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).