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Quality management — Guidelines for quality management in projects

Management de la qualité — Lignes directrices pour le management de la qualité dans les projets

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 176, *Quality management and quality assurance*, Subcommittee SC 2, *Quality systems*.

This third edition cancels and replaces the second edition (ISO 10006:2003), which has been technically revised to align it with ISO 9000:2015, ISO 9001:2015 and ISO 21500:2012.

Introduction

This document provides guidelines for quality management in projects. It outlines quality management principles and practices, the implementation of which are important to, and have an impact on, the achievement of quality objectives in projects. It is aligned with ISO 9000:2015 and ISO 9001:2015, and supplements the guidance given in ISO 21500:2012.

The guidelines given in this document are intended for a wide audience. They are applicable to projects which can take many forms, from the small to very large, from simple to complex, from being an individual project to being part of a programme or portfolio of projects. They are intended to be used by people who have experience in managing projects and need to ensure that their organization is applying the practices contained in the quality management and quality management system standards from ISO/TC 176, as well as those who have experience in quality management and are required to interact with project organizations in applying their knowledge and experience to the project. Inevitably, some users will find that material presented in the guidelines is unnecessarily detailed for them; however, other users require the detail.

This document employs the process approach, which incorporates the Plan-Do-Check-Act (PDCA) cycle and "risk based thinking". The two concepts of "quality management in projects" and "quality management systems in projects" are distinguished as follows:

— quality management in projects includes: quality management systems in projects, management responsibility in projects, resource management in projects, product/service realization in projects, and measurement, analysis and improvement in projects;

— quality management systems in projects includes: project characteristics, quality management principles in projects, project quality management processes and a quality plan for the project.

It is recognized that there are two aspects to the application of quality management in projects: the project processes that are managed within the project management system, and the quality of the project's outputs in the form of products and services. Failure to meet either of these dual aspects can have significant effects on the project's products and services, the project's customer and other interested parties, and the project organization.

NOTE The expression "products/services" is used as an abbreviation for "products and services" throughout the remainder of this document.

These aspects also emphasize that the achievement of quality objectives is a top management responsibility, requiring a commitment to the achievement of quality objectives to be instilled at all levels within the organizations involved in the project; however, each level needs to retain responsibility for its respective processes and products/services.

The creation and maintenance of process and product/service quality in a project requires a systematic approach. This approach needs to be aimed at ensuring that the stated and implied needs of the customer are understood and met, that other interested parties' needs are understood and evaluated, and that the originating organization's quality policy is taken into account for implementation in the management of the project.

This document is designed to be used in the context of the requirements for quality management systems specified in ISO 9001:2015 and the guidance on project management processes provided in ISO 21500. Project management processes are described in ISO 21500.

The structure of this document reflects its design as a supporting standard providing guidance rather than a management system standard. A matrix is presented in Annex B to provide a cross reference between this document, ISO 9001:2015 and ISO 21500:2012.

Quality management — Guidelines for quality management in projects

1 Scope

This document gives guidelines for the application of quality management in projects.

It is applicable to organizations working on projects of varying complexity, small or large, of short or long duration, being an individual project to being part of a programme or portfolio of projects, in different environments, and irrespective of the kind of product/service or process involved, with the intention of satisfying project interested parties by introducing quality management in projects. This can necessitate some tailoring of the guidance to suit a particular project.

This document is not a guide to project management itself. Guidance on quality in project management processes is presented in this document. Guidance on project management and related processes is covered in ISO 21500.

This document addresses the concepts of both "quality management in projects" and "quality management systems in projects". These are distinguished by being addressed separately by the following topics and clauses:

— quality management in projects includes: quality management systems in projects (Clause 4); management responsibility in projects (Clause 5); resource management in projects (Clause 6); product/service realization in projects (Clause 7); and measurement, analysis and improvement in projects (Clause 8);

— quality management systems in projects includes: project characteristics (4.1); quality management principles in projects (4.2); project quality management processes (4.3); and a quality plan for the project (4.4).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 9000:2015, *Quality management systems — Fundamentals and vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9000 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
activity
identified piece of work that is required to be undertaken to complete a *project* (3.3)

Note 1 to entry: The activity in a project can generally be recognized as the smallest identified entity.

3.2
progress evaluation
assessment of progress made on achievement of the *project* (3.3) objectives

Note 1 to entry: This assessment should be carried out at appropriate phases/steps in the *project life cycle* (3.8) across project processes, based on criteria for project processes and product or service.

Note 2 to entry: The results of progress evaluations can lead to revision of the *project management plan* (3.5).

3.3
project
unique process undertaken to achieve an objective

Note 1 to entry: A project generally consists of a set of coordinated and controlled *activities* (3.1) with start and finish dates, conforming to specific requirements, including the constraints of time, cost and resources

Note 2 to entry: An individual project can form part of a larger project structure and generally has a defined start and finish date.

Note 3 to entry: In some projects the objectives and scope are updated and the product or service characteristics defined progressively as the project proceeds.

Note 4 to entry: The output of a project can be one or several units of product or service.

Note 5 to entry: The project's organization is normally temporary and established for the lifetime of the project.

Note 6 to entry: The complexity of the interactions among project activities is not necessarily related to the project size.

3.4
project management
planning, organizing, monitoring, controlling and reporting of all aspects of a *project* (3.3) and the motivation of all those involved in it to achieve the project objectives

3.5
project management plan
document specifying what is necessary to meet the objective(s) of the *project* (3.3)

Note 1 to entry: A project management plan should include or refer to the project's *quality plan* (3.9).

Note 2 to entry: The project management plan also includes or references other plans such as those relating to organizational structures, resources, schedule, budget, risk management, environmental management, health and safety management, and security management, as appropriate.

3.6
project organization
temporary structure that includes project roles, responsibilities and levels of authority and boundaries that need to be defined and communicated to all interested parties of the *project* (3.3)

3.7
project phase
division of the *project life cycle* (3.8) into manageable sets of activities, such as conception, development, realization and termination

3.8
project life cycle
defined set of phases from the start to the end of the *project* (3.3)

[SOURCE: ISO 21500:2012, 2.12]

3.9
quality plan
specification of the actions, responsibilities and associated resources to be applied to a specific object

[SOURCE: ISO 10005:—[1)], 3.2]

3.10
provider
supplier
organization that provides a product or a service

EXAMPLE Producer, distributor, retailer or vendor of a product or a service.

Note 1 to entry: A provider can be internal or external to the organization.

Note 2 to entry: In a contractual situation a provider is sometimes called a "contractor".

Note 3 to entry: In the context of *projects* (3.3), "contractor" or "subcontractor" is often used in place of "provider".

[SOURCE: ISO 9000:2015, 3.2.5, modified — Note 3 to entry has been added.]

4 Quality management systems in projects

4.1 Context and characteristics of the project

4.1.1 General

Both the project organization and the originating organization (see 4.1.2) should consider the context in which their project quality management systems operate. Some internal and external issues can affect the project's ability to achieve the intended project results. Other issues can offer opportunities to work more effectively with internal and external parties (see ISO 9001:2015, 4.1).

Consideration of internal and external issues that can influence the project quality management system enables both the project and originating organizations to:

a) understand the needs and expectations of interested parties;

b) establish or adopt project quality management processes necessary to achieve intended project results;

c) determine risks and opportunities related to project processes and planned outputs.

The main characteristics of projects are as follows:

— they are unique, non-repetitive phases consisting of processes and activities;

— they have some degree of risk and uncertainty;

— they are expected to deliver specified quantified results within predetermined parameters, for example, quality-related parameters;

— they have planned starting and finishing dates, within clearly specified cost and resource constraints;

— they have outputs that can be one or several units of a product or service;

— personnel may be temporarily assigned to a project organization for the duration of the project [the project organization may be assigned by an originating organization (see 4.1.2) and can be subject to change as the project progresses];

— they can be of a long duration, and subject to changing internal and external influences over time.

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4.1.2 Organizations

This document makes separate reference to an "originating organization" and to a "project organization".

The "originating organization" is the organization that decides to undertake the project. It can be constituted as a single organization, joint-venture, consortium or any other acceptable structure. The originating organization assigns the project to a project organization.

The originating organization can undertake multiple projects, each of which should be assigned to a different project organization.

The "project organization" carries out the project. The project organization may be a part of the originating organization. There should be a clear division of responsibility and authority between the project organization and other relevant interested parties (including the originating organization) for the project's processes. These should be maintained as documented information.

4.1.3 Phases and processes in projects

Phases and processes are two different aspects of a project. A project may be divided into interdependent processes and into phases, as a means of planning and monitoring the realization of objectives and assessing the related risks.

Project phases divide the project life cycle into manageable sets of activities, such as conception, development, realization and termination.

Project processes are those processes that are necessary for managing the project as well as those that are necessary to realize the project's product or service.

NOTE 1 ISO 21500 gives guidance on project management processes.

Not all the processes discussed in this document will necessarily exist in a particular project, whereas in others additional processes can be necessary. In some projects, a distinction might need to be made between core and supporting processes. Annex A lists and summarizes the processes that are considered to be applicable for the majority of projects.

NOTE 2 To facilitate the discussion of the guidance to quality management in projects, the "process approach" is adopted in this document (see 5.2.5). Additionally, the processes of a project have been grouped into two categories: the project management processes and the processes related to the project's product or service (those primarily concerned with the project's product or service such as design, production, etc.).

The processes are grouped according to their affinity to one another; for example, all time-related processes are included in one group.

The strategic process covered in Clause 5 sets the direction for the project. Clause 6 addresses resource-related processes and personnel-related processes. Clause 7 covers processes related to interdependency, scope, time, cost, communication, risk and procurement. Processes related to measurement, analysis and continual improvement are covered in Clause 8. These clauses include a description of each process and provide guidance to quality management in the process.

4.1.4 Project management processes

Project management includes the planning, organizing, monitoring, controlling and reporting of all processes of a project, including taking the necessary corrective and improvement actions, that are needed to achieve the project objectives, on a continual basis. The quality management principles (see 4.2, 5.2 and ISO 9000:2015, 2.3) should be applied to all the project management processes.

Guidance on quality in project management processes is discussed in this document.

NOTE ISO 21500 gives guidance on project management and related processes.

4.2 Quality management principles

The guidelines for quality management of projects given in this document are based on the seven quality management principles (see ISO 9000:2015, 2.3):

— customer focus;

— leadership;

— engagement of people;

— process approach;

— improvement;

— evidence-based decision making;

— relationship management.

These generic principles should form the basis for quality management systems for both the originating and project organizations.

NOTE Guidance on the application of the quality management principles to the planning carried out in the strategic process is given in 5.2.

4.3 Project quality management processes

It is necessary to manage project processes within a quality management system in order to achieve project objectives. Where the project organization operates within the originating organization, the project quality management system should be aligned, as far as is possible, with the quality management system of the originating organization. Where a part or all of the project organization is external to the performing organization, quality management system requirements might need to be specified to ensure that project processes are capable of interfacing effectively.

Documented information needed and produced by the project organization to ensure the effective planning, implementation and control of the project should be defined and controlled (see ISO 9001:2015, 7.5).

4.4 Quality plan for the project

The project quality management system should be documented, maintained and included or referenced in a quality plan for the project.

The quality plan should identify the activities and resources necessary for achieving the quality objectives of the project. The quality plan should be incorporated into, or referenced in, the project management plan.

In specifying and developing the quality plan, both the originating and project organizations should apply risk-based thinking to quality management system processes involved in the achievement of project objectives. Risks and opportunities should be addressed in planning and support processes as well as in the project risk-related processes (see 7.7).

In contractual situations, a customer may specify requirements for the quality plan. These requirements should not limit the scope of the quality plan used by the project organization.

NOTE ISO 10005 gives guidance on quality plans.

5 Management responsibility in projects

5.1 Top management commitment

The commitment and active involvement of the top management of both the originating and project organizations are essential for developing and maintaining an effective and efficient quality management system for the project.

Top management of both the originating and project organizations should create a culture for quality, which is an important factor in ensuring the success of the project.

Top management of both the originating and project organizations should provide input into the strategic process (see 5.2). Since the project organization is likely to be disbanded upon completion of the project, the top management of the originating organization should ensure that continual improvement actions are implemented for current and future projects. Top management of both the originating and project organizations should facilitate a culture in which lessons learned lead to continuous improvement of current and future projects.

5.2 Strategic process

5.2.1 Application of quality management principles through the strategic process

Planning for the establishment, implementation and maintenance of a quality management system based on the application of the quality management principles is a strategic process. This planning should be performed by the project organization.

In this planning, it is necessary to focus on the quality of both processes and products/services to meet the project objectives.

The general guidance given in 5.2.2 to 5.2.8 should also be applied to the processes described in 6.1, 6.2, 7.2 to 7.8, and in Clause 8, in addition to the specific guidance given in those clauses.

NOTE See Annex A for an overview of processes.

5.2.2 Customer focus

Organizations depend on their customers and therefore should understand current and future customer needs, meet customer requirements and strive to exceed customer expectations (see ISO 9000:2015, 2.3.1).

Satisfaction of the customer's and other interested parties' requirements is necessary for the success of the project. These requirements should be clearly understood to ensure that all processes focus on, and are capable of, meeting them.

The project objectives, which may include the product/service requirements, should take into account the needs and expectations of the customer and other interested parties. The objectives may be refined during the course of the project. The project objectives should be documented in the project management plan (see 7.2.2), and should detail what is to be accomplished (expressed in terms of time, cost and product/service quality) and what is to be measured.

When determining the balance between time, cost and product/service quality, potential impacts on the project's product or service should be evaluated, taking into consideration the customer's and other interested parties' requirements.

Interfaces should be established with all the interested parties to facilitate the exchange of information, as appropriate, throughout the project. Any conflicts between the interested parties' requirements should be resolved.

When conflicts arise between the requirements of the customer and other interested parties, the customer requirements will normally take precedence, bearing in mind that there can be statutory and regulatory requirements that can affect this.

The resolution of conflicts should be agreed to by the customer and other interested parties. Relevant interested parties' agreements should be retained as documented information. Throughout the project, attention should be paid to changes in the requirements of the relevant interested parties, including additional requirements from new interested parties that join the project after it has started.

5.2.3 Leadership

Leaders establish unity of purpose and direction for the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives (see ISO 9000:2015, 2.3.2).

A project manager should be appointed as early as possible. The project manager is the individual with the defined responsibility and authority for managing the project and ensuring that the project's quality management system is established, implemented and maintained. The authority delegated to the project manager should be commensurate with the assigned responsibility.

The top management of both the originating and project organizations should assume leadership in creating a culture for quality:

a) by setting the quality policy and identifying the objectives (including the quality objectives) for the project;

b) by providing the infrastructure and resources to ensure achievement of project objectives;

c) by promoting the use of the process approach and risk-based thinking;

d) by supporting an organizational structure conducive to meeting project objectives;

e) by making decisions based on data and factual information;

f) by empowering and motivating all project personnel to improve the project processes and products/services, and by being aware of their contribution to the effectiveness of the processes;

g) by planning for preventive actions.

5.2.4 Engagement of people

People at all levels are the essence of an organization and their full engagement enables their abilities to be used for the organization's benefit (see ISO 9000:2015, 2.3.3).

Personnel in the project organization should have well-defined roles, responsibilities and authorities for their participation in the project. The authority delegated to the project participants should correspond to their assigned responsibility. Competent personnel should be assigned to the project organization.

In order to improve the performance of the project organization, appropriate tools, techniques and methods should be provided to the personnel to enable them to operate, monitor and control the processes.

In the case of multinational and multi-cultural projects, joint ventures, international projects, etc., the implications of cross-cultural management should be addressed.

5.2.5 Process approach

A desired result is achieved more efficiently when activities and related resources are managed as a process (see ISO 9000:2015, 2.3.4).