

Australian Standard™

**Information technology—Specification
of data value domains**



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Information technology—Specification of data value domains

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PREFACE

This Standard was prepared by the Standards Australia Committee IT-027, Data Management and Interchange.

This Standard is identical with, and has been reproduced from, ISO/IEC TR 15452:2000, *Information technology—Specification of data value domains*.

The objective of this Standard is to provide identification, specification, development and reuse of enumerated, bounded data value domains for data elements to facilitate electronic data interchange and data sharing for use by electronic commerce and database designers.

The terms ‘normative’ and ‘informative’ are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

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<i>Reference to International Standard</i>		<i>Australian Standard</i>	
ISO/IEC		AS ISO/IEC	
11179	Information technology— Specification and standardization of data elements	11179	Information technology—Metadata registries (MDR)
11179-3	Part 3: Basic attributes of data elements	11179.3	Part 3: Registry metamodel and basic attributes
11179-4	Part 4: Rules and guidelines for the formulation of data definitions	11179.4	Part 4: Formulation of data definitions
11179-5	Part 5: Naming and identification principles for data elements	11179.5	Part 5: Naming and identification principles for data elements
11179-6	Part 6: Registration of data elements	11179.6	Part 6: Registration

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INTRODUCTION

A standardized process of definition and application of data value domains will assist in the sharing and reuse of information across national and international organizations, especially with regard to electronic commerce such as medical commerce and EDI applications.

This Technical Report addresses practical issues encountered in documenting and sharing data. It facilitates the exchange of data values among organizations that use different names, and possibly different languages for equivalent data values.

As new generations of information interchange tools are developed, new technology will enable data to be located faster and more efficiently. Ontologies and other structures for meanings of data elements and data element values will need ways of relating values across these structures. New constructs such as the Global Information Infrastructure must be accommodated. Sets of reusable domain values, with unique identifiers assigned to each value, will provide a mechanism for facilitating this development. This philosophy encourages the assembly of data elements from reusable parts and facilitates the elimination of language barriers.

AUSTRALIAN STANDARD

Information technology — Specification of data value domains

1 Scope

This Technical Report covers the identification, specification, development and reuse of enumerated, bounded data value domains for data elements. A data value domain in this context refers to the possible valid values of a data element concept and its associated data elements. An enumerated domain is one for which all values can be explicitly expressed in a structured or unstructured set. A bounded domain implies knowledge of the upper and lower limits of the value set.

Major issues addressed include:

Specifying attributes of data value domains and, where applicable, each value within the domain; including assigning a unique identifier to each value in the value domain.

Describing attributes for "conceptual values" of a data element concept domain and "represented values" for a data element derived from it.

Defining reuse of value domains which can be defined and specified in a standardized way and can be applied as components of many data elements.

This Technical Report complements and extends the attributes of data elements specified in ISO/IEC 11179, *Information technology - Specification and standardization of data elements*, especially *Part 3: Basic attributes of data elements*.

This Technical Report is meant to assist users of ISO/IEC 11179. This series of standards is currently undergoing significant revision. When this revision work is completed, the contents of this Technical Report will be either amended or integrated into the 11179 series of standards.

2 References

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, *Information technology - Specification and standardization of data elements - Part 6: Registration of data elements*.

3 Terms and definitions

For the purposes of this Technical Report, the following definitions apply.

3.1 attribute: A characteristic of an object or entity.

3.2 conceptual domain: A set of possible valid value meanings of a data element expressed without representation.

3.3 context: A designation or description of the application environment or discipline in which a name is applied or from which it originates.

3.4 data element: A unit of data for which the identification, meaning, representation and permissible values are specified by means of a set of attributes.

3.5 data element concept (DEC): A concept that can be represented in the form of a data element, described independently of any particular representation.

3.6 data element representation: A data element component consisting of a value domain and representation class.

3.7 data identifier: A language independent unique identifier of a data element within a registration authority. An unambiguous name for an object within a given context.

3.8 data item: An occurrence of a data element value.

3.9 data value: An element of a value domain.

3.10 data value domain: A set of possible valid values of a data element expressed in a certain representation, for a data element having a value domain.

3.11 enumerated domain: A value domain that is specified by a list of all permissible values.

3.12 identifier: See data identifier.

3.13 international registration data identifier (IRDI): The unique and registered identifier of a data element.

3.14 name: The primary means of identification of objects and concepts for humans.

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

3.16 permissible value (label): An expression of a value meaning in a specific value domain.

3.17 property: A peculiarity common to all members of an object class.

3.18 representation class: A classification of types of representations.

3.19 structure set: A method of placing objects in context, revealing relationships to other objects. Examples include Entity-Relationship Models, taxonomies, and ontologies.

3.20 value meaning: A valid value in a conceptual domain.

3.21 value meaning identifier (VMID): A label that uniquely identifies a value meaning.

4 Data element components

Figure 1 represents a set of components of a data element, one of which is a **data element concept** (DEC). The data element concept is composed of the object class and property, and related to a set of value meanings collectively known as a **conceptual domain**.

Each member of the conceptual domain is identified by a **value meaning identifier** (VMID). The set of members is represented by the **value meaning** box of figure 1. These items consist of some form of name and/or definition (descriptor) which characterizes a data value.

A **data element** is formed by adding a representation to a DEC. A representation consists of a **representation class** and a **data value domain**, which itself is composed of a set of **permissible values**. Data elements are identified by an **international registration data identifier** (IRDI), as described in ISO/IEC 11179-6.

Identification at the item level can thus be established by the assignment of a combination of IRDI and VMID. The IRDI represents all components of a data element. The VMID identifies each value meaning.

Annexes A through C describe the applications of these building blocks of data sharing and reuse with examples

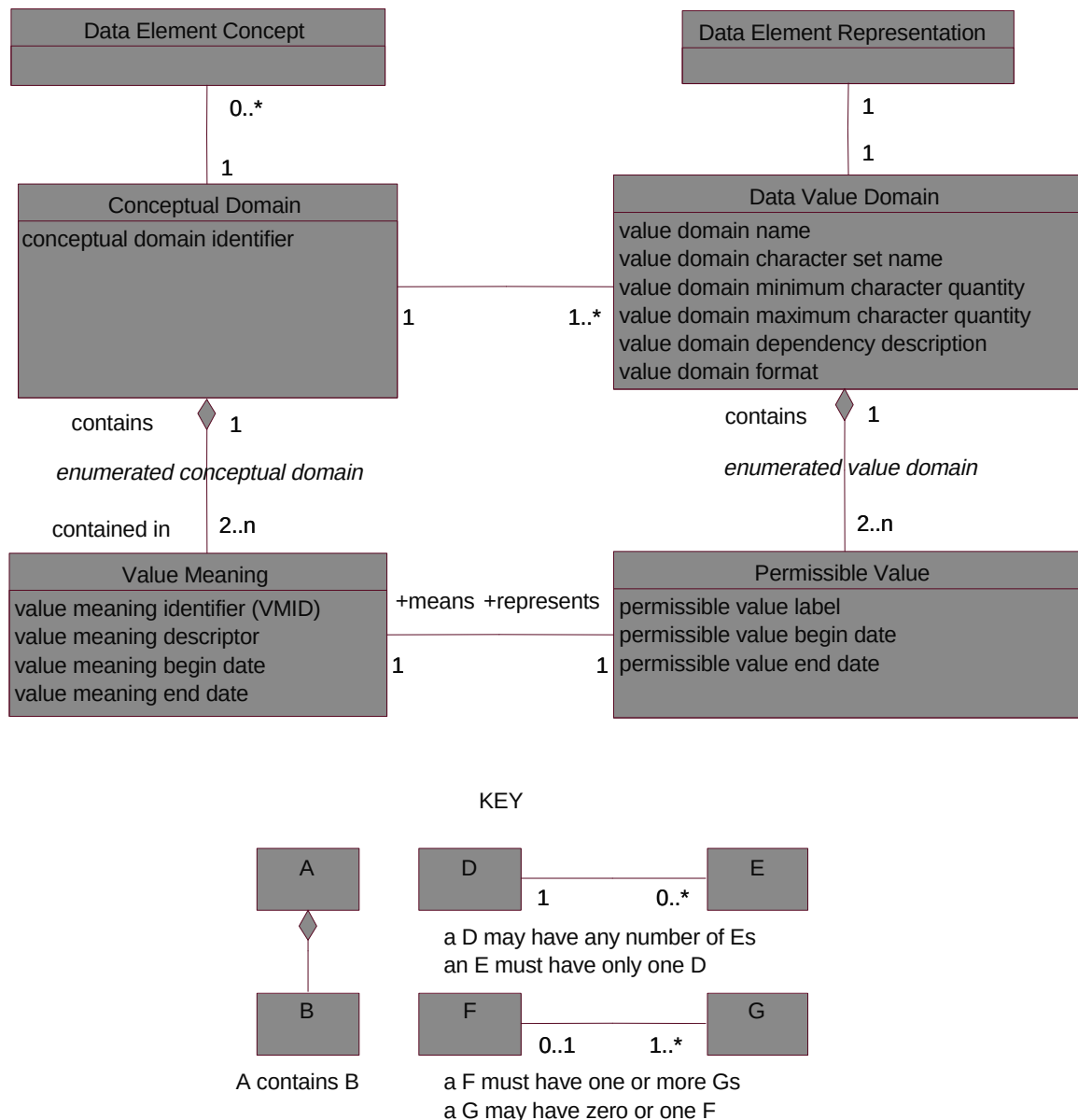


Figure 1. Data Element Components

5 Specification of data value domains

In the discussion below, data element attributes (in **bold**) are placed in relationship to the data element components in figure 1. They are specified in 5.2 below. Those data element attributes which have equivalent attributes in ISO/IEC IS 11179-3 are marked with an asterisk (*).

5.1 Data element component descriptions

5.1.1 Data element concept components

A data element concept is related to one conceptual domain. As a conceptual domain may be related to more than one data element concept, it has a **conceptual domain identifier**. The conceptual domain contains the value meaning set which has, as attributes, a **value meaning descriptor** and a unique identifier. The latter is used to identify each item of the set of value meanings and is called the **value meaning identifier (VMID)**. The value meaning descriptor may contain either a name or definition, or both. In addition, each value meaning can be time-stamped with **value meaning begin date** and **value meaning end date** attributes.