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BSI Standards Publication

Framework for building information modelling (BIM) guidance

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National foreword

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Framework for building information modelling (BIM) guidance

Cadre pour les directives de modélisation des données du bâtiment

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Case postale 56 • CH-1211 Geneva 20
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Foreword

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ISO/TS 12911 was prepared by Technical Committee ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 13, *Organization of information about construction works*.

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Framework for building information modelling (BIM) guidance

1 Scope

This Technical Specification establishes a framework for providing specifications for the commissioning of building information modelling (BIM).

This Technical Specification is applicable to any range of modelling of buildings and building-related facilities, from a portfolio of assets at a single site or multiple sites, to assets at a single small building and at any constituent system, subsystem, component or element. It is applicable to any asset type, including most infrastructure and public works, equipment and material. BIM processes are applicable across the entire life cycle of a portfolio, facility or component, which can span inception to end-of-use. The main user of the framework is the information manager, who utilizes the framework to assist in structuring an international-, national-project- or facility-level BIM guidance document. The framework can also be used for BIM guidance provided by application providers.

2 Normative references

The following referenced documents are indispensable for the application 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 6707-1, *Building and civil engineering — Vocabulary — Part 1: General terms*

ISO 29481-1:2010, *Building information modelling — Information delivery manual — Part 1: Methodology and format*

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
building information model
building (construction) information model
BIM
shared digital representation of physical and functional characteristics of any built object, including buildings, bridges, roads, process plant

NOTE 1 Adapted from ISO 29481-1:2010, definition 2.2.

NOTE 2 Building information model is frequently used as a synonym for BIM.

NOTE 3 It may form the common basis for decisions and may form the contractual point of reference, across one or more stages in the life cycle.

3.2
building information modelling
building construction information modelling
process of managing information related to the facilities and projects in order to coordinate multiple inputs and outputs, irrespective of specific implementations

NOTE BIM is the most common acronym for a broad range of methods being applied in the facilities project sector. The reference to building is historic, as the change in approach from conventional documentation is most pronounced in the building sector, but similar changes are affecting infrastructure and other facilities.

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3.3
BIM guidance document
document that aids users in achieving their intended results through the use of BIM

NOTE 1 See ISO/TR 18529.

NOTE 2 BIM can aid users in discovering the capabilities of a system, enable them to generate a plan for accomplishing their goals, assist users in accomplishing a goal or help users manage error situations.

EXAMPLE Guide, guideline, manual, handbook.

3.4
IDM
information delivery manual
strategy for identifying the processes, exchange requirements, business rules and functional parts for information exchanges in facility projects

NOTE See ISO 29481-1:2010.

3.5
information model
formal model of a set of facts, concepts or instructions to meet a specific requirement

3.6
constraint
relationship between two or more elements in a model, which should be maintained in any modifications made subsequent to a model transfer

NOTE 1 See ISO 10303-108.

NOTE 2 A constraint is either an objective or a measure.

3.7
project
unique process consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of time, cost and resources to effect change to the physical or operational aspects of a facility

NOTE Adapted from ISO 9000:2005, definition 3.4.3.

3.8
clause
subsection of a guidance document which contains an objective and one or more definitions and requirements

3.9
facility
physical structure or installation, including related site works, serving one or more main purpose

NOTE It can require management over part or all of its life cycle.

3.10
framework
structure of processes and specifications designed to support the accomplishment of a specific task

[ISO/IEEE 11073-10201:2004, definition 3.22]

3.11
measure
quantitative or qualitative assessment of relative achievement of a desired quality characteristic

NOTE 1 It is able to be tested against a descriptive model, such as a BIM or a BIM guidance document.

NOTE 2 The outcome is true, false or unknown.

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3.12
objective
constraint that is measurable by examination of its constituent objectives and measures

3.13
life cycle
stages and activities spanning the life of the system from the definition of its requirements to the termination of its use, covering its conception, development, operation, maintenance support and disposal

NOTE 1 Adapted from IEC 61508 and ISO/IEC 15288:2008, definition 4.10.

NOTE 2 Adapted from ISO/TR 18529:2000, Clause 3.

4 Intentions

4.1 Intention of the framework

The construction and facilities industry is adopting the use of object-orientated methods in capturing the information about its products. This is being driven internally by demands for efficiency and externally by demands for a higher quality and value in the product. In order to maximize the return on this investment, the industry needs better structured and more re-usable performance specifications. This Technical Specification specifies a framework for providing a specification for the commissioning of BIM. The framework allows international-, national- and project-specific BIM guidance documents to be collated and partners in new projects to assimilate the practices and expectations of other partners. It is intended that supplements be merged into or appended to this Technical Specification. The objectives of the framework are the following.

a) Create a common framework giving guidance for the application of BIM:

   1) aid the development of clear and repeatable processes;

   2) allow international, national and project/enterprise guidance document to be prepared according to a common framework;

   3) allow application guidance documents to be prepared according to the same common framework.

b) Make BIM guidance documents manageable:

   1) encourage completeness of guidance documents by providing a check-list of outcomes, management and inputs;

   2) encourage the provision of reasoned explanations for demanded performance;

   3) achieve extensibility of guidance documents;

   4) support the merging and comparing of “BIM guidance” documents.

c) Make BIM guidance able to be tested:

   1) encourage the testing of guidance documents against this framework;

   2) encourage the testing of BIM usage against guidance documents;

   3) encourage the use of formal contractual clauses which refer to guidance documents.

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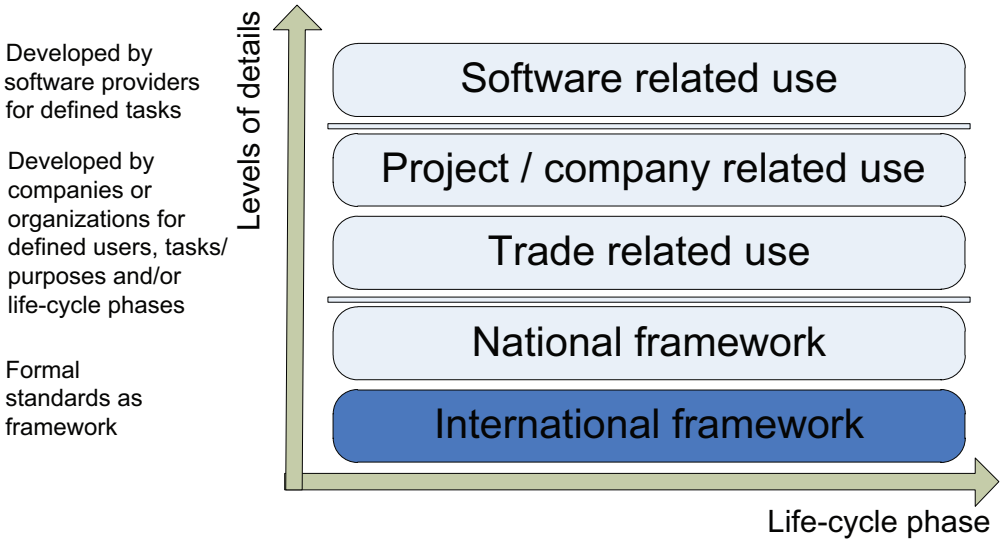

Figure 1 — BIM guidance provided at various levels

4.2 Intention of BIM guidance documents

BIM guidance documents are used for a variety of purposes, including to

a) establish the desired outcomes and define appropriate quality,

b) identify appropriate management effort and tools,

c) identify necessary effort and resourcing, and

d) achieve and maintain a common understanding within the national and project contexts.

4.3 Overview of framework sections

BIM guidance documents may additionally address the presentational conventions for application in the generation of drawings and documents. This content may be carried forward from national and project drawing and document production standards.

Principals, design managers and end users should be able to easily navigate and understand any BIM guidance document that results from implementation of this Framework. The enterprise is supported when the objectives for using BIM (BIM guidance Framework section 1: Outcomes) is reviewed and approved at the principal level. Design management (BIM guidance Framework section 2: Controls) is supported by reviewing and implementing the management policies needed. Since these policies are keyed into the overall objectives, the dialogue between the design manager and the principals is supported. Design teams can review and implement the input requirements (BIM guidance Framework section 3: Controls) as this defines what they shall do. Again, since these requirements are keyed into the management policies, the dialogue between the design teams and design manager is supported.

The style and content is intended to ensure that the requirements within the guidance document are directly measurable either by human inspection or by automated checking.

A BIM guidance document may be provided at an overall project or facility level, but may also be provided more specifically for individual BIM sub-processes within those overall objectives. These individual processes may be arranged in series and in parallel. The IDM methodology (as given in ISO 29481-1) shall be used to document, review and specify new BIM processes. The outcomes of review of new processes should then be documented in the BIM guidance document, thus adhering to this framework.

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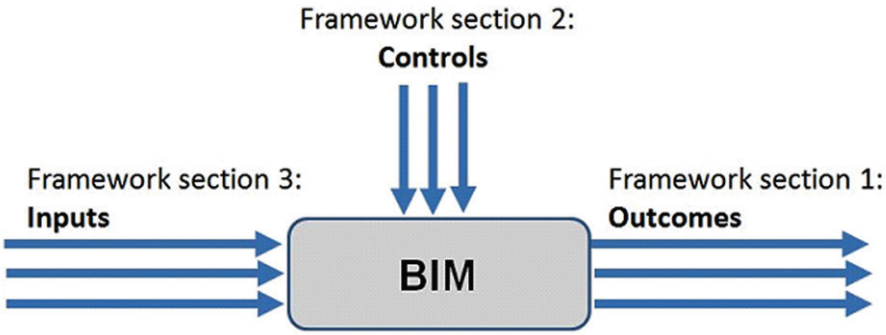

NOTE BIM process: the desired results determine the required inputs and controls.

Figure 2 — Overview of framework sections in the BIM process

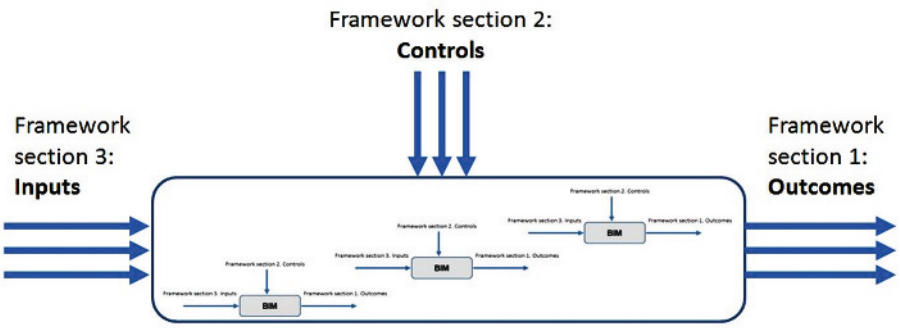

Figure 3 — Interaction of BIM subprocesses

5 Formal aspects of BIM information exchange

5.1 General recommendations

The following recommendations are intended as a checklist for the formal aspects of information exchange arising from the use of BIM a guidance document .

5.2 Delivery agreement

An agreement may be written for each process where data are exchanged between actors, for a project or a facility. The objective of the agreement is to specify the purpose, how the delivery shall be conducted and controlled and what data are to be delivered. The agreement should be harmonized with national legislation, as well as with other contractual documents. It may be included as part of a contract for a service or as an attachment to the contract. It may specify the consequences of non-fulfillment of the requirements. The agreement on information delivery/exchange should only cover this where the compensation for faults in delivered information is not covered by the main contract for the assignment.

5.3 Specification of content

The intended result (deliverables) may be specified by use of this framework. The agreement may cover how the information shall be delivered and/or stored, including:

a) file or database format;

b) data schema;

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