
Informacijski modeli stavb - Piročnik z informacijami - 3. del: Shema podatkov in koda (ISO/DIS 29481-3:2021)

Building information models - Information delivery manual - Part 3: Data schema and code (ISO/DIS 29481-3:2021)

Bauwerksinformationsmodelle - Handbuch der Informationslieferungen - Teil 3: Datenschema und Klassifikation (ISO/DIS 29481-3:2021)

Modèles des informations de la construction - Protocole d'échange d'informations - Partie 3: Schéma de données et code (ISO/DIS 29481-3:2021)

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Part 3: Data schema and code

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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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).

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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 59, *Buildings and civil engineering works*, Subcommittee SC 13, *Organization of information about construction works*.

A list of all parts in the ISO 29481 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.

ISO/DIS 29481-3:2021(E)**Introduction**

This document defines the international standard for a machine applicable, readable and transferable (SMART) data schema and code for the efficient development, management, and reuse of the ISO 29481-1 (information delivery manual, IDM) specification. The information delivery manual (IDM) specification sets out a methodology for describing the processes and data requirements for a defined purpose within the development or management of a built facility. Due to the lack of a standard data schema for exchanging and sharing the contents of IDMs in an electronic format, IDM documents have historically been developed as either a static document file or as a data file specified in a proprietary data format. Consequently, their contents could not be efficiently exchanged, shared, and reused. The goal of ISO 29481-3 is to expedite the development and sharing of the IDM documents to meet the rapidly increasing demand for various building information modelling (BIM) use cases.

ISO 29481-3 specifies a data schema for authoring, exchanging, and sharing an IDM document defined by ISO 29481-1 in the XML (eXtensible Markup Language). The data schema is referred to as the idmXML schema definition (idmXSD). idmXSD aims to allow users to electronically store, search, share and exchange IDM documents and their contents, including meta-data such as authors, dates, languages, revision history, supported project phases, as well as detailed descriptions of each information requirement. In addition, this document specifies the IDM code generation rules based on their key properties.

This standard improves the interoperability of IDM documents and their contents, providing tight digital links between the components of an IDM document; and to external data definitions such as ISO 16739-1 (industry foundation classes, IFC), ISO 12006-3, ISO 19650-1, ISO 23386, ISO 23387, EN 17412-1 (Level of Information Need), ISO 21597-1 (Information Container for Linked Document Delivery), and model view definitions (MVDs) of standard data schemas.

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Building information models — Information delivery manual —

Part 3: Data schema and code

1 Scope

This part of ISO 29481 is the technical addition to the methodology set out in ISO 29481-1. It defines a specification to store, exchange and read IDM documents in a standardized and machine-readable way.

2 Normative references

The following documents are referred to in the text in such a way that some or all 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 Directives Part 1:2020 Procedures for the technical work

ISO 639-1:2002, *Codes for the representation of names of languages — Part 1: Alpha-2 code*

ISO 3166-1:2020, *Codes for the representation of names of countries and their subdivisions — Part 1: Country code*

ISO 8601-1:2019, *Date and time — Representations for information interchange — Part 1: Basic rules*

ISO/IEC 9834-8:2005, *Information Technology — Open Systems Interconnection*

ISO 29481-1:2016, *Building information models — Information delivery manual — Part 1: Methodology and format*

ISO 12006-2:2015, *Building construction — Organization of information about construction works — Part 2: Framework for classification*

ISO 12006-3:2007, *Building construction — Organization of information about construction works — Part 3: Framework for object-oriented information*

ISO 21597-1:2020, *Information container for linked document delivery — Exchange specification — Part 1: Container*

ISO 22263:2008, *Organization of information about construction works — Framework for management of project information*

ISO 23386:2020, *Building information modelling and other digital processes used in construction — Methodology to describe, author and maintain properties in interconnected data dictionaries*

ISO 23387:2020, *Building information modelling (BIM) — Data templates for construction objects used in the life cycle of built assets — Concepts and principles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 29481-1 and the following apply.

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ISO and IEC maintain terminological 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

IDM code

identifier for an IDM document created based on the mandatory attributes of an IDM document

3.2

IDM document

instance of an IDM and its components

3.3

use case

UC

description of an information use for a specific purpose by one or more actors and systems

3.4

business context map

description of the information flow in a business context represented, for example, in the form of a process map or interaction map

4 Overview of the IDM schema

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4.1 Naming convention

The naming convention shown below is used for the IDM schema elements.

- a) The camel case convention shall be used for the naming of IDM schema elements.
- b) Except for the terms below, all the terms shall be spelled out.

- idm: information delivery manual
- uc: use case
- er: exchange requirement
- pm: process map
- im: interaction map
- tm: transaction map
- id: identifier

- c) Elements that represent descriptions, a group, or a set shall be specified using a plural form.

EXAMPLE benefits, limitations, requiredResources, and requiredCompetencies

4.2 Restriction notation

The following XSD restriction notation is used for the IDM data schemas.

- PK: Primary Key
- Required: Mandatory
- Optional: Not mandatory

- The 1:1 restriction depicts that both the minimum and maximum occurrence of an element is 1. This means there shall be one element.
- The 0:1 restriction depicts that the minimum occurrence of an element is 0 and the maximum occurrence is 1.
- The 0:* restriction depicts the zero to many relationship, which is represented as minOccurs = "0" to maxOccurs = "unbounded" in the XML schema.

4.3 Overall structure of the IDM schema

The idmXSD consists of the IDM element, its three core components (i.e. UC, business context map, and ER), and the relations and properties related to them.

- An IDM consists of a UC, a business context map, and an ER.
- A UC shall include the header information specified in ISO 29481-1 and other metadata sufficient to provide the context and the scope of an IDM.
- A business context map visually and formally represents the information delivery processes for a use case. ISO 29481-1 requires the exchange method and process to be specified in one or more PM and/or IM.
- An ER defines the information required by a specific UC at an individual information-unit level; possibly with references to the elements of standard information schemas, such as cityGML, ISO 16739-1 (IFC), gbXML, or ISO 12006-3.

The following clauses define the entities, relationships, attributes, and restrictions of the IDM schema. [Figure 1](#) illustrates a conceptual view of the IDM schema. The full idmXSD is presented in [Annex A](#).

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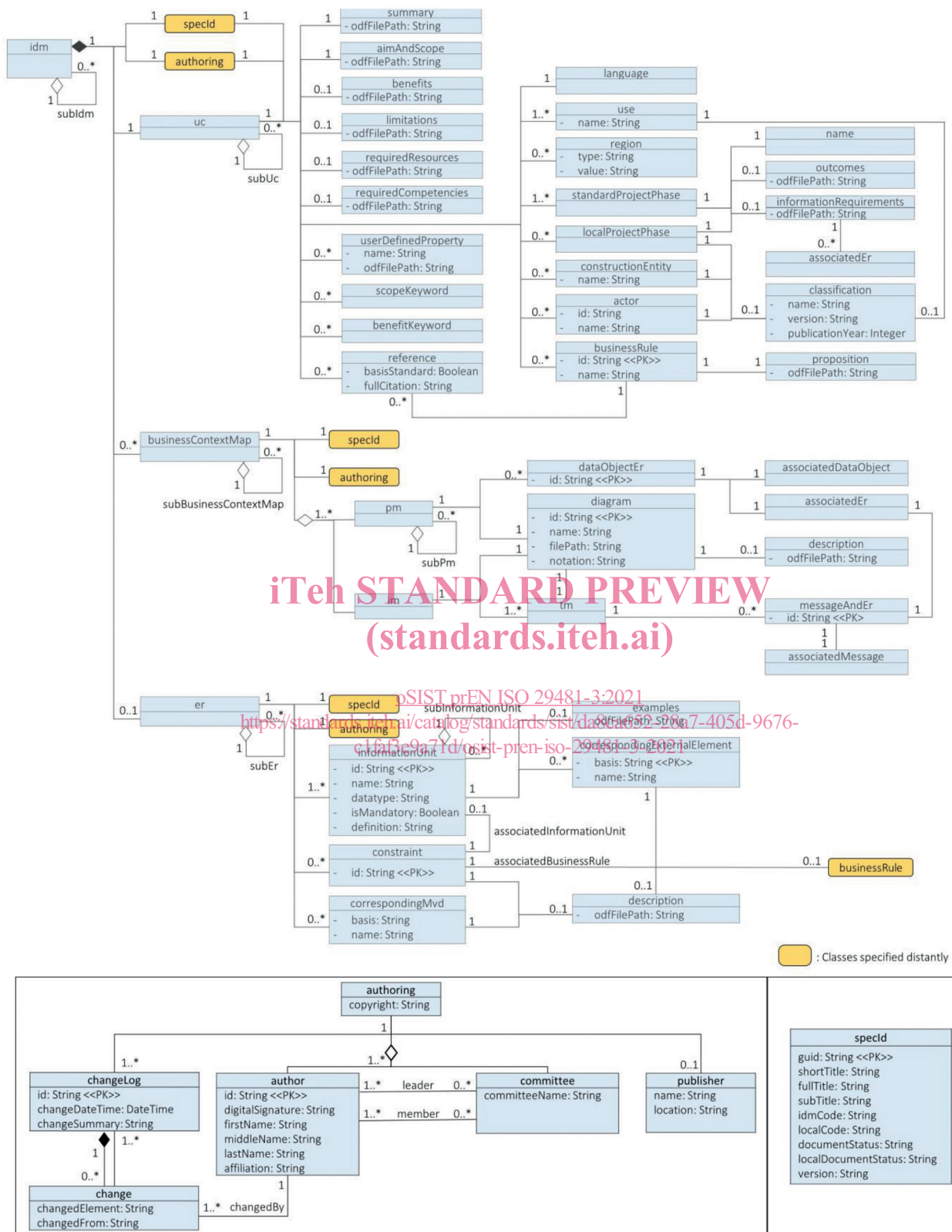


Figure 1 — A logical view of the IDM schema in the unified modelling language (UML) class diagram