
**Building information models —
Information delivery manual —**

**Part 1:
Methodology and format**

*Modèles des informations de la construction — Contrat
d'interchange —*

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
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).

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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

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 second edition cancels and replaces the first edition (ISO 29481-1:2010), which has been technically revised.

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*

Introduction

This International Standard has undergone a major review in the light of refined approaches to the development of information delivery manuals and their technical implementation in software readable forms. It is important to note that these changes do not render existing information delivery manuals (IDM) invalid.

Building information modelling provides a digital technology for describing and displaying information required in the planning, design, construction and operation of constructed facilities. Increasingly, this modelling approach is expanding to encompass all aspects of the built environment, including civil infrastructure, utilities and public space. These are collectively referred to as construction processes. This approach to managing information brings together the diverse sets of information used during the life cycle of the built environment into a common information environment, reducing, and often eliminating the need for the many types of paper documentation currently in use.

This approach is commonly referred to as building information modelling (BIM; reflecting its initial application in the architectural domain), while the same acronym is used to refer to the product of the process, the information model itself, or building information model (BIM).

Though the focus of construction processes described above is on the physical fabric of the built environment, BIM technology can also benefit the processes associated with managing the use of space within buildings, urban neighbourhoods and cities at the broader scale, as well as infrastructure networks and facilities. These are referred to here as use cases.

An IDM provides help in getting the full benefit from a BIM. If the required information is available in the BIM to support a construction process or use case, and the quality of information is satisfactory, then the process itself will be greatly improved.

For this to happen, there needs to be a common understanding of the processes involved across the entire life cycle development of a built environment project, including the information that is required for and results from the execution of that process. This applies to any activity that results in an exchange of information and may not relate directly to a BIM, e.g. the process to arrive at a work plan or contractual agreement.

This part of ISO 29481 sets out a methodology for the provision of an integrated reference document that describes the processes and data required in the development or management of a constructed facility. It describes how to identify and describe the processes undertaken within that context, the information required for their execution and the results. This part of ISO 29481 also describes in general terms how this information can be further detailed to support solutions provided by software developers, enabling its reuse, and configured to meet national, local and project needs.

In summary, this part of ISO 29481 provides a basis for reliable information exchange/sharing for users so that they can be confident that the information they are receiving is accurate and sufficient for the activities they need to perform. The development of this part of ISO 29481 has been driven by the need of users for reliability in information exchange.

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Building information models — Information delivery manual —

Part 1: Methodology and format

1 Scope

This part of ISO 29481 specifies

- a methodology that links the business processes undertaken during the construction of built facilities with the specification of information that is required by these processes, and
- a way to map and describe the information processes across the life cycle of construction works.

This part of ISO 29481 is intended to facilitate interoperability between software applications used during all stages of the life cycle of construction works, including briefing, design, documentation, construction, operation and maintenance, and demolition. It promotes digital collaboration between actors in the construction process and provides a basis for accurate, reliable, repeatable and high-quality information exchange.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6707-1, *Buildings and civil engineering works — Vocabulary — Part 1: General terms*

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 actor

person, organization or organizational unit (such as a department, team, etc.) involved in a construction process

3.2 building information modelling BIM

use of a shared digital representation of a built object (including buildings, bridges, roads, process plants, etc.) to facilitate design, construction and operation processes to form a reliable basis for decisions

Note 1 to entry: The acronym BIM also stands for the shared digital representation of the physical and functional characteristics of any construction works.

3.3 BIM software application

software application that is used to create, modify, analyze, manage, publish, share, expire, or otherwise manipulate elements of a BIM

3.4

business requirement

requirement that describes in business terms what needs to be delivered or accomplished

3.5

information constraint

statement that formally defines or constrains the scope of a piece of information due to some aspect of the business, a rule under which an organisation operates or a policy or decision that influences a process

3.6

class

type or collection of things that share common attributes

3.7

construction works

everything that is constructed or results from construction operations

[SOURCE: ISO 6707-1:2014, 3.1.1]

Note 1 to entry: This can refer to a building, piece of civil infrastructure (road, bridge, pipeline, etc.) or a landscape element and is extended to include aggregations of those elements to form an urban precinct, campus, or other institutional facility.

3.8

construction process

process that uses *construction resources* to achieve *construction results*

Note 1 to entry: Each construction process can be split up into its component processes.

3.9

exchange requirement

ER

defined set of information units that needs to be exchanged to support a particular business requirement at a particular process phase (or phases)/stage (or stages)

3.10

information delivery manual

IDM

documentation which captures the business process and gives detailed specifications of the information that a user fulfilling a particular role would need to provide at a particular point within a project

Note 1 to entry: This can be referred to as an information delivery specification (IDS).

3.11

IDM components

basic elements that form an IDM: interaction maps/transaction maps, process maps and exchange requirements

3.12

information unit

individual information item, such as a window identifier or a room depth

3.13

interaction map

representation of the roles and transactions relevant for a defined purpose

3.14

interaction framework

formal description of the elements of interaction, including definition of roles, transactions, messages in transaction, and data elements in messages

3.15 model

representation of a system that allows for investigation of the properties of the system

3.16 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.

3.17 object

part of the perceivable or conceivable world

Note 1 to entry: An object is something mental or physical toward which thought, feeling, or action is directed.

3.18 process map PM

representation of the relevant characteristics of a process associated with a defined business purpose

3.19 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.

3.20 transaction

communication event that fulfils a relationship between two roles

3.21 transaction map

representation of a set of messages that are exchanged between participating roles for a particular purpose

4 Information delivery manual

4.1 General

This Clause describes a series of concepts and principles that inform the development of an IDM.

4.2 Users of this part of ISO 29481

The main users are expected to be the IDM developers who create interaction maps, process maps, exchange requirements and information constraints using knowledge elicited from end users and solution providers.

In addition, some users of specific IDMs might identify needs for new IDMs and thus become users of this part of ISO 29481. These users include the following:

- professional IDM-developers and solution providers;
- information users, i.e. executive users and end users concerned with producing the content of the IDMs and benefiting from the result.

Another group of users will be those who use the documentation that results from the use of the standard, taking note of the business process and detailed specifications of the information that a user fulfilling a particular role would need to provide at a particular point within a project. Such users include the following:

- project manager, responsible for organizing the business process and ensuring that the information exchange is appropriately managed;
- BIM manager, making the necessary arrangements to support an exchange requirement;
- client, who initiates (develops) and includes an IDM in the contract;
- contractor/consultant, using the IDM to make the necessary arrangements to comply with the required business process and to comply with the required information delivery;
- business manager, using an IDM as a template or standard to be applied in many projects within its organization;
- construction organization, using an IDM for a specific project type as a template or standard to be applied in the sector.

4.3 Business context

Figure 1 shows an example of a business context that requires an IDM: a client (Role 1) engages a consultant (Role 2) to deliver some service. In such a scenario, there is a need to understand and formalize both the collaborative and contractual aspects of their relationship and how information will be delivered within that context. The IDM describes the information requirements associated with all the transactions (both ways) associated with that relationship. Some of that information will be held within a BIM, while other may originate from either party or from an external source.

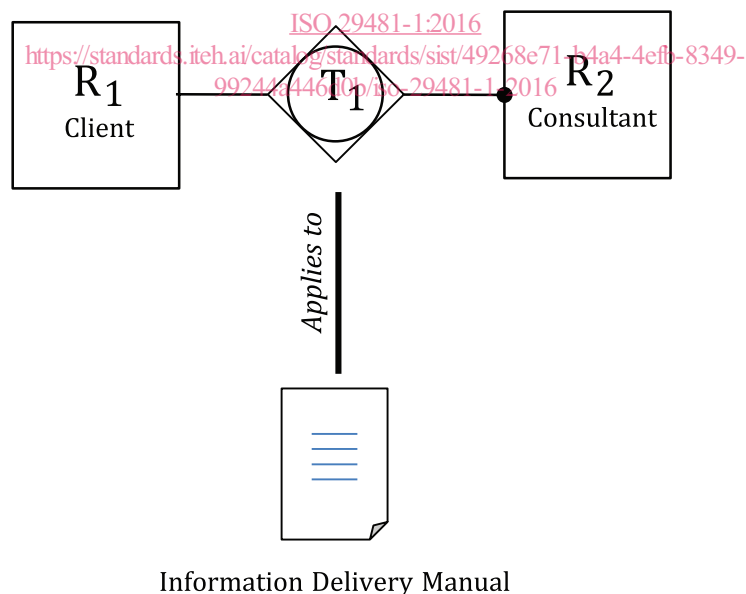


Figure 1 — Example of a simple business context requiring an IDM

The first step in developing an IDM is to consider the nature or context of the information exchange. There are two ways of looking at that, each with an associated methodology.

- Process maps are most useful when the focus is on the business processes (defined by activities executed by actors with roles) that need to be followed to deliver a service or produce an end product (such as a design). In this case, the information that is the focus of the IDM is associated with a business requirement.

- Interaction maps/transaction maps are most useful within a business process when the focus is on the interactions between actors with roles who are to deliver a service or product and the concern is to ensure that agreed communication protocols are in place to ensure that the project goals are achieved. In this case, the information that is the focus of the IDM is associated with a transaction.

These are complementary approaches and are explained in further detail in later sections. Within a given business context, it may be appropriate to use both methodologies: process mapping can be used to clarify the details of a transaction identified in an interaction mapping exercise, while an interaction map can be used to rigorously understand an information transaction defined in a process map.

4.4 Complete schema

Where the information requirements are satisfied by a BIM, a complete information schema that covers all of the information required for all actors throughout the construction process will be large and comprehensive. Such a schema is relevant in defining all of the project information needs for all business processes at all life cycle stages, but it is not the way that project information is usually delivered.

4.5 Breaking a complete schema to support requirements

It is more usual for information to be exchanged about a particular topic and the level of detail provided to be driven by the life cycle stage. This may be a single business process at a specific point in the project life cycle, but commonly consists of information units that may be relevant to more than one life cycle stage or business processes. This is commonly referred to as a model view and is a matter of deciding which components of the information schema should be used to meet requirements.

4.6 Supporting the building information modelling process

Elements of the overall information schema are used in a building information model (see [Figure 2](#)). For a particular business process, only certain classes of information are required. Multiple objects are derived from each class, each object having an identity (determined by a unique identifier) and a state (determined by the values given to each attribute of the object). The classes that support the business process form a unique and identifiable standard schema or model view.

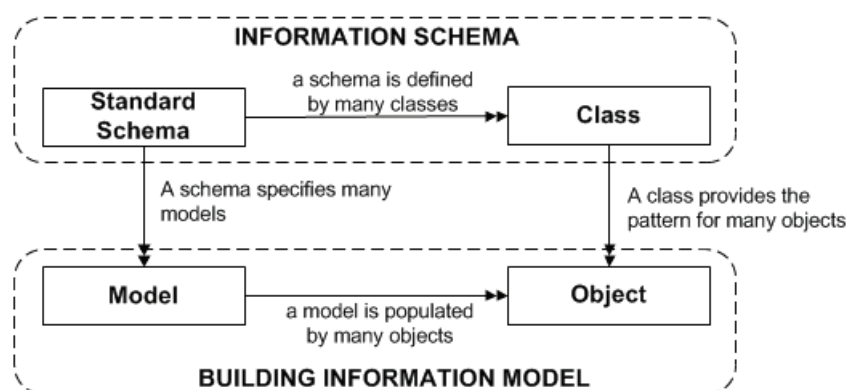


Figure 2 — Supporting the BIM process

4.7 Supporting the business process

To do this means that the set of information required to be exchanged to support a particular business process or interaction in the relevant life cycle stages (within a business process) shall be established. This is termed an exchange requirement.

An exchange requirement provides a description of the information to be exchanged in non-technical terms. An exchange requirement may support the communication of object information enabling

the construction and operation of a project or it may support the communication of management information that controls the project execution.

4.8 Supporting the software solution

Moving from the defined exchange requirement to a software implementation provided by a solution provider involves the development of a model view definition (MVD). This approach supersedes the need to implement functional parts as defined in earlier versions of this International Standard.

4.9 Content in the specific IDM

The content in a specific IDM shall

- describe the need for information exchange within the business context,
- identify the actors sending and receiving information,
- define, specify and describe the information being exchanged to satisfy the requirements at each point within the business context,
- ensure that definitions, specifications and descriptions are provided in a form that is useful and easily understood,
- create detailed specifications of the information captured within exchange requirements to facilitate the development of BIM software applications, and
- ensure that the information specifications can be made relevant to local working practices.

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

5 IDM Framework

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5.1 General

An information delivery manual comprises ([Figure 3](#)) the following:

- an interaction map/transaction map and/or a process map;
- one or more exchange requirements.

The interaction map defines the roles involved and the transactions between roles. For each defined transaction, one role is initiator while another is executor. The corresponding transaction map defines the messages in a transaction and the rules that apply on the sequence of execution.

The process map shows a swim lane for each role and defines within the lane the relevant sequence of activities to be executed by that role. Activities undertaken by different roles may have relations that require an exchange of information in the form of a message. Such messages correspond to a message in a transaction shown in a transaction map.