

# Effective Quality Assurance Planning

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## Introduction

Each one of the project aspects competes for the effort of the project management team. In some point of the project execution, the management team often realize that the effort devoted to quality management has been significantly less than the one devoted to scope, cost or time management.

Realizing a poor dedication to quality management too late during the execution of a project inevitably causes a negative impact in some or all of the other aspects, eroding the results of the project management team. In consequence, the successful execution of a project demands a balance in the effort of the management team, and an effective quality assurance planning is essential to achieve the balance.

Good quality management will help avoiding cost overrun or schedule slippage involved in rework to fulfill the customer acceptance criteria. Nevertheless quality is not free. It requires the development and execution of a quality assurance plan, which involves resources, time and money. The management team should assure a good balance between the investment in the quality assurance plan and the positive impact expected for the project.

The project management team has many aspects to consider in developing an effective quality assurance plan for the project. The quality policies and quality system of the parent company are the mandatory framework to consider, but will not be sufficient. Culture of the organization, awareness of the people, management willingness to invest in quality among other aspects, must be taken in consideration if the team want to have an executable quality plan.

The magic formula: Quality = DTRTRTFT. Do the right things right the first time. Simple, isn't it?. Right things should be the tasks which are in the project plan, and the right way to do them should be described in the process definition of the functional department process involved in their execution. But project managers know very well that is not that simple. Assemble and manage a project team to identify all the right things to do is not so easy. Realize which are the functional process supporting the detailed work, evaluate their present status, and assure that the team members are behaving accordingly is not always done properly, under the belief that the parent organization will take care of those aspects.

## Process Quality Versus Project Quality

The profuse literature related to quality is mainly based in the concept of continuous improvement of processes. The idea is improve the operation of any given organization applying a methodological approach for: a) identifying every repetitive process this organization is performing, b) identifying the most appropriated person in this organization who should be appointed as the owner for every identified process, c) identify the suppliers, customers, input and output for every process, d) document the process steps actually performed to convert the input into the output of the process. Then, start the improvement process, consistent in: e) create and apply a measurement procedure for the process, f) define opportunities to improve the process (root cause of failures), g) modify the process to improve its performance, and h) iterate from point e, going back to point a each time an improvement implies a change in other processes.

Projects are commonly not as long and iterative as they should be to take advantage of an improvement process like the one described above. An attempt to apply this improvement process directly and specifically to a project would not be practical. Nevertheless, quality is so important for the project success that the project management practice needs to address it in the most effective way possible.

The way to address quality in projects varies depending on several factors, like the type of project team, how is the project inserted into a parent organization, and the level of commitment to quality in the parent organization and subcontractors. To keep this paper short, it is focused in projects executed under the control of a core team, integrated by a project manager and one technical leader for every technical aspect of the project, with the responsibility to manage either the technical personnel of the project, who work in independent functional department of the parent company, or to manage a subcontractor. It is also assumed that the parent organization and the subcontractors have a reasonable approach about quality.

The project manager is responsible for raising the priority of quality in the mind of every team member. People in the core team must be committed to identify "all the right things" that have to be done to succeed, and technical workers must be committed to do them "right the first time".

The right things are not only the deliverables to the external customer, who pays for the final result of the project. The right things are also those intermediate results that are needed for “internal customers”, that means the next person or functional area in the sequence of project activities. Each phase in the life cycle of the project has its own objective and produces different results, calling for a particular focus on the project manager behavior.

All the mentioned circumstances makes it difficult to perceive how the multiple aspects related to quality are interrelated and flow through the project life cycle. A well-organized Quality Assurance Plan for the project helps in perceiving every aspect and their interconnection, and triggering appropriated actions on time. The plan document should be the reference to find ways to address every quality aspect of the project during its multiple phases. The following sections present the relevant aspects related to quality within each classical project phase, providing guides for the project manager and other project team member to address them. The subjects presented below should be the main components of the quality assurance plan for a project.

## Concept Phase

During the conceptualization of the project and the product, the project manager has the role of leader for the people involved. To be the leader of the innovation that takes place during this phase, the project manager has to be creative and also analytical, and should inspire the project team to start creating the plan for the project. The project managers should raise quality to the surface in every one of the main activities, which in this phase are as follows.

**Needs Identification:** It is difficult to identify all the customers needs, and is not easy to precisely define and document those identified. This situation is a common root cause for cost overruns and schedules slippage. But it is a quality matter: with incomplete or poorly defined customer needs, the project team can not state all the right things to do during the rest of the project. The project manager should not be satisfied with “a” list of customer needs: must demand a detailed definition of all the relevant customer needs the project is expected to fulfil.

**Feasibility Evaluation:** From quality perspective, project feasibility is mainly related to the probability to achieve the expected results from the project team that will be assigned to the project. The project manager should validate if the assumptions about performance could be achieved in the real project environment. To do that, the project manager should validate if the organizations involved in the execution of the

project are capable to produce their corresponding project results under the time and cost constraints, taking into account that their capability is widely dependent from the maturity of their internal processes. The project manager should consider alternatives of subcontracting and process improvement for the cases where the assumed organization performance is not likely to be achieved in the real project environment.

**Risk Analysis:** The result from this analysis, from the point of view of quality, should be the identification, probability of occurrence and impact estimation for cases in which the project could not fulfill the expected quality results. For those cases with higher probability and impact, a mitigation strategy should be developed, including some degree of reprocess to rebuild what was wrong the first time. This analysis can not be very detailed at this phase of the project, and will demand a deeper and recursive analysis later in the project life cycle.

**Strategy and Alternatives Development:** There are normally multiple ways to approach a project, and during concept phase the project team should develop a variety of alternatives, based on different strategies to design the project product and develop the project plan. In this creative process, the project manager should remember to the team members the need to constantly check the assumptions on organization capabilities that is referenced above, under Feasibility Evaluation. The objective is to avoid alternatives based on assumptions requiring improvements in the supporting organizations that are beyond the scope, budget and/or time for the project.

**Project Authorization:** Concept phase of the project ends after the parent organization decides to proceed, giving the budget and assigning resources for the project execution. This is a crucial moment for the project, including the quality aspects of it. Executives need to realize the level of commitment to quality that the project is expecting from its parent organization. This moment is even more critical when the alternative selected for the project implies an improvement over present functional organization processes, because the decision to proceed with the project must imply the commitment for the mentioned process improvements, and the project manager should not leave this phase without formalizing those commitments.

## Planning Phase

At planning phase, the project manager should be the entrepreneur of the project. She or he should lead this phase not only to develop the basic design of the project product and the project plan, but to leverage the

interaction among the group of people assigned to the project. The project manager should assure and accelerate the transformation of that group of people into a team, the project core team, integrated with people willing to support each other. And this is also the time to seed the passion for excellence, which is the warranty for quality results in the project. An good way for this sowing is to raise quality to surface in every one of the main activities within this phase.

**Product Design:** Based on a consistent definition of customer needs, the project team focuses in the design of a product to fulfill them. Additionally, this is the time to start designing the tracking mechanism that the team is going to follow to assure that each product components and/or feature included in the design is adequately progressing throughout the project. This mechanism is part of the cost of quality, it takes time and money, but is imperative to assure the success in producing quality products. It must be checked if the involved functional organization processes already have this tracking mechanism, to avoid duplication of effort and cost.

The previous mechanism is focused on the project team performance, to assure quality building. But the project manager also needs to assure customer certification. At this phase, the project team should start identifying the certification criteria, which is the method that the customer must be committed to use to confirm that the product performs as expected. The development of certification criteria starting here should be finalized, documented and agreed with the customer before ending the planning phase.

**Prototype Development and Test:** Under configuration management approach, it is common (and safe) to have same sort of prototyping to test the design of the product, with the propose of improve the probability of project success. The feasibility and effectiveness of the tracking mechanism (for customer needs fulfillment) and certification criteria should be evaluated during the prototyping, and improvements should be discussed and implemented. The prototyping team should also recommend or evaluate measurement and control methods for the real construction activities.

**WBS Preparation:** Quality is more something to build than something to control, and building quality demand to succeed in every project activity. The project manager should have a good understanding of the actual quality policy in the parent organization, should analyze how it is implemented in the quality systems of the functional organizations, in terms of measurement systems and control activities, and should assure that the project WBS is taking those processes and procedures in consideration. In terms of quality, the WBS should incorporate as much as

possible of the current quality system in the parent organization, and should compensate any relevant weakness the system could have to face quality aspects of the specific project.

**Detailed Plan Preparation:** Quality must be in minds of project team members when developing the detailed plan. The well thought breakdown of activities done in previous step should be complemented with a resource assignment done in a way that each tangible project result component or feature can be mapped to the person responsible for it. This is an effective way to leave the so common approach of human resources “involvement” in quality, arriving to human resources “committed” to quality. There must be tasks planned to control the quality of results, which may be part of the functional organization processes or may be added in the specific project. As important as developing and implementing this infrastructure, is the effectiveness in communicating it to the extended project team (technical people executing the work packages). The communication should not be done to threaten people, but to show how dependent the project is on quality results, and how important is this subject for the management team.

**Project Presentation:** This presentation normally involves the customer and, like at the end of the previous phase, it is very important to present all the assumptions and plans related to quality that are involved in the project. Executives from the customer and from the parent organization of the project must understand, agree and be committed to the approach planned to manage quality in the project. A transcendental action in this step is the agreement with the customer about the planed certification criteria.

## Execution Phase

The project manager needs to adopt the behavior of a manager in order to adequately lead this phase. He should receive and organize all the resources committed by some internal or external organization, which are very often assigned part time to the project. In this phase, creativity should only be applicable to manage risk and problems. The theme of this phase should be “execute the project plan”. The project manager should focus on attaining what is expected from the project resources, on time, within budget, according to specs, and achieving customer satisfaction. To assure quality, motivation and control over the project resources is needed in all the main activities of this phase.

**Resource Assignment:** Several factors could attempt against the actual assignment of planned resources to their

corresponding activities, like conflicts of agendas and changes in the functional organization personnel (promotions, turnover, etc.). The project manager is frequently exposed to negotiate for resources, and negotiation always implies some degree of flexibility. Nevertheless, the project manager should assure that the resources they get are really qualified to fulfill all the assumptions and plans related to quality.

**Project Execution Start:** This activity always involves the assignment of the first tasks to every one of the project technical teams, following the project plan and schedule. The core team of the project should communicate and assure the launching of every activity in the functional organization processes that were identified as part of the quality plan for the project.

**Tasks Performance:** Here is where quality is built, and the people assigned to every task is responsible for the quality of its result. Managers should have previously established an environment where it is feasible that every project resource can attain quality results, and now managers should concentrate in checking that the plan is properly implemented, and giving the expected results. Measures should be taken according to the plan, and reported to managers for analysis, so variances from expected results can be identified, corrective actions can be defined and incorporated into the project plan. This plan/do/check/act approach should be clearly described into the project audit and review processes.

**Results Delivery:** The disciplined application of the tracking mechanism, planned to maintain the control over the development of every product component or feature, should have led the team to the success delivering quality products. Certification criteria, identified during Product Design, tested in Prototyping and agreed with the customer in Project Presentation (Planning Phase), should be the foundation for a smooth and quick certification of the project deliverables. This is the payback for the cost of implementing the tracking mechanism, the certification criteria, and any other component of the plan to assure the quality of the project: No delivery rejection, reprocesses, schedule slippage, cost overrun.

**Progress Control/Reporting:** The information process of the project should not only process, control and report data regarding cost and schedule, as it commonly does. This system should also manage the information coming from the diverse measurement and control procedures, imbedded in the functional organization processes and in the specific task included in the WBS for these purposes. Information about quality should be integrated in the project progress reports. Otherwise, customer's and parent organization's executives develop a false perception about project status and estimate to

complete. Earned value, to be true, needs to relate to quality project results.

**Problem Resolution:** The criteria used to resolve project problems should not compromise quality as a consequence of protecting cost or schedule. The project manager should leverage the attitude of the team members more conscious about quality, to permeate the arguments of those who does not assign to quality a priority equal to other project dimensions. Parent company managers and the project core team should pay close attention to their decision criteria for problem resolution, because if it were against the quality policy would not only damage quality in the related problem. Their attitude could seriously compromise quality for the rest of the project.

## Closing Phase

At the end of the project, the project manager needs to focus in completing the certification process with the customer, organizing the project documentation to be used as reference in future projects, and facilitating to dismantle the project team for the best of the people involved and the parent company.

**Final Results Delivery:** The core team should focus in resolving all pending issues of the project, and completing the delivery of the final product to the customer. It is possible to have minor pending issues related to the quality of deliverables previously certified, for which an agreement could be done with the customer for later remedy. Testing and certification of those possible pending issues should be included in the certification process of the last project deliverables.

**Customer Certification Achievement:** The core team has to be prepared to confront the hardest attitude from the customer during this certification process. This certification means that the customer declares complete acceptance of all the project deliverables, and the customer's personnel involved in this process normally stresses every test, and review every detail not only related to the final deliverables. The project team should make the same cautious review of the project, and be prepared to discuss at front every issue with the customer, to avoid that the customer starts presenting small quantity of issues in an iterative motion.

**Responsibility Transfer:** At closing phase, the project team prepares the customer to receive the responsibility for the maintenance of the project products during their productive life. The delivery of product documentation should be completed at this time, together with information about specific product performance, utilization and maintenance.

### **Project Accounting and Reporting Systems Closing:**

The experience acquired during every project should help the performing organization to improve its ability in managing and performing projects. The project manager has an important role in this learning process, paying attention to every single lesson learned during the execution of the different project phases, and documenting those lessons in a way that can be shared by the whole parent organization. The lesson should not be focused only in the project management aspects, but in all the functional organizations and subcontractors issues that have emerged during the project and represent opportunities for improvement in their respective sectors.

**Project Personnel Reassignment:** When every person start working for the project, the project manager should explain the appraisal method, emphasizing that the attitude related to quality is one of the high priority appraisal areas. The mapping from quality project results and responsible person should be clearly communicated. Information about the performance of every project team member should be maintained by the core team, and should be available to help the reassignment process. This approach helps raising the priority of quality in the mind of every project team member.

## **Quality Assurance Plan**

The effectiveness in managing quality is tightly dependent on the quality of the project organization, and this last is the result of making the organization chart development, role definition, and people selection. All this tasks are under the responsibility of the project manager and they must be done very early in the project life cycle. To create an effective project team organization, the project manager should take in consideration four critical factors for every person: authority (right to demand some degree of obedience), accountability (get things done within his/her area of control), responsibility (tasks to be performed by each role) and reliability (ability to perform as expected for the role). An adequate project organization must consider how every role (and ultimately the specific person appointed to the role) is expected to be involved in the management of quality throughout the life cycle of the project.

To support the action of a quality project organization, the project manager should develop a quality assurance plan. This plan is a well-organized compendium of the definitions related to quality management which could also be imbedded in other part of the project plan. The main propose of the quality assurance plan is helping the project core team to focus on quality, perceive

how all the pieces fit together, and realize rooms for improvements. It is also the place to document the interfaces between the project quality assurance plan and the quality system of the parent organization. The following are the main recommended sections around which the plan should be developed.

**Plan Overview:** Describes the project, in terms of customer's needs, project scope, objectives and approach. It summarizes the quality assurance activities, test, and acceptance process, and should explain how this plan interfaces from and depends upon the quality policy and quality system of the parent organization. The role of the quality assurance manager is summarized, stating if it is a full- or part-time assignment and name the person who is in the role.

**Deliverables Quality Assurance:** The deliverables definition, or reference to it, should be included in the plan, together with the relevant details about components and features which are tested during the acceptance processes. The processes to test and accept deliverables should also be detailed, as well as the acceptance criteria agreed with the customer to certify every deliverable.

**Quality Assurance Processes:** Describes the monitoring processes, either specifically developed for the project or those that are part of the involved functional organization processes. This section identifies the metrics to use, the process to collect the measures and the way to process and report them, with detailed information about when and who performs every control task.

**Audits and Reviews:** Discusses how quality is presented and managed in project audits and reviews, and how the results of this events can be used to improve the project and associated functional processes.

**Team Responsibilities:** Identify responsibilities related to quality for every project team's role, like functional specs status documentation and control, acceptance tests, project audits, etc.

**Quality Assurance Manager Responsibilities:** Considering the number of aspects to have in mind around quality, it is recommended that one person in the parent organization develop specific and deep experience, becoming the quality assurance manager for multiple projects. This section of the plan describes the responsibility of the role, and the way it interacts with other project team members, and also with the project manager.

## **Summary**

Quality management in projects is not only the application of principles and procedures explained in the literature to improve process quality. Quality management in

projects can not be resolved including one or a few activities in the WBS. Quality management in projects demands a system, which inside every project is represented for the quality assurance plan. This plan is not independent from the rest of the project plan, it is actually an integral part of the project plan, but needs to be documented separately to help perceiving the cohesion of their components, and to facilitate their maintenance.

Without an approach to quality like this, the risk for late delivery, late certification and financial loss is hard to estimate, either in probability or impact, but surely will be very high in both ways.