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**Language resource management —  
Lexical markup framework (LMF) —**

**Part 2:  
Machine-readable dictionary (MRD)  
model**

*Gestion des ressources linguistiques — Cadre de balisage lexical  
(LMF) —*

*Partie 2: Modèle de dictionnaire lisible par ordinateur (MRD)*



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## 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.

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 ISO documents 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](http://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 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](http://www.iso.org/patents)).

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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 37, *Language and terminology*, Subcommittee SC 4, *Language resource management*.

This first edition of ISO 24613-2, together with ISO 24613-1:2019, ISO 24613-3<sup>1)</sup>, ISO 24613-4<sup>1)</sup>, ISO 24613-5<sup>1)</sup>, ISO 24613-6<sup>2)</sup> and ISO 24613-7<sup>2)</sup>, cancels and replaces ISO 24613:2008, which has been divided into several parts and technically revised.

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

This edition merges two normative annexes from the previous edition, [Annex A](#), Morphology extension, and Annex C, Machine-readable dictionary extension, providing a more cohesive description of the key structures (classes and associations) found in that edition. The cross-reference (CrossREF) model introduced in Part 1, Core model, of this edition, provides a new capability for correlating lexical features across different form and sense classes. In addition, the CrossREF model has replaced the ListOfComponents and Component classes, enabling a more extensible and flexible capability for managing multiword expressions. The metamodel of generalization by typing introduced in Part 1 provides a more rigorous and unambiguous framework for applying LMF modelling mechanisms in ways that enable greater editorial freedom and support the comparison of different LMF conformant designs. This edition has kept most of the informative examples found in the previous edition (deleting only a few redundant examples) and has added new examples to illustrate new modelling features. There have been some class name changes (e.g. OrthographicRepresentation for Representation and Translation for Equivalent), but no changes in the underlying concepts of the previously existing classes.

A list of all parts in the ISO 24613 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](http://www.iso.org/members.html).

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1) Under preparation.

2) Planned.

## Introduction

The ISO 24613 series is based upon the definition of an implementation-independent metamodel combining a core model and additional models that onomasiological (form-oriented) and semasiological (concept-oriented) lexical content can take.

It provides guidelines for various implementation use cases, and where appropriate describes LMF compliant serializations that fit various application contexts.

This document extends ISO 24613-1, the LMF core model, through the use of the processes and mechanisms described in ISO 24613-1. The objective is to enable flexible design methods to support the development of machine-readable dictionaries for different purposes while enabling cross-comparisons of different designs and a basis for developing assessments of standards conformance. The scope of supported design goals ranges from simple to complex human-oriented MRDs, both monolingual and bilingual, lexicons that support conceptual-lexical systems through links with ontological resources, rigorously constrained lexicons for supporting machine processes, and lexicons that provide an extensional description of the morphology of lexical entries. Since this document is based on ISO 24613-1, the LMF core model, it is designed to interchange data with other parts of the ISO 24613 series where applicable.



# Language resource management — Lexical markup framework (LMF) —

## Part 2: Machine-readable dictionary (MRD) model

**IMPORTANT** — The electronic file of this document contains colours which are considered to be useful for the correct understanding of the document. Users should therefore consider printing this document using a colour printer.

### 1 Scope

This document describes the machine-readable dictionary (MRD) model, a metamodel for representing data stored in a variety of electronic dictionary subtypes, ranging from direct support for human translators to support for machine processing.

### 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 24613-1, *Language resource management — Lexical markup framework (LMF) — Part 1: Core model*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 24613-1 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/>

### 4 Key standards used by LMF

The key standards applicable to this document are described in ISO 24613-1, the LMF core model.

## 5 The machine-readable dictionary (MRD) model

### 5.1 General

The MRD model is represented by UML classes, associations among the classes (the structure), sets of data categories (attribute-value pairs), and links (cross-references). [Subclauses 5.2](#) through [5.12](#) describe each of these features, their interdependencies, and their implementation.