TECHNICAL SPECIFICATION

ISO/TS 16668

First edition
2000-09-15

Basic Semantics Register (BSR)

Registre sémantique de base (BSR)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/TS 16668:2000
https://standards.iteh.ai/catalog/standards/sist/b2dfbba9-6b9f-4429-b6d3-052a71171f7e/iso-ts-16668-2000

Reference number
ISO/TS 16668:2000(E)

© ISO 2000

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/TS 16668:2000
https://standards.iteh.ai/catalog/standards/sist/b2dfbba9-6b9f-4429-b6d3-052a71171f7e/iso-ts-16668-2000

© ISO 2000

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

© ISO 2000 – All rights reserved

Contents

Page

iTeh STANDARD PREVIEW
(standards.iteh.ai)
https://standards.iteh.ai/catalog/standards/sist/b2dfbba9-6b9f-4429-b6d3-052a71171f7e/iso-ts-16668-2000

© ISO 2000 – All rights reserved

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

iTeh STANDARD PREVIEW
(standards.iteh.ai)

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed every three years with a view to deciding whether it can be transformed into an International Standard.

ISO/TS 16668:2000
https://standards.iteh.ai/catalog/standards/sist/b2dfbba9-6b9f-4429-b6d3-052a71171f7e/iso-ts-16668-2000

Attention is drawn to the possibility that some of the elements of this Technical Specification may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 16668 was prepared by Technical Committee ISO/TC 154, *Processes, data elements and documents in commerce, industry and administration.*

Annex D forms a normative part of this Technical Specification. Annexes A, B and C are for information only.

© ISO 2000 – All rights reserved

Introduction

The BSR is an official ISO register of data for use by designers, implementers and users of information systems in a manner which will allow systems development to move from a closed to an open multilingual environment, especially for use in domestic and international electronic communication including electronic commerce and electronic data interchange (EDI).

It is important to say, and to emphasize, the major part that the user community is expected to play in the BSR. The register is to serve the user community, contain its data and meet its priority needs in a global and common manner. It is not intended to be an academic exercise with a set of paper documents to be filed away. It is expected to be a database in the public domain growing in line with expanding user needs, managed in a secure manner and working in partnership with the worldwide user community.

The purpose of the BSR is to provide an internationally agreed register of multilingual data concepts with its technical infrastructure. This will provide storage, maintenance and distribution facilities for reference data about BSR semantic units and their links (bridges) with operational directories. The use of the term “Basic” in the BSR is to recognize that the BSR semantic units will be built from basic semantic components, which can be considered as building blocks. It should be noted that the term “directories” also includes repositories, and the single term directories will be used to include both throughout this Technical Specification. Its principal function is to provide data in multiple languages that has been developed in a consistent, unambiguous manner according to International Standards.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

As a consequence of establishing the BSR, it will also be used to

ISO/TS 16668:2000
https://standards.iteh.ai/catalog/standards/sist/b2dfbba9-6b9f-4429-b6d3-052a71171f7e/iso-ts-16668-2000

— specify new entries or to respecify inadequate entries in existing directories, and hence upgrade the systems using the registered data,

— align and harmonize data among and between existing directories by providing the pivotal data for the cross-referencing of equivalent data in various directories which are maintained by different agencies,

— provide input based on the experience gained in the BSR for standards work in related standards areas, such as for Open-edi, and

— form the basis of the semantics for XML.

The main benefits to be obtained from the BSR will be as follows.

a) Cost Reduction

— faster and more cost-effective development of new information systems;

— reduced maintenance cost for existing information systems;

— fewer dictionaries to be maintained through harmonization and alignment.

b) Business Efficiency

— more effective business communication through clear definitions of business data and their standardized unique identifiers, hence fewer possibilities for misinterpretation;

— more effective multilingual communication.

© ISO 2000 – All rights reserved

The three main components of the BSR are the following.

— BSR semantic components (units of thought used in everyday life). They shall be identified by a unique code. They shall have a preferred name and synonyms as relevant in each language. These names will be used in the specification of BSR semantic units. Examples: Delivery, Actual, Latest, Person, PurchaseOrder, BillOfMaterial, Date, Name, Identifier, etc.

— BSR semantic units (the equivalence of semantically complete data element concepts, i.e. the property of an object class with full qualification). They are the basis for the specification of data elements in information systems. They shall be identified by a unique code. They shall have a preferred name and synonyms as relevant in each language. Examples: GoodsDelivery.Latest.Date; Sales.Information.Contact.Telephone. Number; Product.Bill Of Material.Reference.Identifier; Person.SocialSecurity.Number

— Bridges (the links between a BSR semantic unit and its equivalence in various directories).

The main users of the BSR are

— designers of applications where

  — data interchange across regions, functions and between business partners is of prime importance, and

  — business data management is required within an organization's own application systems portfolio and with its business partners,

— information-systems business systems engineers,

iTeh STANDARD PREVIEW
(standards.iteh.ai)

NOTE Business systems engineers are the interface between the business community and the information-systems programmers, having knowledge of both the business and systems development.

— electronic message developers/implementers/users,

ISO/TS 16668:2000
https://standards.iteh.ai/catalog/standards/sist/b2dfbba9-6b9f-4429-b6d3-
16668-2000

— builders of converters between communication standards.

— system information end users.

The first population of the BSR was made with EDI directories, but other needs for unambiguously defined semantics have raised; for example with XML or in the business modelling domain. The very simple structure of the BSR (BSR semantic units, composed of BSR semantic components) permits capturing the semantic of all kinds of "object" that must be "shared" by many people and organizations from different sectors, countries and cultures.

© ISO 2000 – All rights reserved

Basic Semantics Register (BSR)

1 Scope

This Technical Specification covering the BSR is intended to be an internationally agreed register of multilingual standard data from any business sector.

This Technical Specification describes rules and guidelines for developing, updating and maintaining the BSR.

Those rules and guidelines place emphasis on the key success factor, which is to work in strong partnership with end-user communities.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this Technical Specification. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this Technical Specification are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO/TS 16668:2000
https://standards.iteh.ai/catalog/standards/sist/b2dfbba9-6b9f-4429-b6d3-052a71171f7e/iso-ts-16668-2000

ISO/IEC 11179-1:1999, *Information technology — Specification and standardization of data elements — Part 1: Framework for the specification and standardization of data elements.*

ISO/IEC 11179-2, *Information technology — Specification and standardization of data elements — Part 2: Classification for data elements.*

ISO/IEC 11179-3:1994, *Information technology — Specification and standardization of data elements — Part 3: Basic attributes of data elements.*

ISO/IEC 11179-4:1995, *Information technology — Specification and standardization of data elements — Part 4: Rules and guidelines for the formulation of data definitions.*

ISO/IEC 11179-5:1995, *Information technology — Specification and standardization of data elements — Part 5: Naming and identification principles for data elements.*

ISO/IEC 11179-6:1997, *Information technology — Specification and standardization of data elements — Part 6: Registration of data elements.*

3 Terms and definitions

For the purposes of this Technical Specification, the following terms and definitions apply.

3.1
attribute
characteristic of an **object class** (3.14)

3.2
bridge
link between a **BSR semantic unit** (3.4) and its related unit(s) of information (equivalence) in a given directory

© ISO 2000 – All rights reserved

3.3
BSR semantic component
BSC
generic term comprising the components of BSR semantic units, including two types of BSR semantic component: **representation class** (3.20) and **concept** (3.5)

3.4
BSR semantic unit
BSU
concept unambiguously defined, independently of any particular physical representation, and which is semantically complete

NOTE The BSU is independent of the process or application in which it is used. It is constructed using BSR semantic components.

3.5
concept
unit of thought constituted through abstraction on the basis of characteristics common to a set of objects

[ISO/IEC 11179-1:1999]

3.6
data
representation (3.20) of facts, concepts, or instructions in a formalized manner, suitable for communication, interpretation, or processing by humans or by automatic means

iTeh STANDARD PREVIEW

NOTE This definition refers to a group of facts taken as a unit, thus it is used with a singular verb.

(standards.iteh.ai)

[ISO/IEC 11179-1:1999]

ISO/TS 16668:2000
https://standards.iteh.ai/catalog/standards/sist/b2dfbba9-6b9f-4429-b6d3-052a71171f7e/iso-ts-16668-2000

3.7
data element concept
DEC
concept that can be represented in the form of a data element, described independently of any particular **representation** (3.20) source

[ISO/IEC 11179-1:1999]

3.8
data element directory
any systematic collection of data elements

NOTE This includes **EDI** (3.10) directories.

3.9
definition
word or phrase expressing the essential nature of a person or thing or class of persons or things: an answer to the question “what is x?” or “what is an x?”; a statement of the meaning of a word or word group [Webster’s Third New International Dictionary of the English Language Unabridged, 1986]. Statement that expresses the essential nature of a data element and permits its differentiation from all other data elements

[ISO/IEC 11179-1:1999]

3.10
electronic data interchange
EDI
automated exchange of predefined and structured **data** (3.6), for business purposes between information systems of two or more parties

© ISO 2000 – All rights reserved

3.11
generic concept
concept that is considered to be collective for the set of **specific concepts** (3.23) which are contained within it

EXAMPLE Communication Channel is the generic concept for the set of specific concepts such as Telephone, Fax, e-mail, etc.

3.12
metadata
data (3.6) that defines and describes other data

[ISO/IEC 11179-1:1999]

3.13
name
primary means of identification of objects and concepts for humans. A single or multiword designation assigned to a data element

[ISO/IEC 11179-1:1999]

3.14
object class
A set of objects. A set of ideas, abstractions, or things in the real world that can be identified with explicit boundaries and meaning and whose properties and behaviour follow the same rules

[ISO/IEC 11179-1:1999]

iTeh STANDARD PREVIEW
(standards.iteh.ai)

3.15
(Open-edi) semantic component (ISO/IEC 14662)
unit of information unambiguously defined in the context of the business goal of the business transaction

ISO/TS 16668:2000
https://standards.iteh.ai/catalog/standards/sist/b2dfbba9-6b9f-4429-b6d3-052a71171f7e/iso-ts-16668-2000

3.16
qualifier
term that specifies and/or limits a broader concept

3.17
register
set of files (paper, electronic, or a combination) containing the assigned data elements and the associated information

[ISO/IEC 11179-1:1999]

3.18
registration identifier
one or more characters or symbols used to identify a data element, data representation, **representation class** (3.21), or **object class** (3.14)

3.19
repository
synonym for a set of **registers** (3.17)

3.20
representation
combination of a value domain, data type, and, if necessary, a unit of measure or a character set

[ISO/IEC 11179-1:1999]

© ISO 2000 – All rights reserved

3.21
representation class
RC
human perception of a single characteristic of an **object class** (3.14) in the real world

3.22
semantics
the branch of linguistic science which deals with the meaning of words (Webster)

[ISO/IEC 11179-1:1999]

3.23
specific concept
BSR semantic component (3.3) that refers to a particular **concept** (3.5)

3.24
term
designation of a defined **BSR semantic component** (3.3) in a specific language by a linguistic expression

NOTE A term may consist of one or more words (i.e. a simple single-word term, or a complex multi-word term) or may even contain symbols.

4 BSR content

iTeh STANDARD PREVIEW
(standards.iteh.ai)

4.1 BSR semantic components (BSC)

There are two types of BSR semantic component in the BSR. These are **Representation Class** and **Concept (Concept** may be considered as **Specific** or **Generic Concepts)**. These may be considered as being the equivalence of Objects or Entities. Definitions of these types are included in clause 2 of this Technical Specification.

ISO/TS 16668:2000
https://standards.iteh.ai/catalog/standards/sist/b2dfbba9-6b9f-4429-b6d3-052a71171f7e/iso-ts-16668-2000

4.1.1 Representation Class (RC)

A **Representation Class** is the root component of a BSR semantic unit and describes what the BSR semantic unit is about. It is the way in which the property is represented. According to ISO/IEC 11179-1, a property is the "a peculiarity common to all members of an object class". A representation class is "a component of the BSR semantic unit which expresses the property of an object class". As a BSU is the equivalent of a data element concept with its representation class included, it is important to identify the set of representation classes so that the BSUs will be the basis for the development of data elements in information systems.

In practice, it has been found necessary to have a set of representation classes that is consistent for use between information systems and business users. The aim of this set is to cover the identified needs with a minimum set of recommended representation classes. Each representation class shall be identified by a unique code. It shall have a preferred name and synonyms as relevant in each language. These synonyms might be used in practice, see below for examples in the use of Number versus Identifier. The representation classes proposed are felt to provide a wide enough field to enable users to find an adequate solution for their needs of categorization.

Informative annex B provides the set of representation classes that have been found necessary for managing this categorization. It should be noted that if, in the future some additional representation classes are considered necessary, the list will be extended. At present, this list is considered sufficient to satisfy the current and anticipated needs. This conclusion is based on what a number of major companies have adopted in practice and found to be realistic, and on what the BSR Production Team have found to be required to date.

4.1.2 Concept (CT)

In the BSR the term **Concept** is the second category of BSR semantic component. Examples include: Communication Channel, Telephone, Fax, Delivery, Earliest, etc. This has by far the largest number of entries per

© ISO 2000 – All rights reserved

category of BSR semantic component. Concepts will thus include terms identifying Object Classes and Qualifiers as defined in ISO/IEC 11179-1. A separate categorization identifying this differentiation will be introduced to enable migration to an object-oriented approach which will be necessary when the decision is made as to the type of database to be used for the operating system for the BSR.

The **Concept** may be a **Generic Concept** or a **Specific Concept**. A **Generic Concept** is one which provides a means to manage the commonality of the **Specific Concepts** within the generic nature of the **Generic Concept**.

EXAMPLE Telephone, Fax, e-mail, etc. are specific concepts of the generic concept, Communication Channel.

The specific or generic aspect of concepts implies a particular relationship (broader/narrower) between BSR semantic units using them.

4.1.3 Specification of BSR semantic components

BSUs are built from the relationship between **BSR semantic components** qualified as required to make the BSU semantically complete. So there is a need for the BSR to establish a list of **BSR semantic components**. This list should include all the **BSR semantic component** types (representation class and concept), with definitions and names in multiple languages.

Some concepts will be used to qualify other concepts as described by JTC 1/SC 32 in ISO/IEC 11179-5.

Once this list of BSR semantic components has been agreed upon, they shall be the basis for the specification of BSR semantic units.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

4.1.3.1 Definition

A **BSR semantic component** shall be defined in a manner that ensures that its meaning is clear and unambiguous. The rules and guidelines for developing definitions in ISO/IEC 11179-4 shall be used as the basis for this work. These are shown in detail in 6.2.

ISO/TS 16668:2000
https://standards.iteh.ai/catalog/standards/sist/b2dfbba9-6b9f-4429-b6d3-052a71171f7e/iso-ts-16668-2000

4.1.3.2 Naming

It is important to recognize that some **BSR semantic components** will have different names, even within a language, based on the business context in which they are used. A generally used name in a language will be chosen as the preferred name, and any other names for the same **BSR semantic component** will be recorded as synonyms, with the context in which they are used also being recorded. Note that different spellings for the same **BSR semantic component** in language variations such as American or Australian English versus English English, will be considered as synonyms.

For the English language, the Oxford English Dictionary, as recommended by ISO, shall be used as the base. French French shall be the basis for the French language with Canadian, Belgian, Swiss French, etc. variations considered as synonyms. Similarly any regional variations within a country will be considered as synonyms. Equivalent decisions will be made for other languages.

In principle, if there is a definition and name used in practice that is widely used, such as in INCOTERMS 1990, that shall be the definition and name used in the BSR. For more general terms, a standard national language dictionary will be used, adapted as required to meet the needs of the data specification in relation to its use in applications systems development and data communication.

Each language may have specific naming conventions. If a naming process exists for a given language, it will assure that there is a certain discipline in this process, with the end result not left to whims, fancies or hazard. Naming conventions for English and other languages, if they exist, are given in normative annex D.

Those naming conventions shall take into account International Standards prepared by TC 37 and TC 46 (see the bibliography).

© ISO 2000 – All rights reserved

4.2 BSR semantic units (BSU)

4.2.1 General

BSR semantic units are complete specifications of data concepts independent of the process/application in which they can be used. BSUs are the basis for the data to be interchanged in any information system between computers.

A BSU is constructed from **BSR semantic components** as follows.

The root component is a **Representation Class** such as Code, Date, Name, etc.

To this root component, one adds Concepts such as Telephone, Fax, Delivery, Earliest, etc.

NOTE A BSU may be composed of only concepts, without a representation class. (A BSU may also be reduced to only one concept.)

4.2.2 Specification of BSR semantic units

From the definition of a BSU, "a **concept** unambiguously defined, independently of any particular physical **representation**, and which is semantically complete", it is clear that a BSU must be equated with a complete semantic specification of the **data** that is to be interchanged or to be modelled.

A BSU may be linked by a bridge to representations specified in an International Standard, or which are internationally accepted, where they exist. If agreements can be made with the owner of the directory and/or standard representation, the values will also be included in the BSR. Provision will be made to include these values in the design of the BSR database, with the values being added once the agreement has been made with the registration authority/maintenance agency concerned.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

JTC 1/SC 32/WG 2, in ISO 11179-1 which provides standards for the specification of data elements, defines a "**data element concept**" as "a concept that can be represented in the form of a data element, described independently of any particular representation". This data element concept is also shown to be the union between an Object Class and a Property in the Object Oriented terminology. Alternatively, in the Entity/Relationship terminology, it is an Attribute of an Entity. The **data element** is the "unit of data for which the definition, identification, representation and permissible values are specified by means of a set of attributes" (ISO/IEC 11179-1), i.e. a representation of the data element concept suitable for communication or processing by automatic means. However, in relation to the BSR, representation is understood to mean the physical representation. The BSU will therefore be the union of an Object class with a Property, with whatever "qualifiers" are needed to make it semantically complete, and its representation class. The link between these concepts and the BSR is shown as follows:

Level 1 **Object Class**

Level 2 **Object Class + Property = Data Element Concept**

Level 3 **Data Element Concept + Representation Class = BSU**

Level 4 **BSU + Value Domain = Data Element**

The relationship of the above with the bridging concept is shown diagrammatically in Figure 1.

© ISO 2000 – All rights reserved