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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 8000-118

Data quality —

Part 118: Application of ISO 8000-115 to natural location identifiers

ICS: 25.040.40

ISO/TC 184/SC 4

Secretariat: **ANSI**

Voting begins on:
2024-02-15

Voting terminates on:
2024-05-09

This document is circulated as received from the committee secretariat.

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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.

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

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

0.1 Foundations of the ISO 8000 series

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

- operational effectiveness and efficiency;
- safety and security;
- 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 Goals¹.

The influence on performance originates from data being the formalized representation of information². 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.

[1] explains that quality is not an abstract concept of absolute perfection. Quality is actually the conformance of characteristics to requirements. This conformance 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.

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”.

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 [2] identifies that data have syntactic (format), semantic (meaning) and pragmatic (usefulness) characteristics.

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

- data governance, data quality management and maturity assessment;

EXAMPLE 5 [3] specifies a process reference model for data quality management.

- creating and applying requirements for data and information;

EXAMPLE 6 [4] specifies how to exchange characteristic data that are master data.

- monitoring and measuring information and data quality;

EXAMPLE 7 [5] specifies approaches to measuring information and data quality.

- improving data and, consequently, information quality;

EXAMPLE 8 [6] 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 [7] 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 for 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”, which can be a representation of many different dates including 4 May 2020, 5 April 2020 and 20 May 2004). The cleansing also cannot address any process issues and people issues, including training, that have caused the inconsistency.

0.2 Understanding more about the ISO 8000 series

[2] provides a detailed explanation of the structure and scope of the whole ISO 8000 series.

ISO 8000-2³ 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).

³ The content is available on the ISO Online Browsing Platform. <http://www.iso.org/obp>

ISO has identified [\[2\]](#), ISO 8000-2 and [\[5\]](#) as horizontal deliverables⁴.

0.3 Role of this document

As a contribution to the overall capability of the ISO 8000 series, this document specifies how to generate an unambiguous natural location identifier.

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.

[Annex A](#) contains an identifier that conforms to [\[8\]](#). The identifier unambiguously identifies this document in an open information system.

0.4 Benefits of the ISO 8000 series

By implementing parts of the ISO 8000 series to improve organizational performance, 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 that 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 re-usability 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.

⁴ Deliverable dealing with a subject relevant to a number of committees or sectors or of crucial importance to ensure coherence across standardization deliverables.

Data quality —

Part 118: Application of ISO 8000-115 to natural location identifiers

1 Scope

This document specifies requirements for natural location identifiers. These requirements supplement those of ISO 8000-115.

The following are within the scope of this document:

- requirements for the prefix element and a single sub-domain element in a location identifier;
- requirements for representing latitude, longitude and storey or elevation of a location.

The following are outside the scope of this document:

- methods to identify latitude, longitude and elevation.

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 8000-115, *Data quality — Part 115: Master data: Exchange of quality identifiers: Syntactic, semantic and resolution requirements*

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

3 Terms and definitions

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

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

coordinate

one of a sequence of numbers designating the position of a point

Note 1 to entry: In a spatial *coordinate reference system*, the coordinate numbers are qualified by units.

[SOURCE: [9], 3.1.5]

3.2

coordinate system

set of mathematical rules for specifying how *coordinates* (3.1) are to be assigned to points

[SOURCE: [9], 3.1.11]

3.3

coordinate reference system

coordinate system (3.2) that is related to an object by a datum

Note 1 to entry: Geodetic and vertical datums are referred to as reference frames.

Note 2 to entry: For geodetic and vertical reference frames, the object will be the Earth. In planetary applications, geodetic and vertical reference frames may be applied to other celestial bodies.

[SOURCE: [\[9\]](#), 3.1.9]

3.4

geodetic coordinate reference system

three dimensional *coordinate reference system* (3.3) based on a geodetic reference frame and having either a three dimensional Cartesian or a spherical *coordinate system* (3.2)

[SOURCE: [\[10\]](#), 3.20]

3.5

coordinate tuple

tuple composed of *coordinates* (3.1)

Note 1 to entry: The number of coordinates in the coordinate tuple equals the dimension of the *coordinate system* (3.2); the order of coordinates in the coordinate tuple is identical to the order of the axes of the coordinate system.

[SOURCE: [\[9\]](#), 3.1.13]

3.6

geographic point location

well defined geographic place described by one *coordinate tuple* (3.5)

[SOURCE: [\[11\]](#), 4.1.11]

3.7

geographic point location representation

syntactic description of a *geographic point location* (3.6) in a well-known format

[SOURCE: [\[11\]](#), 4.1.12]

3.8

elevation reference system

one-dimensional vertical *coordinate reference system* (3.3) with coordinates representing proximity to a chosen vertical reference surface

3.9

discrete elevation reference system

elevation reference system (3.8) with coordinates composed of discrete identifiers in a pre-defined sequence

EXAMPLE Some buildings omit the number “13” as an identifier for a *storey*.

Note 1 to entry: Some buildings do not use a sequential numbering for identifying its storeys. The identifiers for storeys in these buildings are discrete, and therefore are considered part of a discrete elevation reference system.

3.10

ground-level distance

distance of a point from a chosen vertical reference surface, upward or downward along a line that is perpendicular to that surface, where the surface is the ground

Note 1 to entry: The line direction may be straight or be dependent on the Earth's gravity field or other physical phenomena.

Note 2 to entry: A depth below the vertical reference surface can be represented with a negative value.

Note 3 to entry: This definition is derived from [\[9\]](#), 3.1.17.

3.11

building

construction works that has the provision of shelter for its occupants or contents as one of its main purposes, usually partially or totally enclosed and designed to stand permanently in one place

[SOURCE: [\[12\]](#), 3.1.1.3, modified – Note 1 to entry has been removed.]

3.12

floor

horizontal plane construction that provides the lowest surface in any space in a *building* (3.11)

[SOURCE: [\[12\]](#), 3.3.2.10]

3.13

storey

space between two consecutive *floors* (3.12) or between a floor and a roof

[SOURCE: [\[12\]](#), 3.2.1.2, modified – Note 1 to entry has been removed.]

3.14

storey identifier

number, letter or symbol that is a unique identifier of a *storey* (3.13) within the context of a *discrete elevation reference system* (3.9)

EXAMPLE The number and letters displayed on a storey entryway from a stairwell or displayed in an elevator.

3.15

algorithm

finite ordered set of well defined rules for the solution of a problem

[SOURCE: [\[13\]](#), 2121376]

3.16

reversible algorithm

algorithm (3.15) that does not suffer from systemic or quantization error and, therefore, allows lossless recovery

Note 1 to entry: This definition is derived from [\[14\]](#), 3.82.

3.17

natural identifier

identifier that is determined by a set of characteristics of the identified entity, where those characteristics are unique to that entity within the applicable domain

3.18**natural location identifier****NLI**

globally unique *natural identifier* (3.17) generated by a *reversible algorithm* (3.16) that has the characteristics of a *geographic point location* (3.6) as the inputs

4 Fundamental principles and assumptions**4.1 Types of identifiers****4.1.1 General**

Organizations issue identifiers for many purposes. Identifiers are one of two types:

- a) controlled identifiers (see [4.1.2](#));
- b) natural identifiers (see [4.1.3](#)).

4.1.2 Controlled identifiers

Controlled identifiers are issued by an organization that maintains the characteristic data associated with the identifier. These identifiers are, therefore, managed by the organization, which is also responsible for maintaining an identifier registry.

EXAMPLE 1 Controlled identifiers include part numbers, batch numbers and serial numbers, each of which are issued by manufacturers.

EXAMPLE 2 Controlled identifiers include personal identifiers issued by governments, universities and companies.

Each controlled identifier depends on completion of a master data record containing characteristic data to differentiate the identified item within a particular domain. This dependence means resolution of the identifier requires access to the underlying master data that are controlled by the issuing organization.

A controlled identifier is created by and, therefore, belongs to the issuing organization.

4.1.3 Natural identifiers

A natural identifier derives from the characteristics of the identified item, where those characteristics make the item unique within a particular domain. The identifier can be created by applying an algorithm to the characteristics of the item.

EXAMPLE 1 Natural identifiers include life science identifiers, which are persistent, globally unique identifiers for biological objects.

EXAMPLE 2 Natural identifiers include those generated by cryptographic hash functions (to create document and virus signatures) and cyclic redundancy check digits (error-detecting codes to highlight changes to raw data in data transfers).

As a natural identifier derives from accessible information, the identifier is not subject to the control of one owning organization.

4.2 Ownership and usability of identifiers

Controlled identifiers belong to the issuing organization.

Unless the controlled identifier is in the public domain, data containing controlled identifiers can end up becoming a joint work under copyright law.