

SQA Model Suitable For All CMMI Level Companies

S. Rathinagowri

PG Scholar, Dept. of CSE, Anna University, TamilNadu
Email: rathinagowri@gmail.com

ABSTRACT: The Software Quality Assurance is an effective activity to be carried out in every software development life cycle. The lack of standard specifications, out dated models and related issues lead to the avoidance of SQA activities in many companies. We proposed a new model suitable for companies that cannot afford for SQA activities by overcoming major issues in SQA activities

Keywords: Quality assurance, plan, cmm, new model, standard

1 INTRODUCTION

THE Software Quality Assurance activities involve continuous monitoring of software processes in software lifecycle model to ensure that all the activities adhere to the standards specified. The main objective of SQA is to prevent errors during the release of a product and to meet the customer requirement. The SQA activities are carried out along with software development life cycle to enhance the quality in all the phases. Not only SQA is used to achieve quality but also used to tackle issues related to error handling, change, risk, configuration etc., SQA has evolved with its own set of models, tools, standards, architecture etc.,

2 RELATED WORKS:

2.1 SQA Standards

In general Standards are some frame works for software development. It establishes certain criteria for which the product is compared. There are some standards particularly framed for Software Quality Assurance. Ex: ISO 9001 and ISO 9000-3, SW-CMM (Software Capability Maturity Model), ISO/IEC 15504, SPICE (Simulation Program with Integrated Circuit Emphasis) These standards are constantly evolved based on requirements. For instance, A group of experts from industry, government, and the Software Engineering Institute (SEI) at Carnegie Mellon University developed CMMI(Capability Maturity Model Integration)model for improving the processes carried out in a project. This frame work can be used as a standard for comparing software processes carried out by an Introduction organization. In CMMI model, there are five maturity levels are mentioned.

1. Initial
2. Managed
3. Defined
4. Quantitatively Managed
5. Optimizing

- 1) **Initial:** Processes are unpredictable, exceed the budget, success depends on people etc.
- 2) **Managed:** Processes are planned, controlled and managed.
- 3) **Defined:** Processes are well defined , proactive, well understood.
- 4) **Quantitatively Managed:** Quality and performance of process is well understood in this level.
- 5) **Optimizing:** Processes are continuously improved.

3 ISSUES RELATED WITH SQA:

Although SQA is the best practice to improve the quality of SDLC, there are some factors which make the companies not to use SQA. They include

- 1) SQA - cost
- 2) SQA – complexity
- 3) SQA- Integration
- 4) Deadline
- 5) No Appropriate Methodologies
- 6) High Resource requirement

Cost: Sometimes including SQA activity for a small project may exceed the investment and hence some companies avoid SQA activities.

Complexity: The complexity of the development of software makes SQA activities become complex.

Integration: The integration activity in SQA is challenging since it requires the integration of entire project and to maintain the consistency.

Deadline: Since enhancement of quality at each level takes an additional time, the completion of project may exceed deadline time.

No Appropriate Methodologies: The standard specifications may vary from time to time and old methodologies may not suit for new development.

High Resource requirement: Since SQA and SDLC activities are carried out simultaneously, the resource required may also be very high

4 BENEFITS OF SQA:

- 1) The SQA activities implemented in Software Development Life cycle have many benefits.
- 2) Errors can be easily tracked.
- 3) In testing activity, only errors can be found where as SQA activity yields the root cause for the error and hence multiple solutions are possible.
- 4) SQA activity can suggest what plan has to be selected for effective solution.
- 5) SQA keeps track of entire SDLC activities.
- 6) The verifying of documentation often can be avoided.
- 7) SQA tools also help in risk management, configuration, change and stress management.

5 A NEW SQA MODEL SUITABLE FOR ALL CMMI LEVEL COMPANIES:

5.1 Need for a new SQA model

The CMMI model categorises the companies based on the processes carried out in a project. They frame the criteria to be achieved and never provide a means to improve those levels. Many models have evolved to carry out particular tasks. There are no such permanent common solutions come up to make SQA available for all the companies. For instance, The level 1 companies are always regarded with lower quality and higher risk. If at all there is a model to provide resources that a company lacks, the quality of the product can be improved and we can say software quality is assured.

5.2 Ideas lead to the new Framework

The factors affecting the lower level companies are identified as follows

1. Lack of Experience
2. Cost
3. Lack of resources
4. Risk Handling Capacity

When the above factors are rectified, quality of the product could also be improved. A model addressing all these issues should be framed.

5.3 Frame work

So far the possible way to improve the quality in lower level companies is to employ the well trained and well experienced heads. But the other three factors also influence the improvement of quality. Hence a new framework is proposed that provides all lacking "Resources as Service".



Possible Services: With the advancement of technologies like cloud ,open source, the availability of software resources at lower cost has increased. Hence all possible services are included in the "possible service" repository.

Experience as Service: The lower level companies mainly lacks in the experience of handling processes. Hence this repository constitutes of all participating organization's experiences. The experiences may be related to process handling, bug identification, error control, quality improvement etc.,

Expert Service: Not all the experts reside under single roof. Hence when there occur any problem to be solved by experts,

those can be handled over to them and get the problem solved.

SQA as Service: This repository consists of various SQA tools and documentation which holds their functionalities. Along with expert and experience service, SQA can be achieved in lower level companies too with lower price.

Risk Handling Services: This repository consists of tools for handling risks, documents related to similar kind of risk handling, ideas for identifying and monitoring risks etc., The lower level companies are always prone to higher risk due to lack of experts and experience. With this model any lower level company can gain adequate support and knowledge to handle risks at their best.

5.4 Benefits of a new SQA model

So far all the SQA practices suffer from some issues and make the lower level organization to skip SQA practices. The main reason is those lower level organisation has also suffered with same issues. When the issues related to lower level companies could be solved, the problem associated with the SQA practices will also be solved.

1. The cost of software is reduced with possible services.
2. Process can be better understood with experience as service.
3. The lack of knowledge in handling tools can be solved using expert as service.
4. The abandoning of projects due to risk can be avoided and can be solved with available resources.
5. Ultimately with the resources obtained SQA activities could also be performed that enhances the quality of the product.

6 CONCLUSION:

The New SQA model will not only make lower level companies to practice SQA methods but also ultimately improve the experience and expertise in handling the problem in less time period. The co-operation and participation of companies in knowledge sharing and experience sharing along with resources sharing will make this model a great success.

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