Guidelines for Use of ISBD as Linked Data

Written by the ISBD Linked Data Study Group:

María Violeta Bertolini
Vincent Boulet
Gordon Dunsire
Elena Escolano Rodríguez
Massimo Gentili-Tedeschi
Françoise Leresche
Dorothy McGarry
Mélanie Roche
Ricardo Santos Muñoz
Mirna Willer

Final draft: August 2016
Table of Contents

Table of Contents ....................................................................................................................................... 3
Introduction................................................................................................................................................. 4
1 ISBD namespaces ........................................................................................................................................ 5
  1.1 ISBD element set ................................................................................................................................. 5
  1.2 ISBD value vocabularies ....................................................................................................................... 5
2 Constrained and unconstrained namespaces ....................................................................................... 6
3 Alignments and mappings ....................................................................................................................... 6
4 Application Profile and data presentation ............................................................................................... 8
5 Recommendations for use ........................................................................................................................ 8
  5.1 Using constrained properties ................................................................................................................ 8
  5.2 Using unconstrained properties .......................................................................................................... 9
  5.3 Mixing both constrained and unconstrained properties ....................................................................... 9
  5.4 Extending the ISBD namespaces ......................................................................................................... 9
6 Examples .................................................................................................................................................. 10
  6.1 Example 1 ......................................................................................................................................... 10
  6.2 Example 2 ......................................................................................................................................... 12
  6.3 Example 3 ......................................................................................................................................... 13
  6.4 Example 4 ......................................................................................................................................... 15
  6.5 Example 5 ......................................................................................................................................... 16
Introduction

The International Standard Bibliographic Description (ISBD) is a standard that was created and is maintained by the International Federation of Library Associations and Institutions (IFLA), intended to serve as the principal standard to promote universal bibliographic control, that is, to make universally and promptly available, in a form that is internationally acceptable, basic bibliographic data for all published resources in all countries.

The ISBD specifies the requirements for the description and identification of published resources that are likely to appear in library collections. The primary purpose of the ISBD is to provide the stipulations for compatible descriptive cataloguing worldwide in order to aid the international exchange of bibliographic records between national bibliographic agencies and throughout the international library and information community. The ISBD provides stipulations to cover the maximum amount of descriptive information that may be required in a range of different bibliographic activities. It therefore includes elements that are essential to one or more of those activities, but not necessarily to all.


Translations are also available at http://www.ifla.org/publications/translations-of-isbd.

Namespaces for the consolidated edition of the ISBD can be accessed at http://iflastandards.info/ns/isbd/. They are maintained and accessed using the Open Metadata Registry (OMR).

These Guidelines are intended for use by developers of applications that allow libraries to expose ISBD metadata for the Semantic Web. The guidelines aim to promote the use of the ISBD namespaces in the Linked Data environment.

---

1 ISBD namespaces

ISBD namespaces are composed of ISBD element sets and ISBD value vocabularies. The ISBD element set includes Resource Description Framework (RDF)2 classes and properties corresponding to ISBD elements. Six value vocabularies provide the controlled terminologies for the ISBD Area 0 elements, i.e.: content forms, qualifications, and media types. Each class, concept, and property has a Uniform Resource Identifier (URI) for use in Semantic Web data triples.

1.1 ISBD element set

The element set is designed to support the publication of lossless RDF datasets from metadata records that are compliant with the ISBD consolidated edition. The element set attempts to represent all of the semanties, both implicit and explicit, of the ISBD.

The element set contains one class corresponding to the ISBD “Resource”. All other classes in the element set correspond to Syntax Encoding Schemes (SES).

The rest of the element set is designed from the bottom-up. The elements defined in the consolidated edition represent the finest level of granularity. These fine-grained elements are meant to be aggregated into coarser elements, at multiple levels, up to the coarsest level of the ISBD record as a whole.

Diagram 1: Hierarchy of aggregation for Title proper.

![Diagram 1: Hierarchy of aggregation for Title proper.](image)

Some elements to support such aggregation are included in the element set. For example Title statement has been added to aggregate multiple titles associated with the same statement of responsibility, and Place of publication statement to aggregate multiple places associated with the same publisher name.3 Other aggregated elements may be added following further analysis.

1.2 ISBD value vocabularies

Value vocabularies are published for each of the sets of terms defined in ISBD for use in the content form and media type elements in Area 0.

---


The relevant vocabularies maintained in the OMR are:

- ISBD Content Form
  http://metadataregistry.org/vocabulary/show/id/113.html
- ISBD Content Qualification of Dimensionality
  http://metadataregistry.org/vocabulary/show/id/117.html
- ISBD Content Qualification of Motion
  http://metadataregistry.org/vocabulary/show/id/116.html
- ISBD Content Qualification of Sensory Specification
  http://metadataregistry.org/vocabulary/show/id/118.html
- ISBD Content Qualification of Type
  http://metadataregistry.org/vocabulary/show/id/115.html
- ISBD Media Type
  http://metadataregistry.org/vocabulary/show/id/114.html

2 Constrained and unconstrained namespaces

Each ISBD property has a declared domain specifying the ISBD class Resource. The range of each fined grained property is not specified, although it is expected to be a literal based on the transcription of information presented in the resource being described. For properties for aggregated elements the range is declared to be the class of the SES specifying the component elements, their order and delimiters.

Such domain and range declarations are statements about constraints on using the property.

The base domain of this “constrained” namespace is:
http://iflastandards.info/ns/isbd/elements/.

There is a parallel namespace containing the same set of properties with no declared domain and range. This “unconstrained” element set is intended for different purposes:
1. to support multiple instances of the same aggregated element;
2. to support interoperability with data from non-ISBD sources;
3. to allow non-ISBD communities to use ISBD elements in a less formal way.

The base domain of the “unconstrained” namespace is:
http://iflastandards.info/ns/isbd/elements/unc/.

3 Alignments and mappings

An alignment is a match between one or more elements in one schema to one or more elements in another schema. The match does not have to be exact; it can be equivalent, broader, or narrower.

A mapping is an expression in RDF of a single alignment between two elements. A map is a set of mappings between the two schemas.

A mapping is expressed as a single RDF triple with the properties corresponding to the matched elements being the subject and object, and the predicate being an appropriate ontological property. For semantic consistency, the matched properties must have the same domain and range, or the domain and range of one property must be subclasses of the domain and range, respectively, of the other property. Otherwise, unconstrained properties with no domain or range should be used.

The map between ISBD and UNIMARC can use constrained properties because they use the same domain of Resource. Conversely, the map between ISBD and FRBRER must use unconstrained properties because FRBR assigns one of the four classes Work, Expression, Manifestation, Item as the domain for its properties, while ISBD assigns only the class Resource. The ISBD and FRBR classes do not have a simple equivalent or sub-class relationship.

For example, there is an agreed alignment between the ISBD and RDA elements. RDA uses the same domains as FRBRer, so the mappings must use unconstrained properties. The expressions of a narrower, equivalent, and broader alignment are given below.

Case: ISBD narrower than RDA

\[
\text{ISBD subproperty of ISBDu} \\
\text{ISBDu subproperty of RDAu} \\
\Rightarrow \text{ISBD subproperty of RDAu}
\]

Case: ISBD equivalent to RDA

\[
\text{ISBD subproperty of ISBDu} \\
\text{RDA subproperty of RDAu} \\
\Rightarrow \text{ISBD subproperty of RDAu} \\
\Rightarrow \text{RDA subproperty of ISBDu}
\]

Case: ISBD broader than RDA

\[
\text{RDA subproperty of RDAu} \\
\text{RDAu subproperty of ISBDu} \\
\Rightarrow \text{RDA subproperty of ISBDu}
\]

Here, the ontological property “subproperty of” is used to relate the ISBD and RDA element properties. It is defined in the namespace of RDF Schema. This ontological property is transitive; that is, if A subproperty of B, and B subproperty of C, then A subproperty of C. Equivalence between A and B is expressed by A subproperty of B, and B subproperty of A.

---

5 http://iflastandards.info/ns/unimarc/
8 http://www.rdaregistry.info/.
9 https://www.w3.org/TR/rdf-schema/.
4 Application Profile and data presentation

The intended use of ISBD elements to create a complete ISBD record is described in a basic Application Profile (AP)\(^\text{10}\). The AP is based on the Dublin Core Abstract Model (DCAM)\(^\text{11}\) and follows the guidelines of the Dublin Core Metadata Initiative\(^\text{12}\). It represents the multi-level aggregation of elements, indicating the mandatory and repeatable status of each element and aggregated element.

The selection, order, and punctuation of components of an aggregated element is specified in the ISBD. This information forms the basis of the SES that is declared as the range of the property corresponding to the aggregated element. An SES can be expressed as an EXtensible Stylesheet Language Transformation (XSLT)\(^\text{13}\) script that transforms RDF/XML data for an ISBD description into the standardized presentation of the aggregated statement.

5 Recommendations for use

5.1 Using constrained properties

Using a constrained ISBD property in a linked data triple implies that the subject of the triple is a Resource. Any individual constrained property can be used with properties from other namespaces to complete a more generic element set for a given application provided the same type of Resource is intended, such as in the British Library Data Model for Books\(^\text{14}\).

For this reason constrained properties for aggregated elements should only be used when an aggregation only occurs once.

Case 1: Single Publication statement

Triple: R1 has publication ... statement “Place: Name, Date”
Triple: R1 has place of publication, production, ... “Place”
Triple: R1 has name of publisher, producer, distributor “Name”
Triple: R1 has date of publisher, producer, distributor “Date”

Case 2: Multiple Publication statements (PS1 and PS2)

Triple: R1 has publication ... statement PS1
Triple: R1 has publication ... statement PS2
Triple: PS1 has place of publication, production, ... “Place1”
Triple: PS1 has name of publisher, producer, distributor “Name1”
Triple: PS1 has date of publisher, producer, distributor “Date1”
Triple: PS2 has place of publication, production, ... “Place2”
Triple: PS2 has name of publisher, producer, distributor “Name2”
Triple: PS2 has date of publisher, producer, distributor “Date2”

\(^{11}\) http://dublincore.org/documents/2007/04/02/abstract-model/.
\(^{13}\) https://en.wikipedia.org/wiki/XSLT.
In Case 2 the domain of the properties is not Resource but the Publication ... statement, so the constrained property should not be used.

5.2 Using unconstrained properties

When using an unconstrained property the class of the subject of the triple cannot be inferred implicitly and should be declared with an explicit triple if necessary.

For example:

URI 1 is a Resource

These properties allow an application to declare the class of thing being described independently of ISBD.

For example:

URI2 has title proper [unconstrained] “title”
URI2 is a T-shirt

5.3 Mixing both constrained and unconstrained properties

A bibliographic description can mix elements from different element sets. This allows the use of elements from both constrained and unconstrained ISBD element sets.

As noted in case 2, a constrained property should normally only be used between a resource and the next finer level of granularity in the description, because the domain of all ISBD constrained properties is the Resource itself.

5.4 Extending the ISBD namespaces

Aggregation elements that are not currently defined in the ISBD namespaces can be added to a local namespace and mapped to the ISBD namespaces. This extension mechanism can also be used to create elements for sequencing, etc.
6 Examples

**Note:** These examples are derived from existing records in online catalogues. Links to original records are provided. The examples show ISBD elements at different levels of granularity and constraint, and are presented in Turtle (ttl) RDF serialization format.

6.1 Example 1

Spanish description of a book, using English and Spanish controlled terms for area 0 elements and Spanish description

http://datos.bnc.es/edicion/a5181536.html

Example 1a: using fine granularity ISBD properties

```turtledoc
@prefix ex: <http://example.com/> .
@prefix isbd: <http://iflastandards.info/ns/isbd/elements/> .
@prefix isbdcf: <http://iflastandards.info/ns/isbd/terms/contentform/> .
@prefix isbdcqss: <http://iflastandards.info/ns/isbd/terms/contentqualification/sensoryspecification/> .
@prefix isbdmt: <http://iflastandards.info/ns/isbd/terms/mediatype/> .
@prefix skos: <http://www.w3.org/2004/02/skos/core#> .

ex:1
    isbd:P1001 isbdcf:T1009 ;
    isbd:P1002 isbdcqss:T1005 ;
    isbd:P1003 isbdmt:T1010 ;
    isbd:P1004 "El alcalde de Zalamea" ;
    isbd:P1007 "Calderón de la Barca" ;
    isbd:P1008 "14ª ed., 1ª en esta presentación" ;
    isbd:P1010 "edición de José María Ruano de la Haza" ;
    isbd:P1016 "Madrid" ;
    isbd:P1017 "Espasa" ;
    isbd:P1018 "2012" ;
    isbd:P1022 "179 p."@es ;
    isbd:P1024 "19 cm" ;
    isbd:P1026 "Austral" ;
    isbd:P1031 "50" ;
    isbd:P1032 "B 425-2012" ;
    isbd:P1042 "Bibliografía: p. [55]-63"@es ;

isbdcf:T1009
    skos:prefLabel "Text"@en ;
    skos:prefLabel "Texto"@es .

isbdcqss:T1005
    skos:prefLabel "visual"@en ;
    skos:prefLabel "visual"@es .

isbdmt:T1010
    skos:prefLabel "unmediated"@en ;
    skos:prefLabel "sin mediación"@es .
```
Example 1b: using aggregated ISBD elements

@prefix ex: <http://example.com/> .
@prefix isbd: <http://iflastandards.info/ns/isbd/elements/> .
ex:1
  isbd:P1032 "B 425-2012" ;
  isbd:P1042 "Bibliografía: p. [55]-63"@es ;
  isbd:P1158 "Text (visual) : unmediated@en" ;
  isbd:P1158 "Texto (visual) : sin mediación@es" ;
  isbd:P1159 "El alcalde de Zalamea / Calderón de la Barca ; edición de José María Ruano de la Haza" ;
  isbd:P1160 "14ª ed., 1ª en esta presentación" ;
  isbd:P1163 "179 p. ; 9 cm"@es ;

Example 1c: using unconstrained fine granularity ISBD elements

@prefix ex: <http://example.com/> .
@prefix isbdu: <http://iflastandards.info/ns/isbd/unc/elements/> .
@prefix isbdmt: <http://iflastandards.info/ns/isbd/terms/mediatype/> .
@prefix skos: <http://www.w3.org/2004/02/skos/core#> .
ex:1
  isbdu:P1001 isbdcf:T1009 ;
  isbdu:P1002 isbdcqss:T1005 ;
  isbdu:P1003 isbdmt:T1010 ;
  isbdu:P1004 "El alcalde de Zalamea" ;
  isbdu:P1007 Calderón de la Barca ;
  isbdu:P1008 "14ª ed., 1ª en esta presentación" ;
  isbdu:P1010 "edición de José María Ruano de la Haza" ;
  isbdu:P1016 "Madrid" ;
  isbdu:P1017 "Espasa" ;
  isbdu:P1018 "2012" ;
  isbdu:P1022 "179 p."@es ;
  isbdu:P1024 "19 cm" ;
  isbdu:P1026 "Austral" ;
  isbdu:P1031 "50" ;
  isbdu:P1032 "B 425-2012" ;
  isbdu:P1042 "Bibliografía: p. [55]-63"@es ;

isbdcf:T1009  skos:prefLabel "Text"@en ;
              skos:prefLabel "Texto"@es .

isbdcqss:T1005  skos:prefLabel "visual"@en ;
                skos:prefLabel "visual"@es .

isbdmt:T1010  skos:prefLabel "unmediated"@en ;
              skos:prefLabel "sin mediación"@es .
6.2  Example 2

Italian description of a musical score, using English and Italian controlled terms for area 0 elements, using constrained fine granularity with vocabularies in different languages

http://id.sbn.it/bid/MUS0251840

@prefix ex: <http://example.com/> .
@prefix isbd: <http://iflastandards.info/ns/isbd/elements/> .
@prefix isbdcf: <http://iflastandards.info/ns/isbd/terms/contentform/> .
@prefix isbdcqt: <http://iflastandards.info/ns/isbd/terms/contentqualification/type/> .
@prefix isbdcqss: <http://iflastandards.info/ns/isbd/terms/contentqualification/sensoryspecification/> .
@prefix isbdmt: <http://iflastandards.info/ns/isbd/terms/mediatype/> .

ex:2
    isbd:P1001 isbdcf:T1004 ;
    isbd:P1001 isbdcf:T1004 ;
    isbd:P1002 isbdcqt:T1002 ;
    isbd:P1002 isbdcqt:T1002 ;
    isbd:P1002 isbdcqss:T1005 ;
    isbd:P1002 isbdcqss:T1005 ;
    isbd:P1003 isbdmt:T1010 ;
    isbd:P1003 isbdmt:T1010 ;
    isbd:P1004 "Fidelio" ;
    isbd:P1006 "drame lyrique en trois actes" ;
    isbd:P1007 "paroles de MM. N. xxx & xxx" ;
    isbd:P1007 "arrangées pour la scène française par MM. J.T. et A.F. xxx" ;
    isbd:P1007 "musique de L.s van Beethoven" ;
    isbd:P1014 "[Partition]"@fr ;
    isbd:P1016 "Paris" ;
    isbd:P1017 "A.Farrenc" ;
    isbd:P1018 "[1826]" ;
    isbd:P1019 "Paris" ;
    isbd:P1020 "Marquerie frères" ;
    isbd:P1022 "1 partitura (535 p.)"@it ;
    isbd:P1024 "34 cm" ;
    isbd:P1032 "Numero di lastra: 72"@it ;
    isbd:P1045 "Sul frontespizio: Repräsenté p.r la première fois à Paris sur le Théâtre Royal de l'Odeon, le [senza data]" .

isbdcf:T1004
    skos:prefLabel "music"@en ;
    skos:prefLabel "musica"@it .

isbdcq:T1002
    skos:prefLabel "notated"@en ;
    skos:prefLabel "notato"@it .

isbdcqss:T1005
    skos:prefLabel "visual"@en ;
    skos:prefLabel "visivo"@it .

isbdmt:T1010
    skos:prefLabel "unmediated"@en ;
    skos:prefLabel "senza mediazione"@it .
6.3 Example 3

Spanish description of a book, showing both a local standard identifier without label (legal deposit M 43872-199) and standard identifier with label (ISBN), and General material designation as it was before ISBD Consolidated edition, 2011

http://datos.bne.es/edicion/bimo0001497915.html
http://catalogo.bne.es/uhtbin/cgisirsi/0/x/0/05?searchdata1=bimo0001497915{001}

Example 3a: Using constrained fine granularity with General material designation element

@prefix ex: <http://example.com/> .
@prefix isbd: <http://iflastandards.info/ns/isbd/elements/> .
ex:3
  isbd:P1004 "Antropología metafísica" ;
  isbd:P1007 "Julián Marías" ;
  isbd:P1008 "1ª ed. en Ensayo" ;
  isbd:P1016 "Madrid" ;
  isbd:P1017 "Alianza Editorial" ;
  isbd:P1018 "1998" ;
  isbd:P1022 "224 p." ;
  isbd:P1024 "20 cm" ;
  isbd:P1026 "El libro universitario" ;
  isbd:P1031 "49" ;
  isbd:P1032 "M 43872-1998" ;
  isbd:P1148 "Ensayo" ;
  isbd:P1185 "[Texto impreso]\@es .

Example 3b: using constrained ISBD properties mixed with unconstrained properties from other namespaces.

@prefix dct: <http://purl.org/dc/terms/> .
@prefix ex: <http://example.com/> .
@prefix isbd: <http://iflastandards.info/ns/isbd/elements/> .
@prefix rdaco: <http://rdaregistry.info/termList/RDAContentType/> .
@prefix rdamt: <http://rdaregistry.info/termList/RDAMediaType/> .
@prefix rdau: <http://rdaregistry.info/Elements/u/> .
ex:3
  dct:date "1998" ;
  dct:extent "224 p." ;
  dct:extent "20 cm" ;
  dct:identifier "ISBN 84-206-7923-2" ;
  dct:title "Antropología metafísica" ;
  isbd:P1004 "Antropología metafísica" ;
  isbd:P1007 "Julián Marías" ;
  isbd:P1008 "1ª ed. en Ensayo" ;
  isbd:P1016 "Madrid" ;
  isbd:P1017 "Alianza Editorial" ;
  isbd:P1026 "El libro universitario" ;
  isbd:P1031 "49" ;
  isbd:P1032 "M 43872-1998" ;
  isbd:P1148 "Ensayo" ;
  isbd:P1185 "[Texto impreso]\@es ;
  rdau:P60049 rdaco:1020 ;
  rdau:60050 rdamt:1007 ;
rdau:P60327 "Julián Marías".

rdaco:1020
  skos:prefLabel "text"@en ;
  skos:prefLabel "texte"@fr ;
  skos:prefLabel "texto"@es ;
  skos:prefLabel "文本"@zh .

rdamt:1007
  skos:prefLabel "unmediated"@en ;
  skos:prefLabel "sans médiation"@fr ;
  skos:prefLabel "sin mediación"@es ;
  skos:prefLabel "无中介"@zh .
6.4 Example 4

French description of a book, using constrained fine granularity ISBD properties with added aggregated Place of publication, etc. statement and aggregated Publication, production, distribution, etc. area

http://www.sudoc.fr/155268449

@prefix ex: <http://example.com/> .
@prefix isbd: <http://iflastandards.info/ns/isbd/elements/> .

ex:4
  isbd:P1004 "ISBD" ;
  isbd:P1006 "International Standard Bibliographic Description" ;
  isbd:P1007 "Consolidated edition" ;
  isbd:P1007 "recommended by the ISBD Review Group" ;
  isbd:P1007 "approved by the Standing Committee of the IFLA Cataloguing Section" ;
  isbd:P1016 "Berlin" ;
  isbd:P1016 "Boston" ;
  isbd:P1017 "De Gruyter Saur" ;
  isbd:P1018 "cop. 2011" ;
  isbd:P1022 "1 vol. (xvii-284 p.)"@fr ;
  isbd:P1024 "25 cm" ;
  isbd:P1026 "IFLA series on bibliographic control" ;
  isbd:P1030 "ISSN 1868-8438" ;
  isbd:P1031 "v. 44" ;
  isbd:P1032 "ISBN 978-3-11-026379-3 (alk. paper)" ;
  isbd:P1162 "Berlin ; Boston : De Gruyter Saur, cop. 2011" ;
  isbd:P1168 "Berlin ; Boston" ;
  isbd:P1185 "Texte imprimé"@fr .
6.5 Example 5

French description of a book, with parallel elements, using constrained fine granularity ISBD properties with a local aggregated statement

http://catalogue.bnf.fr/ark:/12148/cb358028275.public

@prefix ex: <http://example.com/> .
@prefix isbd: <http://iflastandards.info/ns/isbd/elements/> .
@prefix isbdu: <http://iflastandards.info/ns/isbd/unc/elements/> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .

ex:5
  isbd:P1004 "François Mauriac" ;
  isbd:P1005 "François Mauriac" ;
  isbd:P1006 "psycholectures" ;
  isbd:P1007 "sous la dir. de J. E. Flower" ;
  isbd:P1016 "Exeter, Grande Bretagne" ;
  isbd:P1017 "University of Exeter Press" ;
  isbd:P1016 "Talence" ;
  isbd:P1017 "Presses universitaires de Bordeaux" ;
  isbd:P1018 "1995" ;
  isbd:P1022 "VIII-270 p." ;
  isbd:P1024 "23 cm" ;
  isbd:P1034 "200 F" ;
  isbd:P1042 "Index"@fr ;
  isbd:P1073 "Textes en français et en anglais"@fr ;
  isbd:P1073 "Résumés en français et en anglais"@fr ;
  isbd:P1140 "psychoreadings" ;
  isbd:P1141 "ed. by J. E. Flower" ;
  isbd:P1154 "ISBN 2-86781-162-7 (Presses universitaires de Bordeaux)" ;
  isbd:P1185 "Texte imprimé"@fr ;
  ex:P9001 "Exeter, Grande Bretagne ; University of Exeter Press" ;
  ex:P9001 "Talence ; Presses universitaires de Bordeaux" ;
  ex:P9001 ex:PNS1 ;
  ex:P9001 ex:PNS2 .

ex:P9001
  rdfs:label "has place and name of publisher statement" .

ex:PNS1
  isbdu:P1016 "Exeter, Grande Bretagne" ;
  isbdu:P1017 "University of Exeter Press" .

ex:PNS2
  isbdu:P1016 "Talence" ;
  isbdu:P1017 "Presses universitaires de Bordeaux" .