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Exchange formats for audit data collection — Customs and indirect tax extension: XML and JSON

DTS

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Foreword

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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.

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Introduction

~~This document, exchange formats for audit data collection customs and indirect tax extension, XML and JSON, concerns the specification of technical exchange formats in XML, JSON and CSV as output file formats for the functional content defined in ISO 5401:2024 (customs and indirect tax extension).~~

As one of the follow-up standards for audit data services, this document is based on the previous standards, including ISO 5401 (customs and indirect tax extension), ISO 21378~~:2019~~ (audit data collection standard~~),~~) and ISO/TS 21377~~:2023~~ (exchange formats for the audit data collection standard, XML and JSON). ~~besides ISO 5401:2024.~~

ISO 21378~~:2019, the audit data collection standard,~~ establishes common definitions of accounting data elements and provides the information necessary to extract relevant audit data. ISO 21378 specifies 71 tables which serve as a basis for data extraction in the areas of general ledger, accounts receivable, sales, accounts payable, purchasing, inventory (including both inventory and movement data), and property, plant, and equipment. ISO 21378 primarily focuses on the access of audit data for financial audits (financial statements).

ISO/TS 21377~~:2023, exchange formats for the audit data collection standard, XML and JSON, concerns the specification of~~ specifies technical exchange formats in extensible markup language (XML), JavaScript object notation (JSON) and comma-separated values (CSV) as output file formats for the functional content defined in ISO 21378 ~~(audit data collection standard).~~

ISO 5401~~:2024, the audit data collection customs and indirect tax extension,~~ is an addition of 7 specified tables to the 71 tables of ISO 21378, with the aim of collecting additional data to perform customs and indirect tax audits. The ISO 5401~~:2024~~ tables are set up in accordance with the specifications in ISO 21378.

Exchange formats for audit data collection — Customs and indirect tax extension: XML and JSON

1 Scope

This document ~~concerns the specification of~~specifies technical exchange formats for audit data collection, customs and indirect tax extension, in Extensible ~~Mark up~~Markup Language (XML), JavaScript Object Notation (JSON) and flat file (CSV) as output file formats for the functional content defined in ISO 5401~~:2024, audit data collection customs and indirect tax extension~~.

~~Besides this~~This document ~~the deliverable~~also contains ~~per~~the following schema files and mapping tables related to ISO 5401:~~2024 table:~~

— XML schema~~,~~ files:

~~— XML sample file,~~

— JSON schema~~,~~ files:

~~— JSON sample file,~~

~~— Mapping table.~~

— CSV mapping tables, included as separate sheets in an Excel file.

To keep the three exchange formats (XML, JSON, CSV) consistent, this document also specifies how to use the technical solution in the CSV format.

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 5401~~:2024~~, *Audit data collection — ~~customs~~Customs and indirect tax extension*

ISO 21378~~:2019,~~ *Audit data collection ~~standard~~*

ISO/TS 21377~~:2023~~, *Exchange formats for the audit data collection standard: XML and JSON*

ISO 8601~~-~~-1, *Date and time — Representations for information interchange — Part 1: Basic rules*

ISO/IEC 21778, *Information technology — The JSON data interchange syntax*

W3C Extensible Markup Language (XML) 1.0 (Fifth Edition). Available at https://www.w3.org/TR/2008/REC-xml-20081126/

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W3C XML Schema Part 1: Structures Second Edition. Available at https://www.w3.org/TR/2004/REC-xmlschema-1-20041028/

W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes. Available at https://www.w3.org/TR/2012/REC-xmlschema11-2-20120405/

JSON Schema: A Media Type for Describing JSON Documents. Available at https://json-schema.org/draft/2020-12/json-schema-core.html

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain ~~terminological~~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/

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~~3.2~~3.1 ~~3.1~~
data
reinterpretable representation of information in a formalized manner suitable for communication, interpretation or processing

[SOURCE: ISO/IEC 11179-1:~~2015~~2023, 3.2.~~6~~23, modified — Notes to entry have been deleted.]

~~3.3~~3.2 ~~3.2~~
data element
basic unit of identifiable and definable *data* (3.1~~(3.1)~~)

[SOURCE: ISO 2146:2010, 3.4, modified — The admitted term "element" has been deleted.]

~~3.4~~3.3 ~~3.3~~
data file
collection of *data* (3.1~~(3.1)~~) records having a homogeneous structure

[SOURCE: ISO 21378:2019, 3.4]

~~3.5~~3.4 ~~3.4~~
data structure
framework comprising a number of *data elements* (3.2~~(3.2)~~) in a prescribed form

[SOURCE: ISO 21007-1:2005, 2.16, modified — The word "element" has been deleted from the term.]

~~3.6~~3.5 ~~3.5~~
syntax
set of rules, principles and processes that govern the *data structure* (3.4~~(3.4)~~)

~~3.7~~3.6 ~~3.6~~
data model
graphical ~~and/or~~, lexical or combined representation of *data* (3.1~~(3.1),~~), specifying their properties, structure, and ~~inter-relationships~~interrelationships

[SOURCE: ISO/IEC 11179-1:~~2015~~2023, 3.2.~~7~~24]

~~3.8~~3.7 ~~3.7~~
entity
group of *data elements* (3.2~~(3.2)~~) describing an object

Note 1 to entry: It is equivalent to "object class" in ISO/IEC 11179-1.

~~3.9~~3.8 ~~3.8~~
relation
relationship between two *entities* (3.7~~(3.7)~~)

~~3.10~~3.9 ~~3.9~~
attribute
data element (3.2~~(3.2)~~) describing an object

Note 1 to entry: It is equivalent to "property" in ISO/IEC 11179-1.

~~3.11~~3.10 ~~3.10~~
domain
set of properties to define the value space of *attributes* (3.9~~(3.9)~~)

Note 1 to entry: A domain contains *code lists* (3.11~~(3.11)~~) and *code values* (3.12~~(3.12).~~). It is equivalent to "representation" in ISO/IEC 11179-1.

~~3.12~~3.11 ~~3.11~~
code list
standardized list of *code values* (3.12~~(3.12)~~) with a common scope

~~3.13~~3.12 ~~3.12~~
code value
one value from a *code list* (3.11~~(3.11)~~)

~~3.14~~3.13 ~~3.13~~
data group
~~A~~ structured collection of related *data elements* (3.2~~(3.2)~~) that are grouped together based on a shared characteristic or purpose~~.~~

Note 1 to entry: A data group may represent a logical unit within a dataset, such as all attributes related to a customer, product, or transaction, and is often used to organize data hierarchically or to simplify data exchange and processing.

4 Exchange formats

4.1 General

The data format is the carrier of data exchange between auditor and auditee. So, it is necessary to make an agreement on data format between the two sides in data exchange. There are multiple options for output data formats.

In case of ISO 5401~~:2024~~, three exchange formats are specified:

— XML data files defined by XML schema specification (W3C);

— JSON data files defined by JSON schema specification (json-schema.org);

— CSV data files.

These three formats shall contain the same functional audit data content specification in accordance with ISO 5401:2024, but differ on the technical level only.

This means that these exchange formats are convertible from one to the other. For instance, you could convert XML data files to CSV data files or CSV data files to JSON data files.

The XML and JSON schemas described in this document are an extension of the schemas described in ISO/TS 21377. It is therefore necessary to combine the ISO/TS 21377 schemas in one directory with the schemas described in this document, so that the common data type XML schema from ISO/TS 21377 can be imported by all XML schemas.

To generate the XML and JSON schemas in a consistent way, a data model was set up from ISO 5401:2024 in according to ISO/IEC 11179-1:2015. This data model is used to create consistent exchange format specifications.

Each ISO 5401:2024 table is modelled into a "Parent Entity" and reusable data groups, if applicable, within a table are modelled into "Child Entities", e.g. "Physical Address", "Billing Address", "Tax", "Created", "Modified", "Posted" etc., completely", in line with the ISO 5401:2024. Depending on the context of a "Parent Entity", it may have a relation to one or more "Child Entities". For example, a "Customer" has a relation with a "Billing Address". This way guarantees that all reusable groups that occur in multiple tables are defined in the same way.

As the data model is not in scope of this project, it is only documented for reference purposes in ISO/TS 21377:2023, Annex D.

The various technical specifications are explained in this document; and the additional packaging and communication agreements are defined.

4.2 XML

4.2.1 General

This subclause describes how to exchange the ISO 5401:2024 tables using XML data files.

XML data files shall be created in accordance with:

— the syntax specifications written in W3C Extensible Markup Language (XML) 1.0 (Fifth Edition);

— the functional requirements written in ISO 5401:2024;;

— the functional requirements written in ISO 21378:2019;

— the technical requirements written in ISO/TS 21377:2023;.

4.2.2 Technical requirements

4.2.2.1 General

Each XML data file shall contain only one ISO 5401:2024 table, with all records (lines) for that table included within the file.

The filename shall ~~comply~~be in accordance with 4.6.5~~the rules described in~~ .

Each ISO 5401~~:2024~~ table requires an individual XML schema for defining its XML file structure. For instance, if there are 7 tables, there will be 7 corresponding XML schemas, one for each table.

Such an XML data file contains (schematic):

```
<?xml version='1.0' encoding='UTF-8'?>
<root-tag
    xsi:schemaLocation='name-space xml-schema-name.xsd'
    xmlns='name-space'
    xmlns:xsi='http://www.w3.org/2001/XMLSchema-instance'>
    <table-line-tag>
        <data-element-tag>value</data-element-tag>
        <group-tag>
            <data-element-tag>value</data-element-tag>
        </group-tag>
    </table-line-tag>
</root-tag>
```

Italicized text shall be replaced by the definitions in this document.

4.2.2.2 Root tag

The root tag equals "Adc" followed by the ISO 5401~~:2024~~ table name like: “AdcGlDetailsCharacteristics”.

4.2.2.3 Target name space definition

The target name space equals "http://schemas.iso.org/AdcsML/Messages/” followed by the message name and message version like: "http://schemas.iso.org/AdcsML/Messages/AdcGlDetailsCharacteristics-v1"".

4.2.2.4 XML tags

Table-line-tag, group-tag and data-element-tag are XML tags which are defined in the related XML schema.

XML tags are in the first step derived from the full data element names, and in the second step shortened in a consistent manner, according to an abbreviations list (see Annex A~~).~~).

Because auditors and auditees usually exchange bulk files according to ISO 5401~~:2024~~, abbreviated tags can reduce the file sizes by 30 % to 40 %.

Full data element names and abbreviated XML tags are together specified in ~~the~~ ISO 5401~~:2024~~ to XML mapping tables (see 4.5 for explanation and example of mapping tables~~).~~).

In XML schemas the full data element names are documented as annotations.

This means that programmers can have easy access to the full data element names, either from the mapping tables or from the XML schemas.

4.2.2.5 Optional fields

Optional fields and optional groups of fields can be omitted from the XML data file, only if these data elements are not available in the source system that delivers the audit data.

4.2.2.6 Repeating groups

Repeating groups like “Tax” can occur up to the maximum number that is defined in the XML schema.

4.2.2.7 Special characters to be escaped

The following special characters shall be escaped in XML data files as follows:

< (less than) to be replaced with <

> (greater than) to be replaced with >

& (ampersand) to be replaced with &

‘ (apostrophe) to be replaced with '

“ (quotation mark) to be replaced with "

4.2.3 XML schema

4.2.3.1 General

Each ISO 5401~~:2024~~ file is technically specified by an XML schema and can also be validated by using that schema.

XML schema files shall be created in accordance with the syntax specifications ~~written~~ in W3C Extensible Markup Language (XML) 1.0 (Fifth Edition), W3C XML Schema Part 1: Structures Second Edition, W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes and ~~also in accordance with~~ the functional requirements ~~written~~ in ISO 5401:2024.

Table 1 shows the ISO 5401~~:2024~~ representation formats and the equivalents used in XML schema.

Table 1 — Representation specification in XML schema

ISO 5401~~:2024~~ representation	XML schema representation
%ns	<xsd:restriction base="xsd:string"> <xsd:maxLength value="n"/> </xsd:restriction>
%nc	<xsd:restriction base="xsd:string"> <xsd:length value="n"/> </xsd:restriction>
%m.nf	<xsd:restriction base="xsd:decimal"> <xsd:totalDigits value="m"/> <xsd:fractionDigits value="n"/> <xsd:restriction>
%nd	<xsd:restriction base="xsd:integer"> <xsd:totalDigits value="n"/> </xsd:restriction>