INTERNATIONAL STANDARD

**ISO
8000-150**

Data quality —

Part 150:
Data quality management: Roles and responsibilities

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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 of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 4 *Industrial data*.

This first edition cancels and replaces ISO/TS 8000-150:2011, which has been technically revised.

The main changes are as follows:

— increased emphasis on roles and responsibilities for data quality management;

— removal of being specifically only applicable to master data;

— clarification of the differentiation of this document with ISO 8000-61 (including removing apparent overlaps).

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Digital data deliver value by enhancing all aspects of organizational performance including:

— operational effectiveness and efficiency;

— safety;

— reputation with customers and the wider public;

— compliance with statutory regulations;

— innovation;

— consumer costs, revenues and stock prices.

In addition, many organizations are now addressing these considerations with reference to the United Nations Sustainable Development Goals[1].

The influence on performance originates from data being the formalized representation of information[2]. This information enables organizations to make reliable decisions. This decision making can be performed by human beings directly and also by automated data processing including artificial intelligence systems.

Through widespread adoption of digital computing and associated communication technologies, organizations become dependent on digital data. This dependency amplifies the negative consequences of lack of quality in these data. These consequences are the decrease of organizational performance.

The biggest impact of digital data comes from two key factors:

— the data having a structure that reflects the nature of the subject matter;

EXAMPLE 1   A research scientist writes a report using a software application for word processing. This report includes a table that uses a clear, logical layout to show results from an experiment. These results indicate how material properties vary with temperature. The report is read by a designer, who uses the results to create a product that works in a range of different operating temperatures.

— the data being computer processable (machine readable) rather than just being for a person to read and understand.

EXAMPLE 2   A research scientist uses a database system to store the results of experiments on a material. This system controls the format of different values in the data set. The system generates an output file of digital data. This file is processed by a software application for engineering analysis. The application determines the optimum geometry when using the material to make a product.

ISO 9000 explains that quality is not an abstract concept of absolute perfection. Quality is actually the conformance of characteristics to requirements. This actuality means that any item of data can be of high quality for one purpose but not for a different purpose. The quality is different because the requirements are different between the two purposes.

EXAMPLE 3   Time data are processed by calendar applications and also by control systems for propulsion units on spacecraft. These data include start times for meetings in a calendar application and activation times in a control system. These start times require less precision than the activation times.

The nature of digital data is fundamental to establishing requirements that are relevant to the specific decisions that are made by each organization.

EXAMPLE 4   ISO 8000-1 identifies that data have syntactic (format), semantic (meaning) and pragmatic (usefulness) characteristics.

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1) https://sdgs.un.org/goals

2) ISO 8000-2 defines information as "knowledge concerning objects, such as facts, events, things, processes, or ideas, including concepts, that within a certain context has a particular meaning".

To support the delivery of high-quality data, the ISO 8000 series addresses:

— data governance, data quality management and maturity assessment;

EXAMPLE 5   ISO 8000-61 specifies a process reference model for data quality management.

— creating and applying requirements for data and information;

EXAMPLE 6   ISO 8000-110 specifies how to exchange characteristic data that are master data.

— monitoring and measuring information and data quality;

EXAMPLE 7   ISO 8000-8 specifies approaches to measuring information and data quality.

— improving data and, consequently, information quality;

EXAMPLE 8   ISO/TS 8000-81 specifies an approach to data profiling, which identifies opportunities to improve data quality.

— issues that are specific to the type of content in a data set.

EXAMPLE 9   ISO/TS 8000-311 specifies how to address quality considerations for product shape data.

Data quality management covers all aspects of data processing, including creating, collecting, storing, maintaining, transferring, exploiting and presenting data to deliver information.

Effective data quality management is systemic and systematic, requiring an understanding of the root causes of data quality issues. This understanding is the basis for not just correcting existing nonconformities but also implementing solutions that prevent future reoccurrence of those nonconformities.

EXAMPLE 10   If a data set includes dates in multiple formats including "yyyy-mm-dd", "mm-dd-yy" and "dd-mm-yy", then data cleansing can correct the consistency of the values. Such cleansing requires additional information, however, to resolve ambiguous entries (such as, "04-05-20"). The cleansing also cannot address any process issues and people issues, including training, that have caused the inconsistency.

As a contribution to this overall capability of the ISO 8000 series, this document addresses key considerations when establishing the roles and responsibilities necessary to deliver effective and efficient data quality management. These considerations are supported by a framework that links role levels to structured groups of responsibility and a model of operations to deliver data quality management. This document also provides example scenarios for deployment of the framework. The role levels and responsibility groups are appropriate for all types of data and all types of organization.

Organizations can use this document on its own or in conjunction with other parts of the ISO 8000 series.

This document supports activities that affect:

— one or more information systems;

— data flows within the organization and with external organizations;

— any phase of the data life cycle.

By implementing parts of the ISO 8000 series, an organization achieves the following benefits:

— objective validation of the foundations for digital transformation of the organization;

— a sustainable basis for data in digital form becoming a fundamental asset class the organization relies on to deliver value;

— securing evidence-based trust from other parties (including supply chain partners and regulators) about the repeatability and reliability of data and information processing in the organization;

— portability of data with resulting protection against loss of intellectual property and reusability across the organization and applications;

— effective and efficient interoperability between all parties in a supply chain to achieve traceability of data back to original sources;

— readiness to acquire or supply services where the other party expects to work with common understanding of explicit data requirements.

ISO 8000-1 provides a detailed explanation of the structure and scope of the whole ISO 8000 series.

ISO 8000-2[3] specifies the single, common vocabulary for the ISO 8000 series. This vocabulary is ideal reading material by which to understand the overall subject matter of data quality. ISO 8000-2 presents the vocabulary structured by a series of topic areas (for example, terms relating to quality and terms relating to data and information).

Annex A contains an identifier that conforms to ISO/IEC 8824-1. The identifier unambiguously identifies this document in an open information system.

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[3] The content is available on the ISO Online Browsing Platform. https://www.iso.org/obp

Data quality —

Part 150:
Data quality management: Roles and responsibilities

1 Scope

This document specifies the key considerations for organizations that are establishing appropriate roles and responsibilities for data quality management.

The following are within the scope of this document:

— implementing roles and responsibilities for data quality management;

— providing documentary evidence of this implementation;

— a framework for roles and responsibilities;

— a functional model of roles and responsibilities;

— example deployment scenarios for the framework of roles and responsibilities;

— comparison with the processes specified by ISO 8000-61.

The following are outside the scope of this document:

— process reference models for data quality management (ISO 8000-61 specifies a process reference model for data quality management);

— methods for data quality evaluation and certification;

— models for assessing the maturity of data quality management (ISO 8000-62 and ISO 8000-64 specify approaches to assessing the maturity of data quality management).

This document can be used in conjunction with or independently of standards for quality management systems.

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 8000-2, *Data quality — Part 2: Vocabulary*

ISO 8000-61, *Data quality — Part 61: Data quality management: Process reference model*

3 Terms and definitions

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

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

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

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

4 Principles of roles and responsibilities for data quality management

The following key principles apply when an organization implements roles and responsibilities for managing and improving data quality through systemic and systematic processes.

— **An integrated approach across the organization.** The data managed by each organization are scattered throughout the organization. These data also flow to various places through the hands of many persons. This scattering and flow make difficulties for trying to control data quality by concentrating efforts in a single area of the organization. Data nonconformities can occur anywhere data are processed and from any type of such processing (including inserting, updating, and retrieving). It is, therefore, important to identify exactly what is causing any such nonconformity and to perform data quality management across the entire organization. This, in turn, depends on the allocation, communication and understanding of appropriate roles and responsibilities across the entire organization to ensure processes are delivering their intended outputs.

— **High-level commitment for empowerment.** Data quality management takes significant time and effort because of the frequency, severity and complexity of actual and potential data nonconformities. Furthermore, organizations can only prevent recurrence of such nonconformities by changing ways of working. At all levels of an organization, persons who have responsibilities for data quality require resource and authority assigned to achieve such change. This resource and authority is supported by strong commitment from top management, who are responsible for establishing co-ordinated governance to monitor and control management of data quality across the organization.

— **Value-adding cycle of changes.** Requirements for data evolve dynamically, driven by internal and external changes. Appropriate roles and responsibilities identified for data quality management enable a value-adding cycle to respond to the changes quickly.

These principles can be delivered by an organization:

— using a framework of role levels and responsibility groups (see Annex B);

— using appropriate roles to perform each of the responsibility groups as part of a coherent whole (see Annex C);

— addressing a wide range of deployment scenarios (see Annex D).

5 Implementation requirements

An organization shall implement effective roles and responsibilities for data quality management through the following:

— executing processes within the scope of data quality management specified by ISO 8000-61 (see Annex E for a mapping of those processes to the responsibility groups specified by this document);

— identifying one or more roles that will perform the responsibilities for data quality management;

NOTE 1   As appropriate to the size of the organization, organizations can implement roles either by assigning one or more persons to each role and by assigning one or more roles to each person. Any person can also fulfil other roles that are not responsible for data quality management.

EXAMPLE 1   A small organization appoints a single individual, who is responsible for performing all nine responsibility groups in Annex B in addition to other organizational roles.

EXAMPLE 2   A large organization appoints multiple data diagnosis planners, who are each responsible for performing different aspects of the responsibility group data diagnosis planning. These aspects are the diagnosis in different systems across the organization, such as one planner being responsible for customer relationship data and another being responsible for product catalogue data.

— embedding the processes for data quality management within the business processes that are core to the purposes for which the organization exists;

NOTE 2   An individual process for data quality management can be embedded into many different core processes of an organization, where each one of those core processes involves the creation or use of data.

EXAMPLE 3   A manufacturer embeds data quality management into manufacturing processes.

— implementing appropriate other parts of ISO 8000 to address specific requirements of the organization.

EXAMPLE 4   When an organization exchanges master data, ISO 8000-110 addresses requirements for syntax, semantics and conformance to data specification, ISO 8000-115 addresses requirements for identifiers and ISO 8000-120 addresses requirements for representing information about the provenance of the master data.

6   Conformance

To achieve conformance to this document, an organization shall prepare documentary evidence of the following:

— identification of roles for data quality management;

— assignment of those roles to specific persons within the organization;

— allocation of responsibilities to those roles;

EXAMPLE 1   A job description is documentary evidence of a role and responsibility assignment.

— embedding processes for data quality management within other business processes across the organization;

EXAMPLE 2   An organization-wide process model is documentary evidence of embedding data quality management into other business processes.

— execution of the processes for data quality management;

EXAMPLE 3   Documentary evidence for this execution includes specifications of data requirements, results of data quality measurements, a log of nonconformities and a log of root-cause analysis and corresponding corrective actions.

— auditing assigned roles and responsibilities to check performance and, as necessary, to initiate the development and implementation of improvements.

Annex A
(informative)

Document identification

To provide for unambiguous identification of an information object in an open system, the following object identifier is assigned to this document. The meaning of this value is defined in ISO 10303-1.

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{ iso standard 8000 part(150) version(2) }
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