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Information technology — Metamodel framework for interoperability (MFI) —

Part 1: Reference model

Technologies de l'information — Cadre du métamodèle pour l'interopérabilité (MFI) —
Partie 1: Modèle de référence

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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.

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 19763-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

ISO/IEC 19763 consists of the following parts, under the general title *Information technology — Metamodel framework for interoperability (MFI)*:

— *Part 1: Reference model*

— *Part 2: Core model*

— *Part 3: Metamodel for ontology registration*

— *Part 4: Metamodel for model mapping*

Introduction

Due to the spread of E-business (EB) and E-commerce (EC) over the Internet, the effective exchange of business transactions and other related information across countries and cultures has become a prime concern for people both inside and outside the IT industry.

To follow the current trends of EB or EC, industrial consortia have engaged in the standardization of domain-specific objects including business process models and software components using common modeling facilities and interchange facilities such as UML and XML. They are very active in standardizing domain-specific business process models and standard modeling constructs such as data elements, entity profiles, and value domains.

Following these trends, many standardization activities have focused on the facilities or schema that could enable the collaborations among different organizations, such as

a) modeling facilities or modeling architectures such as UML or MDA;

b) E-Business procedures and exchange formats such as ISO/IEC 15944, ebXML, XMI and SOAP;

c) description facilities of information resources such as XML, RDF and WSDL;

d) business process integration facilities such as BPEL and BPMN;

e) registry facilities such as ISO/IEC 11179 (MDR), ebXML-R&R, UDDI;

f) meta-modeling facilities such as MOF;

g) ontology descriptive facilities such as OWL, DAML+OIL;

h) facilities for logic such as CL, CG and DL.

In addition to the above, other activities which focus on the contents to be treated by facilities have emerged as subjects of standardization.

These include

a) common models for various business domains, such as GCI, CPFR and HL7;

b) modeling profiles or modeling patterns such as UML profile for EDOC and EAI;

c) registry metamodels such as ebXML RIM and HL7 RIM;

d) metamodels such as CWM for data warehouse and ODM for ontology;

e) metadata specifications, such as Dublin Core or ebXML Core Component;

f) ontology models, such as SNOMED in healthcare, SUO in engineering and ISO/IEC 15944-4 E-Business economic and accounting ontology.

These contents could be stored in registries in order to enable the effective sharing among different organizations.

NOTE UML and OMG are trademarks of the Object Management Group.

Many registries and repositories have been developed and implemented. However, due to differences in their metamodels or disharmony in their semantics, effective collaboration among organizations or communities has been difficult. New facilities are required that enable a harmonized federation among these registries.

To satisfy these requirements, ISO/IEC 19763 provides the facilities for describing various types of registries or metamodels as a consolidated set of metamodel frameworks.

This consolidated metamodel framework will provide the following features:

a) metamodel registering mechanisms for enabling the federation of registries;

b) description and registering mechanisms for various modeling constructs to facilitate their reuse;

c) description and registering mechanisms for rules of model mapping and transformation to enable the harmonization of registry contents.

This part of ISO/IEC 19763 describes the basic concept of metamodel framework which should be used in the development of other parts of ISO/IEC 19763. The issues and requirements to be considered in this development are also described.

Information technology — Metamodel framework for interoperability (MFI) —

Part 1: Reference model

1 Scope

ISO/IEC 19763 specifies a framework for metamodel interoperability.

This part of ISO/IEC 19763 establishes general principles for the metamodel framework and gives guidelines for developments of other parts of ISO/IEC 19763.

The multiple parts of ISO/IEC 19763 are to be used in the development of a harmonized metamodel to facilitate the interoperation of existing registries or metamodels.

2 Conformance

ISO/IEC 19763-1 specifies no conformance requirement. Other parts of ISO/IEC 19763 specify their own conformance requirements, as appropriate.

3 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/IEC 11179-1, *Information technology — Metadata registries (MDR) — Part 1: Framework*

ISO/IEC 11179-3, *Information technology — Metadata registries (MDR) — Part 3: Registry metamodel and basic attributes*

ISO/IEC 19502:2005, *Information technology — Meta Object Facility (MOF)*

4 Terms, definitions and abbreviated terms

4.1 Terms and definitions

4.1.1
domain object
object which represents an entity or a process in a particular domain

4.1.2
domain model
model which represents a particular domain

4.1.3
metadata
data which describes other data

NOTE See ISO/IEC 11179-1 and ISO/IEC 19502.

4.1.4
metamodel
model which describes other models

4.1.5
metamodel construct
model construct which is used in metamodels

cf. model construct

4.1.6
meta-modeling facility
modeling facility used for meta-modeling

NOTE MOF is an example of a meta-modeling facility.

cf. modeling facility

4.1.7
model
representation of a universe of discourse (UOD) using a normative modeling facility and modeling constructs

4.1.8
model construct
unit of notation for modeling

NOTE More generic term for modeling element. Sometimes the term is used to include metadata, code and object patterns rather than the notations of a particular modeling facility such as UML.

4.1.9
modeling facility
set of rules and notations for use when modeling

NOTE UML is a typical example.

4.1.10
ontology
description of a universe of discourse in a language that a computer can process

4.1.11
upper model
model which restricts or guides other models

NOTE See 4.1.3.

4.1.12
lower model
model which is restricted or guided by another (upper) model

4.2 Abbreviated terms

BPMN	Business Process Modeling Notation
BPEL	Business Process Execution Language
CWM	Common Warehouse Metamodel
GCI	Global Commerce Initiative
CPFR	Continuous Planning Forecasting and Replenishment
CL	Common Logic (see ISO/IEC 24707, to be published)
ebXML	electronic business XML (see ISO/TS 15000:2004)
EAI	Enterprise Application Integration
EDOC	Enterprise Distributed Object Computing (see bibliography item [12])
HL7	Health Level 7
IDEF1X	Integrated DEFnition Method
MDA	Model Driven Architecture
MOF	Meta Object Facility (see ISO/IEC 19502:2005)
MFI	Metamodel Framework for Interoperability (i.e. ISO/IEC 19763-1)
ODM	Ontology Definition Metamodel
OWL	Web Ontology Language
RDF	Resource Description Framework
SOAP	Simple Object Access Protocol
SUO	Standard Upper Ontology
SNOMED	Systematized NOmenclature of MEDicine
UDDI	Universal Description, Discovery and Integration
UML	Unified Modeling Language
UOD	Universe of Discourse
WSDL	Web Service Description Language
XMI	XML Metadata Interchange (see ISO/IEC 19503:2005)
XML	eXtended Markup Language