

20943-1

First edition
2003-08-01

Information technology — Procedures for achieving metadata registry (MDR) content consistency —

Part 1: Data elements

Technologies de l'information — Procédures en vue d'obtenir la cohérence du contenu d'un registre de métadonnées (RM) —

Partie 1: Éléments de données

Reference number
ISO/IEC TR 20943-1:2003(E)



This is a preview of "ISO/IEC TR 20943-1:2...". [Click here to purchase the full version from the ANSI store.](#)

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.

© ISO/IEC 2003

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.org
Web www.iso.org

Published in Switzerland

This is a preview of "ISO/IEC TR 20943-1:2...". [Click here to purchase the full version from the ANSI store.](#)

Contents

Page

Foreword.....	vii
Introduction	viii
1 Scope.....	1
1.1 Background	1
1.2 Purpose	1
1.3 Scope.....	1
1.4 Registration approach — data elements and value domains	1
2 Normative references	2
3 Terms and definitions.....	2
4 Data element abstraction	2
4.1 Abstraction types.....	3
4.2 Example of specialization/generalization	3
4.2.1 Example of sharing a value domain.....	4
4.3 Example of concatenation/decomposition.....	4
4.4 Example of aggregation	5
5 Data element registration	6
6 Bottom-up approach to data element registration	6
6.1 General procedures for registering a data element	7
6.1.1 Understanding the data element	7
6.1.2 Content research.....	7
6.1.3 Data element definition.....	8
6.1.4 Permissible values and value domain	8
6.1.5 Representation class	9
6.1.6 Names and identifiers.....	9
6.1.7 Other metadata attributes	9
6.1.8 Data element concept.....	10
6.1.9 Classification schemes	11
6.1.10 Registration and administrative status information.....	11
6.2 Example of International Standard with enumerated domain	12
6.2.1 Understanding the data element	12
6.2.2 Content research.....	12
6.2.3 Data element definition.....	13
6.2.4 Permissible values and value domain	13
6.2.5 Representation Class	13
6.2.6 Identification and naming the data element.....	13
6.2.7 Other metadata attributes	14
6.2.8 Data element concept.....	15
6.2.9 Classification	15
6.2.10 Registration and administrative status information.....	16
6.2.11 Other names and codes from ISO 3166	16
6.2.12 Summary of metadata attributes	16
6.3 Application system data element development examples	19
6.3.1 Understanding the data element	19
6.3.2 Content research.....	19
6.3.3 Data element definition.....	19
6.3.4 Permissible values and value domain	20
6.3.5 Representation Class	20
6.3.6 Identify and name the data element.....	20
6.3.7 Other metadata attributes	21

This is a preview of "ISO/IEC TR 20943-1:2...". Click here to purchase the full version from the ANSI store.

6.3.8	Data element concept	22
6.3.9	Classification	22
6.3.10	Registration and administrative status information	22
6.3.11	Related data elements	23
6.3.12	Summary of metadata attributes	23
6.4	Example of International Standard with non-enumerated domain	25
6.4.1	Understanding the data element.....	25
6.4.2	Content research	26
6.4.3	Data element definition	26
6.4.4	Permissible values and value domain.....	26
6.4.5	Representation Class.....	27
6.4.6	Identifying and naming the data element	27
6.4.7	Other metadata attributes.....	28
6.4.8	Data element concept	28
6.4.9	Classification	29
6.4.10	Registration and administrative status informaiton	30
6.4.11	Other data elements in ISO 6709	30
6.4.12	Summary of metadata attributes	30
6.5	Example of a standard data element that uses a standard non-enumerated domain	33
6.5.1	Understanding the data element.....	33
6.5.2	Content research	33
6.5.3	Data element definition	33
6.5.4	Permissible values and value domain.....	33
6.5.5	Representation Class.....	34
6.5.6	Identifying and naming the data element	34
6.5.7	Other metadata attributes.....	35
6.5.8	Data element concept	36
6.5.9	Classification	36
6.5.10	Registration and administrative status information	37
6.5.11	Related data elements	37
6.5.12	Summary of attributes	37
6.6	Classification of data elements.....	40
6.6.1	General procedures for registering a classification of data elements	40
6.6.2	Data elements in a document.....	41
6.6.3	Data elements in a standard.....	42
6.7	Linking of data elements	43
7	Example of top-down approach to data element registration	44
7.1	Classification and Context	45
7.2	Objects and properties of data element concepts.....	46
7.3	Professional organization identifier example.....	47
7.3.1	Data element concept, conceptual domain and value meanings.....	47
7.3.2	Define and identify data elements	47
7.3.3	Specify value domain and permissible values.....	48
7.3.4	Other data element attributes	48
7.3.5	Classify the data element	49
7.3.6	Registration and administrative status information	49
7.3.7	Summary of attributes	49
7.4	Language expert identifier example.....	49
7.4.1	Data element concept, conceptual domain and value meanings.....	49
7.4.2	Define and identify data elements	49
7.4.3	Specify value domain and permissible values.....	50
7.4.4	Other data element attributes	50
7.4.5	Classify the data element	51
7.4.6	Registration and administrative status information	51
7.4.7	Summary of attributes	51
7.5	Language skill type identifier example	51
7.5.1	Data element concept, conceptual domain and value meanings.....	51
7.5.2	Define and identify data elements	52
7.5.3	Specify value domain and permissible values.....	52

This is a preview of "ISO/IEC TR 20943-1:2...". [Click here to purchase the full version from the ANSI store.](#)

7.5.4	Other data element attributes	53
7.5.5	Classify the data element	53
7.5.6	Registration and administrative status information	53
7.5.7	Summary of attributes	53
7.6	Natural language identifier example	53
7.6.1	Data element concept, conceptual domain and value meanings	54
7.6.2	Define and identify data elements	54
7.6.3	Specify value domain and permissible values	54
7.6.4	Other data element attributes	55
7.6.5	Classify the data element	55
7.6.6	Registration and administrative status information	55
7.6.7	Summary of attributes	56
7.7	Skill level discriminator example	56
7.7.1	Data element concept, conceptual domain and value meanings	56
7.7.2	Define and identify data elements	56
7.7.3	Specify value domain and permissible values	57
7.7.4	Other data element attributes	57
7.7.5	Classify the data element	58
7.7.6	Registration and administrative status information	58
7.7.7	Summary of attributes	58
7.8	Example summary table of attributes	58
8	Example of complex data	58
8.1	Examples	58
Annex A (informative) Tables of data element attributes for examples		65
Annex B (informative) Application of ISO/IEC 11179-2, -4, -5 and -6		75
B.1	Data element definition	75
B.1.1	Rules for definitions	75
B.1.2	Guidelines for definitions	77
B.1.3	Data element definition syntax	80
B.1.4	Terms commonly used in definitions	81
B.2	Representational attributes	81
B.2.1	Permissible values	81
B.2.2	Value domain	82
B.2.3	Representation class	83
B.2.4	Data Element Example	84
B.3	Identifying and naming a data element	85
B.3.1	Name context	85
B.3.2	Establish a naming convention	86
B.3.3	Example of a naming convention	87
B.3.4	Formulating a data element name	87
B.4	Identification	88
B.4.1	Data element identifier	88
B.4.2	Versioning	89
B.5	Conceptual relationships	90
B.5.1	Data element concept	90
B.5.2	Conceptual domain	91
B.5.3	Value meanings	91
B.6	Classification	92
B.7	Quality review	93
B.7.1	Registration status	93
B.7.2	Administrative status	93
Annex C (informative) Crosswalk of names in Technical Report to ISO/IEC 11179-3 metamodel		95
Annex D (informative) Example of complete associated metadata item descriptions using top-down approach to data element registration		98
D.1	Example data model	98
D.2	Presentation of Information	99
D.2.1	Format of Item identifier	99

This is a preview of "ISO/IEC TR 20943-1:2...". [Click here to purchase the full version from the ANSI store.](#)

D.3	Context	100
D.4	Object classes and properties	101
D.5	Data element concepts and conceptual domains	105
D.6	Value Meanings	112
D.7	Value Domains and Representation Classes	114
D.8	Permissible Values.....	118
D.9	Data elements	121
	Bibliography.....	125

This is a preview of "ISO/IEC TR 20943-1:2...". [Click here to purchase the full version from the ANSI store.](#)

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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

In exceptional circumstances, the joint technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when the joint technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

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

ISO/IEC TR 20943-1:2003, which is a Technical Report of type 3, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

ISO/IEC 20943 consists of the following parts, under the general title *Information technology — Procedures for achieving metadata registry (MDR) content consistency*:

Note: Parts 2 and 3 are currently under development.

- *Part 1: Data elements*
- *Part 2: XML structured data*
- *Part 3: Value domains*

Introduction

The exchange of metadata between metadata registries based on International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) 11179 *Information technology — metadata registries (MDR)*, depends not only on registry software that conforms to the standard, but also on metadata contents that are comparable between registries. While the standard has provisions for data specification and registration, there are pragmatic issues pertaining to populating the registries with content. Based on the experiences of organizations that are implementing the standard, a Technical Report to explore content issues will help current and future users.

Metadata registries can be used to register data elements, value domains, and associated attributes for many kinds of organizational data resource collections. Metadata registries can store information on data elements used on forms, represented in enterprise data models, contained in EDI message sets, and described in documents and standards, as well as those data elements that are part of computer system applications. Some organizations use the registry to record essential facts about how data elements are used in existing applications, while other organizations use the registry as a repository of standard data elements to be used as models for data elements in application development. ISO/IEC 11179-6 specifically addresses the development and population of metadata registries.

ISO/IEC 11179-3 models a data element and its associated data element concept. Conceptualization and articulation of rules and relationships are needed in the creation of data element concepts, data elements, and value domains. Explication of the various possible levels of data elements and data element concepts and their relationships would greatly assist in the creation of shareable, well-formed data. Relationship and inheritance from the most generalized data element to the most specialized application data element need to be specified. Reuse of data value domains should be enabled and regularized.

While metadata registries can be used for storing information about a variety of metadata entities, this report addresses only data elements and associated metadata items. The goal of this paper is to ensure that there is a common understanding of the content of the data element attributes so that metadata can be shared between registries, despite their differences.

This Technical Report is based ISO/IEC 11179-3 of the six-part ISO/IEC standard that describes the organization of a registry for managing the semantics of data. The standard specifies the structure of a registry in the form of a conceptual model. The conceptual model is not intended to be a logical or physical data model for a computer system.