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PROJECT QUALITY MANAGEMENT
QUALITY PLANNING

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Abstract:

Project Quality Management includes the processes required to ensure that the project will satisfy the needs for which it was undertaken. It includes “all activities of the overall management function that determine the quality policy, objectives, and responsibilities and implements them by means such as quality planning, quality assurance, quality control, and quality improvement, within the quality system”.

1. Introduction

Quality management in projects addressing both outcomes of project management such as cost and schedule performance and quality of the product / service from the project, eg deliverables. Quality control of project is used to verify that the specific deliverables are of acceptable quality and that they meet the criteria of completeness and fairness established in the planning process quality.

Quality Management processes include the following major projects.

1 Quality Planning—identifying which quality standards are relevant to the project and determining how to satisfy them.

2 Quality Assurance—evaluating overall project performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards.

3 Quality Control—monitoring specific project results to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory performance.

These processes interact with each other and with the processes in the other knowledge areas as well. Each process may involve effort from one or more individuals or groups of individuals, based on the needs of the project. Each process generally occurs at least once in every project phase.

Although the processes are presented here as discrete elements with welldefined interfaces, in practice they may overlap and interact in ways not detailed here.

The basic approach to quality management described in this section is intended to be compatible with that of the International Organization for Standardization (ISO), as detailed in the ISO 9000 and 10000 series of standards and guidelines. This generalized approach should also be compatible with a) proprietary approaches to quality management such as those recommended by Deming, Juran, Crosby, and others, and b) nonproprietary approaches such as Total Quality Management (TQM), Continuous Improvement, and others.

Project quality management must address both the management of the project and the product of the project. The generic term *product* is occasionally used, in literature regarding quality, to refer

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to both goods and services. Failure to meet quality requirements in either dimension can have serious negative consequences for any or all of the project stakeholders. For example:

_ Meeting customer requirements by overworking the project team may produce negative consequences in the form of increased employee attrition.

_ Meeting project schedule objectives by rushing planned quality inspections may produce negative consequences when errors go undetected.

Quality is “the totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs” . Stated and implied needs are the inputs to developing project requirements. A critical aspect of quality management in the project context is the necessity to turn implied needs into requirements through project scope management.

The project management team must be careful not to confuse *quality* with *grade*. Grade is “a category or rank given to entities having the same functional use but different technical characteristics” . Low quality is always a problem; low grade may not be. For example, a software product may be of high quality (no obvious bugs, readable manual) and low grade (a limited number of features), or of low quality (many bugs, poorly organized user documentation) and high grade (numerous features). Determining and delivering the required levels of both quality and grade are the responsibilities of the project manager and the project management team.

The project management team should also be aware that modern quality management complements project management. For example, both disciplines recognize the importance of:

_ Customer satisfaction—understanding, managing, and influencing needs so that customer expectations are met. This requires a combination of conformance to requirements (the project must produce what it said it would produce) and fitness for use (the product or service produced must satisfy real needs).

_ Prevention over inspection—the cost of preventing mistakes is always much less than the cost of correcting them, as revealed by inspection.

_ Management responsibility—success requires the participation of all members of the team, but it remains the responsibility of management to provide the resources needed to succeed.

_ Processes within phases—the repeated plan-do-check-act cycle.

Figure 1 provides an overview of the following major project quality management processes:

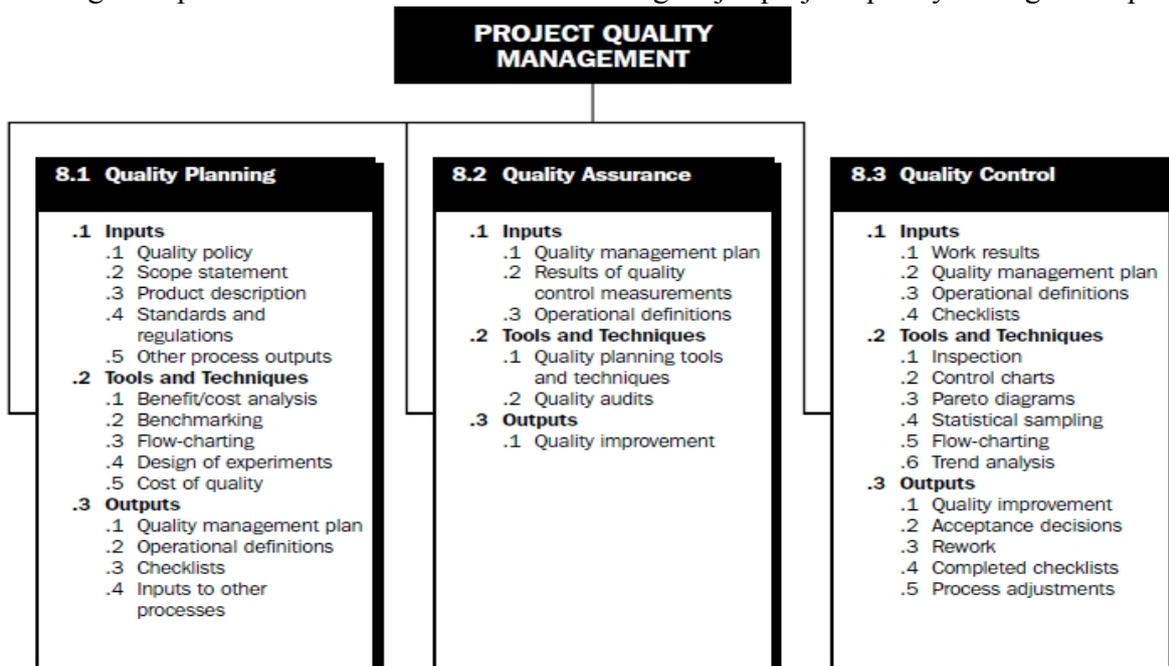


Figure 1. Project Quality Management Overview

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In addition, quality improvement initiatives undertaken by the performing organization (e.g., TQM, Continuous Improvement, and others) can improve the quality of the project's management as well as the quality of the project's product.

However, there is an important difference of which the project management team must be acutely aware—the temporary nature of the project means that investments in product quality improvement, especially defect prevention and appraisal, must often be borne by the performing organization since the project may not last long enough to reap the rewards.

2. QUALITY PLANNING

Quality planning involves identifying which quality standards are relevant to the project and determining how to satisfy them. It is one of the key facilitating processes during project planning and should be performed regularly and in parallel with the other project planning processes. For example, the changes in the product of the project required to meet identified quality standards may require cost or schedule adjustments, or the desired product quality may require a detailed risk analysis of an identified problem. Prior to development of the ISO 9000 Series, the activities described here as quality planning were widely discussed as part of quality assurance.

The quality planning techniques discussed here are those most frequently used on projects. There are many others that may be useful on certain projects or in some application areas.

The project team should also be aware of one of the fundamental tenets of modern quality management—quality is planned in, not inspected in.

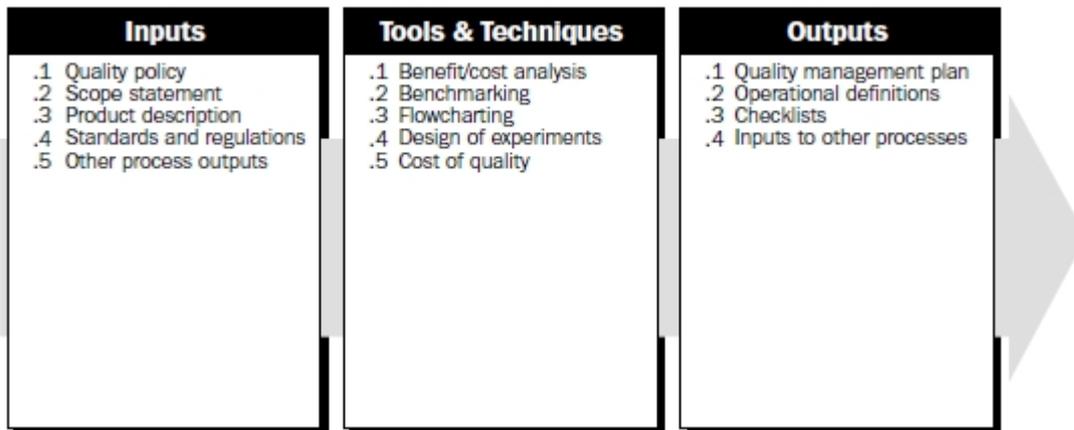


Figure 1. Quality Planning Overview

2.1 Inputs to Quality Planning

1. Quality policy.

Quality policy is “the overall intentions and direction of an organization with regard to quality, as formally expressed by top management” .

The quality policy of the performing organization can often be adopted “as is” for use by the project. However, if the performing organization lacks a formal quality policy, or if the project involves multiple performing organizations (as with a joint venture), then the project management team will need to develop a quality policy for the project. Regardless of the origin of the quality policy, the project management team is responsible for ensuring that the project stakeholders are fully aware of it (e.g., through appropriate information distribution).

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2. Scope statement.

The scope statement is a key input to quality planning since it documents major project deliverables, as well as the project objectives that serve to define important stakeholder requirements.

3. Product description.

Although elements of the product description may be embodied in the scope statement, the product description will often contain details of technical issues and other concerns that may affect quality planning.

4. Standards and regulations.

The project management team must consider any application area-specific standards or regulations that may affect the project.

5. Other process outputs.

In addition to the scope statement and product description, processes in other knowledge areas may produce outputs that should be considered as part of quality planning. For example, procurement planning may identify contractor quality requirements that should be reflected in the overall quality management plan.

2.2 Tools and Techniques for Quality Planning

1. Benefit/cost analysis.

The quality planning process must consider benefit/cost tradeoffs. The primary benefit of meeting quality requirements is less rework, which means higher productivity, lower costs, and increased stakeholder satisfaction. The primary cost of meeting quality requirements is the expense associated with project quality management activities. It is axiomatic of the quality management discipline that the benefits outweigh the costs.

2. Benchmarking.

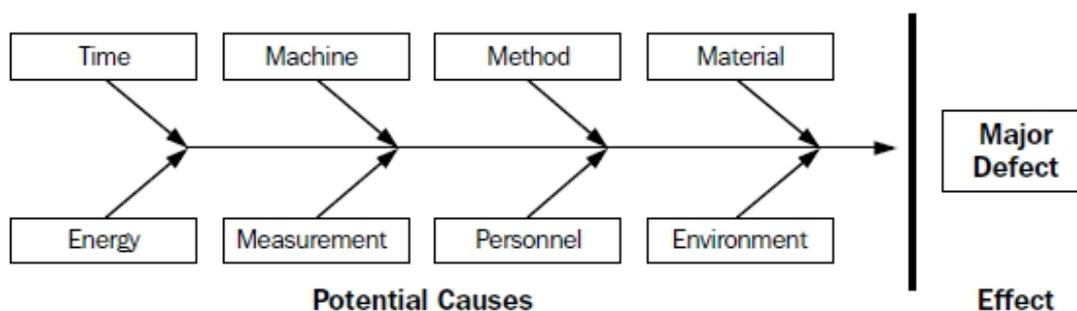
Benchmarking involves comparing actual or planned project practices to those of other projects to generate ideas for improvement and to provide a standard by which to measure performance. The other projects may be within the performing organization or outside of it, and may be within the same application area or in another.

3. Flowcharting.

A flow chart is any diagram that shows how various elements of a system relate. Flowcharting techniques commonly used in quality management include:

_ Cause-and-effect diagrams, also called Ishikawa diagrams or fishbone diagrams, which illustrate how various factors might be linked to potential problems or effects. Figure 2 is an example of a generic cause-and-effect diagram.

_ System or process flow charts, which show how various elements of a system interrelate. Figure 3 is an example of a process flow chart for design reviews.



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Figure 3 Cause-and-Effect Diagram

Flowcharting can help the project team anticipate what and where quality problems might occur, and thus can help develop approaches for dealing with them.

4. Design of experiments.

Design of experiments is a statistical method that helps identify which factors might influence specific variables. The technique is applied most frequently to the product of the project (e.g., automotive designers might wish to determine which combination of suspension and tires will produce the most desirable ride characteristics at a reasonable cost).

However, it can also be applied to project management issues, such as cost and schedule tradeoffs. For example, senior engineers will cost more than junior engineers, but can also be expected to complete the assigned work in less time. An appropriately designed “experiment” (in this case, computing project costs and durations for various combinations of senior and junior engineers) will often allow determination of an optimal solution from a relatively limited number of cases.

5. Cost of quality.

Cost of quality refers to the total cost of all efforts to achieve product/service quality, and includes all work to ensure conformance to requirements, as well as all work resulting from nonconformance to requirements. There are three types of costs that are incurred: prevention costs, appraisal costs, and failure costs, where the latter is broken down into internal and external costs.

2.3 Outputs from Quality Planning

1. Quality management plan.

The quality management plan should describe how the project management team will implement its quality policy. In ISO 9000 terminology, it should describe the project quality system: “the organizational structure, responsibilities, procedures, processes, and resources needed to implement quality management” (5).

The quality management plan provides input to the overall project and must address quality control, quality assurance, and quality improvement for the project.

The quality management plan may be formal or informal, highly detailed, or broadly framed, based on the requirements of the project.

2. Operational definitions.

An operational definition describes, in very specific terms, what something is and how it is measured by the quality control process. For example, it is not enough to say that meeting the planned schedule dates is a measure of management quality; the project management team must also indicate whether every activity must start on time or only finish on time; whether individual activities will be measured, or only certain deliverables, and if so, which ones. Operational definitions are also called metrics in some application areas.

3. Checklists.

A checklist is a structured tool, usually item specific, used to verify that a set of required steps has been performed. Checklists may be simple or complex. They are usually phrased as imperatives (“Do this!”) or interrogatories (“Have you done this?”). Many organizations have standardized checklists available to ensure consistency in frequently performed tasks. In some application areas, checklists are also available from professional associations or commercial service providers.

4. Inputs to other processes.

The quality planning process may identify a need for further activity in another area.

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Conclusion

Quality planning involves identifying which quality standards are relevant to the project and determining how to satisfy them.

It is one of the key processes when doing the Planning Process Group and during development of the project management plan

Any required changes in the product to meet identified quality standards may require cost or schedule adjustments, or the desired product quality may require a detailed risk analysis of an identified problem.

References

1. Wikipedia - en.wikipedia.org/wiki
2. Guide to the Project Management Body of Knowledge (PMBOK® Guide)