

Outline Example of an organisation's ISO 9001 style Quality Manual

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1. Introduction

1.1 Purpose

This document constitutes Level 2 of Company X's engineering quality management system (QMS).

It is the primary high-level specification of the system and its components.

This Quality Manual provides each employee with a common structured environment conducive to productive, rewarding work. The manual describes the organisation and procedures that have been developed by Company X to attain, maintain and ensure Quality. It represents a source of reference for the company's quality policies and procedures.

It provides potential customers with a basis for having confidence in the capability of the company to produce quality products and allows them to audit the engineering quality management system.

1.2 Scope

The quality management system is applicable to all Company X's software development projects.

1.3 Structure of the Quality Manual

For convenience, particularly in ensuring completeness and in checking compliance, the structure of ISO 9001 is followed almost exactly.

In addition, it is intended that the essentials of the philosophy and structure of the CMM software engineering system are.

1.4 Procedures for Updating this Manual ...

2. Reference documents ...

3. Definitions

See separate glossary ...

4. Quality Management System Overview

The system is composed of four levels.

- Level 1 provides a statement of strategic and specific objectives from the perspective of company management.
- This manual (Level 2) defines the structure of the quality management system.
- Levels 3 and 4 are concerned with how the system actually works.

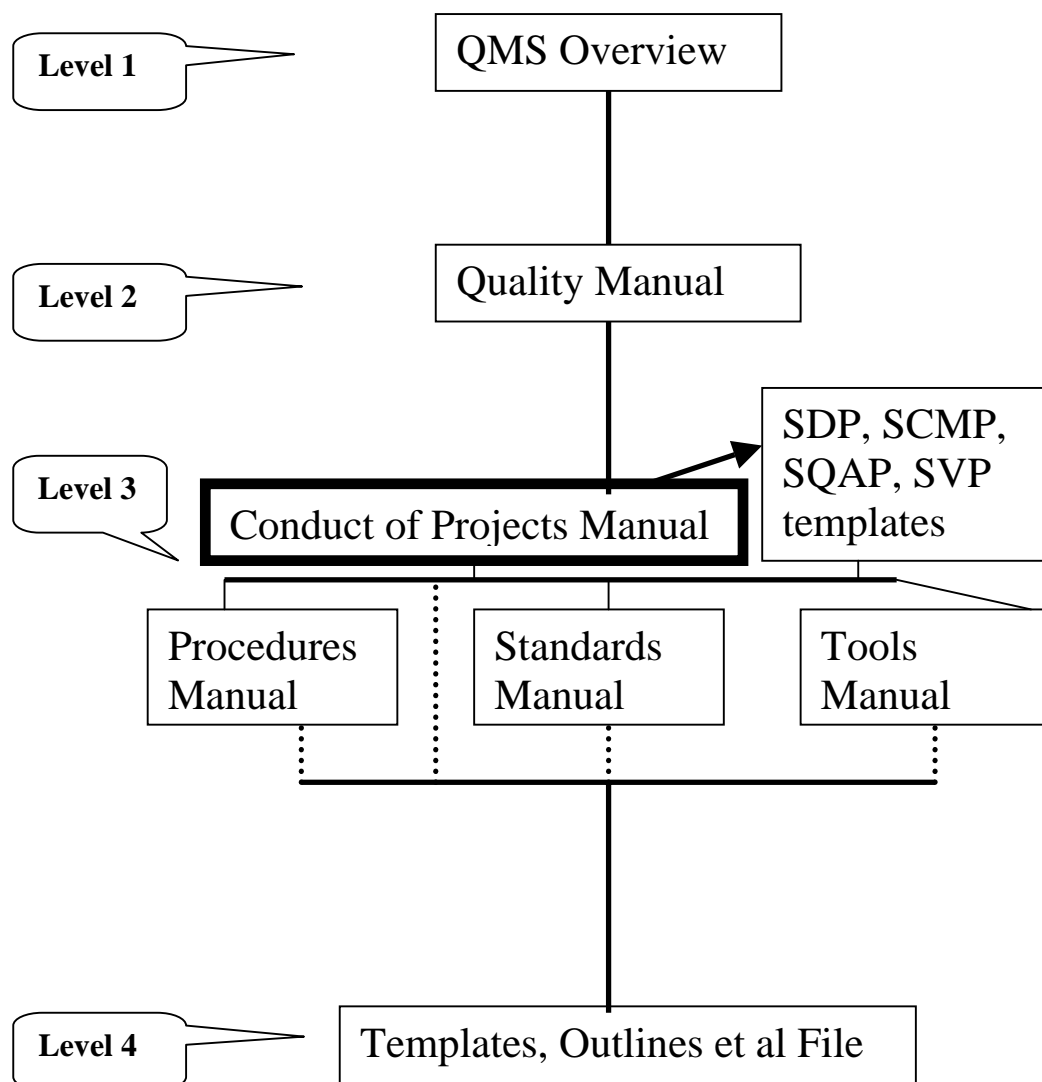


Figure 4.1: Overview of X's Quality Management system

4.1 Higher Management Responsibility

Covers broadly points such as:

- Statement that higher management is committed to and supports the QMS
- Identification of specific short term and long term quality improvement goals
- Ensure that all staff know what the QMS is & what it means for them

- Diagram of company structure including where Quality Manager fits in
- Who is responsible for quality implementation & checking at project level?
- Statement of independence of quality engineers from project teams
- Job of Quality Engineer: check project plans & monitor/assure their implementation.
- Purpose of software quality assurance is to provide management with assurance that standards & procedures are being followed and are appropriate for use.

4.2 The Quality Management System

4.2.1 General

The purpose of the Quality Management System is to enable Company X to develop software which both meets customers' needs and satisfies contractual cost and schedule constraints. There are two aspects of the system, the organisation-wide structures and the project-specific (or product-specific) activities.

4.2.2 Quality Management System: Documentation, Means & Organisation

The primary structures on which the Quality Management System rests are

- This Quality Manual
- The Conduct of Projects, Procedures and Standards Manuals.
- A quality organisation under the responsibility of the Quality Manager
- Provision of necessary tools, procedures and methods (see Tools Manual)
- A training policy as defined in X's Company Training Plan

4.2.3 Quality Plan

For each project or product development, the nominated Quality Engineer prepares a **Software Quality Assurance Plan (SQAP)** to detail the activities and tasks that (s)he proposes to carry out. The SQAP must be agreed by the Project Manager but the Quality Engineer is independent of the project team when carrying out its provisions. It is emphasised that Quality Assurance activities are an integral part of all phases of a project life-cycle.

4.3 Proposal and Contract Review

4.3.1 Proposal Preparation

- Preparation of a proposal must include, as a minimum:
 - elaboration of a work breakdown structure

- evaluation of costs
 - risk analysis by the responsible technical officer.
- Every proposal must be endorsed by relevant senior manager
- As a client's requirements may not be defined in complete and stable detail at the outset of a project, it is of key importance that
- contractual arrangements
 - project structure (esp. lifecycle)
- are flexible enough to meet evolving requirements in a controlled, effective manner.

4.3.2 Contract Acceptance

Ensure that all contracts are carefully reviewed prior to sign-off

4.3.3 Contract Amendment

Put in place mechanisms to handle any major unforeseen departures from the initial requirements (whether coming from customer or from Company X).

4.4 Requirements, Design and Development Control

For detail refer to lower level elements of QMS. For example,

- Company X's approach to conducting projects is documented in the “**Conduct of Projects**” manual. In CMM terms, this “**Conduct of Projects**” manual defines X's “STANDARD PROCESS”.
- The “**Conduct of Projects**” manual (and **associated template plans**), together with project-specific constraints, is the basis on which the Project Manager (or equivalent) prepares the key **Software Development Plan (SDP)**.
- In support of this project management approach, the company uses a collection of techniques appropriate to each of the principal activities (requirements management, design, coding, test, etc), in some cases supported by tools.

4.5 Document and Data Control

Include coverage of issues such as:

- Project documents are identified and managed in accordance with ...
- Records kept of all incoming & outgoing project documentation, and all significant communications with customers
- Each team member must keep an engineering diary to record day-to-day technical activities, especially key problems arising and decisions taken.

- Maintain up to date list of all the items making up the project development baseline
- Responsibility of project team to ensure it is working from correct baseline.
- Changes with respect to previous versions of documentation must be marked
- Machine-readable form of documentation to be backed up regularly ...

4.6 Purchases

Include coverage of issues such as:

- Procedure for checking purchased items on receipt
- Need contractual agreements for incorporating bought-in software in X's products
- Store software media and documentation for purchased products appropriately

4.7 Products Furnished by the Customer

Provide appropriate mechanisms, particularly for resolution of problems in the furnished products (anomalies, delays, inadequate performance, etc).

4.8 Identification and Tracing of the Product

- The configuration management system, for each project or product, allows different items (documents, programs, development and test environments, etc) to be identified, their interconnections to be established and their status to be reported.
- SW Config. Management Plan for each project (Project Manager responsibility)
- Ensure common approach to configuration management for all projects & products.

4.9 Process Control

Include coverage of issues related to projects' support environment, such as:

- Project documents & software retained on servers - basis for config. management.
- System Administration to ensure availability of computing equipment
- System Administrator to define general procedures for back-up and for 'saving & recovery' after breakdown. Extra, project specific backups defined in project SCMP.
- System Administrator to put in place procedures for generation, duplication and control of software and software products ...
- Config. management of all computing equipment done by System Administration.
- Tools to be installed and maintained by System Administration.

4.10 Inspections and Tests

Include coverage of issues such as:

- Reports maintained of all verification activities
- Before delivery, subject software products to independent audits:

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- Physical audit (all configured items are present)
- Functional audit (check that all planned verifications (particularly tests) have been performed and record their success or failure)

4.11 Control of Inspection, Measuring and Test Equipment

Test software to be developed & configured according to same procedures as actual product software (though not necessarily to same development standard).

4.12 Inspection and Test Status

Development status (draft, inspected, unit tested, etc) of each item to be identified ...

4.13 Control of Non-Conforming Items

Mechanism needed to make a disposition on identified non-conforming items, i.e.

- Make necessary changes to re-establish conformity with specifications
- Utilise as is, with a waiver or deviation
- Discard

4.14 Corrective Actions

Include coverage of issues such as:

- Standardised system for receiving customer complaints & comments, and discrepancies identified by other mechanisms.
- Centralise and analyse problem reports and change requests.
- Quality Manager to report regularly on quality findings from problem analysis.
- Initiate actions to remove causes of complaints.

4.15 Handling, Storage, Packaging and Delivery

Include coverage of issues such as:

- Procedure for storage of software products
- Time limit or not on continued availability of product support & maintenance?
- Config. control & delivery of "mature" items done centrally, not by developers.

4.16 Data Logging/Collection associated with Quality

Include coverage of issues such as:

- Quality related data collection to be centralised and reported on periodically.
- Quality data to include "project summaries", "evaluation of SW quality by clients", "QA audit reports", and the "summary of client complaints" (see §4.14).

4.17 Internal Engineering Quality Audits

Occasional non-project specific audits carried out to assess compliance with QMS.

4.18 Training

- Training plan in place, including for individual engineers.
- Specific quality related training provided to all staff.

4.19 After Sales Support**Include coverage of issues such as:**

- Provision of an agreed warranty period.
- Possibility of a range of maintenance agreements.
- Mechanisms for resolving customer problems
- Periodic version upgrades
- Client training sessions

4.20 Statistical Techniques**Include coverage of issues such as:**

- Techniques for analysis of defects in delivered items.
- Techniques for evaluating development and support processes (e.g. no. of errors found during different phases of testing (and other verification activities), coverage achieved in testing, complexity measures for design and code)
- Progress statistics (e.g. milestone achievement, planning variations, risk analyses).