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Data quality —

Part 61:

Data quality management: Process reference model

Qualité des données —

*Partie 61: Gestion de la qualité des données: Modèle de référence des
procédés*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on 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.

The committee responsible for this document is Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 4, *Industrial data*.

ISO 8000 is organized as a series of parts, each published separately. The structure of ISO 8000 is described in ISO/TS 8000-1.

Each part of ISO 8000 is a member of one of the following series: general data quality, master data quality, transactional data quality, and product data quality. This part of ISO 8000 is a member of the general data quality series but is also applicable to the other series.

A list of all parts in the ISO 8000 series can be found on the ISO website.

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Introduction

The ability to create, collect, store, maintain, transfer, process and present information and data to support business processes in a timely and cost effective manner requires both an understanding of the characteristics of the information and data that determine its quality, and an ability to measure, manage and report on information and data quality.

ISO 8000 defines characteristics of information and data that determine its quality, and provides methods to manage, measure and improve the quality of information and data.

When assessing the quality of information and data, it is useful to perform the assessment in accordance with documented methods. It is also important to document the tailoring of standardized methods with respect to the expectation and requirements pertinent to the business case at hand.

ISO 8000 includes parts applicable to all types of data and parts applicable to specific types of data. ISO 8000 can be used independently or in conjunction with quality management systems.

There is a limit to data quality improvement when only the nonconformity of data is corrected, since the nonconformity can recur. However, when the root causes of the data nonconformity and the related data are traced and corrected through data quality processes, recurrence of the same type of data nonconformity can be prevented. Therefore, a framework for process-centric data quality management is required to improve data quality more effectively and efficiently. Furthermore, data quality can be improved through assessing processes and improving under-performing processes identified by the assessment.

This part of ISO 8000 specifies the processes required for data quality management. This specification is used as a reference for assessing and improving the capability of the processes or increasing organizational maturity with respect to data quality management.

This part of ISO 8000 can be used on its own or in conjunction with other parts of ISO 8000.

This part of ISO 8000 is intended for use by those actors that have a vested interest in information or data quality, with a focus on one or more information systems both inter- and intra-organization views, throughout all phases of the data life cycle.

[Annex A](#) contains an identifier that unambiguously identifies this part of ISO 8000 in an open information system.

Data quality —

Part 61:

Data quality management: Process reference model

1 Scope

This part of ISO 8000 specifies the processes required for data quality management. Each process is defined by a purpose, outcomes and activities that are to be applied for the assurance of data quality.

The following are within the scope of this part of ISO 8000:

- fundamental principles of data quality management;
- the structure of the data quality management process;
- definitions of the lower level processes for data quality management;
- the relationship between data quality management and data governance;
- implementation requirements.

The following is outside the scope of this part of ISO 8000:

- detailed methods or procedures by which to achieve the outcomes of the defined processes.

This part of ISO 8000 is applicable to managing the quality of digital data sets that include not only structured data stored in databases but also less structured data such as images, audio, video and electronic documents. This part of ISO 8000 can be used by an organization managing data quality at the organization level because, for instance, multiple software applications are sharing and exchanging data.

This part of ISO 8000 is used as a process reference model by internal and external parties, including certification bodies, to assess process capability or organizational maturity for data quality management and to enhance data quality through process improvement.

This part of ISO 8000 can be used in conjunction with, or independently of, quality management systems standards (e.g. ISO 9001).

2 Normative references

The following referenced documents are indispensable for the application 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 8000-2, *Data quality — Part 2: Vocabulary*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8000-2 apply.

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3.2 Abbreviated terms

DBMS database management system

4 Fundamental principles of data quality management

The following fundamental principles apply to managing the quality of data.

- Process approach: the processes that use, create and update data are defined and operated. These processes become repeatable and reliable by also defining and operating processes for managing data quality.
- Continuous improvement: data are improved through effective measurement and correction of data nonconformities that arise from data processing. Such improvements, however, do not prevent the same nonconformities occurring repeatedly. Sustained improvement arises from analysing, tracing and removing the root causes of poor data quality, usually requiring the improvement of processes.
- Involvement of people: specific responsibilities for data quality management exist at different levels of the organization. End users have the greatest direct effect on data quality through data processing activities. In addition, data quality specialists perform the necessary intervention and control to implement and embed processes for improvement of data quality across the organization. Finally, oversight by top management ensures the necessary resources are made available and directs the organization towards achieving the vision, goals and objectives for data quality.

5 The data quality management process

5.1 The basic structure of the data quality management process

The basic structure of the data quality management process is as follows.

- The data quality management process consists of Implementation, Data-Related Support, and Resource Provision. This is depicted in [Figure 1](#).
- To achieve continuous improvement of data quality, the Implementation process is performed following the Plan-Do-Check-Act pattern.
- The Data-Related Support process enables the Implementation process by providing information and technology related to data management.
- The Resource Provision process improves the effectiveness and efficiency of the Implementation and the Data-Related Support processes by providing resources and training services at the organizational level.

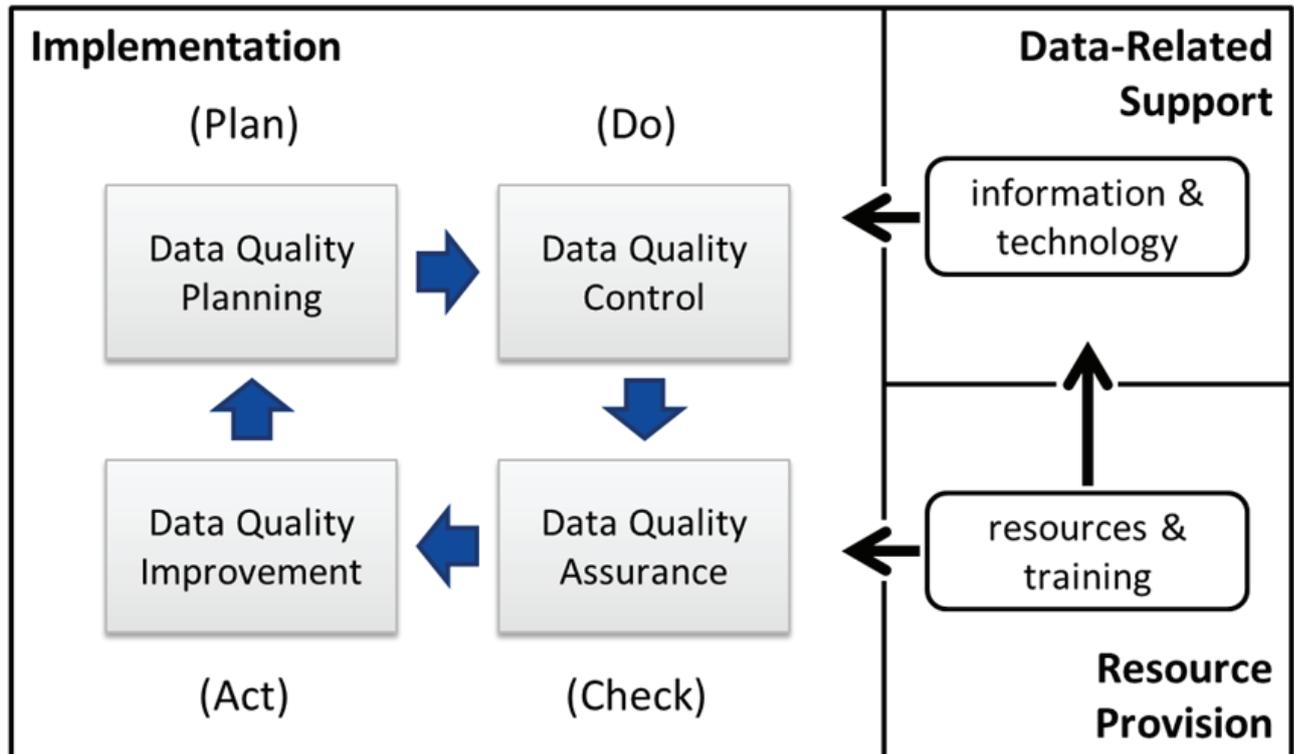


Figure 1 — Basic structure of data quality management

NOTE The structure of Implementation, Data-Related Support, and Resource Provision processes is adapted from the concept of Primary, Support and Organizational processes in ISO 12207:1995 and from the Plan-Do-Check-Act cycle from ISO 9001.

The Plan-Do-Check-Act cycle is also applicable to improving the performance of any of the lower level processes of data quality management. These improvements will contribute to more effective and efficient data quality. The Plan-Do-Check-Act cycle consists of:

- plan: establish the strategy and implementation plans as necessary to deliver results in accordance with data requirements;
- do: implement the processes;
- check: monitor and measure data quality and process performance against the strategy and data requirements and report the results;
- act: take actions to continually improve process performance.

5.2 The detailed structure of the data quality management process

As shown in [Figure 2](#), the data quality management process is a hierarchy of lower level processes, as follows.

- a) The Implementation process consists of four sub-processes based on the “Plan-Do-Check-Act” pattern:
 - 1) Data Quality Planning, corresponding to “Plan”:
 - Requirements Management;
 - Data Quality Strategy Management;

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- Data Quality Policy/Standards/Procedures Management;
 - Data Quality Implementation Planning;
 - 2) Data Quality Control, corresponding to “Do”:
 - Provision of Data Specifications and Work Instructions;
 - Data Processing;
 - Data Quality Monitoring and Control;
 - 3) Data Quality Assurance, corresponding to “Check”:
 - Review of Data Quality Issues;
 - Provision of Measurement Criteria;
 - Measurement of Data Quality and Process Performance;
 - Evaluation of Measurement Results;
 - 4) Data Quality Improvement, corresponding to “Act”:
 - Root Cause Analysis and Solution Development;
 - Data Cleansing;
 - Process Improvement for Data Nonconformity Prevention.
- b) The Data-Related Support process provides Implementation with information, constraints and technology. This process consists of:
- 1) Data Architecture Management;
 - 2) Data Transfer Management;
 - 3) Data Operations Management;
 - 4) Data Security Management.
- c) The Resource Provision process enhances the performance of Implementation and Data-Related Support by providing resources at the organizational level. This process consists of:
- 1) Data Quality Organization Management;
 - 2) Human Resource Management.

The sub-processes of Implementation take place in sequential order, while those of Data-Related Support and Resource Provision take place as and when necessary.

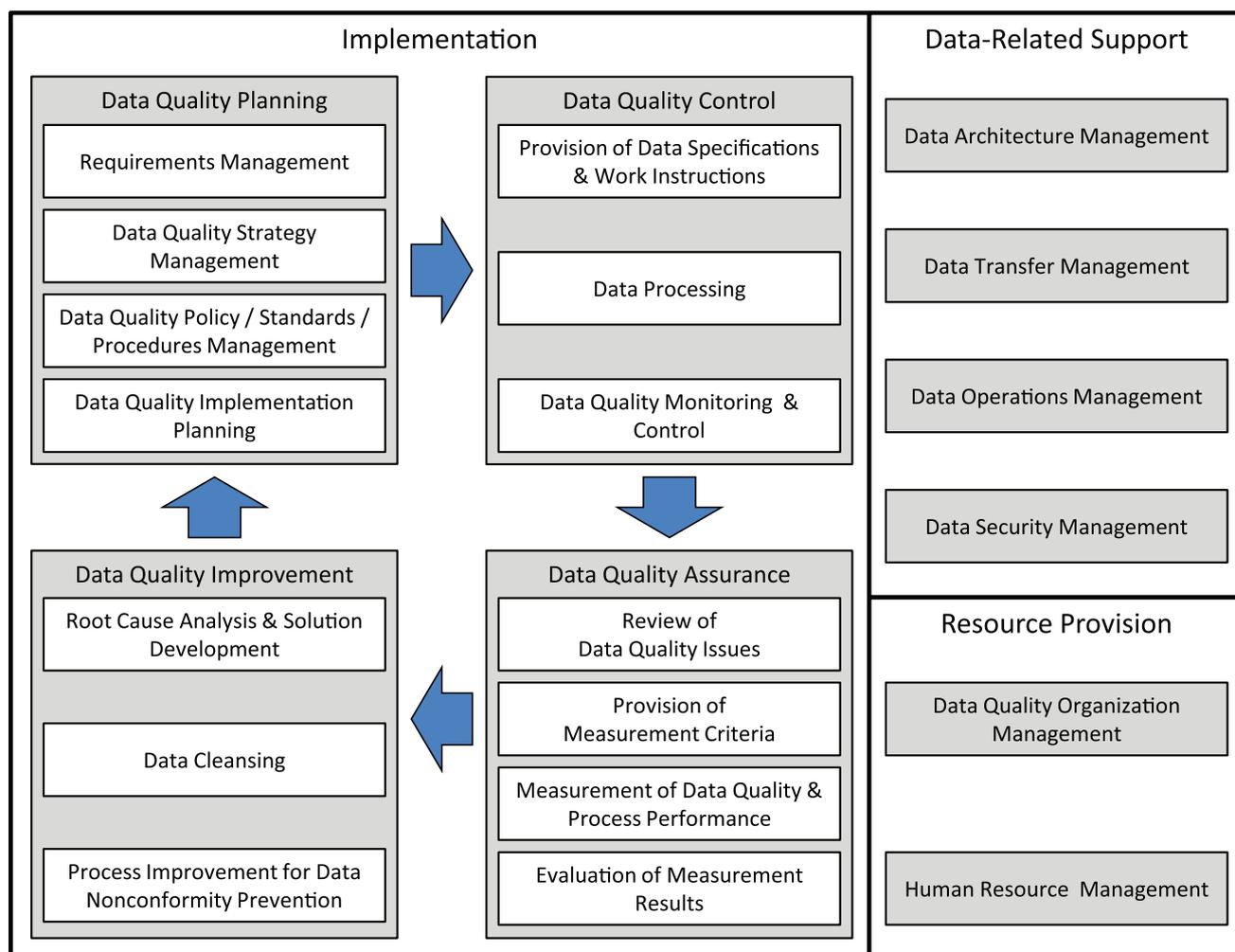


Figure 2 — Detailed structure of data quality management

5.3 The elements of a process description

The process descriptions in the remainder of this part of ISO 8000 consist of the following elements:

- title, which is a descriptive heading for the process;
- purpose, which describes the goal of performing the process;
- outcomes, which express the observable results expected from successful performance of the process;
- activities, which is a list of actions that can achieve the outcomes.

NOTE ISO/IEC/TR 24774 provides further details on these elements.

6 The Implementation process

6.1 Overview of Implementation

The Implementation process identifies data requirements corresponding to the needs of stakeholders, establishes objectives and creates implementation plans to meet those requirements. In line with these plans, end users perform data processing according to data specifications and work instructions, while data quality specialists monitor and control the conformance of data to requirements.