Part 4: Static testing - Reviews

A review is a type of static testing during which a work product or process is evaluated by one or more individuals to detect issues and to provide improvements. The main purpose of reviews is to reduce costs by cutingthe number of faults before text execution. That also helps to improve the quality of the product. There are also many other benefits: defects detected earlier are cheaper (16 times) to remove, it gains understanding: find omissions in requirements or specifications.

There are two types of reviews: informal and formal. An informal review is a type of review without a formal (documented) procedure. A formal review is a form of review that follows a defined process with a formally documented output. Each formal review consists of the following main activities: *Planning, Initiate review, individual review, issue communication and analysis, fixing and reporting.* Planning helps to define the scope of the review and estimate effort and the timeframe for the review. Initiate review helps to explain the scope, process, roles, and work products to the participants, also to answer any questions. Individual review helps to make review more effective and efficient because every participant can identify defects. During the issue communication and analysis phase, every defect and his severity is logging. Severity classes can be divided into critical, major and minor. At the end of the meeting, a decision on the work product under review has to be made by the participants. Fixing and reporting are related to accepting the work product when the exit criteria (which are an important part of the previous phase) are reached. During fixing activity, the author is improving the work product based on the issues or defects detected by the individual reviewers. Roles, in general, will be discussed later in this paper.

Even though this paper has already covered formal and informal reviews, there are more types of reviews. The main review types are informal, walkthrough, technical and inspection. Informal review helps to solve minor problems quickly or generate new ideas or solutions. Walkthrough is a type of review in which an author leads members of the

review through a work product and the members ask questions and make comments about possible issues. That type of review is often used to transfer knowledge and educate a wider audience about a particular work product. These two types require little documentation. Technical review is a formal review type by a team of technically qualified personnel that examines the suitability of a work product for its intended use and identifies discrepancies from specifications and standards. That type of review is often a discussion meeting that focuses on achieving consensus about the technical content of a work product that all the participants have studied before the meeting. The last type of a formal review is inspection. Inspections help to identify issues in a work product, which provides measurement to improve the review process and the software development process. Inspection is the most popular type of a formal review. However, there is no single best type of a review, but the different types serve different purposes at different stages in the life cycle of a work product.

Reviews do not take place without people. The roles have already been discussed above, but it is necessary to talk about it more broadly. Within a review team, six types of roles can be distinguished: author, manager, facilitator (or moderator), review leader, reviewers and scriber. An *Author* is a person whose chief responsibility is to review the documents and do the rework. *Manager* has a number of very important responsibilities in successful reviews including: deciding on the execution of reviews, assigning resources: staff, budget and time, monitoring ongoing cost-effectiveness and executing control decisions in the event of inadequate outcomes. *Facilitator (or moderator)* is responsible for ensuring the effective running of review meetings, mediating, if necessary, between the various points of view and is often the person upon whom the success of the review rests. *Review leader* is taking the overall responsibilities of the document and deciding who will be involved. *Reviewers* identifying potential defects in the work product under review. *Scriber (or recorder)* documents all the issues, problems and open points that were identified during the meeting. It is important to mention that one person may take more than a single rele.

Reviews can also be difficult and frustrating. The most common reasons for review failures are due to either organizational factors or people-related factors. But there are a number of aspects that can make or break the effectiveness and efficiency of reviews done within an organization. Each review should have clear objectives. Choosing the right review type and technique is very important. It is also important to allow adequate time for reviewers to do the preparation and individual examination of the work product before any meeting, as this is when most defects are identified. No less important is early and frequent feedback. An organization cannot be imagined without people who operate in it. So people-related factors are no less important. Some of them can also contribute to the success that is why it's important that all participants create and operate in an atmosphere of trust. The people chosen to participate in a review have a significant impact on the success and outcome of the review, so picking the right reviewers could be an important aspect. Each reviewer has responsibilities and possibly roles to play in the review, so it's important that each of them takes the reviewing work seriously and does it to the best of their ability. Defects should be reported and handled objectively; defect reporting should never become personal, as this creates ill will and damages the review process and culture. Thus, cooperation is another important aspect. Checklists and roles are recommended to increase the effectiveness of defect identification. Valuable use of time is important. The meeting should be focused on the review objectives, and any discussion should be tightly controlled. In the end, it is important to mention that the defect information is considered sensitive data so it should be handled accordingly.

To find defects early, both static and dynamic test activities should be started as early as possible in the software development life cycle. Static analysis will be discussed later in this paper. Testing early in the software development life cycle helps reduce or eliminate costly changes. The third of the seven principles says that early testing saves time and money. This principle tells us that we should start testing as early as possible in order to find as many defects as possible. As mentioned at the beginning, defects detected earlier are 16 times cheaper to remove than if it would be detected after releasing.

Compliance with requirements is an integral part of every process. So it would be appropriate to talk about how static analysis and reviews are related. Static analysis is the process of evaluating a component or system without executing it, based on its form, structure, content or documentation. A review is a type of static testing during which a work product or process is evaluated by one or more individuals to detect issues and to provide improvements. Since static testing can start early in the life cycle, early feedback on quality issues can be established, for example, an early validation of user requirements rather than late in the life cycle during acceptance testing. Feedback during design review or backlog refinement is more useful than after a feature has been built. This can save time, money and human resources.

Some people consider reviews as an efficient means of quality assurance, but I would be quite critical of it. I would only partially agree with this notion because a review is only a factor of quality assurance. All review types have at least one of their purposes to find detects. It can be said that the elimination of defects contributes to the improvement of quality, i.e. compliance with the standard. It would be more correct to consider reviews as one of the many activities that contribute to quality assurance. But to keep reviews an efficient means of quality assurance is fundamentally wrong.

In order to increase assigment's quality, I've primarily used informal review. I chose this method because I've completed the assignment alone. That helped me to learn from my own mistakes throughout the process. The main purpose was to detect potential defects and improve the quality that is why informal type of review suited the best for this

assignment. Since I wrote this compulsory assignment alone, I have encountered a few difficulties. Although the requirements were clear and of a good structure, it was a human factor (psychological and time planning) as well as the situation around the world which has aggravated working conditions. It also showed me how important it is to distribute the roles. It took a long time, much longer than I expected. Hence, it is likely the process would be smoother when writing together with a team. It was occasionally challenging. Even though a larger team could have offered more effective solutions, I believe I've successfully accomplished the goal.