Requirement management review

In the process of implementation, it is found that there is a need to change the requirements, that is, to increase the need to obtain room information. To solve this problem, the standardized process is used to complete the requirement change.

Main steps:

1. Request for change

The request change applicant shall write "request change application form" and submit it to the project manager or the person in charge of the client.

The "request for change" must state: (1) the reason for the change; (2) the content of the change; (3) the impact of the change on the project.

2. Approve request change application

The project manager and the customer jointly approve the "request change application". If either party disagrees with the change, the change request shall be returned and the project shall be executed according to the "original requirements document". If both parties agree on the change, carry out the next change to the requirements document.

3. Change requirement document

The Requirement Analyst changes the "original requirement document" as needed to generate a new requirement document.

4. Reconfirm requirements

Conduct requirements review again and obtain written requirements commitment again.

5. Fill in the requirement change control report

Requirement development

The purpose of requirement development is to obtain user requirements and define product requirements through investigation and analysis.

Requirement development process domain is an important part of SPP model, which includes requirement survey and requirement definition.

Requirements development can be divided into two stages: "user requirements survey stage" and "product requirements definition stage". And "demand analysis" runs through the above two stages. There is a logical sequence between the requirements investigation stage and the requirements definition stage, which are usually carried out iteratively in the actual work. We call the people who work on requirements development requirements analysts (also called system analysts) to avoid confusion with other developers.

First, train the requirements analysts to master the necessary requirements development skills.

Configure and manage all valuable documents generated by the requirements development process domain.

For non contractual projects, the activities related to customers in this specification can be simplified.

The modeling and analysis of requirement has high technical difficulty, and the requirement analyst should choose and choose according to his own level. It is recommended that enterprises purchase rational rose as a tool for requirement modeling and analysis.

The Requirement Analyst shall modify the template of user requirements specification and product requirements specification according to the characteristics of the product.

Technical pre research

Technical pre research refers to learning and studying the key technologies to be used in the project in advance after the project is approved and before the completion of the development work, so as to find and solve the technical obstacles encountered in the development process as early as possible.

Technology pre research process area is an important part of SPP model. This specification describes the procedures for technical pre research. The "objectives", "roles and responsibilities", "start criteria", "input", "main steps", "output", "completion criteria" and "measurement" of the procedures have been defined.

This specification is applicable to software R & D projects of domestic IT enterprises. It is suggested that users modify this specification according to their own conditions, and then promote its use.

Technology pre research is different from the real development of products, the investment of personnel and time is relatively small. A project may have multiple technical pre studies, which shall be determined by the project manager or technical director according to the specific situation.

Configure and manage all valuable documents generated in the process of technical pre research.

system design

System design refers to the design of software system architecture, user interface, database, modules, etc., so as to build a bridge between requirements and codes, and guide developers to achieve software products that can meet the needs of users.

System design process area is an important part of SPP model. The process domain of system design includes architecture design, user interface design, database design and module design.

The solution is to train the system designers in "special topics" first, so that they can master the necessary system design skills.

Because the vast majority of domestic universities do not offer "user interface design course", most software developers are not good at designing user interface. The project development team shall try to invite user interface design experts to participate in (or guide) the interface design of the software.

Configure and manage all valuable documents generated in the system design process.

Implementation and testing

The purpose of implementation and test is to write and test the whole system code according to the system design documents. In this specification, implementation and testing is a comprehensive expression of "programming, code review, unit testing, integration testing, defect management and error correction". Implementation and test process area is an important part of SPP model, including preparation, implementation and test.

Our proposal for this module is to train developers in "high quality programming" so that they can master the skills of writing high quality programs.

Training developers in "code review, testing, error correction" to improve their work efficiency.

The development team can reduce the test workload properly according to the resource, time and other constraints of the project.

The development team can modify various document templates of this specification according to the characteristics of the product.

Configure and manage all code and valuable documents generated during implementation and testing.

System testing

The purpose of system testing is to test the final software system comprehensively to ensure that the final software system meets the product requirements and follows the system design.

System test process area is an important part of SPP model. This specification describes the procedures for system testing. The "objectives", "roles and responsibilities", "start criteria", "input", "main steps", "output", "completion criteria" and "measurement" of the procedures have been defined.

Our suggestion for this module is to train the system tester to improve their test efficiency.

The project manager and the test team try to reasonably reduce the test workload, such as reducing "redundant or invalid" tests, according to the resource, time and other constraints of the project.

The system test team can modify various document templates of this specification according to the characteristics of the product.

Configure and manage all code and valuable documents generated during system testing.

In order to mobilize the enthusiasm of testers, it is suggested that enterprises or projects establish incentive mechanism, for example: according to the harm degree of defects, bonus is divided into different levels, each new defect corresponds to a bonus, and the bonus is given to the first person who finds the defect.

Beta test

Beta testing refers to that before the product is officially sold, the developer delivers the product to some potential customers for free trial, asks them to test the product, and obtains their suggestions for the product.

Beta test process area is an important part of SPP model. This specification describes the procedures of beta testing, and the objectives, roles and responsibilities, startup criteria, input, main steps, output, completion criteria and measurement of the procedures have been defined.

Our recommendation for this module is to configure and manage all valuable documents generated during beta testing.

Good relationship with beta customers.

Customer acceptance

Customer acceptance means that the customer reviews and tests the products according to the contract to ensure that the products meet customer needs.

Customer acceptance process area is an important part of SPP model. This specification describes the procedures for customer acceptance. The "objectives", "roles and responsibilities", "start criteria", "input", "main steps", "output", "completion criteria" and "measurement" of the procedures have been defined.

Our suggestion for this module is that the developer should provide necessary product training for the acceptance personnel before the technician acceptance.

The developer can give the system test cases to the acceptance personnel for reference, so as to reduce the time of designing test cases.

The technician shall assist the acceptance personnel with enthusiasm. The software defects found by the acceptance personnel shall be corrected immediately; the complicated problems shall be immediately referred to the relevant leaders without delay. Do not quarrel with the customer during the acceptance period, leaving a good impression on the customer.

Configure and manage all valuable documents generated in the acceptance process.

Technical review

In theory, in order to ensure the quality of products, all work results of products should be subject to technical review. In reality, in order to save time, people are allowed to carry out technical evaluation of work results selectively. The way of technical review also depends on the importance and complexity of the work results.

There are three main procedures for technical review process area

"Develop technical review plan", "formal technical review" and "informal technical review".

There are two basic types of technical review:

Formal technical review (FTR). FTR is relatively strict, and a review meeting needs to be held. There are many people participating in the review meeting.

Informal technical review (ITR).The form of ITR is flexible. It is usually carried out among peers, and there is no need to hold review meetings. There are few reviewers.

Precautions for technical review:

The reviewer‘s responsibility is to find defects in the work results and help the developers to provide solutions to eliminate the defects, rather than eliminating the defects for the developers.

The technical review should be "just about the matter", not to crack down on the enthusiasm of the developers who have made mistakes, let alone engage in personal attacks (such as sarcasm, satire, etc.).

Limit too many arguments during the meeting review to avoid wasting others‘ time.

Develop technical review plan

Determine the work results to be reviewed, review methods, scheduled review time, place and relevant personnel.

Roles and responsibilities

The technical director (or technical backbone) of the project shall formulate the technical review plan.

The project manager approves the technical review plan.

Main steps

1.Determine the work results to be reviewed

If the time of the project is sufficient, in order to ensure the quality of the product, all the work results of the product shall be subject to technical review. If the time of the project is not enough, in order to save time, some important work results can be selected for technical review.

2.Determine the technical review method

Determine the technical review method according to the importance and complexity of the work results. The importance and complexity are divided into three levels: high, medium and low.The corresponding relationship between importance complexity combination and technical review method is shown in the table below.

|  |  |
| --- | --- |
| **Importance complexity combination** | **Technical review method (FTR, ITR)** |
| High High | FTR |
| high Middle | FTR |
| High Low | Either FTR or ITR |
| Middle Middle | Either FTR or ITR |
| Middle Low | ITR |
| Low Low | ITR |

3.Scheduled review time, place and relevant personnel

According to the schedule in the project plan, schedule the review time and place.

The review host and other reviewers are scheduled according to the characteristics of the work results.

4.Approval plan

The project manager shall review and approve the technical review plan according to the project plan and the actual situation (such as disposable human resources).

The technical director (or technical backbone) of the project shall revise the technical review plan according to the instructions of the project manager.

configuration management

There are two main types of configuration items:

(1) work achievements that are part of the product, such as requirements documents, design documents, source code, test cases, etc.

(2) documents generated from project management and institutional support process areas. Although these documents are not part of the product, they are worth saving.

The main properties of each configuration item are: name, identifier, file status, version, author, date, etc. All configuration items are saved in the configuration library to ensure that they are not confused or lost. Configuration items and their history reflect the evolution of software.

Baseline consists of a set of configuration items, which constitute a relatively stable logical entity. Configuration items in the baseline are "frozen" and can no longer be modified by anyone at will (see change control procedure).Baselines usually correspond to milestones in the development process. A product can have multiple baselines or only one baseline. The main attributes of baseline include name, identifier, version, date, etc. Generally, the baseline delivered to customers is called a "release", and the baseline for internal development is called a "build".

All project members use configuration management software to protect their work. The organization shall adopt unified configuration management software. Common configuration management software includes Microsoft’s visual SourceSafe and rational Clear Case. In order to improve the efficiency and security of configuration management, an organization should have a special configuration administrator (role). The configuration administrator makes the configuration management plan for each project, and creates and maintains the configuration library.

In view of the importance and complexity of configuration management, an organization should also establish a configuration control board (CCB).CCB is a virtual group, which has decision-making power for configuration management activities (such as approving plans, approving change requests, etc.).For configuration management, CCB is the decision maker, and configuration administrator is the executor.

If each project of the organization is closely related (for example, multiple projects under a product line), it is recommended that the organization establish a public CCB, which has decision-making power for configuration management of all projects. If the organization’s projects are relatively independent, each project can have its own CCB. The decision-making of CCB adopts the principle of "minority is subordinate to majority".

Configuration management process

1.Develop configuration management plan

The configuration administrator shall prepare the configuration management plan, which mainly includes configuration management software and hardware resources, configuration item plan, baseline plan, delivery plan, backup plan, etc. CCB approves the plan.

2.Configuration library management

Configuration administrators create configuration libraries for projects and assign permissions to each project member. Each project member operates the configuration library according to their own permissions. The configuration administrator maintains the configuration library on a regular basis, such as clearing garbage files, backing up the configuration library, etc.

3.version control

In the process of project development, most configuration items need to be modified many times before they are finally determined. Any changes to the configuration item will result in a new version. Because we can’t guarantee that the new version is "better" than the old one, we can’t abandon the old one. The purpose of version control is to save all versions of configuration items according to certain rules, avoid version loss or confusion, and quickly and accurately find any version of configuration items.

There are three statuses of configuration items: "draft", "official release" and "being modified". This procedure establishes the rules of configuration item status change and version number.

4.Change control

In the process of project development, configuration item changes are almost inevitable. The purpose of change control is to prevent configuration items from being randomly modified and causing confusion.

Modifying the configuration item in draft status is not a "change" and does not require the approval of CCB. The modifier can execute according to version control rules.

When the configuration item status becomes "officially released" or "frozen", no one can modify it at will. It must be implemented according to the rules of "Application - Approval - change implementation - reevaluation - end".

5.Configuration audit

In order to ensure that all personnel (including project members, configuration administrators and CCB) comply with the configuration management specifications, the quality assurance personnel shall regularly audit the configuration management work. Configuration audit is a kind of "process quality inspection" activity, which is one of the responsibilities of quality assurance personnel.

Quality assurance

There are three basic ways to improve product quality:

Quality assurance. Quality assurance personnel monitor and improve the "process quality" and "product quality" by systematically checking whether the "work process and work results" conform to the established specifications.

Technical review. Experts and technicians of the same trade are invited to review the work results and find the defects in the work results as early as possible.

Test. By running test cases to find defects in the software. For example, unit test, integration test, system test, acceptance test, etc.

Quality assurance concerns both process quality and product quality. If the "work process and work results" do not meet the established specifications, the product quality must be in question. Based on this reasoning, quality assurance personnel can objectively check and monitor the quality of products even if they are not technical experts. This is the productive side of quality assurance methods. But "work process and work results" in line with the established specifications does not mean that the product quality must be qualified, because only the specifications can not identify a large number of possible defects in the product. This is the deficiency of quality assurance method. So "quality assurance" alone can’t "guarantee quality".

Technical review and test focus on product quality rather than process quality, and their technical strength is much higher than quality assurance. Technical review and test can make up for the deficiency of quality assurance, and they are complementary quality management methods. In practice, we cannot confuse quality assurance, technical review and testing, nor isolate them for implementation. It is a good way for quality assurance personnel to participate in and supervise important technical review and test work. The combination of the three can improve work efficiency and reduce cost.

Quality assurance group (QAG):

The quality assurance team is administratively independent of any project. This independence helps the quality assurance team to objectively check and monitor "process and product quality".

The quality assurance team has certain rights to deal with unqualified work results. This right enables the work of the quality assurance team not to be despised, and helps to strengthen the quality awareness of the whole staff. It should be emphasized that improving product quality is the responsibility of all members, not just the quality assurance team.

Quality Assurance Planning

I. develop quality assurance plan

       The quality assurance team designates a quality assurance officer (i.e. interface person) for each project. The quality assurance personnel shall write the quality assurance plan, which shall be approved by the project manager and the quality manager. The main contents of quality assurance plan are "process and product quality inspection plan", "participation in technical review plan" and "participation in test plan".

II. Process and product quality inspection

The quality assurance personnel shall objectively check whether the "work process" and "work results" of the project members conform to the established specifications, and negotiate with the project members for improvement measures. The quality assurance personnel shall record the results and lessons of this inspection, and timely report to all relevant personnel.

III. problem tracking and quality improvement

The quality assurance personnel shall try to solve the quality problems within the project first. If it is difficult to solve the problems within the project, it shall be submitted to the superior leader for handling. The quality assurance team analyzes the common quality problems in the mechanism and gives the quality improvement measures.

Quality assurance procedures

1.Develop process and product quality inspection plan

Quality assurance personnel shall determine the main process areas and main work results to be inspected according to the characteristics of the project, and estimate the inspection time and personnel. Note that some process areas should be checked periodically rather than once, such as configuration management, requirements management, and so on.

2.Make a plan of "participating in technical review"

The technical review plan is generally formulated by the project manager or the technical backbone of the project.

Quality assurance personnel shall participate in and supervise the technical review of important work results such as requirements, design and code. The quality assurance personnel shall formulate the plan of "participating in the technical review" according to the technical review plan.

3.Develop a plan for "participating in the test"

Generally, the project development team is responsible for unit test and integration test, and the agency independent test team is responsible for the final product test (such as system test and acceptance test).Due to the variety of tests, there may be more than one test plan.

Quality assurance personnel shall participate in and supervise the testing of important work results. The quality assurance personnel shall refer to various test plans to make plans for "participating in tests".

4.Approval of quality assurance plan

Although the quality assurance team is administratively independent of any project, the work of the quality assurance personnel is closely related to the project, so the quality assurance plan shall be approved by the project manager before it comes into effect, so as to ensure that the quality assurance plan is consistent with the project plan.

If there is a quality manager in the organization, the quality manager shall also approve the quality assurance plan to ensure that the quality assurance plan meets the requirements of the organization (to avoid too loose and formality).