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Building information models - Information delivery manual - Part 1: Methodology and format (ISO/DIS 29481-1:2024)

Bauwerksinformationsmodelle - Handbuch der Informationslieferungen - Teil 1: Methodik und Format (ISO/DIS 29481-1:2024)

Modèles des informations de la construction - Protocole d'échange d'informations - Partie 1: Méthodologie et format (ISO/DIS 29481-1:2024)

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Part 1: Methodology and format

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d'échange d'informations —*

Partie 1: Méthodologie et format

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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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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.

The committee responsible for this document is ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 13, *Organization of information about construction works*.

This third edition cancels and replaces all previous editions, updated to cover infrastructure assets as well as buildings and align terminology not specific to this document with other related standards.

ISO 29481 consists of the following parts, under the general title *Building information models — Information delivery manual*:

- *Part 1: Methodology and format*
- *Part 2: Interaction framework*
- *Part 3: Data schema*

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 part of ISO 29481 specifies how to present the information exchange requirements for a use case and its associated business processes. This is referred to as an Information Delivery Manual (IDM) since it precisely defines the “information delivery” requirements of the use case, recording those using plain language in a “manual” that can be understood by all stakeholders. An IDM consists of three components: the use case description, the business context and specified exchange requirements.

This document may be followed as a methodology that begins by identifying a use case, then defines the business context and its associated business processes using recommended mapping techniques to finally arrive at a detailed specification of the required information exchange requirements between parties at specific times during those processes.

This IDM methodology may be applied to any information management trigger event to identify the details of the information required to be exchanged. It has been developed specifically for the built environment sector concerned with all aspects of the delivery and management of assets. These activities may be both contractual (such as asset delivery) and non-contractual (such as regulatory compliance) between all stakeholders within the built environment sector and across the whole asset lifecycle.

IDM development may be streamlined in various ways as described in the informative [Annex A](#). This document also includes a brief overview of technical implementations of IDMs to support solutions provided by software developers, and how an IDM can be configured to meet national, local and project needs.

IDMs can be used to solve commonplace problems associated with communication between different parties in project teams or asset management teams by ensuring the clarity of and responsibility for information. An IDM helps all parties get the full benefits from any information model by understanding how the information will be used. If the required information is delivered in a reliable format to support different purposes across the life of an asset and the quality of the information is satisfactory, then the use cases and associated processes will be greatly improved.

Previous versions of this document assumed that information delivery would be achieved using a building information model (represented using the IFC schema) and conforming to a model view definition to satisfy the exchange requirements. This document significantly broadens that assumption to include any information formats that may satisfy (in whole or in part) the exchange requirements for a given business process.

Since the time that ISO 29481-1 was first developed in 2010 and subsequently revised in 2016, additional standards have been published in support of information management and the process of building information modelling. This document has been revised to reflect its position within the context of these other standards as shown in [Figure 1](#).

ISO 19650 has been published in several parts from 2018 onwards and sets out general concepts and principles for information management throughout the whole asset life cycle, as well as specific process requirements to manage information during project delivery or asset management. It also specifies an approach for achieving information security in a collaborative working environment and sets out criteria to be used to assess the quality of information deliverables. ISO 19650 and ISO 29481 use the same terminology wherever possible. The IDM specification in this document is the appropriate way to record the relationships between types of organizations that fulfil the party roles named in ISO 19650 and to set out the detailed information that one type of organization requires from another. The exchange requirement defined in an IDM specifies in detail the information that is required but does this in terms of generic actor types (e.g. what a client requires from an architect for a given business process). This is different from the exchange information requirement described in ISO 19650 which is specific to a given appointment (e.g. what the client for project XYZ requires from their architect on that project) where the information may be defined in whatever level of detail is deemed appropriate. This means it is possible for one exchange information requirement to correlate to multiple exchange requirements. The business context established as part of an IDM can also help define the information management resources used in ISO 19650, such as the information standard and the information production methods and procedures. An IDM should be considered as a toolkit for information managers to identify what information should be received or sent, the actors involved, how that information flows, for what purpose and the milestones for pre-defined use cases.

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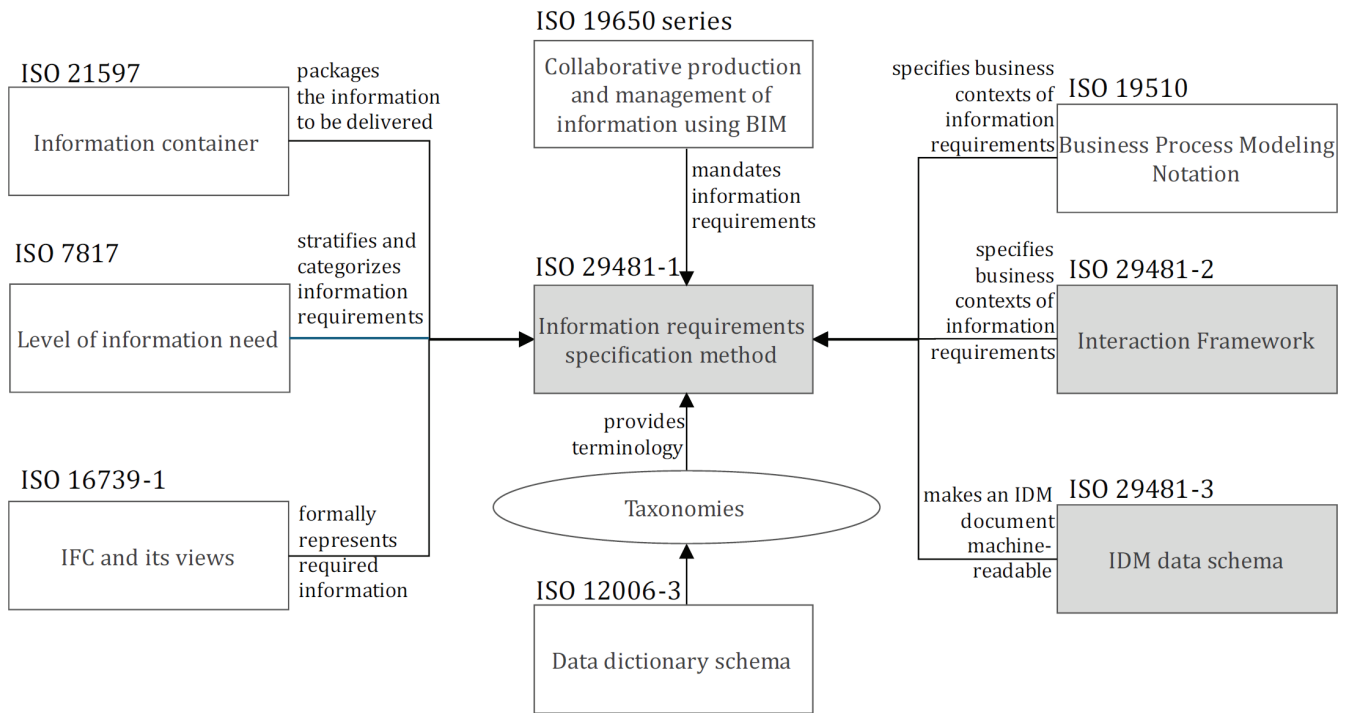


Figure 1 — Relationships between the ISO 29481 series and other relevant standards

ISO 7817 sets out the overview of the level of information needs. This concept was introduced in ISO 19650 as the way for a project client or asset owner to indicate the quantity and nature of information expected in response to any given information requirement. Level of information need provides a more comprehensive way of defining information units that form part of the IDM's exchange requirement.

The ISO 21597 specifies the use of linked data techniques to create a collection of structured information models and associated datasets with explicit relationship links between elements in the separate documents, all contained in a single archive format. It provides a way of packaging information deliverables in a consolidated container to support information exchange.

ISO 12006-3 provides a specification for a taxonomy in any domain of interest, allowing terms used to denote information units in an IDM to be structured and mapped to other terms.

ISO 16739-1 provides a way to create a semantically precise representation of real-world assets, resulting in a very effective way of delivering information that satisfies the exchange requirements as specified in this document.

In summary, this document provides a basis for reliable information exchange and sharing so that users can be confident that the information they are receiving is accurate and sufficient for the tasks they need to perform. The development of this document has been driven by the need for reliability in information exchange between parties in any business context.

Building information models — Information delivery manual —

Part 1: Methodology and format

1 Scope

This part of ISO 29481 prescribes

- how to document a use case with an associated business context and exchange requirements.
- a methodology to identify and specify the information exchanges required at identified times during the life cycle of assets.

The information delivery manual (IDM) is intended to be presented in plain language terms to facilitate interoperability between software applications used during all stages of the life cycle of assets (both buildings and infrastructure). It promotes digital collaboration between actors within the identified business context and provides a basis for accurate, reliable, repeatable and high-quality information exchange.

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6707-1 and the following apply.

3.1 General Terms

3.1.1

actor

person, organization or organizational unit involved in a process

Note 1 to entry: Organizational units include, but are not limited to, departments, teams.

3.1.2

role

functions being performed by an actor at a point in time

Note 1 to entry: The role of an actor is determined by action and outcome and not necessarily by the profession or trade followed by the actor.

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3.1.3

asset

item, thing or entity that has potential or actual value to an organization

[SOURCE: ISO 55000:2014, 3.2.1, modified — Notes to entry have been removed.]

3.1.4

metadata

data about data or data elements

[SOURCE: ISO 2382:2015, modified - The notes to entry have been removed.]

3.1.5

schema

formal description of a model

[SOURCE: ISO 19101-1:2014, 4.1.34]

3.2 Terms related to information organisation and management

3.2.1

information model

set of structured and unstructured information containers

[SOURCE: ISO 19650-1:2018, 3.3.8]

3.2.2

information container

named persistent set of information retrievable from within a file, system or application storage hierarchy

[SOURCE: ISO 19650-1:2018, 3.3.12, modified – Examples and notes to entry have been removed.]

3.2.3

model view definition

MVD

computer-interpretable definition of an exchange requirement, specifically bound to one or more particular standard information schemas

Note 1 to entry: A model view definition (MVD) is also referred to as a view definition, a subset (of a schema) and a conformance class (CC) especially in ISO 10303.

3.3 Terms related to information delivery

3.3.1

information delivery manual

IDM

specification of a use case using business context maps and exchange requirements

Note 1 to entry: Use case, context maps, and exchange requirements can be collectively referred to as IDM components.

3.3.2

use case

UC

description of a process by defining a sequence of actions performed by one or more roles to realize a purpose

Note 1 to entry: A use case specifies the scope of the context.

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3.3.3

business context

environment in which actors undertake processes

Note 1 to entry: Such an environment includes all the roles, activities, and interactions, products and services under the actor's control.

3.3.4

business process

set of interrelated or interacting activities that use inputs to deliver an intended result

EXAMPLE Example results include: agreements, systems, services, or products.

Note 1 to entry: a process always contains one or more transactions

[SOURCE: ISO 9000:2015, 3.4.1, modified - The notes to entry have been replaced with a note to entry. An example has been added.]

3.3.5

business context map

graphical representation of the information flows related to a context

EXAMPLE interaction maps and process maps.

3.3.6

process map

PM

context map of the activities related to a use case

3.3.7

interaction map

context map of the interactions related to a use case

3.3.8

information exchange

act of satisfying an information requirement or part thereof

[SOURCE: ISO 19650-1:2018, 3.3.7, modified - The term has had the word "verb" removed.]

3.3.9

information requirement

specification for what, when and for whom information is to be produced

Note 1 to entry: The specification of how information is to be produced is part of level of information need

[SOURCE: ISO 19650-1:2018, 3.3.2, modified - The words "how" have been removed.]

3.3.10

exchange requirement

ER

defined collection of information units required to fulfil a use case

3.3.11

information unit

single piece of information

EXAMPLE Window identifier, room depth.

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3.4 Terms related to interaction within organisations

3.4.1

interaction framework

XML file for the elements of an interaction

Note 1 to entry: Elements of an interaction include roles, transactions, messages, and information units

[SOURCE: ISO 6707-2:2017, 3.2.1]

3.4.2

interaction

communicative action between two roles

3.4.3

transaction

sequence of interactions involving the exchange of information using messages

EXAMPLE Processing of a request by one role on behalf of another.

Note 1 to entry: A transaction is a message between the initiator and the executor.

4 Information delivery manual

4.1 General

This subclause describes the concepts and principles that inform the development of an IDM and its three main components: a defined use case, a description of the business context and the specification of the exchange requirements. The IDM methodology presented in this document may be followed to develop an IDM from first principles, but that process may also be streamlined as described in the [Annex A](#) as long as the prescribed components of the IDM are provided as described in this this document and the information specifications are able to be made relevant to local working practices.

4.2 General requirements of an IDM

An IDM shall deliver at least the following

- a detailed description of the use case addressed by the IDM;
- a description of the need for information exchange within the business context;
- the identity of the actors involved in any information exchange;
- a definition and description of the activities or interactions where information is created, used or exchanged between actors to deliver a service or produce an end product;
- definitions, specifications and descriptions that are useful and easily understood;
- detailed specifications of exchange requirements including links to objects within industry standard structured information containers.

Guidance for development of content and the approach to follow is given in [Annex A](#).

4.3 Users of this document

The main users are expected to be IDM developers who consider a specific use case, employ a discovery process or other means to define the corresponding business context, and specify exchange requirements using knowledge elicited from end users.