the system, make the system after the combination of innovative features, that is, integrated Benefits, improve system integration function [3]. Because the systematic engineering method is a scientific method of dealing with problems that effectively combines social practice with modern science and technology, we must boldly innovate and develop the concept and structure of the system when we combine modern science and technology with innovation so that the system can reach the best effect.

4. The Application of System Engineering Methods

Step 1: Clearly deal with the conditions of the problem (for example, conduct comprehensive statistics and in-depth research on related materials, and then purify and integrate the information on the basis of information to achieve the purpose of clearly defining the conditions required for the problem); Step 2: Put forward the relevant planning (specifically, research on the nature and effective information of the issue as a whole, and find out the information that can make the diversified planning. In the process of compilation, it is necessary to have feasibility and practicability, Depth analysis to ensure planning operability); Step 3: choose the best solution (the realization of this goal requires the detection and comparison of the practical value of the diversity of programs, analysis of their strengths and weaknesses, choose Best solution to ensure the efficiency of problem solving); Step 4: Promote and identify the solution (clear the best solution, you can promote it, while paying close attention to the operational status of the system, the practicality of the solution Make objective comments).

Third, the system engineering methods in computer software design of the specific application

The rapid development of computer-related technology today, the computer software design can be said to put forward higher requirements, but also brought a greater workload. At the same time, the scale and scope of software research and development also become larger and larger, making software development and design encountered an unprecedented development obstacles. With this method, we can understand and analyze system tasks from a global perspective, analyze various system functions in detail, and then combine modular technologies to divide the system layers and start with the system and its various components to find the best solution for Design work related to software design reasonably reduced, and promote the development of software design. In accordance with the system engineering program flow to the software development and design is

divided into the following items: a clear software design tasks! Demonstrate the operability of software! Analysis of user needs! Simple software design and detailed design! Software programming and testing! And full issue.

Put forward the software design task. Computer software is not designed and developed before the handling of computer software development unit strict software development system running live, and then software design staff to put forward a clear software design standards, to convey the task notification, and software development staff signed the agreement, set the computer software Design task. R & D of computer software R & D personnel assigned to enterprises on software development system issued specific requirements, and the corresponding tasks to be arranged. In the release of the task link, handing over the business to produce the task book, at the same time and R & D personnel to sign the formal contract, but also for the project has direct control over. R & D personnel to study the mandate in detail, at the same time a full analysis of the contents [4].

To ensure that the quality of software planning and research and development, the nature of software systems in-depth research is the foundation, and then plan to have an operational program. Technical staff with the relevant information and data integrated, its purpose is to find out the practical value of the information, of course, computer software market research is also necessary to achieve the goal of confirming the practicality of the software.

In the information age, there is no great difficulty to realize the above goals. With the aid of modern technology, designers can know the user's satisfaction with the computer software system and their expectations by using the network questionnaire. The way to optimize the practicality of the designed software, running fast and the excellent performance, the preparation of the content of a compact software type specification, so as to ensure the smooth development of computer software process.

The design of computer software structure is to refer to the above work, to the scientific planning of the design of computer software framework and software system structure, and to build a database of computer software design system, whose role lies in the clear diversification of the management interface. Software development staff in the process of reviewing the program should be a scientific simplification of software design procedures to ensure its refining.

Systematic design of software is opposite to simple design. It is the process of hierarchical and overall elaboration on the summary flow, sub-flow and related continuation of simple design in the assistance of related planning of structured design. Different sections of the minor problems of the treatment plan for planning in advance to ensure the convenience of the source code. The software is streamlined and detailed design for the software development heavy difficulty link. In the aspect of software simplification design, in combination with the above preparations, the overall structure of the expected system software and the overall architecture as well as the interrelationships among the modules are constructed, the complete data structure is designed, and the interfaces and control interfaces are defined. At the same time to assess the appropriate part of assessment. Detailed design is mainly for the stratification of streamlined design, to be consistent with the principles of structured programming, and then the module design details for the next source code to lay a solid foundation.

Software code programming and testing. In order to maximally match with the programming language standard, put forward by users of computer software system, the development and operation of the database language compilation process can be more smooth and smooth. The technicians can transform the systematic design result of program editing language, Evolved into computer system software. The technician should also test the performance of the designed program and the subroutine in time so as to ensure the smoothness and comprehensiveness of the user's instruction manual [5].

Identify and implement the software results. Ensuring the high quality of the software system is the basis for customer satisfaction and the prerequisite for its smooth implementation. The realization of the above objectives requires that the software to be developed by the technician be placed in the context of a real-world software application, teach the user how to use the software correctly, and ensure the real-time availability of maintenance services. Of course, software design

and development staff should also closely observe the software running status, and strengthen the recognition of users, this time the software will be very large-scale promotion of links will be very smooth. The final R & D personnel should be based on the system software users to install and run in a simulated environment, the formal software test results prove that the software is reliable and practical, and then to the user at the same time to make late guidance and maintenance of security. During the process of using the user, the R & D personnel also need to supervise the operation of the software in real time. In addition, the software system maintenance must be well protected.

5. Conclusion

In short, the system engineering methods in computer software design and development process, the results achieved are extremely impressive, systematic engineering methods with a holistic character, can maintain the normative aspects of computer software design, a substantial research computer Software design time, optimize software design quality, and inject vitality into the realization of the goal of sustainable development of computer software.

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