Tactful Management Research Journal
ISSN: 2319-7943
Impact Factor : 2.1632(UIF)

SKILL DEVELOPMENT IN THE ERA OF QUALITY ASSURANCE MANAGEMENT WITH RESPECT TO PRODUCTS & SERVICES BASED SOFTWARE IT ORGANIZATIONS

Prashant Prakash Chavan and Dr. Shripad Joshi

Miles Software Solutions
G. Saraf College of Arts & Commerce, S.V. Road, Malad West, Mumbai

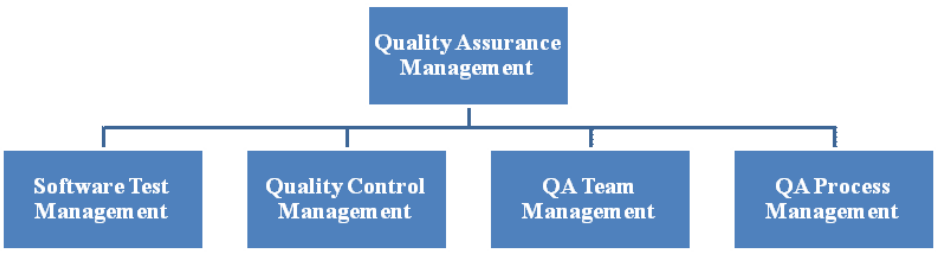
Abstract : In the present competitive environment with changing technology and fluctuating economy, it is very important for every IT service or product organization to focus on Esteemed Quality and On-Time Delivery within Estimated Budget. Quality of Product or Service or Project in terms of the accuracy and efficiency plays a major role in establishing a business, growing a business, and building a brand value. This proposal highlights important factors to be taken care during Software Testing Management.

KEYWORDS:- Software Testing, Quality Assurance (QA), Quality Control (QC), Quality Analysis, Software Testing Life Cycle (STLC), Risk Assessment, Automation

INTRODUCTION

An important part of software quality is the process of testing, validating, and verifying the software. The purpose of this paper is to introduce testing concepts about, and provide QA best practices in the field of quality management. Quality Assurance management is the practice of defining, organizing, implementing, controlling, and optimizing the process and artifacts required for the software testing. The paper discusses how testing can be improved with the help of processes.

The section starts by considering the purpose of QA or the QA mission, and the relation between QA policy, QA strategy and QA objectives. Managing the QA team and managing QA activities throughout the organization are addressed extensively and special attention is given to the various project management tasks that would apply at the expert QA management level. This paper concludes with an overview of special QA management considerations for different domains, customized processes, and project / product factors. The QA Management can be divided into four parts:



SOFTWARE QUALITY ASSURANCE MANAGEMENT

The general goal of quality management is to allow teams to plan, develop, execute, and assess all testing activities within the overall software development effort. This includes coordinating efforts of all those involved in the testing effort, tracking dependencies and relationships among test assets and, most importantly, defining, measuring, and tracking quality goals.

Software Quality Assurance Management Structure			
Aspects	**Artifacts**	**Attributes**	**Disciplines**
Organization	Test Scripts	Test Strategy	Test Repository Management
Planning	Test Data	Test Plan	Requirements Management
Authorizing	Test Software	Test Execution	Change Management
Execution	Test Environment	Test Reporting	Configuration Management
Reporting	Test Results	Quality Metrics	Defects Management

QUALITY MANAGEMENT CHALLENGES:

- Why should I test? What should I test? Where should I test? When should I test?
- How should I conduct the tests? Not enough time to test. Not enough resources to test.
- Testing teams are not always in one place. Difficulties with requirements
- Keeping in synch with development. Reporting the right information

QUALITY MANAGEMENT RECOMMENDATIONS:

- Start test management activities early, Test iteratively, Reuse test artifacts
- Utilize requirements-based testing , Validating that something does what it is supposed to do
- Trying to find out what can cause something to break, Leverage remote testing resources
- Defining & enforcing a flexible QA process, Coordinate and integrate with the rest of development
- Communicate status, Focus on goals and results, Automate to save time
- Tracking the relationship of testing to requirements and other test motivators
- Test case organization and reuse, Documentation and organization of test configurations
- Planning and coordination of test execution across multiple builds and applications
- Calculating test coverage, Various reporting tasks, Proper tooling and automation

IMPORTANCE OF THE STUDY:

Few people can argue against the need for improved quality in software development. Users of technology that utilizes software have come to expect various faults and flaws and, especially in the world of personal computers, we consider frequent problems to be completely normal and expected. However, as software development matures, we are beginning to better understand how to achieve a necessary improvement in quality. The purpose of this article is to introduce concepts about, and provide general best practices in the field of, test management.

- The probability of discovery of defects is high as testing are formulated keeping the defects in mind.
- Goal focused evaluation of the software is adapted.
- Higher and wider test coverage is possible. The overall validation strategy is effective.
- Efforts can be prioritized with respect to product features by concentrating on critical areas first.
- It is possible to define an objective quality growth model.
- The overall test assessment and product analysis is accelerated.
- The amount of defect leakage is reduced since most of the defects are found at the early stage.
- Minimal/No defects are found in production/post-production cycle.
- The overall productivity is boosted since HBT helps in selecting an appropriate tool.
- QA strategy can be customized as per individual project requirements.

OBJECTIVES:

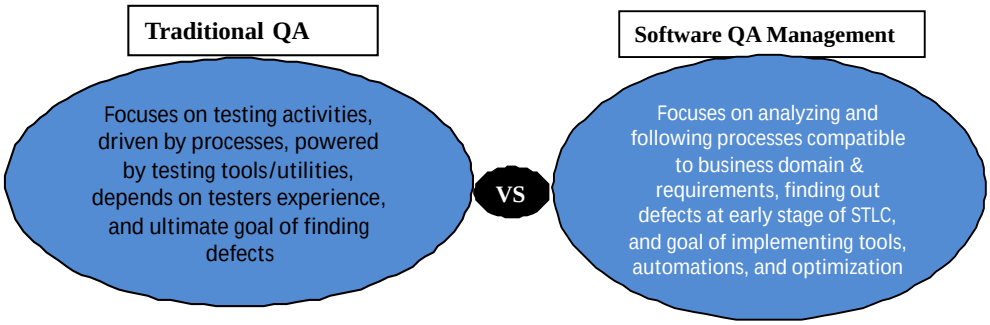
- Lead the QA management within an organization to identify and manage critical success factors.
- Take appropriate business-driven decisions on QA strategy and quality KPIs.
- Assess the current status of the quality management, and propose step-wise improvements.
- Set up a strategic policy for improving the quality assurance and the testing, and implement the same.
- Analyze specific problems with the product quality and propose effective solutions.
- Create a QA Process Handbook with matching governance dashboard to meet the business objectives.
- Develop required roles, skills, methodologies, tools, and organizational structure.
- Establish the best QA practices for implementing quality management effectively & efficiently.
- Understand and manage the human issues associated with quality and implement necessary changes.

HYPOTHESIS:

- The dimensions of quality parameters and various product domains have been used.
- It was not possible to exhaustively test every feature of a web-application on every browser or device.
- Studied which features of the application to focus on and which browsers or devices have been utilized.
- A defect is exposed in a certain feature when viewed in a certain browser using a probability distribution; it was possible to model these distributions and used them to guide our decision making.

SCOPE & LIMITATIONS:

As opposed to traditional QA methodologies, the focus is on defining, implementing activities, and tools that have helped discovering potential defects in the software.



Below are the guidelines as to how QA Management actually can be implemented.

- Identify the defects that may occur in the software. Define the cleanliness criteria for the software.
- Then define the places, loops or functionalities where the defects can be found.
- Also, write the other conditions that may cause the defect to occur.
- Based on the above, create test plan, test strategy and test cases.
- Choose a tool that can assist you with the defect detection. If possible, opt for sensible automation.
- Perform the test cases and record the results.
- Based on the results, certify the cleanliness of the software.
- Repeat the HBT and code fixing until the software is defect-free.

REVIEW RELATED LITERATURE:

- Feigenbaum A.V. (1994), Quality Education And America Competitiveness, Quality Progress, Vol.2, Issue-9, pp.83-84. This literature article talks about examining the need of Quality Assurance Management, Testing Strategies, Testing Methodologies, QA Processes, and Testing techniques.
- Roffe I.M. (1998), Conceptual Problems Of Continuous Quality Improvement And Innovation In Higher Education, Quality Assurance In Higher Education, Vol.6, Issue-2, pp.74-82. This article was beginning with an exploration of processes, its definition, history, benefits and questions of quality.
- Harvey L. And Green D. (1993), Defining Quality, Assessment And Evaluation In Higher Education, Vol.18, Issue-1, pp.9-26. This article is mainly explores on general role of Quality Assessment & Education.
- Kulkarni P. (1999), Quality In Engineering Education, The Journal Of Engineering Education, pp.10-25. This article presents more on the literature of Quality in engineering era with respect to concepts, tools, and techniques.
- Pandi P., Rao U.S. And Jeyatilagar D. (2009), A Study On Integrated Total Quality Management Practices In Technical Institutions - Students Perspective, International Journal Of Educational Administration, Vol.1, Issue-1, pp.17-30. This article segues into various aspects of Total Quality Management thoughts and study.

RESEARCH DESIGN:

- The pilot study was conducted on 5 software QA managers who are working in various software companies in Mumbai region. They were asked to list down the various risks that they have faced during the

Software Testing Lifecycle.

◆ Survey method was used for data collection. Approximately 10 surveys conducted among QA people who are working on various domains in Mumbai region.

◆ Interviews also taken of Junior and Senior QA engineers to find out qualitative nature of the information.

◆ Case study method was used for in-depth investigation of a single individual and group. It. It provided a systematic way of looking at events, collecting data, analyzing information, and reporting the results.

RESEARCH METHODOLOGY:

◆ Exploration of the quality dimensions, and then comparison of these dimensions across the various domain and project characteristics.

◆ Identification and exploration of the organizational policies that is present in the Indian software companies. This will be done by detecting the factors through field survey and comparing them across the demographics and project characteristics.

◆ The moderating effect of demographic characteristics and organizational climate factors on the project specific quality factors was studied through regression analysis.

◆ The study will also assessed the impact of quality factors and domain factors on the success and the three performances constructs of success namely budget, schedule and quality separately.

COLLECTION OF DATA:

The study was aimed at employees working in the software and service companies in India. For the data collection, 10 companies were selected randomly from the two major IT hubs of Maharashtra viz. Mumbai and Pune. A total of 100 questionnaires were sent to these 10 companies with a request to get these filled from the software QA/Testing professionals having an experience of more than 3 to 4 years of handling software testing assignments.

ANALYSIS OF DATA:

Age, total experience, designation, team size, total duration and total value of the project were entered in to the computer. The questions and responses were entered in the computer using Microsoft Excel software. Required analysis was done with the aid of Statistical Package. Certain statistical methods were applied on the data to get the results.

QUESTIONNAIRE:

For survey, interview, and case studies, questionnaires were prepared on Personal Information, Quality, difference between QA & QC, Quality metrics, QA team, Defects management, Quality management, Quality issues, Challenges in quality, Testing tools/techniques, Testing standards, QA processes, Internal or external quality audit.

CONCLUSION:

An important step to improve software quality is advancing QA practices beyond old-fashioned, document-based methods. Quality assurance encompasses various processes, including planning, authoring, executing, and reporting on tests, as well as addressing how testing fits in and integrates with the rest of the software development effort. There are a number of daunting and inevitable challenges to QA management, such as scarcity in time and resources, testing teams located in remote geographic locations, problems linking testing with requirements and development, and reporting the right information.

The good news is that there are a number of best practices/processes that can help prevail over these challenges. Starting test activities early and iteratively, focusing on goals and results, and coordinating and integrating with the rest of development will keep the testing effort from becoming an afterthought to the software. Maximizing the reuse of test artifacts, leveraging remote testing resources, defining, enforcing a flexible testing process, and building automation to run multiple test cycles are definitely help to improve quality for any product or service based software IT organization.

◆ Align the QA expectations and objectives with business goals.

◆ Understand the context of QA in terms of QA requirements and the success criteria.

◆ Formulate an appropriate QA processes and potential methodologies

◆ Develop QA strategy, test design, requirements traceability matrix, and define measurements.

- Identify and Select appropriate tools. Perform tooling benefit analysis.
- Assess the software based on testing results, and carry out defect management activities.

REFERENCES (BOOKS & LINKS):

1.Feigenbaum A.V. (1994), Quality Education And America Competitiveness, Quality Progress, Vol.2, Issue-9, pp.83-84.
2.Roffe I.M. (1998), Conceptual Problems Of Continuous Quality Improvement And Innovation In Higher Education, Quality Assurance In Higher Education, Vol.6, Issue-2, pp.74-82.
3.Harvey L. And Green D. (1993), Defining Quality, Assessment And Evaluation In Higher Education, Vol.18, Issue-1, pp.9-26.
4.Saxena P. K. (2009), Principals Of Management, Global India Publications Pvt.Ltd., New Delhi.
5.Kulkarni P. (1999), Quality In Engineering Education, The Journal Of Engineering Education, pp.10.
6.Pandi P., Rao U.S. And Jeyatilagar D. (2009), A Study On Integrated Total Quality Management Practices In Technical Institutions - Students Perspective, International Journal Of Educational Administration, Vol.1, Issue-1, pp.17-30.
7.Mahapatra S.S. And Khan M.S. (2006), Current Practices Of Total Quality Management Implementation And Future Trend, Journal Of Industrial Engineering, Vol.35, Issue-6, pp.28-33.

URLS:

1.http://www.sqa.org/; http://www.gurock.com/testrail/; http://www.qam.com.sg/
2.http://asq.org/learn-about-quality/quality-assurance-quality-control/overview/overview.html
3.http://www.pmi.org.in/