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Standard**

**ISO 21926**

**Semantic data model for audit data  
services**

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**Sample Document**

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# Contents

Page

|                                                                         |           |
|-------------------------------------------------------------------------|-----------|
| <b>Foreword</b>                                                         | <b>iv</b> |
| <b>Introduction</b>                                                     | <b>v</b>  |
| <b>1 Scope</b>                                                          | <b>1</b>  |
| <b>2 Normative reference</b>                                            | <b>1</b>  |
| <b>3 Terms and definitions</b>                                          | <b>1</b>  |
| <b>4 Abbreviated terms</b>                                              | <b>10</b> |
| <b>5 Naming conventions</b>                                             | <b>10</b> |
| <b>6 Audit data services standards</b>                                  | <b>10</b> |
| 6.1 General                                                             | 10        |
| 6.2 Target users classified for this document                           | 11        |
| <b>7 Semantic data model</b>                                            | <b>12</b> |
| 7.1 General                                                             | 12        |
| 7.2 Workflow for data model development and syntax and semantic binding | 12        |
| 7.3 Representation terms                                                | 14        |
| 7.3.1 General                                                           | 14        |
| 7.3.2 Character string                                                  | 14        |
| 7.3.3 Numeric                                                           | 15        |
| 7.3.4 Date and time                                                     | 15        |
| 7.3.5 Other                                                             | 15        |
| 7.4 Foundational Semantic Model (FSM)                                   | 15        |
| 7.4.1 General                                                           | 15        |
| 7.4.2 Properties table for the Foundational Semantic Model (FSM)        | 17        |
| 7.5 Business Semantic Model (BSM)                                       | 19        |
| 7.5.1 General                                                           | 19        |
| 7.5.2 Properties table for the BSM                                      | 20        |
| 7.6 Logical Hierarchical Model (LHM)                                    | 21        |
| 7.6.1 General                                                           | 21        |
| 7.6.2 Relationship between metamodels of BSM and LHM (informative)      | 21        |
| 7.6.3 Graph walk method                                                 | 22        |
| 7.6.4 Meta data model of the Logical Hierarchical Model (LHM)           | 23        |
| 7.6.5 Properties table for the Logical Hierarchical Model (LHM)         | 25        |
| 7.6.6 Logical hierarchical model table example                          | 27        |
| 7.7 Hierarchical Message Definition (HMD)                               | 29        |
| 7.7.1 General                                                           | 29        |
| 7.7.2 Properties table for Hierarchical Message Definition              | 29        |
| 7.7.3 Syntax binding                                                    | 29        |
| 7.7.4 Semantic binding                                                  | 30        |
| <b>Annex A (informative) Tabular definitions of semantic data model</b> | <b>31</b> |
| <b>Annex B (informative) Graph walk method</b>                          | <b>32</b> |
| <b>Annex C (informative) Guidelines on creating extensions</b>          | <b>35</b> |
| <b>Bibliography</b>                                                     | <b>36</b> |

## 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 document 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](http://www.iso.org/directives)).

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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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 295, *Audit data services*.

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](http://www.iso.org/members.html).

## Introduction

A semantic data model for audit data services (ADS) provides a unified definition of accounting data elements, focusing on making audit data accessible while bridging the gap between stakeholders such as auditors, auditees, software developers and IT professionals. By offering a methodology that decouples accounting information from specific systems and applications, the model facilitates standardized data extraction for financial audits.

The increasing complexity of audits necessitates tools for managing, analysing and displaying audit data. This document outlines a methodology and framework for developing and maintaining the model, as well as for creating data exchange formats and binding to existing audit data standards. By integrating practical applicability with a strong theoretical foundation, the model and framework aim to remain relevant in the evolving audit data landscape.

This document aims to:

- Provide a comprehensive lexicon: The model organizes audit data within a fundamental semantic structure, based on the tables and fields defined in ISO 21378.
- Offer structured guidelines: This document includes guidance for adapting and extending the model to meet regional or organizational requirements, enhancing its versatility.
- Describe the binding process: This document explains the steps required to transform the foundational model into a logical hierarchical model, and subsequently to specific hierarchic message definitions, resulting in file formats such as CSV, XML and JSON.

This document comprehensively addresses the semantic data model for ADS. It introduces the framework and foundational knowledge for implementing audit data services based on modelling techniques. Furthermore, it explains how the logical hierarchical model can be derived from the business semantic model using the graph walk method. The logical hierarchical model is the basis for the hierarchic message definitions, that are the basis for the exchange formats.

The electronic version of the semantic data model and its derivatives includes:

- foundational semantic model (FSM);
- business semantic model (BSM);
- logical hierarchical model (LHM).

These models can be downloaded in tabular format, see [Annex A](#).

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# Semantic data model for audit data services

## 1 Scope

This document aims to define a methodology and framework to build a semantic data model for audit data services (ADS), adapt it (by extensions), and convert it to exchange formats.

The methodology describes a standardized semantic structure for audit data, focusing on specifying object classes and their attributes and associations, how to decouple audit data from specific systems (ERP applications) and how to extract and exchange data uniformly for audits, and describes the methods used for this such as graph walk (from relational to hierarchical model), syntax binding (to technical formats), semantic binding (link to other standards).

The semantic data model applies to areas such as general ledger journal entries, accounts receivable, sales, accounts payable, purchasing, inventory (movement and data), and property, plant, and equipment, customs and indirect tax and payroll.

These areas are limited to the functional requirements set forth in ISO 21378, ISO 5401, and ISO 5405 and can be extended with future extensions to ISO 21378.

This document describes the methodology and framework, not the full implementation or concrete technical exchange standards.

## 2 Normative reference

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/IEC 11179-4, *Information technology — Metadata registries (MDR) — Part 4: Formulation of data definitions*

ISO/IEC 11179-5, *Information technology — Metadata registries (MDR) — Part 5: Naming principles*

ISO/IEC 19505-1, *Information technology — Object Management Group Unified Modeling Language (OMG UML) — Part 1: Infrastructure*

ISO/IEC 19505-2, *Information technology — Object Management Group Unified Modeling Language (OMG UML) — Part 2: Superstructure*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions 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/>

### 3.1

#### **class**

description of a set of *objects* (3.14) that share the same *attributes* (3.9), operations, methods, *relationships* (3.3) and semantics

[SOURCE: ISO/IEC 11179-3:2023, 3.1.1, modified — The domain "<metamodel>" has been removed; note 1 to entry has been removed.]

### 3.2

#### **abstract class**

*class* (3.1) that does not provide a complete declaration and typically cannot be instantiated

Note 1 to entry: An abstract class is intended to be used by other classes as a general class for *specialization* (3.6).

[SOURCE: ISO/IEC 11179-3:2023, 3.1.1, modified — The domain "<metamodel>" has been removed; notes 2 and 3 to entry have been removed.]

### 3.3

#### **relationship**

connection among model elements

Note 1 to entry: In this document, a relationship is one of: an *association* (3.4) a *generalization* (3.5) or a *specialization* (3.6).

[SOURCE: ISO/IEC 11179-3:2023, 3.1.4, modified — The domain "<metamodel>" has been removed.]

### 3.4

#### **association**

semantic *relationship* (3.3) between two *classes* (3.1) or between two or more instances of the same class

Note 1 to entry: An association is a type of relationship.

[SOURCE: ISO/IEC 11179-3:2023, 3.1.5, modified — The domain "<metamodel>" has been removed; note 2 to entry has been removed.]

### 3.5

#### **generalization**

*relationship* (3.3) between a more general *class* (3.1) (the parent) and a more specific class (the child) that is consistent with the general class and that adds additional information

Note 1 to entry: A generalization is a type of relationship.

Note 2 to entry: The more general class is referred to as the *superclass* (3.7).

Note 3 to entry: The more specific class is referred to as a *subclass* (3.8).

Note 4 to entry: A generalization is directed from the subclass to the superclass.

Note 5 to entry: A subclass may not have all of the *attributes* (3.9) and relationships of the superclass.

Note 6 to entry: Generalization is the inverse of *specialization* (3.6).

[SOURCE: ISO/IEC 11179-3:2023, 3.1.7, modified — The domain "<metamodel>" has been removed; the word 'fully' has been removed to allow subclasses within both the aligned and distinct layers the flexibility to exclude properties inherited from their superclass; note 5 to entry has been replaced by a new one; note 7 to entry has been removed.]

### 3.6

#### **specialization**

*relationship* (3.3) between a more general *class* (3.1) (the parent) and a more specific class (the child) that is consistent with the general class and that adds additional information

Note 1 to entry: A specialization is a type of relationship.

Note 2 to entry: The more general class is referred to as the *superclass* (3.7).

Note 3 to entry: The more specific class is referred to as a *subclass* (3.8).

Note 4 to entry: A specialization is directed from the superclass to the subclass.

Note 5 to entry: A subclass may not have all of the *attributes* (3.9) and relationships of the superclass.

Note 6 to entry: Specialization is the inverse of *generalization* (3.5).

[SOURCE: ISO/IEC 11179-3:2023, 3.1.8, modified — The domain "<metamodel>" has been removed; the word 'fully' was removed to allow subclasses within both the aligned and distinct layers the flexibility to exclude properties inherited from their superclass; note 5 to entry has been replaced by a new one; note 7 to entry has been removed.]

### 3.7

#### **superclass**

*class* (3.1) that is a *generalization* (3.5) of one or more other classes

Note 1 to entry: The classes being generalized are known as *subclasses* (3.8).

[SOURCE: ISO/IEC 11179-3:2023, 3.1.9, modified — The domain "<metamodel>" has been removed; notes 2 and 3 to entry have been removed.]

### 3.8

#### **subclass**

*class* (3.1) that is a *specialization* (3.6) of another class

Note 1 to entry: The class being specialized is known as the *superclass* (3.7).

[SOURCE: ISO/IEC 11179-3:2023, 3.1.10, modified — The domain "<metamodel>" has been removed; notes 2 and 3 to entry have been removed.]

### 3.9

#### **attribute**

characteristic of an *object* (3.14) or set of objects

Note 1 to entry: An attribute describes one non-repeatable characteristic of an object. The attribute has a certain *value domain* (3.30).

[SOURCE: ISO/IEC 11179-3:2023, 3.1.11, modified — The domain "<metamodel>" has been removed; note 1 to entry has been added.]

### 3.10

#### **datatype**

set of distinct values, characterized by *properties* (3.16) of those values and by operations on those values

[SOURCE: ISO/IEC 11179-3:2023, 3.1.13]

### 3.11

#### **identifier**

sequence of characters, capable of uniquely identifying that with which it is associated, within a specified *context* (3.18)

Note 1 to entry: Unlike a *name* (3.20), an identifier is linguistically neutral.

[SOURCE: ISO/IEC 11179-3:2023, 3.1.16]

### 3.12

#### **aggregation**

"whole-part" *association* (3.4) where the part can exist independently of the whole

Note 1 to entry: Aggregation is a special type of association.

Note 2 to entry: The *relationship* (3.3) between the aggregate and its components is a weak "has-a" relationship: The components may be part of several aggregates, may be accessed through other *objects* (3.14) without going through the aggregate, and may outlive the aggregate object. The state of the component object still forms part of the aggregate object.

### 3.13

#### **composition**

"whole-part" *association* (3.4) where the part cannot exist independently of the whole

Note 1 to entry: A composition is a special type of association.

Note 2 to entry: The *relationship* (3.3) between the composite and its parts is a strong "has-a" relationship: The composite *object* (3.14) has sole responsibility for the existence and storage of the composed objects. A composed object can be part of at most one composite. If a composite object is deleted, all of its part instances that are objects are deleted with it.

### 3.14

#### **object**

anything perceivable or conceivable

Note 1 to entry: Objects can be material (e.g. 'engine', 'sheet of paper', 'diamond'), immaterial (e.g. 'conversion ratio', 'project plan') or imagined (e.g. 'unicorn', 'scientific hypothesis').

[SOURCE: ISO/IEC 11179-3:2023, 3.2.1]

### 3.15

#### **object class**

set of ideas, abstractions or things in the real world that are identified with explicit boundaries and meaning and whose *properties* (3.16) and behaviour follow the same rules

[SOURCE: ISO/IEC 11179-3:2023, 3.2.2]

### 3.16

#### **property**

quality common to all members of an *object class* (3.15)

Note 1 to entry: In general, two types of properties can be distinguished: *attributes* (3.9) and *associations* (3.4).

[SOURCE: ISO/IEC 11179-3:2023, 3.2.3, modified — Note 1 to entry has been added.]

### 3.17

#### **concept**

unit of knowledge created by a unique combination of characteristics

Note 1 to entry: Concepts are not necessarily bound to particular languages. They are, however, influenced by the social or cultural background which often leads to different categorizations.

[SOURCE: ISO/IEC 11179-5:2015, 4.3]

### 3.18

#### **context**

setting in which a *designation* (3.19) or *definition* (3.23) is used

[SOURCE: ISO/IEC 11179-5:2015, 4.4]

### 3.19

#### **designation**

representation of a *concept* (3.17) by a sign which denotes it

[SOURCE: ISO/IEC 11179-5:2015, 4.6]

### 3.20

#### **name**

*designation* (3.19) of an *object* (3.14) by a linguistic expression

[SOURCE: ISO/IEC 11179-3:2023, 3.2.12]

### 3.21

#### **binding**

mapping from one framework or specification to another, enabling *data* (3.27), commands or both to be passed between them

[SOURCE: ISO/IEC 11179-3:2023, 3.2.21]

### 3.22

#### **naming convention**

specification of how signs of *designations* (3.19), scoped *identifiers* (3.11) or both are formulated

Note 1 to entry: A naming convention can apply to scoped identifiers when they are included in the associated namespace.

[SOURCE: ISO/IEC 11179-3:2023, 3.2.22]

### 3.23

#### **definition**

representation of an item by a descriptive statement which, in a given language and *context(s)* (3.18), serves to differentiate it from other items

[SOURCE: ISO/IEC 11179-3:2023, 3.2.23, modified — The domain "<registry>" has been removed; "registry item(s)" has been changed to "item(s)".]

### 3.24

#### **definition text**

text of the *definition* (3.23)

[SOURCE: ISO/IEC 11179-3:2023, 3.2.24]

### 3.25

#### **extension**

feature not defined by this document

[SOURCE: ISO/IEC 11179-3:2023, 3.2.40]

### 3.26

#### **notation**

formal syntax and associated semantics for the representation of information

EXAMPLE UML, MOF, OCL, OWL/RDF, SKOS, CGIF, XCL, XTM or ISO/IEC 11404[1].

Note 1 to entry: A formal syntax consists of a set of symbols and the rules for their use.

Note 2 to entry: A formal syntax is often intended for machine processing.

[SOURCE: ISO/IEC 11179-3:2023, 3.2.36]

### 3.27

#### **data**

re-interpretable representation of information in a formalized manner suitable for communication, interpretation, or processing

Note 1 to entry: Data can be processed by humans or by automatic means.

[SOURCE: ISO/IEC 11179-3:2023, 3.2.29]

### 3.28

#### **multiplicity**

specification of the range of allowable number of elements in a set

Note 1 to entry: Multiplicity specifications can be given for *associations* (3.4) or roles within associations and *hierarchic classes* (3.47) in a logical hierarchic model.

Note 2 to entry: A multiplicity is a (possibly infinite) subset of the non-negative integers.

[SOURCE: ISO/IEC 11179-3:2023, 3.2.38, modified — The words "cardinalities that a set can assume" in the definition have been substituted with "number of elements in a set"; note 1 to entry has been modified so that multiplicity is only applicable to associations and hierarchic classes in a logical hierarchic model; for attributes, mandatory/optional/conditional status should be used.]

### 3.29

#### **value meaning**

semantic content of a value

[SOURCE: ISO/IEC 11179-3:2023, 3.2.46, modified — Note 1 to entry has been deleted.]

### 3.30

#### **value domain**

##### **VD**

set of *permissible values* (3.31)

Note 1 to entry: The value domain provides representation but has no implication as to what *data* (3.27) element *concept* (3.17) the values are associated with nor what the values mean.

Note 2 to entry: The permissible values can either be enumerated, expressed via a description, or a combination of the two.

[SOURCE: ISO/IEC 11179-3:2023, 3.2.47]

### 3.31

#### **permissible value**

*designation* (3.19) of a *value meaning* (3.29)

Note 1 to entry: Permissible values may be specified either as part of a *value domain* (3.30) or only associated with a value meaning.

Note 2 to entry: Within a value domain, permissible values can either be enumerated, expressed via a description, or a combination of the two.

Note 3 to entry: Explicit mapping of a single permissible value to a single value meaning is possible only when both the value meaning and permissible value are enumerated, e.g. for code sets. For described permissible values, it is possible for the described meaning to be associated with a range of values, e.g. weight in kilograms.

[SOURCE: ISO/IEC 11179-3:2023, 3.2.48]

### 3.32

#### **mandatory**

always required

Note 1 to entry: One of three obligation statuses applied to the *attributes* (3.9) of items, indicating the conditions under which the attribute is required; see also *conditional* (3.34) and *optional* (3.33).

[SOURCE: ISO/IEC 11179-3:2023, 3.2.75, modified — In note 1 to entry, the word "registry" has been removed; note 2 to entry has been deleted.]