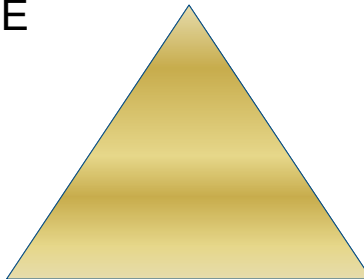




Quality Assurance

- People: Quality Organization
- Processes: Standards
- Tools: CASE

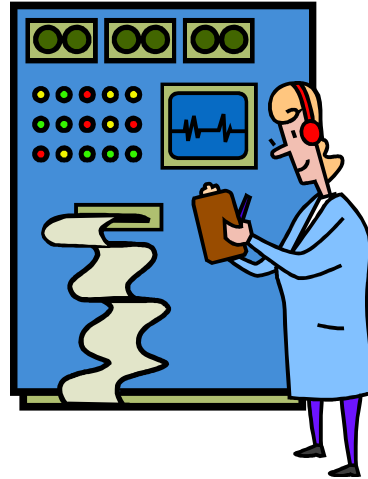


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In this video we will discuss the quality triangle as it applies to the assurance of quality. After you watch it, you will be able to name the three main functions in the quality organization. You will be able to identify the organizations that provide standards for software engineering. You will be able to define the acronym CASE and name some tools that support software production.

Quality Functions

- Configuration Management
- Testing
- Software Quality Assurance



Let's talk about the "people" dimension of quality assurance. There are three main functions related to quality assurance.

One is Configuration Management. These people are responsible for version control of the artifacts being produced by the developers. This includes code, of course, but also requirements and design documentation. Also the standards and procedures that are used by the developers should be kept under configuration control.

Testing is another function in the quality assurance organization. Now the developers themselves are responsible for unit testing of their own pieces of work, but there needs to be a separate group of people responsible for larger scale testing. We have an entire module related to testing later in the course.

The third function is sometimes called Software Quality Assurance. These people are managerially Independent from the developers, as well as configuration management and testing.

SQA is concerned with the software processes that regulate the work of these other groups. First, SQA ensures that standards are in place and are approved. They ensure that the standards are placed under configuration control. Then SQA runs periodic reviews to ensure that the standards are being followed. Thus, SQA assures all stakeholders of the quality of the workmanship of the rest of the team.

Standards

- Government standards
 - <http://everyspec.com/>
- IEEE standards
 - <https://standards.ieee.org/>
- ISO standards
 - <http://www.iso.org/iso/>



The second side of our triangle is Processes. Standards are embodiments of best practices.

Government organizations have historically been the largest originators of standards documents. This would include the US Military, NASA, FAA, and other government agencies, as well as NATO and governments of other countries. Typically, for government contracts, the customer will provide a set of standards to be followed.

There are also two big non-governmental organizations that sponsor standards activity in software engineering: the IEEE (Institute of electric and electronic engineers) and the ISO (International Standards Organization).

If you follow the links, you will get a sense of the magnitude of standardization efforts.

Much of the time, these standards will be tailored to meet the needs of each project. Some small projects may not need a lot of standards, while large projects are likely to fail if there are no standards applied to the work effort.



Tools

- CASE – Computer Aided Software Engineering



The third side of the triangle is Tools. The acronym CASE, for Computer Aided Software Engineering, is frequently used to refer to thee types of tools. CASE tools aid in all aspects of software engineering:

One group of tools are the so-called Upper CASE tools. They support earlier phases in the software development process such as

- Planning and estimating.
- Project management.
- Requirements analysis.
- Analysis and design.

And then there are Lower CASE tools that support the production of the software

- Coding and reuse.
- Analyzing code.
- Testing.
- Configuration management.
- Metrics.
- Documentation.
- Maintenance.



Summary

You should now be able to:

- Define Software Quality.
- Demonstrate how to achieve and assure software quality.
- Justify the Return on Investment (ROI) of quality processes.
- Explain how to prevent defects.
- Demonstrate how investments in People, Process and Tools can promote quality.
- Describe the Quality organization: CM, Testing, and SQA.

Here are the topics we have covered in this module. You should now be able to

- Define the term, Software Quality.
- Demonstrate how to achieve quality in our efforts and assure ourselves and others that we are producing a quality product.
- Justify the Return on Investment (ROI) of quality processes of achieving and assuring quality.
- Explain how to manage defects, most importantly how to prevent them.
- Demonstrate how investments in People, Process and Tools can promote quality.
- Describe the Quality organization: CM, Testing, and SQA.