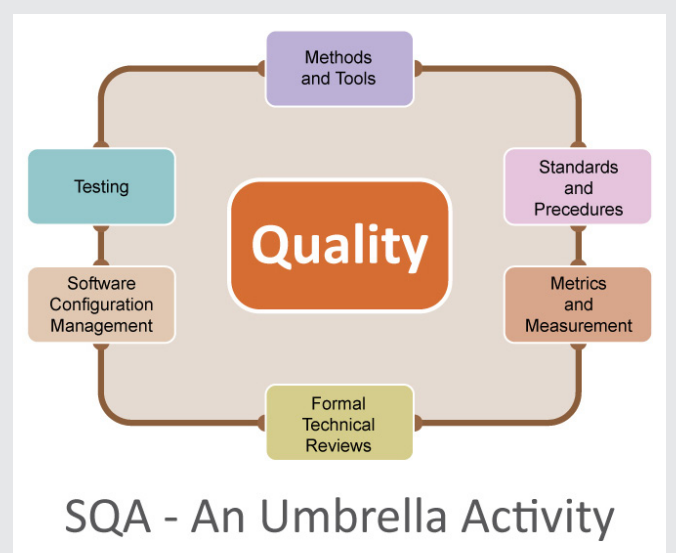# Software Quality Assurance

Abstract

Although most of the organizations these days have a separate bunch of people to work upon the software quality assurance activities yet many of the other working groups in the organization take these activities as burdensome and unnecessary. In spite of the software quality assurance practices reaping beneficial outcomes yet most of the development team members do it just for the sake of doing it.

In order to overcome this common dilemma, it is important for any organization to first understand their processes and then insert the quality assurance activities to facilitate the development process so that the benefits can be obtained through it. Instead of treating SQA as a distinct set of operations they should be involved in the software development life cycle so that the quality can be taken care of at each stage of the development process.

Quality concepts

Before talking about quality improvement it is necessary to understand what quality actually is and its conceptual details.

Quality is a measure of excellence. It is being at a state with zero defects and no deviations/ variances. Quality means to adhere to the pre-defined standardized processes and give consistent output and increasing the customer satisfaction. Quality can be controlled means to measure the output with the measurable standards. Quality can also be assured means providing the assistance to achieve quality products and reporting function of management.

SQA - An Umbrella Activity

CMMi Level RATED 5

The quality control is taken care by the different testing methods whereas the quality assurance is taken care by the various software quality assurance activities which serve as an umbrella activity throughout the software process.

With quality we also need to consider the cost to quality. The activities like review, testing, training and rework generally add up to the overall costs incurred for improving the quality. Out of these, testing is the only activity on which a lot of efforts are spent by the IT organizations. There are special teams devised for the same. If an organization implements the software assurance activities in its software development lifecycle then it can save on its effort spent on testing. Testing can detect the defects and help in curing it but it cannot prevent them from occurring. This is where the role of the software quality assurance activities comes into play.

Achieving Quality in Software Development

The four important P's needed for software development include the following.

1. Process

2. Project

3. People

4. Product

As can be seen that all the four components are interlinked which are necessary to achieve quality output.

The people work upon the development of the projects and are facilitated by the various processes which are in place to render help for the development. The project that is developed gives the outputs/ products on which the testing is done to measure the defect density. Hence the software quality assurance activities are implemented for the measurement and improvement of the processes so that the end result i.e. product is error free. The more efficient the quality assurance activities are the lesser the defect density would be.

The various people who play as significant role in this cycle are:
1. Project managers
2. Software engineers
3. Customers
4. Senior management
5. SQA group
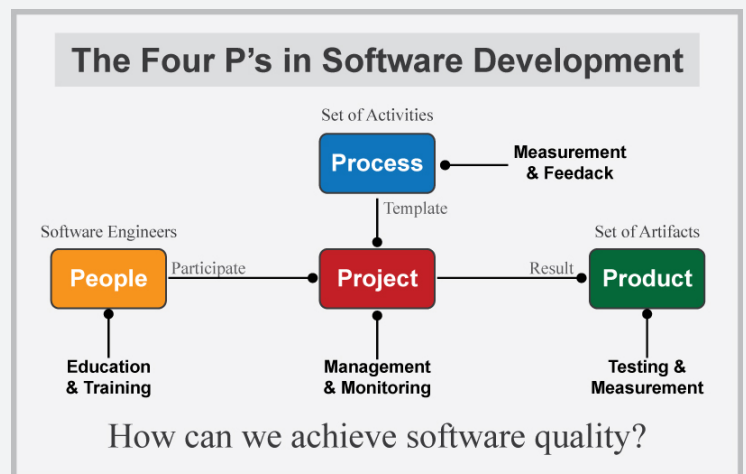
Devising software engineering group

The software engineering groups are devised at organization level for taking care of the process improvement activities. In Silver Touch we have the Software Engineering Process group which plans all the process improvement activities to be carried out in the organization and it has various subgroups as mentioned below:

- **Software Engineering Process Group (SEPG):** Carries out all the process improvement activities and facilitates the sub groups. Is involved in the review and approvals of all the activities of the sub groups.
- **Process Change Management (PCM):** Undertakes all the process related changes to map the business needs of the organization.
- **Technology Change Management (TCM):** Undertakes all the technology related changes to map the business needs of the organization.
- **Software Quality Assurance (SQA) Group:** Verifies adherence to the processes and carries out quality assurance activities like reviews, audits, analysis etc.
- **Project Review Group (PRG):** A combination of members from various work areas reviews the project level artifacts and gives feedback for improvement.
- **Metrics Council (MC):** Quantifies the outputs at the organization and project level and analyzes the output for base lining the organization goals for various metrics.

- **Functional Area Representative (FAR) Group:** They are subject matter experts for particular process areas responsible for reviewing and improving the processes related to process area.
- **Causal Analysis and Resolution (CAR) Group:** Carry out all the activities to find out the root causes of the problems prevailing at the organization level and implementing solutions for it. Also to carry out various defect prevention activities organization wide.

The SEPG group structure and its sub groups are depicted in the diagram below:
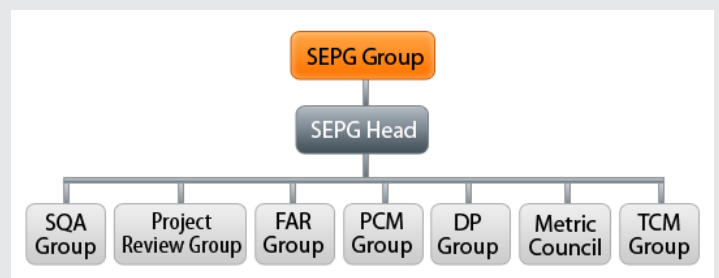
- All the groups as mentioned above are actively working in Silver Touch. Each group consists of members as per the roles and responsibilities of each group. These groups have carried out activities to satisfy the process areas of CMMi level 5 and have successfully helped the organization to be assessed with CMMi level 5.

Roles and responsibilities of a Quality Analyst

The quality assurance team member in an organization has the responsibility to plan all the quality assurance activities. All the short term as well long term plans should be documented and communicated to all the stakeholders who are involved in achieving the goals of the software quality assurance team.

Software Quality Assurance

Apart from planning the activities the group is responsible for conducting the various quality assurance activities throughout the organization like the reviews, audits, analysis, reporting, etc. The main function of this team is to facilitate all the main stream processes like software development.

There is always a need to analyze the results in order to improve for the future endeavors. They used statistical tools for the purpose of analysis. The result of all the activities is documented which serves as a learning database at the organization level.

The quality analyst performs the gap analysis against the current processes in order to refine the processes and adapt the best practices. The reviews conducted serves as a filter to engineering processes. The outcomes or the non compliances in the processes are always reported to the top management which helps in decision making process.

The quality assurance activities should be such that it covers activities as the project as well as the organizational level. A plan is made for each one of them.

Hindrance in the implementation

There are always some of the other problems whenever a change is implemented. Humans generally tend to resist change before even knowing that the change is beneficial or not. Due to this resistance it is always a problem to implement the quality assurance activities and inject them in the ongoing development activities of an organization. In case of severe resistance most of the organizations tend to forcibly implement the activities. Hence, most of the people take the quality assurance activities as burdensome.

It is necessary to know the essence of these activities. The quality analysts should therefore adapt the approaches which can is readily accepted by the other members. As said before the quality assurance activities are supposed to facilitate the software development process and hence a huge amount of support is needed from the development teams. The support of the top management is equally important. The quality analysts should be involved within the team instead of working parallel only then can they both envision their goals together and work to progress towards it.

In order for the quality analysts to work together as a team and achieve the quality goals the members of the software assurance team should have the below mentioned set of skills:

- Experience in conducting quality assurance activities
- Being knowledgeable about quality management system
- Understanding the whole software development life cycle
- Have good communication and writing skills
- Understand the software engineering process
- Team working ability
- Good knowledge of metrics

Conclusion

The decision to have quality assurance activities implemented in an organization is the sole decision of the top management. But it should be noted that this decision is accepted whole heartedly by the entire organization for the benefit and the growth of it and should not be taken as a burden or hindrance to the current activities. The benefit from these activities does take time but are evergreen. Patience is the key and hard work and dedication is added on. The implementation and success in small projects or operations adds on to the overall success of an organization. The software quality assurance practices not only changes the processes and the people associated to it but also changes the whole perception and the way people thing and approach to different issues.

Deliver best products, software solutions and services, on time with quality, and as per customer expectations

About SilverTouch

SilverTouch, a company established in 1992 is widely accepted for its IT solutions with a huge customer base in more than 20 countries across the world.

SilverTouch is actively engaged in Enterprise software development, enterprise content management, document management and IT consulting services such as Business process optimization, process consulting, implementation and customization of ERP. SilverTouch leads brilliantly in new technical developments such as: Mobile Application development services on iPhone, iPad, Blackberry, Android, J2ME and Windows mobile platforms. Even now, SilverTouch helps its global clients for major developments, deployments and managements of their mobility solutions and enterprise application development programs.

SilverTouch has alliance with several industry leaders such as Microsoft, Apple, Cisco, IBM, Oracle, SAP, Java, Dell, VM ware, Symantec, Sonic Wall which provides a competitive edge over other industry peers and targets to understand and cater to all types of requirements that concern our clients, thereby, leading to serve them precisely to their satisfaction.

For more information, please visit **www.silvertouch.com** or email **info@silvertouch.com**

CMMi Level RATED 5

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