

Research on Software Project Quality Management Based on CMMI

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Abstract—With the rapid development of information technology and the wide application of compute software, software consumers' requirements of quality about software products are getting higher and higher. This paper mainly studies the problems of software project management and software project risk management, and puts forward the strategy of improving the quality management of software project. The results show that effects are good after the quality of software CMMI improved.

Keywords—CMMI; quality management; software project

I. INTRODUCTION

With the arrival of the information age and wide range of software in various fields, the market for software quality requirements continue to improve, software quality management has become the focus of attention. In particular, the use of CMMI software project quality management system on the line, which enhance the quality of the software project is of great significance.

II. SOFTWARE PROJECT QUALITY MANAGEMENT OF CMMI

A. About CMMI

The essence of CMMI(Capability Maturity Model Integration) is a part of software management project. Software process improvement is the core of the current software management project. CMMI provides a new integrated model framework to improve the various processes of an rated framework, eliminates the inconsistency in each model, reduce the duplication model and increase transparency and understanding so that it establish a framework of automatic and scalable. So it can improve the quality and efficiency of the organization in general.

B. Software project quality management

The international standardization organization ISO defines the software quality as the sum of the characteristics and features of the software product to meet the specified requirements and potential requirements. From the concept, it can be found that the quality of the software project has a direct relationship with the quality of demand. Software development and production needs are affected by different factors, so it is difficult to guarantee the quality of its effective. Managing the software project is to use and manage the technology, knowledge and so on, in order to achieve the requirements of the software.

C. The necessity of software project management

The characteristics of the software itself determines the differences between software project management and other management. First, because software is one of the intellectual product, the development process exists a certain degree of difficulty. And because the schedule and quality is difficult to control, we should strengthen the management of software project; Secondly, because the software system itself has a certain degree of complexity, this leads to a lot of difficult to control the risk in the process of development. Software project management affect the work of software development in a certain extent, with the continuous optimization and innovation of software technology, the corresponding enterprises began to pay more attention to the quality of software engineering management.

III. CMMI SOFTWARE PROJECT RISK MANAGEMENT OVERVIEW

A. Software project risk management

Software project risk management is simply said that the software may affect the quality of the software and the problems caused by the loss and so on. Because there is a

certain difference between the field, the risk of understanding is also different. For example, some researchers believe that the risk is the possibility of loss, which mainly considers the risk with a certain purpose, and its behavior has a direct impact on people's behavior. Some researchers believe that the risk is divided into two parts which can be predicted or difficult to predict. It is the factors of project schedule, quality and cost. In CMMI, the risk management is mainly to analyze the problem, and to assess the risk of the occurrence of the risk, so let relevant management personnel for the correct understand the risk correctly^[1].

B. Current situation of software risk management

Compared with the traditional project, the software risk management has the following characteristics. First of all, the influence of human resources to the project is relatively obvious. Because the software is intellectual products, the developer should have professional knowledge and skills and have a sense of responsibility in order to effectively produce the software. Secondly, the goal of software project is not exact. Under normal circumstances, customers often just on its own needs and simple functions were initially given at the start of the project phase, but they have not clear idea and specific goals for customers' needs change relatively frequently. Due to a software product of the lack of visibility in the prior to the completion, which will have a certain impact on the original design so as to improve the cost. Software engineering management is comparatively special for software quality and outcomes are difficult to measure. For software has no logic, we should do a good job of personnel management in the development process, once appearing the loss of technical personnel and adjustment will directly affect the software quality.

IV. THE IMPROVEMENT STRATEGY OF SOFTWARE PROJECT QUALITY MANAGEMENT BASED ON CMMI

Because there are some problems and deficiencies in the management of software project, it is difficult to effectively control the quality of the software. Therefore, the software system should be improved and perfected from the following four aspects.

A. Improvement of demand management

CMMI model for demand management has been able to put forward a clear purpose, and at different levels to maintain the dynamic balance of demand.

First, making the demand management plan. When taking over the new project, the requirements management plan should be made according to the characteristics of the project to develop. With the establishment of demand management team and in improving the organization and evaluation, it should strengthen the demand management professionals to understand the needs of the depth, so that demand management more refined. In this way, it can strengthen the running of software system, and it can effectively control the change of demand.

Second, demand research. Demand for research should develop standardized research plan, with professional developers, testers and system designers to assist the team as a whole needs, strengthening of information needs to understand and master, to lay the foundation for improving the quality of software.

Finally, demand analysis. Demand analysis contains a number of content which is to be used as a measure of user demand to optimization and analysis and to develop the "requirements specification", after the audit to form a demand baseline. In view of the different functional requirements analysis, it is necessary to define its importance, priority and difficulty to achieve^[2].

B. Improvement of system design

In the process of software development, it is needed to improve the system design in the influence of design process. In the process of design improvement, it should be made the optimization scheme according to the sequence of detailed design flow chart.

First, it should confirm the detailed design of the original data according to the different needs of the system module to carry out specific analysis.

Secondly, the need to carry out the training work, explain in detail the requirements and design specifications, the classification of software design, including database design, class design and interface design. Among them in the database design, for the same industry related personnel to the software database application specific tests, after the completion of the test to review. Class design and interface design and database design process

are similar which are through the professional designing analysis and the review. In the process of system design, the detailed design personnel need to carry on the concrete analysis to the problem which exists in the design link, and carries on the full understanding and the grasping to the different content, enhances the overall design quality.

Finally, after the audit is completed, the design process and process optimization content integration, the formation of the "detailed design" document summary, the process of improvement and optimization. In order to avoid the problem, the original plan is needed to execute the project according to the project investment and development stage^[3].

C. Improvements of system achieve

1) Improvement of coding and unit testing

Coding and unit testing process is important procedure for system implemented, which need to emphasize the coordination of technical training and to ensure code rule level to coordinate a unified. In the specific business analysis and coordination, it can enhance the comprehensive ability of the developers and change the understanding for software project management. In the original code unit testing process, it should be added of the module group to write the test link which to enhance the understanding of different business modules.

2) Improvement of integration test

The improvement of integrated test process need to establish industry review of expert. From the specific business point of view, it emphasize the integrity of software design to ensure that the system functions to achieve. The quality of software projects usually is tested that whether the business needs in the software system to achieve. Good integration test can ensure system improvement strategy optimization.

3) Improvement trial operation

Software testing run data selection is an important part of the whole software testing process. In the trial operation stage, it should arrange the professional personnel to test the internal data and involve the test data to the use of the client. In the whole stage of trial operation, the problems in this stage are summarized and listed, and analyzed the causes and solved the effective solution^[4].

D. Improvement of project control

Software project tracking and control is an important

means to maintain the stable operation of the software. In the improved process control specific software project, internal personnel need to carry out their duties. The project manager implement project management according to plan and analysis and control the deviation of project, and the project team to form a good communication mechanism. Project team members in accordance with the plan carry out project work, report writing and reporting the results of software project. Configuration management and control personnel should be responsible for tracking the software project, and control activities and report problem which is found timely.

At the same time to fully understand the operation of the software, to provide basic protection for the problem. Each member of the project team can avoid management confusion if form a specific standard.

V CONCLUSION

To sum up, the improvement of the quality management of software project based on CMMI aimed at a comprehensive summary of the problems existing in the process of quality management. And to enhance the software operation in the different phases of the software project of management and improvement. At present, CMMI has been widely used, and become an important way to improve the quality management of enterprise software, it is worth popularizing and applying.

REFERENCES

- [1] Hou Xiaoliang. Software project risk management based on CMMI Study [J]. Beijing University of Posts and Telecommunications, 2012 (05).
- [2] Han Shaohua. Software project quality management practice analysis based on CMMI system [J]. Enterprise technology development, 2015, 4.
- [3] Fei Li, He Yumin, Wu Chaoying. Research on project quality management of software company based on CMMI[J]. Journal of Beihang University (SOCIAL SCIENCE EDITION), 2012, 10.
- [4] Li Feifei, Zhu Chao. Research on the quality management of enterprise software project based on CMMI [J]. Shopping mall modernization, 2014, 10.