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Building information modelling — Level of information need —

Part 1: Concepts and principles

Modélisation des informations de la construction (BIM) — Niveau du besoin d'information —

Partie 1: Concepts et principes

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Foreword

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This document was prepared by Technical Committee ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 13, *Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM),* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 442, *Building Information Modelling (BIM),* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 7817 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.

Introduction

This document sets out the concepts and principles for defining the level of information need and information deliveries which form part of the information exchange processes during the life cycle of built assets when using building information modelling (BIM). These concepts and principles can deliver clear benefits to all participants in the various life cycle phases of built assets as they provide a common understanding on the right level of information needed at a certain time. One purpose of defining the level of information need is to prevent delivery of too much information. Information exchange should ensure the required information to be delivered at the agreed time for the agreed purpose to facilitate verification and validation processes.

This document provides methods for describing information to be exchanged according to exchange information requirements. The exchange information requirements specify the wanted information exchange. The result of this process is an information delivery.

There is a need that these concepts and principles are described in a common and comparable way to allow services related to building information modelling to be procured and offered on a global scale. The need has arisen by the fact that there are several conflicting terms, concepts and usages in place, internationally, that hinder the objective of having a common understanding and practise in describing the level of information need. It is therefore helpful not to use an acronym to refer to level of information need as this can oversimplify these concepts.

The concepts and principles contained in this document are aimed at all those involved in the asset life cycle. These include, but are not limited to, the asset owner/operator, the client, the asset manager, the design team, the construction team, an equipment manufacturer, a technical specialist, a regulatory authority, an investor, an insurer and an end-user.

The information exchange, as well as related topics such as the exchange information requirements and the information delivery are defined and explained in context of ISO 19650-1 and ISO 29481-1.

Building information modelling — Level of information need —

Part 1: Concepts and principles

1 Scope

This document specifies concepts and principles to establish a methodology for specifying level of information need and information deliveries in a consistent way when using building information modelling (BIM).

This document specifies the characteristics of different levels used for defining the detail and extent of information required to be exchanged and delivered throughout the life cycle of built assets. It gives guidelines for principles required to specify information needs.

The concepts and principles in this document can be applied for a general information exchange and while in progress, for a generally agreed way of information exchange between parties in a collaborative work process, as well as for an appointment with specified information delivery.

This document is applicable to the whole life cycle of any built asset, including strategic planning, initial design, engineering, development, documentation and construction, day-to-day operation, maintenance, refurbishment, repair and end-of-life.

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

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 29481-1, ISO 6707-1 and the following 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
information container
named persistent set of *information* (3.11) retrievable from within a file, system or application storage hierarchy

EXAMPLE Including sub-directory, information file (including model, document, table, schedule), or distinct subset of an information file such as a chapter or section, layer or symbol.

Note 1 to entry: Persistent information exists over a timescale long enough for it to have to be managed, i.e. this excludes transient information such as internet search results.

Note 2 to entry: Naming of an information container should be according to an agreed naming convention.

[SOURCE: ISO 19650-1:2018, 3.3.12, modified — Note 1 to entry has been removed; subsequent notes to entry have been renumbered.]

3.2
information delivery milestone
scheduled event for a predefined *information exchange* (3.3)

[SOURCE: ISO 19650-2:2018, 3.1.3.2]

3.3
information exchange, verb
act of satisfying an *information* (3.11) requirement or part thereof

[SOURCE: ISO 19650-1:2018, 3.3.7]

3.4
information model
set of structured and unstructured *information containers* (3.1)

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

3.5
level of information need
framework which defines the extent and granularity of *information* (3.11)

Note 1 to entry: One purpose of defining the level of information need is to prevent delivery of too much information.

[SOURCE: ISO 19650-1:2018, 3.3.16]

3.6
verification
confirmation, through the provision of objective evidence, that specified requirements have been fulfilled

[SOURCE: ISO 9000:2015, 3.8.12, modified — Notes 1 to 3 to entry have been removed.]

3.7
validation
confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled

[SOURCE: ISO 9000:2015, 3.8.13, modified — Notes 1 to 3 to entry have been removed.]

3.8
breakdown structure
decomposition of a defined scope into progressive levels

[SOURCE: ISO 21511:2018, 3.13 modified — The word “work” has been deleted from the term; “scope of the project and programme” has been replaced with “scope”; “progressively lower levels consisting of elements of work” has been replaced with “progressive levels”.]

3.9
object
any part of the perceivable or conceivable world

[SOURCE: ISO 12006-2:2015, 3.1.1, modified — Note 1 to entry has been removed.]

3.10
geometry
shape, size and location of an *object* (3.9)

[SOURCE: ISO/IEC 13249-3:2016, 3.1.2.27, modified — The word "size" has been added; "geographic location" has been replaced with "location"; "feature" has been replaced with "object".]

3.11
information
meaningful data

[SOURCE: ISO 9000:2015, 3.8.2]

3.12
geometrical information
information (3.11) expressed using *geometry* (3.10)

3.13
alphanumerical information
information (3.11) expressed using characters, digits and symbols or tokens

EXAMPLE Mathematical symbols and punctuation marks are such tokens.

3.14
documentation
collection of documents related to a given subject

[SOURCE: IEC 82045-1:2001, 3.2.4, modified — Notes 1 to 4 to entry have been removed.]

3.15
information deliverable
information container (3.1) used to fulfil an appointment

4 General

To support information exchange, level of information need should be used.

The level of information need provides a framework for describing information exchanged in terms of geometrical information, alphanumerical information and documentation. Different purposes have their own needs of geometrical information, alphanumerical information and documentation.

The level of information need should be used to discuss and agree on the information exchange between two or more actors.

The level of information need describes information requirements that can be human-readable and machine-interpretable.

5 Framework to specify the level of information need

5.1 General

In specifying the level of information need and how information is going to be delivered, the following prerequisites shall be considered:

— purposes of the information to be delivered;

— information delivery milestones for the delivery of the information;

— actors who are either information receivers or information providers of the information;

— objects organized in one or more breakdown structures.

The specification of level of information need is informed by but does not include the listed prerequisites (see also Figure 8 in 6.5 for the relationship between the prerequisites and the level of information need).

See Annex A for more information related to the conceptual relationships between this document, ISO 19650-1 and ISO 29481-1.

5.2 Consider the purposes

In specifying the level of information need, the purposes for information delivery shall be considered.

The purposes should be specified to clarify why the information is needed. The level of information need should be used for the purposes it has been required for.

The level of information need does not specify the purposes.

To achieve the same purpose, the geometrical information, alphanumerical information and documentation can vary for different objects.

EXAMPLE 1 To perform an accessibility analysis, properties such as the clear opening width of a door, its location, the position and shape of the handle are needed. Other properties, such as the name of the manufacturer and the acquisition cost, are not relevant to fulfil the purpose. On the other hand, for cost analysis purpose, the acquisition cost of a door is needed, but the appearance of the handle is not relevant. For rendering purpose, the geometrical appearance of a door is relevant, while the name of the manufacturer and the acquisition cost are not.

At an information delivery milestone, the same level of information need required for an object can be used for different purposes.

EXAMPLE 2 In concept design, the same geometry and information of a block can be used for clash detection and quantity take off.

In some cases, the purpose should not be explicit to all actors (e.g. for security reasons). In those cases, the purpose should be considered as “not disclosed” and only authorized actors should be informed.

NOTE The purposes can be extracted from organizational information requirements, project information requirements and asset information requirements as described in ISO 19650-1:2018. 5.2, 5.3, 5.4 and ISO 19650-2:2018, 5.1.2.

5.3 Consider the information delivery milestones

In specifying the level of information need, information delivery milestones shall be considered.

The information delivery milestones should be specified to clarify when the information is needed.

The level of information need does not specify the information delivery milestones.

At the same information delivery milestone, the geometrical information, alphanumerical information and documentation can vary for different objects.

EXAMPLE 1 To do accessibility analysis, usually the same level of information need is required at different milestones.

EXAMPLE 2 To do energy analysis, different level of information need is required at different milestones.

5.4 Consider the actors

In specifying the level of information need, actors who receive and provide the information shall be considered.

The level of information need does not specify the actor (actors).

NOTE 1 The same level of information need can be required by different actors at the same milestone to fulfil different purposes.

NOTE 2 Different level of information need can be required by different actors at the same milestone to fulfil the same purpose.

NOTE 3 At different milestones, e.g. especially in the early phase, it is possible that the actor responsible for delivering specified level of information need is not specified.

EXAMPLE 1 A client can ask for a specific level of information need for an object at an agreed information delivery milestone without specifying who needs to deliver it. In this case the supply chain is free to assign responsibilities as preferred.

NOTE 4 Different actors can be responsible for different level of information need at the same information delivery milestone to fulfil the same purpose.

EXAMPLE 2 For design purposes, at an agreed information delivery milestone, a wall in a project can be made up of a structural element, architectural cladding and an air duct penetration with an air duct passing through the penetration. Mechanical, electrical and plumbing engineers are responsible for providing reliable information concerning the sizing of the duct and associated desired penetration sizing so that the structural and architectural teams can continue their work to respectively validate the wall structure and cladding design.

5.5 Consider the objects within a breakdown structure

In specifying the level of information need, the objects within a breakdown structure for the information delivery shall be considered.

The level of information need does not specify the objects within a breakdown structure.

To be able to specify the level of information need, the considered objects within a breakdown structure should be specified, identifying the semantic, functional and/or spatial decomposition of the project into objects (e.g. construction elements and spaces are identified) or any other breakdown structure.

NOTE 1 Based on the purpose, the level of information need can be related to:

a) construction results (spaces, construction complexes, construction entities and construction elements);

b) construction information (information model, building model, specification, documentation, diagram).

NOTE 2 Breakdown structures can follow a classification system, systems engineering principles or a federation strategy.

NOTE 3 Different purposes can require different breakdown structures and derived decompositions.

EXAMPLE To fulfil the purpose of cost estimation during the construction phase, a breakdown structure can be different from a breakdown structure required for scheduling.

6 Definition of level of information need and its subdivision

6.1 General

The level of information need is the framework which defines the extent and granularity of information to be exchanged. The level of information need should be described by different concepts:

— geometrical information;

— alphanumerical information;

— documentation.

The level of information need can be answered by a combination of geometrical information, alphanumerical information and/or documentation (see Annex B).

It is possible that information contained within documentation, geometrical information and alphanumerical information overlaps and/or is contradictory, which can create consistency problems within the information

model. A clear hierarchy of the information provided within different information containers should then be established.

Level of information need can either be predefined or can be defined for a particular information delivery.

NOTE 1 A predefined level of information need can be included in regulations, standards, plans of work, recommendations or specific project requirements; while other level of information need can be project specific.

If an aspect of level of information need is not relevant, 'not applicable' can be used.

EXAMPLE 1 For building permission purpose during the briefing, the geometrical information and alphanumerical information can be 'not applicable' if only documentation is required.

The level of information need identifies the amount of geometrical information, alphanumerical information and/or documentation required to address a specific purpose at a specified information delivery milestone or agreed date.

The aspects of level of information need for all identified objects at specific information delivery milestones should be combined to ensure that all identified purposes are met.

NOTE 2 This implies that geometrical information, alphanumerical information or documentation to be delivered for certain objects can be greater than what is strictly required for one particular identified purpose, because it is required by another identified purpose at the same information delivery milestone.

The status, tolerance, accuracy and reliability associated to the aspects of level of information need shall be considered to be managed through metadata.

NOTE 3 Metadata are initially indicated by its author and then amended by the following approval and authorization processes. ISO 19650-1 describes the use of metadata of information containers. In this document, the use of metadata is related to the specified geometrical information, alphanumerical information and/or documentation associated to objects.

6.2 Geometrical information

6.2.1 General

To specify the geometrical information of an object or a set of objects, the following independent aspects should be specified:

— detail;

— dimensionality;

— location;

— appearance;

— parametric behaviour.

NOTE 1 Figure 1 to Figure 7 illustrate the existence of the variation in a continuum within one aspect.

NOTE 2 Geometrical information contains several aspects from current different industry practices elaborating upon existing terms such as level of detail and level of geometry.

6.2.2 Detail

Detail as an aspect of geometrical information describes the complexity of the object geometry compared to the real-world object. This is a continuum ranging from simplified to detailed.

More refined geometric representations can contain more features, and/or be more decomposed, thereby being a better approximation of the shape of the real-world object.

EXAMPLE 1 In a project, the detail of the door can be different, depending on the required purpose and/or information delivery milestones. In early design, the door can be represented as a hole in the wall to support structural analysis (see Figure 1 A) or with a simplified box representing the door panel for asset management during operation (see Figure 1 B). Higher detail adds the different components, such as the threshold and casing for clash detection (see Figure 1 C), or even the door handle and glazing for visualization (see Figure 1 D).

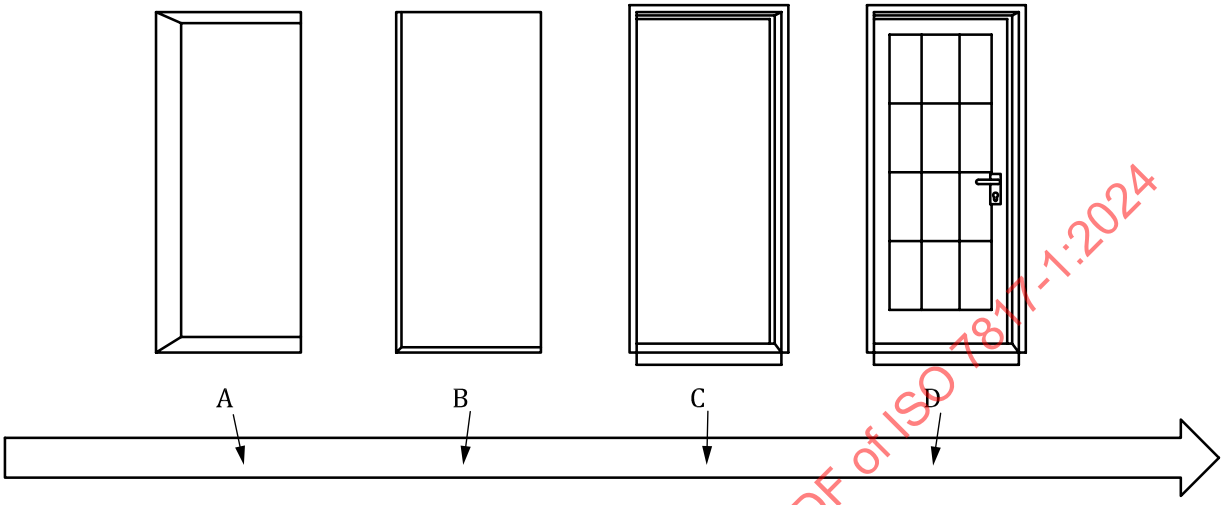


Figure 1 — Example of the concept of "continuum" associated to the detail of a door

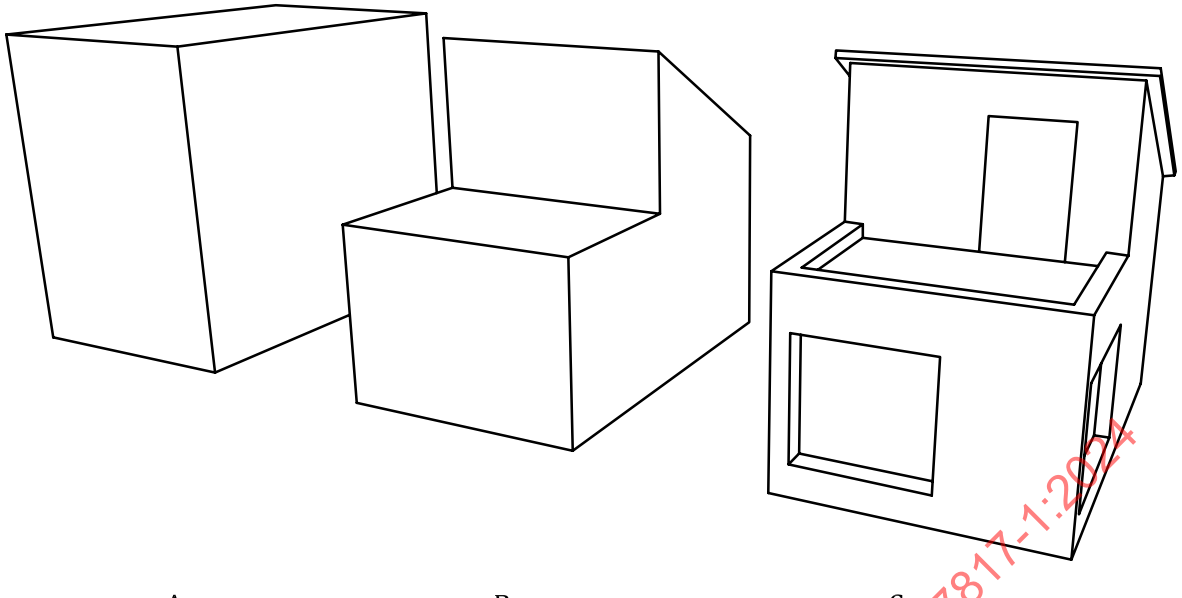
EXAMPLE 2 For facility management purposes the detail of a boiler can be simplified and reduced to a box including the volume of the operational space.

EXAMPLE 3 For clash detection purpose the detail of a boiler can be simplified and reduced to its outer shell.

EXAMPLE 4 For visualization purpose the detail of a boiler can use the detailed geometry from the manufacturer.

EXAMPLE 5 For 2D drawing production the detail of a door can be different based on the information delivery milestone.

EXAMPLE 6 For the same purpose at different information delivery milestones, the detail of a building can be different (see Figure 2).



A B C

Key

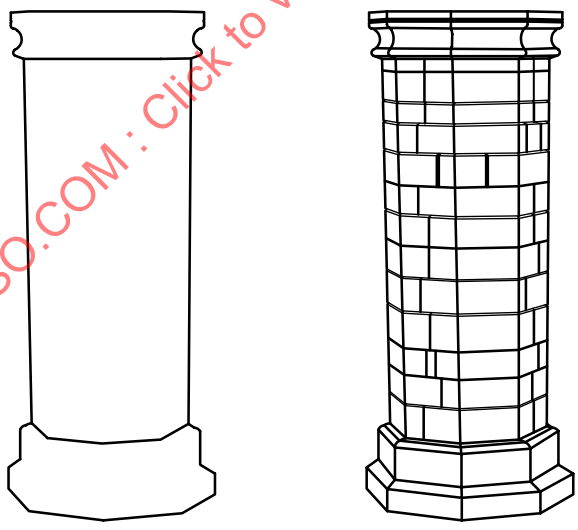
A example representation of the detail of a building at master planning delivery milestone

B example representation of the detail of a building at early design delivery milestone

C example representation of the detail of a building at detail design delivery milestone

Figure 2 — Example of three different representations of the detail of a building for light analysis

EXAMPLE 7 The same existing column can have different detail at the same information delivery milestone to support different purposes (see Figure 3).



A B

Key

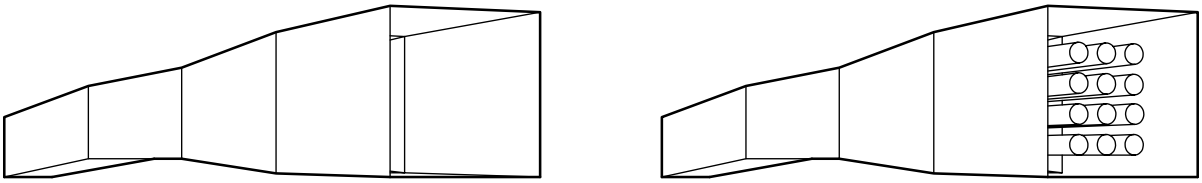
A purpose of site planning

B purpose of heritage conservation

Figure 3 — Example of different detail of a column at the same information delivery milestone for different purposes

EXAMPLE 8 For coordination the detail of an underground multitubular network can be simplified and reduced to its outer shell (see Figure 4 A).

EXAMPLE 9 For on-site construction the detail of an underground multitubular network can be detailed geometry including the individual tube components (see Figure 4 B).



A B

Key

A purpose of coordination

B purpose of on-site construction

Figure 4 — Example of different detail of an underground multitubular network at the same information delivery milestone for different purposes

6.2.3 Dimensionality

A number of spatial dimensions characterize an object.

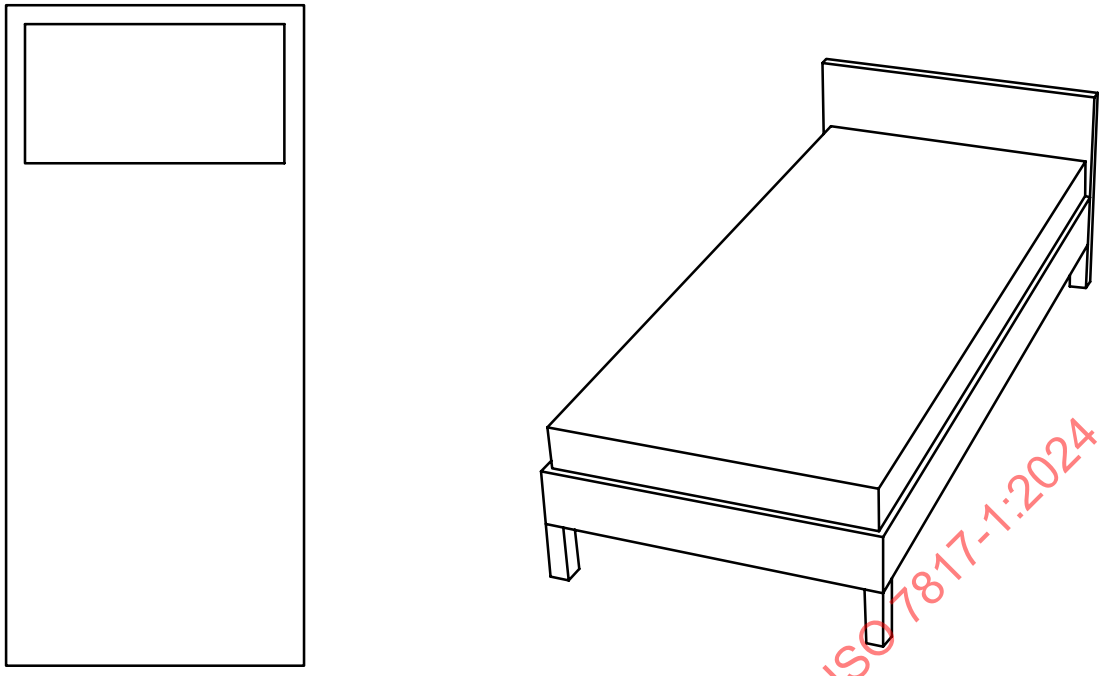
Dimensionality can be zero-dimensional — 0D (location point), one-dimensional — 1D (e.g. line, curve, path), two-dimensional — 2D (e.g. surface, face) or three-dimensional — 3D (e.g. body, volume).

EXAMPLE 1 For quantity take off purpose, in a 3D environment, the dimensionality of a pipe can be 1D to extract pipe lengths.

EXAMPLE 2 For clash detection purpose the dimensionality of a pipe can be 3D.

EXAMPLE 3 For the parcel management the dimensionality of a road can be 2D also in a 3D environment.

EXAMPLE 4 For furniture planning the dimensionality of a bed can be 2D, for accessibility analysis it can be 3D at the same information delivery milestone (see Figure 5).



A B

Key

A 2D dimensionality for furniture planning

B 3D dimensionality for accessibility analysis

Figure 5 — Example of dimensionality 2D and 3D of a bed at the same information delivery milestone for different purposes

6.2.4 Location

Location describes the position and orientation of an object. Location can be absolute, against a reference point, or relative, against another object.

EXAMPLE 1 The absolute location of an object can be expressed by its position and orientation in a reference system based on grids, alignment or reference point (e.g. a survey point in a coordinate reference system).

EXAMPLE 2 The relative location of an object can be expressed by its position and orientation in terms of topological relationships with other objects (e.g. a window can be positioned at a specified distance along the length of a wall).

6.2.5 Appearance

Appearance describes the visual representation of an object. This is a continuum ranging from symbolic to realistic compared to the real-world.

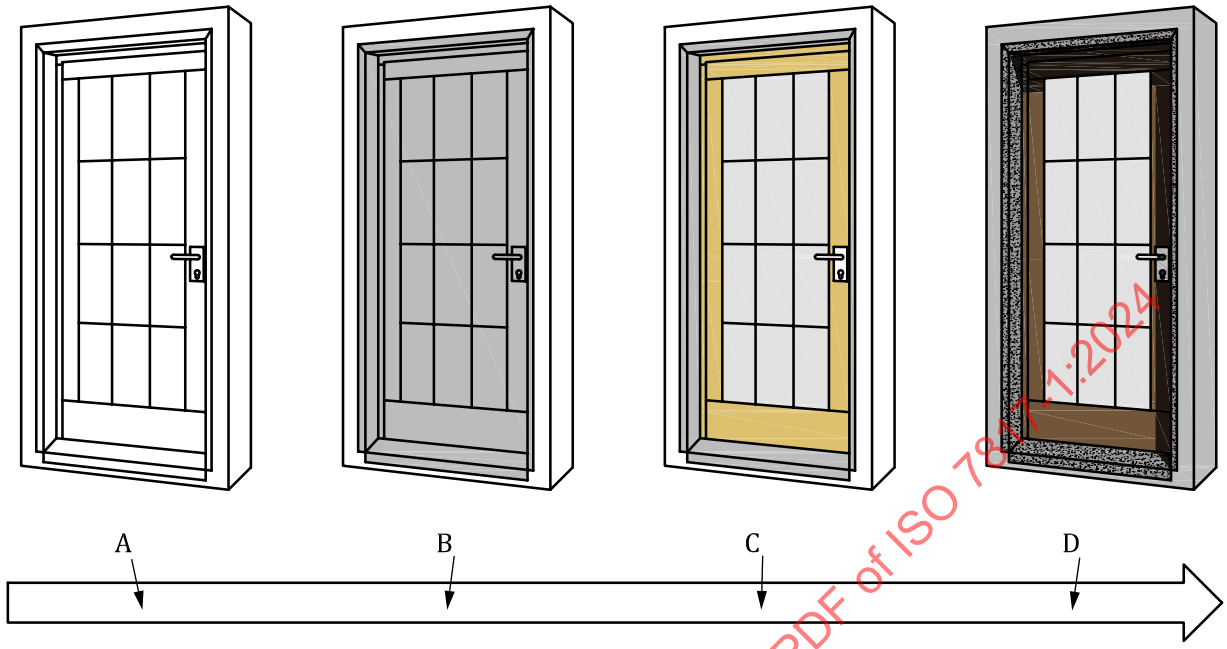
More refined appearance can contain more shading characteristics (e.g. diffuse colouring, transparency, reflectance, emissivity), thereby being a better approximation of the visual characteristic of the real-world object. Shading characteristics can be expressed in many ways, e.g. as colours and/or texture maps.

EXAMPLE 1 For communication purpose the appearance of a plumbing pipe can be symbolic using red or blue colours describing the water temperature.

EXAMPLE 2 For coordination purpose the appearance of a plumbing pipe can be “not applicable”.

EXAMPLE 3 For visualization purpose the appearance of a plumbing pipe can be realistic using colours and texture from the manufacturer.

EXAMPLE 4 For a door the appearance can be different for different purposes: for clash detection no appearance is required (see Figure 6 A), for function analysis a thematic colour can be used (see Figure 6 B), for building permit the colour can indicate the individual materials of the door components (see Figure 6 C), for rendering purpose a realistic appearance can be used (see Figure 6 D).



Key

A no colour
B single colour
C material colour
D textures

Figure 6 — Example of different appearances of a door

6.2.6 Parametric behaviour

Parametric behaviour describes whether or not the shape, position and orientation is created to remain dependent on other information associated to the object, or to the context, into which the object is placed, allowing full or partial reconfiguration.

Parametric behaviour of an object can be transferred as part of the information delivery or not. In the context of information exchange, the parametric behaviour can be fully, partially or not requested.

The following geometry types can allow the transfer of parametric behaviours to a certain degree:

— explicit geometry: definition of shape as boundary representations (vertices, edges and faces) that do not allow for modification of the shape by other parameters;

— constructive geometry: definition of shape as constructive solid geometry based on geometric primitives and swept solids that allow for modification of the shape by shape parameters;

— parametric geometry: definition of a singular shape or an assembly of shapes by equations that provide values for the shape parameters allowing for shape modifications based on object or context characteristics.

EXAMPLE 1 The same shape (see Figure 7 A) allows different manipulations, depending on its parametric behaviour. With explicit geometry, you may move a single vertex (see Figure 7 B), with constructive solid geometry, you may use a different profile to extrude (see Figure 7 C) and with parametric geometry, you can change the values of parameters P1, P2 and P3 (see Figure 7 D).

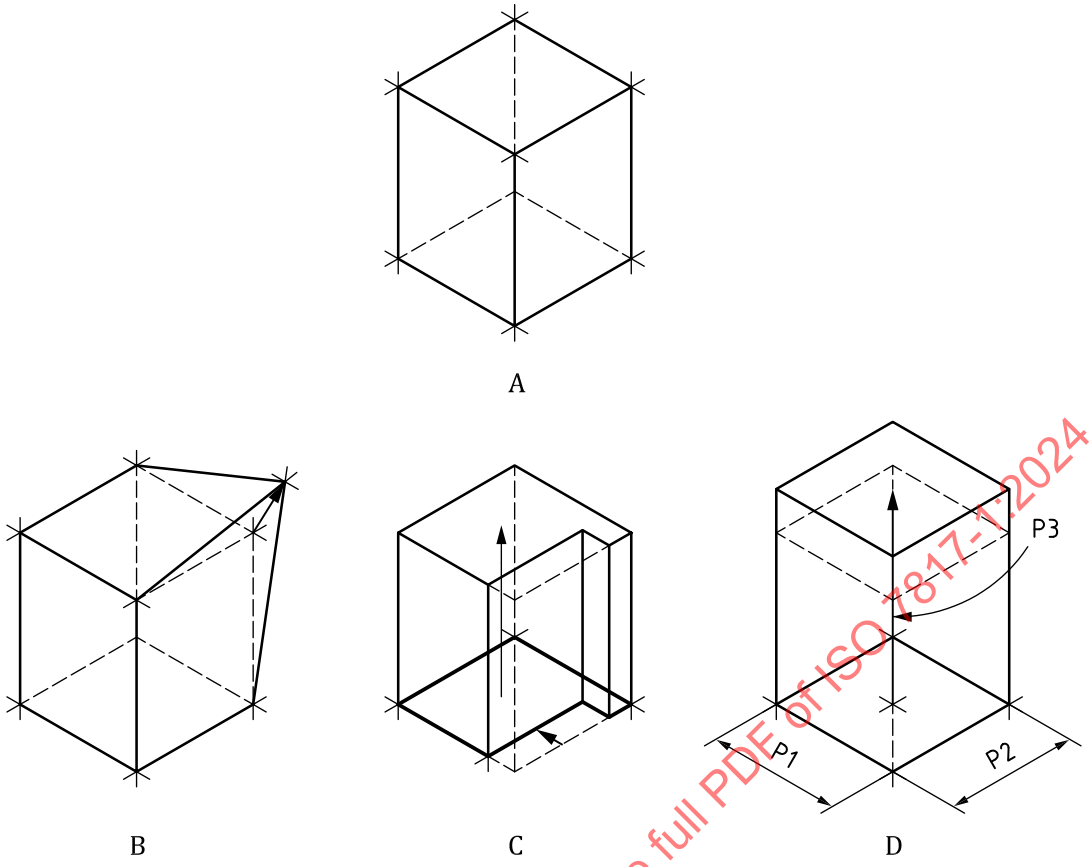


Figure 7 — Example of different parametric behaviours

EXAMPLE 2 Transferring building elements such as walls, slabs, roofs as constructive geometry enables the receiving model element author to import the information model and use the appropriate tools for splitting, changing etc.

6.2.7 Relationships of aspects of geometrical information and prerequisites

Detail, dimensionality, location, appearance and parametric behaviour are independent.

Specific definitions for each object should be provided to enable verification and validation against specific purposes.

Multiple details, dimensionality, location, appearance and parametric behaviour can be required for the same object depending on the purposes.

EXAMPLE 1 For a quantity take off purpose, the dimensionality of a pipe can be 1D to extract pipe length, without requiring 3D dimensionality nor its position. However, that same object can require 3D dimensionality and its position for clash detection purpose.

EXAMPLE 2 For visualization purpose during a design contest the dimensionality of an object can be 3D and the appearance can be realistic, while the detail can be simplified.

6.3 Alphanumerical information

6.3.1 General

To specify the alphanumerical information for an object or a set of objects, the identification and information content should be specified.

Alphanumerical information should be represented by or linked to a data template according to ISO 23387.

6.3.2 Identification

Identification is used to position an object within a breakdown structure.

EXAMPLE Name, type name, classification, codification, reference structuring, index, numbering.

6.3.3 Information content

Information content is the list of all required properties.

Properties can be grouped to facilitate the management of the alphanumerical information.

EXAMPLE 1 Alphanumerical information for objects during an early design can specify a presence of only objects identified as external walls and an information content containing name of the type, classification and a property indicating if the object is load bearing.

EXAMPLE 2 Alphanumerical information for objects during the final handover for operational purpose, can specify a presence of all objects identified as requiring maintenance. They will have an extensive information content, including product, manufacturer and warranty information.

EXAMPLE 3 Based on the chosen breakdown structure, alphanumerical information can be specified for all objects, set of objects with a common type, or for individual objects.

The alphanumerical information should be based on types or sets of objects with similar characteristics.

EXAMPLE 4 For quantity take-off purpose, the information content for all objects can include e.g. a type name, the breakdown structure code and/or volume and area.

The alphanumerical information can be used to identify objects to fulfil a specific purpose.

EXAMPLE 5 For a cost estimation of the structure, only objects which have the property “load bearing” can be retained.

6.4 Documentation

The documentation for an object or a set of objects to support processes, decisions, approvals and verification of information deliverables should be specified as a set of required documents.

EXAMPLE 1 To get approval of proposed design solutions, e.g. with technical requirements.

To supplement the modelling process, e.g. a door handle not being modelled but described within documents.

To get milestone approvals in e.g. the conceptual phase or the design phase.

To reuse the output from one process as an input for the next phase or a new process.

To obtain a complete and finalized documentation on the finalized construction entity, e.g. as built.

Documentation can consist of different types of information containers.

EXAMPLE 2 Possible types of documents include:

— reports (such as geotechnical reports, reports of existing building conditions, soil surveys, pre-calculations);

— specifications;

— manuals (such as maintenance and user manuals);

— photographs (such as records of work done, records of existing conditions);

— hand-drawn sketches (such as initial sketches, site plans);

— signed documents (such as test certificates, insurance policies, delivery notes);

— hard copies of geometrical information or alphanumerical information can also be considered as documents.

Documentation can cover one or more construction elements, spaces, construction entities, etc. The documentation indicates that a specific collection of documents is needed.

NOTE Documents can be interoperable and/or machine-interpretable. Documents can be directly linked to geometrical information or alphanumerical information, e.g. within an information container. Documents can be related to other information containers by linking, attaching or by referencing to the information model e.g. using a defined classification and identification method referencing a breakdown structure.

6.5 Relationship diagram on level of information need

Figure 8 shows the level of information need diagram and the relation with the prerequisites illustrated in Clause 5.

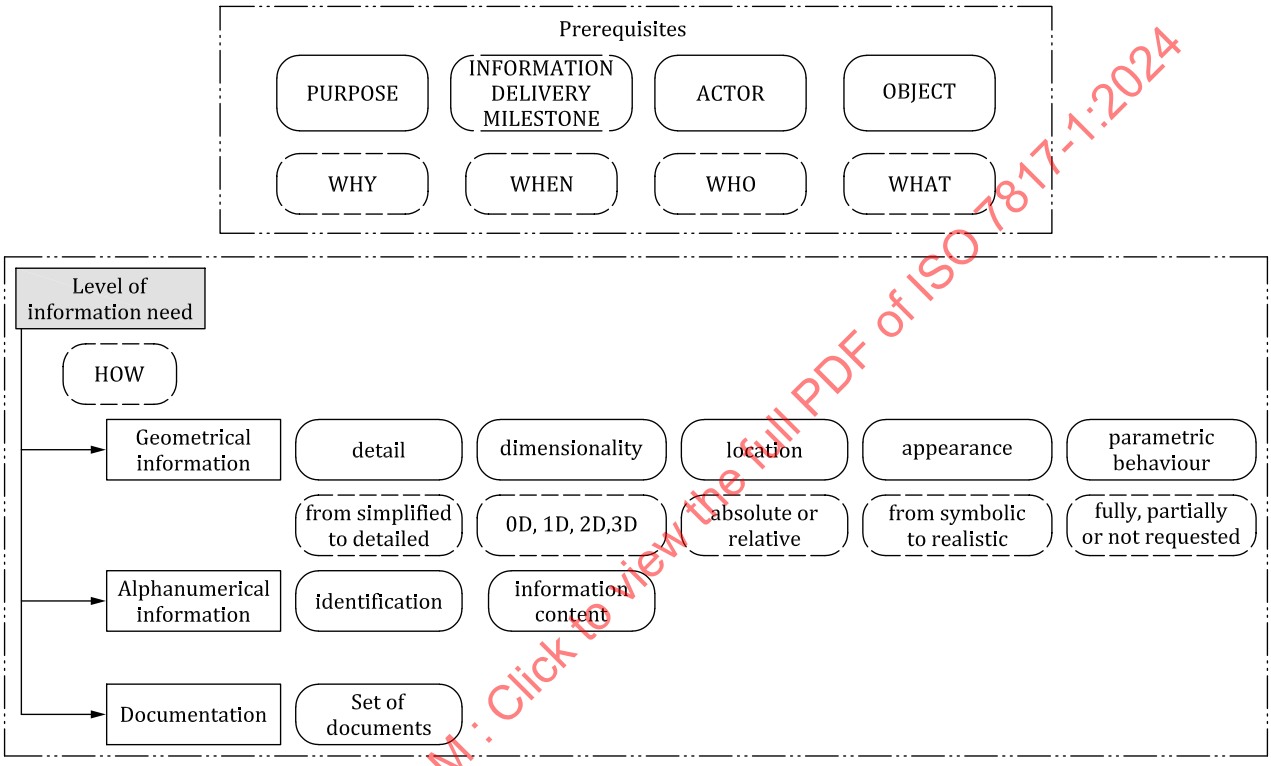


Figure 8 — Relationship diagram on level of information need

Alphanumerical information, geometrical information and documentation can be derived from each other.

Alphanumerical information can be derived from geometrical information, e.g. the dimensions of an object, the distance between objects.

Documentation can be derived from geometrical information, e.g. views extracted from an information model and recorded as an external document.

Geometrical information can be described from alphanumerical information.

EXAMPLE 1 The nominal width of a road as alphanumerical information can steer the generation of the geometrical representation of the road.

Documentation can be derived from alphanumerical information.

EXAMPLE 2 Schedules extracted from an information model and recorded as an external document.

7 Verification and validation

Level of information need is a framework that supports the verification and validation processes.

Using the concepts and principles of this document allows the verification that specifying level of information need has been fulfilled, conforming to the prerequisites and the incorporation of level of information need in the exchange information requirements and information delivery plan.

Verification and validation can be performed when an information deliverable has been provided according to the specified level of information need, exchange information requirements and its associated acceptance criteria. Level of information need should be specified in a way to allow both manual and machine interpretable verification and validation processes and/or schemas. Machine interpretable specification of level of information need reduces time and human errors when verifying and validating information deliverables.

Level of information need should be specified in a clear and unambiguous way to avoid different interpretations of the same requirement.

Verification of information deliverables against the level of information need can support checking the presence of objects (e.g. a building, a space, a door), alphanumerical information (e.g. fire resistance, expected life, exposition class), geometrical information (e.g. location, dimensionality), and/or documentation (e.g. building permit, warranty).

EXAMPLE 1 The verification of an information deliverable can check the presence of the fire resistance property for each object that requires such a check (e.g. a fire door).

Validation of information deliverables against the level of information need ensures that the provided alphanumerical information, geometrical information and documentation can be used for the purpose they have been specified for.

EXAMPLE 2 The validation of an information deliverable can check that the value of the fire resistance property is a time-based value or similar according to national legislations.

Reliability and tolerance can be added as metadata to alphanumerical information, geometrical information, and documentation.

NOTE Completeness of verification criteria is included within ISO 19650-4:2022, 7.6.

Annex A
(informative)

Overview of the main concepts related to information exchange

Figure A.1 explains the main concepts related to information exchange included in this document, in ISO 19650-1 and in ISO 29481-1. Only terms defined in the standards mentioned are provided. Figure A.1 is thereby a focused section of some of the important processes described in these standards and it represents the relations between these concepts at the time of the publication of this document; it can change in the future.

Level of information need, process maps and interaction/transaction maps contribute with prerequisites and elements of exchange information requirements (EIR) and exchange requirements (ER). The EIR and ER define information exchange and transactions by information containers which result in information deliverables. The model view definition (MVD) supports the transaction. Geometrical information and alphanumerical information can be parts of documentation. Geometrical information, alphanumerical information and documentation can individually or collectively be parts of information containers.

The level of information need can be used to describe:

— EIR between two parties, e.g. the appointing party and the lead appointed party as described in ISO 19650-1.

— ER between several parties in the processes as described in ISO 29481-1.

The level of information need can be used whether or not there is a formal appointment.

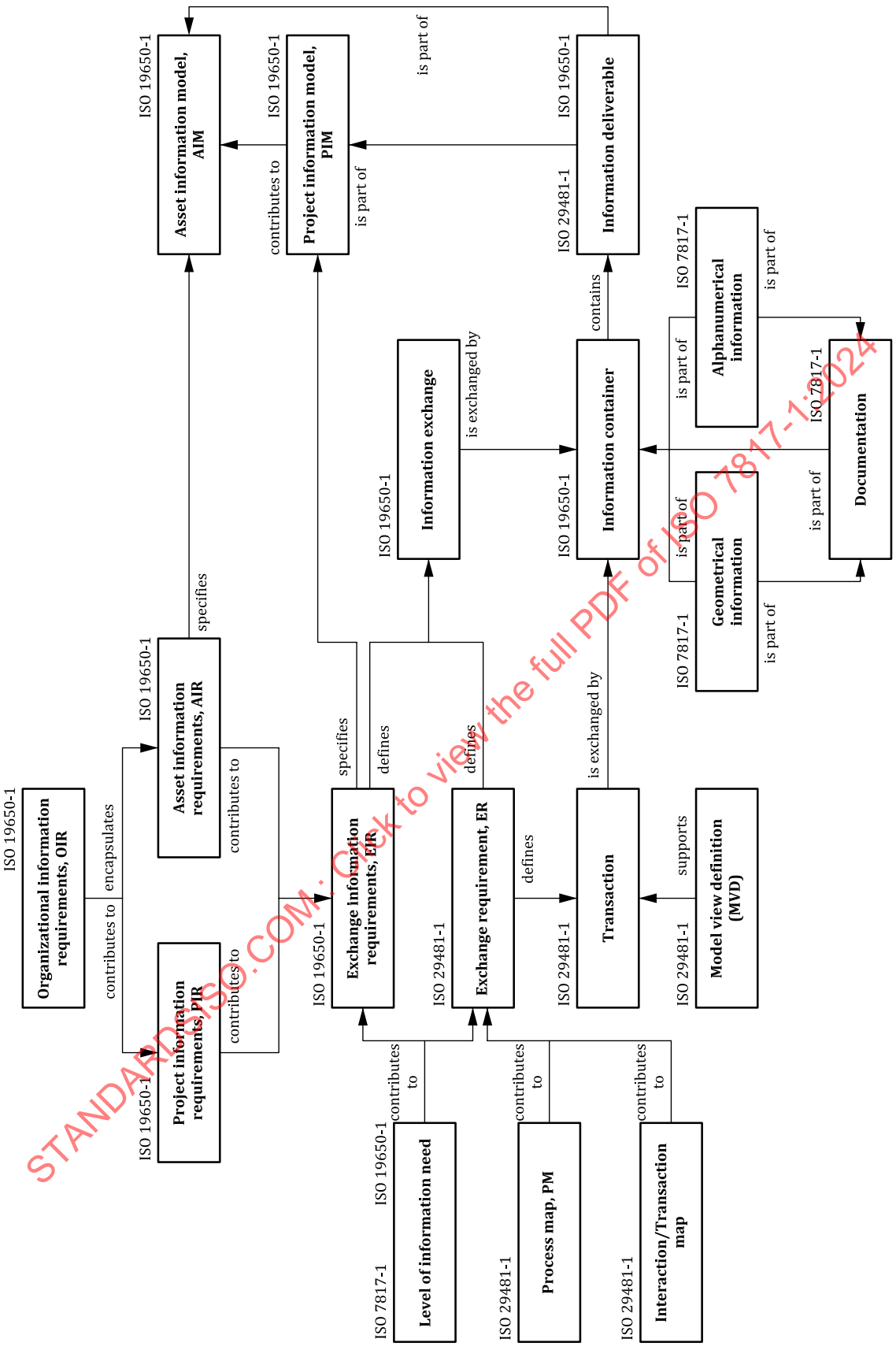


Figure A.1 — Conceptual relationships between this document, ISO 19650-1 and ISO 29481-1

Annex B
(informative)

Examples of methods to specify level of information need

B.1 General

This annex describes some examples to specify the level of information need. This annex does so through the use of a single scenario, shown in two examples.

The same method or methods included in this annex can be applied for every project information delivery milestone for all purposes. Further examples can be found in other parts of the ISO 7817 series.

Each example has been created from the prerequisites detailed in this document, particularly the relationship diagram on level of information need.

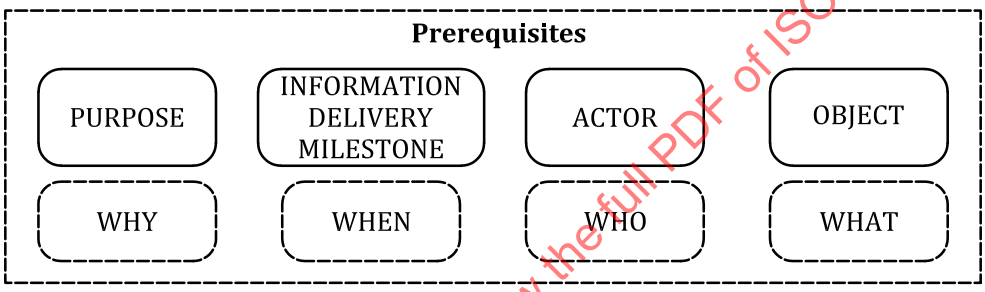


Figure B.1 — Prerequisites as shown in a section of Figure 8

NOTE The order in which prerequisites are listed can be flexible. For example, the purpose does not always precede information delivery milestone and it can be considered after the information delivery milestone has been determined.

B.2 Examples

B.2.1 General

The following two examples use the same prerequisites but demonstrate different possible ways of presenting the information. The first example uses a table approach whilst the second uses a clause-based approach.

The prerequisites are listed in the order as shown in Figure B.1, being:

— purpose (why);

— information delivery milestone (when);

— actor (who);

NOTE 1 According to 5.1 two types of actors are presented: actors who receive information and actors who provide information. Provision has been provided for both information receiver and information provider.

— object (what).

NOTE 2 5.5 states 'the objects within a breakdown structure for the information delivery shall be considered'. Provision has been provided for both object and breakdown structure.