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Information and documentation — Codes for written language conversion systems

Information et documentation — Codes pour les systèmes de conversion des langues écrites

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This document was prepared by Technical Committee ISO/TC 46, *Information and documentation*.

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Introduction

A number of international applications require the identification of written language conversion systems, including for terminology, lexicography, bibliography, and linguistics, especially for reverse transliteration, computational linguistics and machine pronunciation.

This document sets out the necessary procedures to maintain the registry of written language conversion systems.

The chosen term “written language conversion” is intended to refer to all types of conversions, i.e. transformations of written texts from one spelling system to another. It thus includes both script conversion (change of script: transliteration, transcription) and conversion of texts without changing the script (e.g. transcription of foreign names or words using the alphabet of a target language, change of the orthography in a language, etc.). For the sake of compactness of expression, “written language conversion” has been shortened to “conversion” in this document where it does not cause ambiguity.

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Information and documentation — Codes for written language conversion systems

1 Scope

This document provides principles for establishing codes for the representation of written language conversion systems.

The codes are devised for usage in any application requiring the expression of written language conversion systems, including transliteration and romanization systems, in coded form.

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 639-2, *Codes for the representation of names of languages — Part 2: Alpha-3 code*

ISO 639-3, *Codes for the representation of names of languages — Part 3: Alpha-3 code for comprehensive coverage of languages*

ISO 639-5, *Codes for the representation of names of languages — Part 5: Alpha-3 code for language families and groups*

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country code*

ISO 5127, *Information and documentation — Foundation and vocabulary*

ISO 8601 (all parts), *Date and time — Representations for information interchange*

ISO 15924, *Information and documentation — Codes for the representation of names of scripts*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5127 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

3.1
script
particular graphic representation or class of representations of a set of characters used to write one or more languages

[SOURCE: ISO 5127:2017, 3.1.6.02]

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3.2
spelling system
set of rules governing the orthography of a language

Note 1 to entry: Typically, a spelling system defines how the spoken form of a language is represented in writing. Several languages have undergone orthographic reforms which means they have had different spelling systems.

3.3
natural language
language which is or was in active use in a community of people, and the rules of which are mainly deduced from the usage

[SOURCE: ISO 5127:2017, 3.1.5.02]

3.4
character
member of a set of elements that is used for the representation, organization, or control of data

[SOURCE: ISO 5127:2017, 3.1.4.02]

3.5
written language
natural language (3.3) realized through the writing of *characters* (3.4)

[SOURCE: ISO 5127:2017, 3.1.5.04]

3.6
written language conversion
process whereby one *spelling system* (3.2) is converted into another spelling system

Note 1 to entry: This is a general term that includes script conversion but also, e.g. cases when a language changes its orthography without changing the script.

3.7
transliteration
process which consists of representing the characters of an alphabetical or syllabic system of writing by the characters of a conversion alphabet

3.8
transcription
process whereby the sounds of a given language are noted by the system of signs of a conversion language

3.9
romanization
script conversion from non-Roman to Roman *script* (3.1) by means of *transliteration* (3.7), *transcription* (3.8) or both

[SOURCE: ISO 5127:2017, 3.1.6.14]

3.10
written language conversion system
set of rules for *written language conversion* (3.6)

3.11
language code
combination of characters used to represent the name of a *language* or languages

[SOURCE: ISO 5127:2017, 3.2.5.14]

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3.12
script code
combination of characters used to represent the name of a *script* (3.1)

[SOURCE: ISO 15924:2004, 3.8]

3.13
conversion system code
combination of characters used in a structured way to represent a *written language conversion system* (3.10)

4 Conversion system codes

4.1 Structure of conversion system codes

4.1.1 General

A conversion system code shall consist of four segments:

— titular segment;

— source spelling system segment;

— target spelling system segment;

— identifying segment.

Each segment shall consist of one or more elements.

4.1.2 Construction of the conversion system code

The following rules are to be adhered to for the construction of a conversion system code:

— The codes shall consist of elements from the following Unicode ranges:

  — DIGIT ZERO through DIGIT NINE (U+0030 — U+0039)

  — LATIN CAPITAL LETTER A through LATIN CAPITAL LETTER Z (U+0041 — U+005A)

  — LATIN SMALL LETTER A through LATIN SMALL LETTER Z (U+0061 — U+007A)

— Segments shall be separated by a single “COLON” (“:”, Unicode U+003A).

— Elements within a segment shall be separated by a single “HYPHEN-MINUS” (“-”, Unicode U+002D).

— “HYPHEN-MINUS” (“-”, Unicode U+002D) within an element (e.g. `233-3`) will also be accepted.

— Other characters in the elements not covered by the above should be omitted or substituted.

4.1.3 Titular segment

This part will contain a reference to the conversion system authority or authorities by using identifiers, the list of which is maintained by ISO 24229/RA (see A.1). If an authority cannot be identified but the conversion system has a national character and/or is used by the government, the 2-letter country code from ISO 3166-1 should be used as the conversion system authority. If no conversion system authorities can be identified or its identification is not relevant, “Var” (varia) is used as the titular segment. See Clause 5 for more details.

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4.1.4 Source spelling system segment

Except as specified in 4.6, a script code is a mandatory element. Language-specific spelling systems also have language codes. In order to cover more specific needs, the following four elements in the order given shall be used:

— language code (3-letter code from ISO 639-2 or ISO 639-3 with preference to terminological codes. If a synonym is used from ISO 639-2, the ISO 639-2/T associated code should be used. ISO 639-2/T codes are intended to be used for terminology applications.);

— script code (4-letter code from ISO 15924);

— country code (2-letter code from ISO 3166-1);

— spelling system extension (an ad hoc string to refer to a non-default spelling system of a language, such as old orthography).

EXAMPLE 1 `ind-Latn-pre1972` (Indonesian language using the pre-1972 orthography).

EXAMPLE 2 `bos-Arab` (Bosnian language using Arabic script).

EXAMPLE 3 `uzb-Arab-AF` (Uzbek language as used in Afghanistan).

4.1.5 Target spelling system segment

This part may have the same four elements as listed in 4.1.4.

4.1.6 Identifying segment

This part will serve to distinguish by version, year of issue, etc. conversion systems that otherwise have the same scope. It may also contain elements necessary for the recognition of the system itself if the system has some kind of identification element. All in all, the following elements may occur (in the order given):

— identifying numbers, letters or else (such as standard number, e.g. 843);

— version number (e.g. `v6`, `v4-1`);

— year of adoption;

— year of issue;

— method identifier (if a standard devises more than one method of conversion, this optional ad hoc identifier can be used for distinction).

If there are cases when no elements can be used for this part, “na” (not applicable) will be the substitute.

EXAMPLE `2017` is the identifying segment of the system coded as `UN:ara-Arab:Latn:2017`.

4.2 Requirements for new conversion system codes

Additions to the list of conversion system codes shall be made on the basis of information from upon the request of a member of ISO 24229/AG (see A.2) or the conversion system authority that manages this system.

The ISO 24229/AG decides upon the addition, on the basis of the justification given for the actual requirements for international interchange. Code elements will be allocated accordingly.

A written language conversion system is eligible for a conversion system code assignment if it fulfils one of the following criteria.

— The system has been approved for official use at some level of government.

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— The system has been developed and used by educational/scientific institutions, published in a peer reviewed scientific publication.

— The system has been in substantial usage.

Assigning of a conversion system code also requires demonstration of one of the following usage factors:

— necessity of identification of the system in interchange.

— necessity of identification of the system in data encoding.

Systems that are used in isolation or only for temporary usage do not need to have assigned codes.

4.3 Deprecation of conversion system codes

Deprecation of conversion system codes shall be made upon request of a member of ISO 24229/AG or the conversion system authority that manages the system.

The ISO 24229/AG will decide upon the marking of deprecation, on the basis of the information received. The corresponding code is reserved for backwards-compatibility.

NOTE Deprecation only applies to the code representation of the written languages conversion system, and not the system itself. For example, deprecation can be necessary when the authority undergoes a rename.

4.4 User assigned conversion system codes

If users need codes to represent conversion systems not included in the conversion system registry, the code prefix of `zz` can be used, which shall be placed at the beginning of the conversion system code, in the titular segment, and followed by a “HYPHEN MINUS” character (“-”, Unicode U+002D).

NOTE Users are advised that the above series of codes are not universally used, those code elements are not compatible between different entities.

4.5 Capitalization of conversion system codes

Conversion system codes will use capitalization according to the relevant standards but this does not have any distinctive meaning. For example, an all lower case code will be an equally valid code.

4.6 Abbreviated conversion system codes

In case of user demand, abbreviated conversion system codes may additionally be registered whereby in identifying language-specific spelling systems script codes are omitted if they can be considered as default scripts for the languages concerned. Examples are given in 4.7. Sources, such as Common Locale Data Repository (CLDR) of the Unicode Consortium, should be consulted when determining default scripts for languages.

4.7 Examples of conversion system codes

The examples given here are only indicative and do not guarantee that such codes will be actually registered.

EXAMPLE 1 `UN:ara-Arab:Latn:2017` (possible abbreviation — `UN:ara:Latn:2017`; United Nations system for the romanization of Arabic, approved 2017)

EXAMPLE 2 `UN:mon-Mong-CN:Latn:1977` (possible abbreviation — `UN:mon-CN:Latn:1977`; United Nations system for the romanization of Mongolian in China, approved 1977)

EXAMPLE 3 `BGN-PCGN:chn-Hans:Latn:1979` (BGN/PCGN 1979 Agreement — Romanization of Chinese)

EXAMPLE 4 `ALA-LC:mal-Mlym:Latn:2012` (possible abbreviation — `ALA-LC:mal:Latn:2012`; ALA-LC romanization system that transliterates the Malayam language from Malayam script characters into Latin script)

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EXAMPLE 5 `ISO:Cyrl:Latn:9-1995` (ISO 9:1995 for the transliteration into Latin of Cyrillic characters)

EXAMPLE 6 `ICAO:Arab:Latn:2015` (ICAO rules for rendering Arabic-script names in Latin letters, issued in 2015)

EXAMPLE 7 `DIN:bel-Cyrl:Latn:1460-1982` (possible abbreviation — `DIN:bel:Latn:1460-1982`; DIN 1460 for the transliteration of Belarusian into Latin)

EXAMPLE 8 `ESKT:udm-Cyrl:est-Latn:2021` (possible abbreviation — `ESKT:udm:est:2021`; Estonian Language Committee's rules for rendering Udmurt names in Estonian texts, approved 2021)

EXAMPLE 9 `LV:eng-Latn:lav-Latn:2006` (possible abbreviation — `LV:eng:lav:2006`; official instructions in Latvia on rendering English proper names in Latvian, issued in 2006)

Target spelling systems can also be language-specific. Example 8 denotes a system to represent Udmurt names in Estonian texts using the Estonian alphabet, not Latin as a whole.

5 Conversion system authority

5.1 General

A conversion system authority is a competent authority that creates, publishes and/or manages written language conversion systems.

Authorities that are no longer competent will depend on ISO 24229/AG for managing codes, which will be considered on a case-by-case basis.

5.2 Requirements

5.2.1 General

A conversion system authority should:

a) have at least one written language conversion system eligible for a conversion system code;

b) be competent in managing its written language conversion systems (5.2.4).

5.2.2 Inactive authorities

If a conversion system authority does not meet requirements outlined in 5.2.1 b), it is considered "inactive".

5.2.3 Varia authorities

The "Varia systems" (Var) conversion system authority is managed by ISO 24229/AG to represent written language conversion systems that:

a) have a need to be represented as determined by ISO 24229/AG;

b) yet do not have a clear extant authority.

5.2.4 Competency

A competent conversion system authority is a recognized institution that has standardized processes surrounding the management of the written language conversion systems, covering the following processes:

a) planning of written language conversion systems, including the process of designing and defining written language conversion systems; and

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b) performing changes to written language conversion systems are well planned.

It is recommended for a competent conversion system authority to also establish standardized processes for the following:

a) public announcement and dissemination of its written language conversion systems; and

b) allows a public review period for people affected by written language conversion systems under its management prior to enactment.

5.3 Registration

The ISO 24229/AG is tasked with managing a list of conversion system authorities.

5.4 Conversion system authority identifiers

5.4.1 Principles for construction of identifiers

5.4.1.1 Relationship with names

The principle behind the alphabetic identifiers for conversion system authorities is a visual association between the conversion system authorities' names and their corresponding identifiers.

In applying this principle, the identifiers will be generally assigned on the basis of the abbreviated names of the conversion system authorities, thus avoiding, wherever possible, any reflection of their political status.

5.4.1.2 Construction of the alphabetic identifier

The following rules shall be adhered to for the construction of the alphabetic identifier.

— The maximum length of the identifier shall be 16 characters.

— The identifier shall consist of elements from the following Unicode ranges:

  — DIGIT ZERO through DIGIT NINE (U+0030 — U+0039)

  — LATIN CAPITAL LETTER A through LATIN CAPITAL LETTER Z (U+0041 — U+005A)

  — LATIN SMALL LETTER A through LATIN SMALL LETTER Z (U+0061 — U+007A)

— The identifier elements shall be separated by a single HYPHEN-MINUS (U+002D).

— The minimal length of the identifier is 3 characters to encourage the creation of descriptive and distinguishable elements, with the exception of the following:

  — UN, for United Nations

— Identifiers with 2 characters shall be reserved for codes in ISO 3166-1, each representing the administration authority of the particular jurisdiction.

5.4.1.3 Capitalization of conversion system authority identifiers

Conversion system authority identifiers will use capitalization like in ordinary abbreviations, but this does not have any distinctive meaning. For example, an all lower case identifier will be an equally valid identifier.

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5.4.2 Examples of conversion system authority identifiers

The examples given here are only indicative.

EXAMPLE 1 `ISO` for International Organization for Standardization

EXAMPLE 2 `BGN-PCGN` for the United States Board on Geographic Names — Permanent Committee on Geographical Names for British Official Use

EXAMPLE 3 `ALA-LC` for American Library Association — Library of Congress

EXAMPLE 4 `DIN` for German Institute for Standardization

EXAMPLE 5 `ICAO` for International Civil Aviation Organization

EXAMPLE 6 `UN` for United Nations

6 Data model and attributes

6.1 Common data model and attributes

6.1.1 General

The data models in this clause shall be used by other data models specified in this document.

6.1.2 Data models

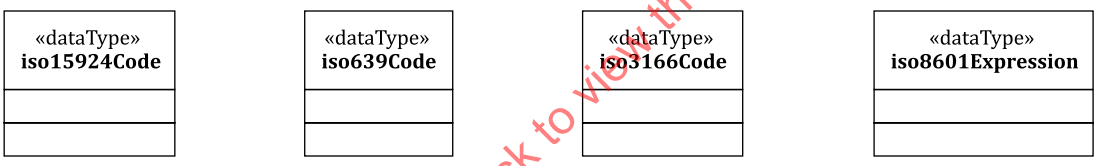

Figure 1 — Data types

6.1.3 Usage of ISO 15924 code elements

`iso15924Code` represents code elements from ISO 15924 for reference to scripts.

6.1.4 Usage of ISO 639 code elements

`iso639Code` represents code elements from ISO 639-2, ISO 639-3 and ISO 639-5 for reference to languages.

6.1.5 Usage of ISO 3166 code elements

`iso3166Code` represents country codes from ISO 3166-1.

6.1.6 Usage of ISO 8601 expressions

`iso8601Expression` represents datetime expressions that conform with ISO 8601.

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6.2 System authority data model and attributes

6.2.1 Diagram

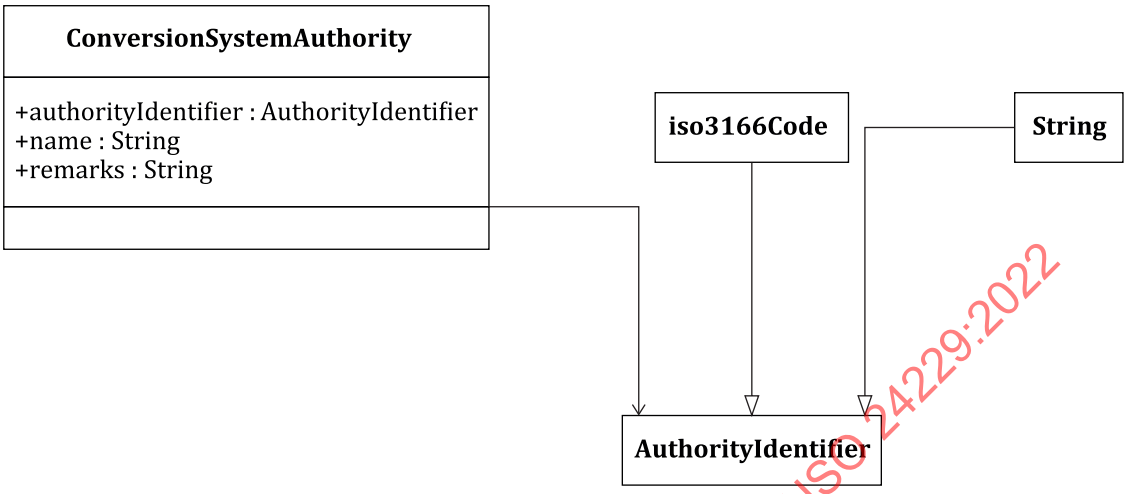

Figure 2 — Conversion system authority

6.2.2 Conversion system authority

authorityIdentifier	An identifier that represents the conversion system authority (4.1.3).
name	The identifiable short name that uniquely identifies the conversion system authority.
remarks	Any further notes.

6.2.3 Authority identifier

Either a 2-letter `iso3166Code`, or a `String` under the constraints of 5.4.1.2.

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6.3 Conversion system data model and attributes

6.3.1 Diagram

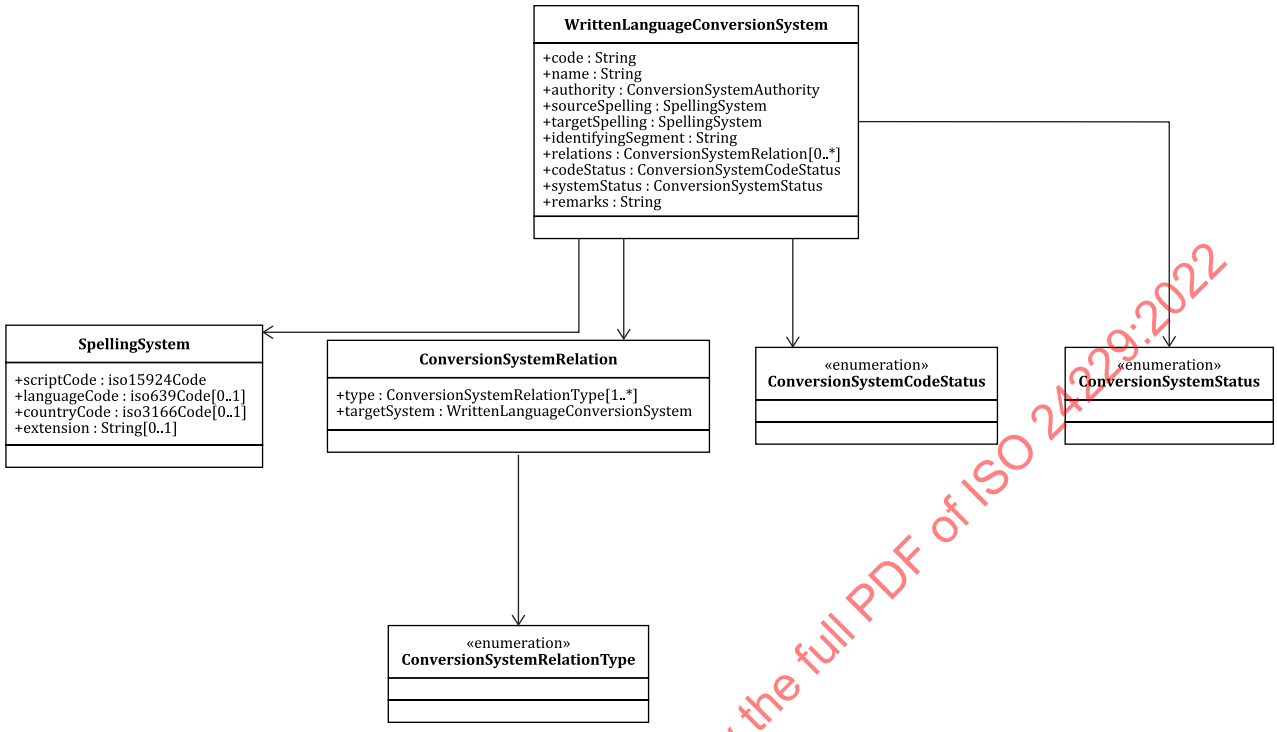

Figure 3 — Written language conversion system

6.3.2 Written language conversion system

code	A code that identifies the written language conversion system.
name	A name that represents the written language conversion system.
authority	The conversion system authority under which this conversion system belongs.
sourceSpelling	The spelling system used in the source text.
targetSpelling	The spelling system used in the output text.
identifyingSegment	An identifier that distinguishes the written languages conversion system from others with the same conversion system authority and spelling scopes.
relations	Written language conversion systems can be related to other written language conversion systems in a number of ways. For example, a written language conversion system may represent an adoption or variant of another written language conversion system. Hierarchical structures of written language conversion systems can be constructed by means of relationships. This element is optional.
codeStatus	An optional code that identifies the current status of the conversion system code itself.

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systemStatus — An optional code that identifies the current status of the written language conversion system itself.

remarks — Any further notes.

The date of the adoption of the written language conversation system by the authority may be noted in the remarks.

A typical use case is to show its original code from the original system from where this code has been imported.

EXAMPLE `NOTE: OGC 11-122r1 code urd_Arab2Latn_ODNI_2004`

6.3.3 Spelling system

`scriptCode` shall be present. In the case of a language-specific spelling system, `languageCode` is also required.

languageCode — A 3-letter code from ISO 639-2, ISO 639-3 and ISO 639-5 that identifies the source language being processed.

scriptCode — A 4-letter code from ISO 15924 that identifies the script of the spelling system.

countryCode — An optional 2-letter code from ISO 3166-1 that identifies the country associated with the spelling system.

extension — An optional ad hoc string to refer to a non-default spelling system of a language.

6.3.4 Conversion system relation

targetSystem — The conversion system of which this relation is a target.

type — One or more types of relation that the conversion system has with the target conversion system.

6.3.5 Conversion system code status

Examples of system code statuses:

`preferred` — The current system code is marked as “preferred”.

`deprecated` — The current system code is marked as “deprecated”.

NOTE The deprecation marker in no way indicates deprecation of the system itself.

EXAMPLE When a conversion system code has been renamed, maybe due to the renaming of the corresponding system authority, then the old code can be considered “deprecated” in favour of the renamed code. The conversion system itself remains unchanged.

6.3.6 Conversion system status

Examples of system statuses:

`former` — The current system is marked as “former”.

`current` — The current system is marked as “current”.

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`inactive` The current system is marked as “inactive”.

EXAMPLE When it has been deprecated of its own accord, it can be considered “inactive”.

6.3.7 Conversion system relation type

Examples of relation types:

`basedOn` The current system is based on the target system. The conversion process inherits certain attributes from the target system.

EXAMPLE 1 `ALA-LC:jpn-Hrkt:Latn:1997` is based on `Var:jpn-Hrkt:Latn:Hepburn-1886`.

`basisFor` The target system is based on the current system. It can be thought of as the inverse of `basedOn`.

EXAMPLE 2 `Var:jpn-Hrkt:Latn:Hepburn-1886` is the basis for `ALA-LC:jpn-Hrkt:Latn:1997`, `BGN:jpn-Hrkt:Latn:1930`, `BGN-PCGN:jpn-Hrkt:Latn:1976` and `BGN-PCGN:jpn-Hrkt:Latn:2017`

`aliasOf` The current system is an alias to the target system. The conversion processes are identical.

`adoptedFrom` The current system is adopted from the target system. The conversion processes may not be identical.

`supersedes` The current system supersedes the target system.

`supersededBy` The current system is superseded by the target system.

`relatedTo` The current system is related to the target system.

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Annex A
(normative)

Registration authority

A.1 Registration authority (ISO 24229/RA)

A.1.1 General

For the purpose of registering conversion system codes and conversion system authority identifiers, ISO has designated a Registration authority for ISO 24229.

The name and contact information of the Registration authority for this document can be found at https://www.iso.org/mara

The ISO list identifies the Registration authority and where the Registration authority has published materials related to this document on the Internet.

A.1.2 Functions of the Registration authority

It has been entrusted with the following functions with regard to the list of conversion system authorities and written language conversion systems, together with code assignments and information associated with each entry:

a) to add and eliminate these entries, in accordance with the rules in this document;

b) to advise users and ISO member bodies regarding application of such information;

c) to update and disseminate such information;

d) to maintain a reference list of such information;

e) to publish changes made to such information and the history of changes allowing traceability;

f) to administer the reservation of the codes.

Changes to the content of the list of entries becomes effective immediately upon publication.

The criteria provided in A.3 to A.4 shall be observed by the ISO 24229/RA for changes to the list of conversion system authorities and written language conversion systems, their code assignments and associated information, and for reservations of code elements.

A.1.3 Data provided by the Registration authority

The RA will provide at least the following data on conversion system codes:

— the conversion system code;

— the name of the conversion system and its authority;

— the source language and script of the conversion system;

— the target language and script of the conversion system;

— the source bibliographic reference;

— method identifier of the conversion system;

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