INTERNATIONAL STANDARD

ISO/IEC 19763-3

Third edition
2020-10

Information technology — Metamodel framework for interoperability (MFI) —

Part 3: Metamodel for ontology registration

Technologies de l'information — Cadre du métamodèle pour l'interopérabilité (MFI) —

Partie 3: Métamodèle pour l'enregistrement de l'ontologie

Reference number
ISO/IEC 19763-3:2020(E)

© ISO/IEC 2020



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **1**

3 Terms, definitions and abbreviated terms **1**
3.1 Terms and definitions 1
3.1.1 Terms on ontology 2
3.1.2 Other terms 2
3.2 Abbreviated terms 2

4 Conformance **3**
4.1 General 3
4.2 Levels of conformance 3
4.2.1 General 3
4.2.2 Conformance level 1 3
4.2.3 Conformance level 2 3
4.3 Degree of conformance 3
4.3.1 General 3
4.3.2 Strictly conforming implementation 3
4.3.3 Conforming implementation 3
4.4 Implementation conformance statement (ICS) 4

5 Structure of MFI ontology registration **4**
5.1 Overview of MFI ontology registration 4
5.2 Overview of Basic_Model package 4
5.3 Overview of Evolution_Model package 6
5.4 Association between MFI ontology registration and MFI core and mapping 7
5.5 Basic_Model package 8
5.5.1 Authoritative_Extent 8
5.5.2 Local_Item 8
5.5.3 Ontology_Language 9
5.5.4 Ontology_Whole 9
5.5.5 Registered_Ontology_Whole 9
5.5.6 Unregistered_Ontology_Whole 10
5.5.7 Reference_Registered_Ontology_Whole 10
5.5.8 Local_Registered_Ontology_Whole 11
5.5.9 Ontology_Component 11
5.5.10 Registered_Ontology_Component 12
5.5.11 Reference_Registered_Ontology_Component 12
5.5.12 Local_Registered_Ontology_Component 13
5.5.13 Ontology_Atomic_Construct 14
5.5.14 Registered_Ontology_Atomic_Construct 14
5.5.15 Unregistered_Ontology_Atomic_Construct 15
5.5.16 Reference_Registered_Ontology_Atomic_Construct 16
5.5.17 Local_Registered_Ontology_Atomic_Construct 16
5.6 Evolution_Model package 17
5.6.1 Item_Evolution 17
5.6.2 Registered_Ontology_Whole_Evolution 17
5.6.3 Registered_Ontology_Component_Evolution 18
5.6.4 Registered_Ontology_Atomic_Construct_Evolution 19

Annex A (informative) **List of Ontology_Languages** **20**

Annex B (informative) **Example of Basic_Model** **21**

Annex C (informative) **Example of Evolution_Model** **31**

© ISO/IEC 2020 – All rights reserved

Annex D (informative) **Mapping from ISO/IEC 19763-3:2010 to ISO/IEC 19763-3:2020** **36**
Bibliography **37**

 © ISO/IEC 2020 – All rights reserved

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see http://patents.iec.ch).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

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

This third edition cancels and replaces the second edition (ISO/IEC 19763-3:2010), which has been technically revised.

The main changes compared to the previous edition are as follows:

— no direct inheritance from Administered Item of ISO/IEC 11179-3 in 5.2 and 5.4 to align with ISO/IEC 19763-10;

— clarification in 5.4 that "Ontology_Language", "Ontology_Whole", "Ontology_Component" and "Ontology_Atomic_Construct" are inherited from "Modelling_Language", "Model" or "Model_Element" of ISO/IEC 19763-10;

— changes of attribute and reference names in 5.4 and 5.5 to align with ISO/IEC 19763-10 (see Annex D);

— editorial changes throughout the document to fully align with ISO/IEC Directives Part 2.

A list of all parts in the ISO/IEC 19763 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

© ISO/IEC 2020 – All rights reserved

Introduction

Interoperability among heterogeneous application systems serves to improve business performance. To promote it, unambiguous and formal specifications of the systems, especially of their inputs and outputs, are indispensable. Ontologies have a key role for that.

Several efforts to establish standards associated with ontologies have been made. But, most of them specify languages or are based on some particular language. To promote ontology-based interoperability, in addition to them, a generic framework for registering administrative and evolution information related to ontologies, independent of languages, is necessary.

This document provides a generic framework for registering administrative and evolution information related to ontologies.

The metamodels of ontologies expressed in specific languages and the mappings among them are specified in other specifications such as Reference [1].

Figure 1 illustrates the MFI ontology registration specified in this document.

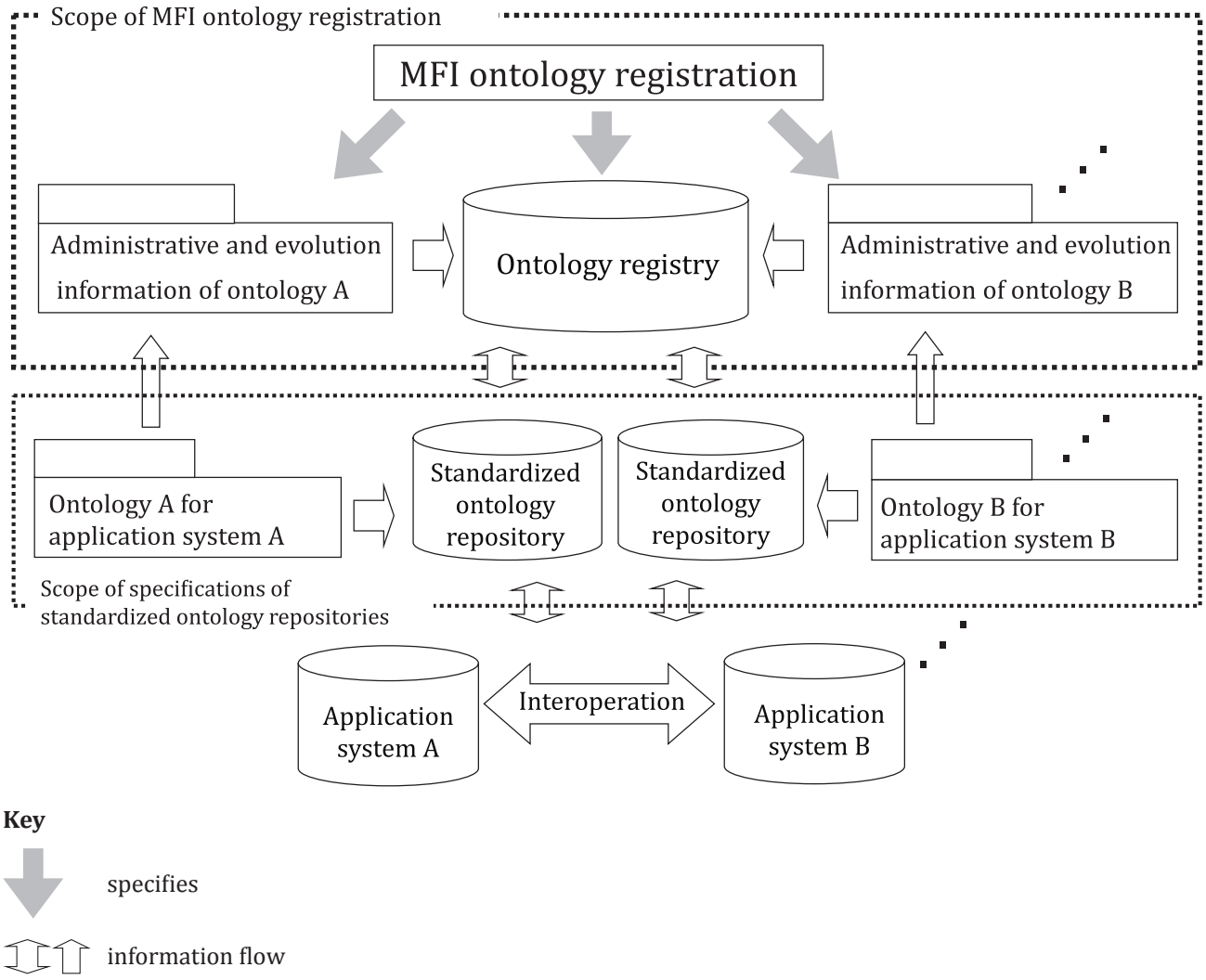


Figure 1 — MFI ontology registration

© ISO/IEC 2020 – All rights reserved

Information technology — Metamodel framework for interoperability (MFI) —

Part 3: Metamodel for ontology registration

1 Scope

This document specifies the metamodel that provides a facility to register administrative and evolution information related to ontologies.

The metamodel is intended to promote interoperability among application systems, by providing administrative and evolution information related to ontologies, accompanied with standardized ontology repositories that register ontologies themselves in specific languages.

This document does not specify the metamodels of ontologies expressed in specific languages and the mappings among them.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 11179-3, *Information technology — Metadata registries (MDR) — Part 3: Registry metamodel and basic attributes*

ISO/IEC 19763-1, *Information technology — Metamodel framework for interoperability (MFI) — Part 1: Framework*

ISO/IEC 19763-10, *Information technology — Metamodel framework for interoperability (MFI) — Part 10: Core model and basic mapping*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 11179-3, ISO/IEC 19763-1 and ISO/IEC 19763-10 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

© ISO/IEC 2020 – All rights reserved