TECHNICAL SPECIFICATION

ISO/TS 19139-2

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Geographic information — Metadata — XML schema implementation —

Part 2: Extensions for imagery and gridded data

Information géographique — Métadonnées — Mise en oeuvre par des schémas XML —

Partie 2: Extension pour l'imagerie et les données maillées

Reference number
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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.

ISO/TS 19139-2 was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

ISO/TS 19139 consists of the following parts, under the general title *Geographic information — Metadata — XML schema implementation*:

— *Part 1: Geographic information — Metadata — XML schema implementation*

— *Part 2: Extensions for imagery and gridded data*

Introduction

The importance of metadata describing digital geographic data is explained in detail in the text of ISO 19115 and in the text of ISO 19115-2 (for imagery and gridded data). ISO 19115 and ISO 19115-2 are abstract in that they provide a worldwide view of metadata relative to geographic information, but no encoding.

Since ISO 19115 does not provide any encoding, implementation of geographic information metadata could vary based on the interpretation of metadata producers. In an attempt to facilitate the standardization of implementations, ISO/TS 19139 provides a definitive, rule-based encoding for carrying out ISO 19115. ISO/TS 19139 provides Extensible Markup Language (XML) schemas that are meant to enhance interoperability by providing a common specification for describing, validating and exchanging metadata about geographic datasets, dataset series, individual geographic features, feature attributes, feature types, feature properties, etc.

This Technical Specification utilizes ISO/TS 19139 specification and extends it to define XML Schema implementation for ISO 19115-2. It provides a definitive, rule-based encoding for carrying out ISO 19115-2.

Geographic information — Metadata — XML schema implementation —

Part 2: Extensions for imagery and gridded data

1 Scope

This Technical Specification defines Geographic Metadata for imagery and gridded data (gmi) encoding. This is an XML Schema implementation derived from ISO 19115-2.

2 Conformance

The framework, concepts, and methodology for testing, and the criteria to be achieved to claim conformance, are specified in ISO 19105. Conformance to this specification may apply to:

a) a candidate XML Schema implementation of ISO 19115-2 which shall pass the test module defined in A.2;

b) an XML document containing XML fragments referring to an XML Schema implementation of ISO 19115-2 conformant to this Technical Specification. Such an XML document shall pass the module defined in A.3.

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 19105:2000, *Geographic information — Conformance and testing*

ISO 19107:2003, *Geographic information — Spatial schema*

ISO 19115:2003, *Geographic information — Metadata*

ISO 19115:2003/Cor.1:2006, *Geographic information — Metadata — Technical Corrigendum 1*

ISO 19115-2:2009, *Geographic information — Metadata — Part 2: Extensions for imagery and gridded data*

ISO 19136:2007, *Geographic information — Geography Markup Language (GML)*

ISO/TS 19139:2007, *Geographic information — Metadata — XML schema implementation*

W3C XML, *Extensible Markup Language (XML) 1.0* (Second Edition), W3C Recommendation (6 October 2000)

W3C XML Schema Part 1, *XML Schema Part 1: Structures*. W3C Recommendation (2 May 2001)

W3C XML Schema Part 2, *XML Schema Part 2: Datatypes*. W3C Recommendation (2 May 2001)

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

4.1
document <XML>
well-formed data object

[SOURCE: W3C XML]

4.2
schema document <XML Schema>
XML *document* (4.1) containing schema component definitions and declarations

Note 1 to entry: The W3C XML Schema provides an XML interchange format for schema information. A single schema document provides descriptions of components associated with a single XML namespace, but several documents may describe components in the same schema, i.e. the same target namespace.

[SOURCE: ISO 19136:2007, 4.1.55]

4.3
namespace
collection of names, identified by a URI reference, which are used in XML *documents* (4.1) as element names and attribute names

[SOURCE: W3C XML]

4.4
package
general purpose mechanism for organizing elements into groups

[SOURCE: ISO/TS 19103:2005, 4.2.22]

EXAMPLE Identification information, Metadata entity set information, Constraint information.

5 Symbols and abbreviated terms

5.1 Abbreviations

UML Unified Modelling Language

URI Unique Resource Identifier

XML eXtensible Markup Language

XCGE XML Class Global Element

XSD XML Schema Definition

5.2 UML model stereotypes

A UML stereotype is an extension mechanism for existing UML concepts (see ISO 19115-2. In addition to the stereotypes already defined in ISO 19115-2 for describing metadata, this Technical Specification uses stereotypes defined in ISO/TS 19139 which are necessary for a rules-based encoding into XML Schema.

The elements of the UML diagrams depicted in this Technical Specification can carry stereotypes specifying an XML implementation. Those stereotypes are carried by classes representing XML elements or XML types, UML attributes, UML links (realizations or dependencies) and UML packages.

In this Technical Specification the following Stereotypes of classes are used:

a) <<xs:element>>: The class represents an XML global element.

In this Technical Specification the following Stereotypes of links are used:

b) <<XCGE>>: (carried by realization relationships). The XCGE of the abstract concept to implement is substituted by the specified external implementation.

c) <<implement>>: (carried by dependency relationships). The source represents an XML schema implementing the abstract concepts defined in the target.

d) <<include>>: (carried by dependency relationships). The source and the target represent XML schemas. The source includes (<xs:include ... />) the target.

e) <<import>>: (carried by dependency relationships). The source and the target represent sets of XML objects grouped within the same namespace. The source imports (<xs:import ... />) the target.

In this Technical Specification the following Stereotypes of packages are used:

f) <<xmlSchema>>: The package represents an XML schema.

g) <<xmlNamespace>>: The package represents a set of XML objects grouped within the same namespace.

6 XML Schema requirements

6.1 Introduction

This XML Schema implementation of ISO 19115-2 follows the encoding rules stated in ISO/TS 19139:2007, Clause 8. Its specificity (particularly, the exceptions and the implementations based on external types) is detailed in this clause, using the UML notation commonly used in the ISO 191*nn* family of International Standards and the specific notations defined in ISO/TS 19139:2007, 5.4.

6.2 XML namespaces

In the list below, the item on the left describes the namespace prefix commonly used to describe the elements in the namespace. The second item is an English description of the namespace prefix, and the item in parentheses is the URI of the actual namespace.

gmi	Geographic Metadata for imagery and gridded data	(http://www.isotc211.org/2005/gmi)
gco	Geographic Common extensible markup language	(http://www.isotc211.org/2005/gco)
gmd	Geographic MetaData extensible markup language	(http://www.isotc211.org/2005/gmd)
gml	Geography Markup Language	(http://www.opengis.net/gml/3.2)
gmx	Geographic Metadata XML Schema	(http://www.isotc211.org/2005/gmx)
gss	Geographic Spatial Schema extensible markup language	(http://www.isotc211.org/2005/gss)
gsr	Geographic Spatial Referencing extensible markup language	(http://www.isotc211.org/2005/gsr)
gts	Geographic Temporal Schema extensible markup language	(http://www.isotc211.org/2005/gts)

While the namespace URI is the normative identifier of a namespace from the perspective of the W3C XML Schema specification, the designations of the namespaces in this document are based on prefixes within this document (i.e. gmi namespace means the namespace identified by the http://www.isotc211.org/2005/gmi URI).

6.3 gmi namespace

6.3.1 Organization of the gmi namespace

The XML Schema definitions resulting from this XML Schema implementation of ISO 19115-2 shall pertain to the gmi namespace as illustrated in Figure 1.

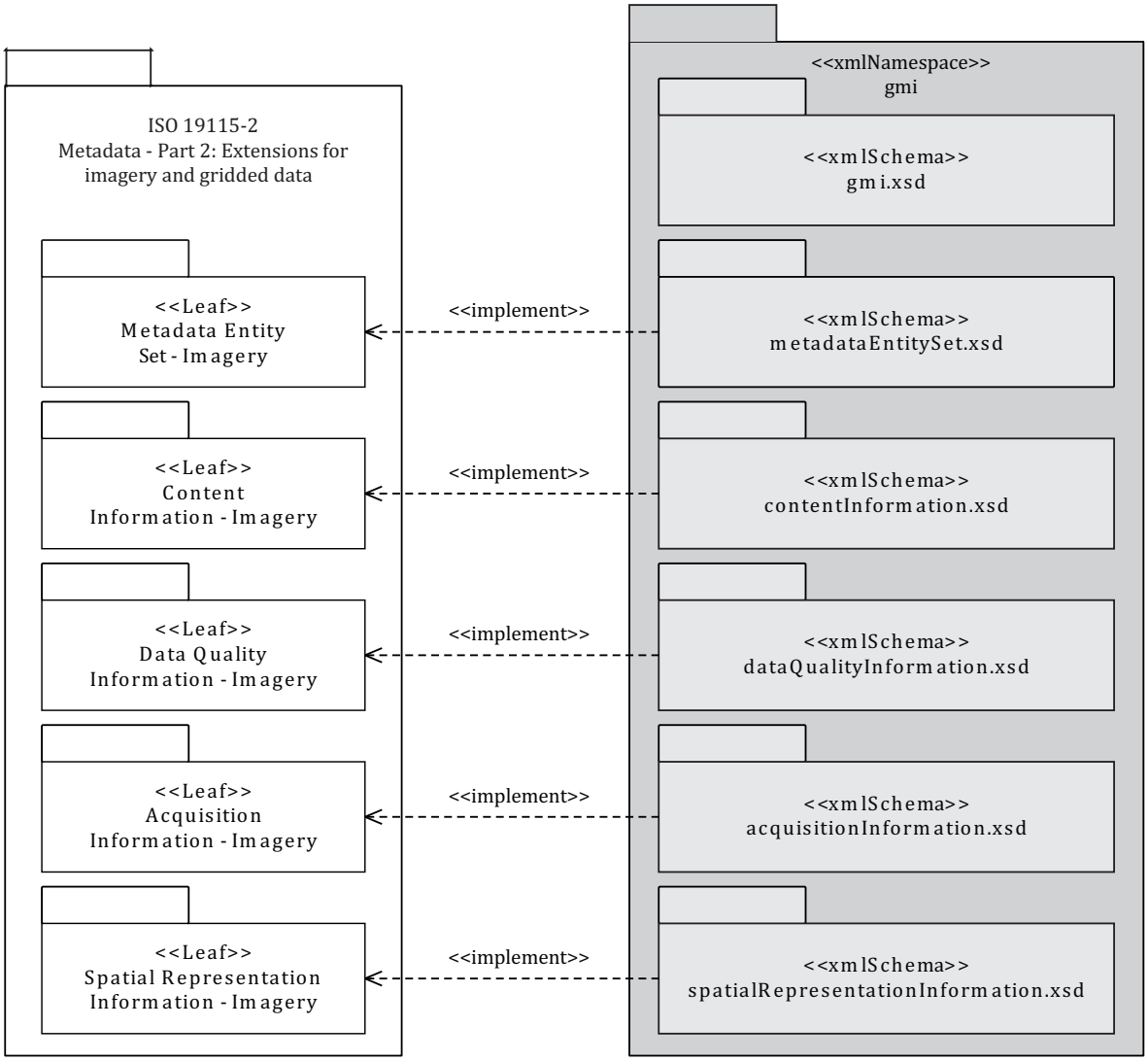

Figure 1 — Relationship between the gmi XML Schema documents and ISO 19115-2 packages

The root of this namespace shall be gmi.xsd.

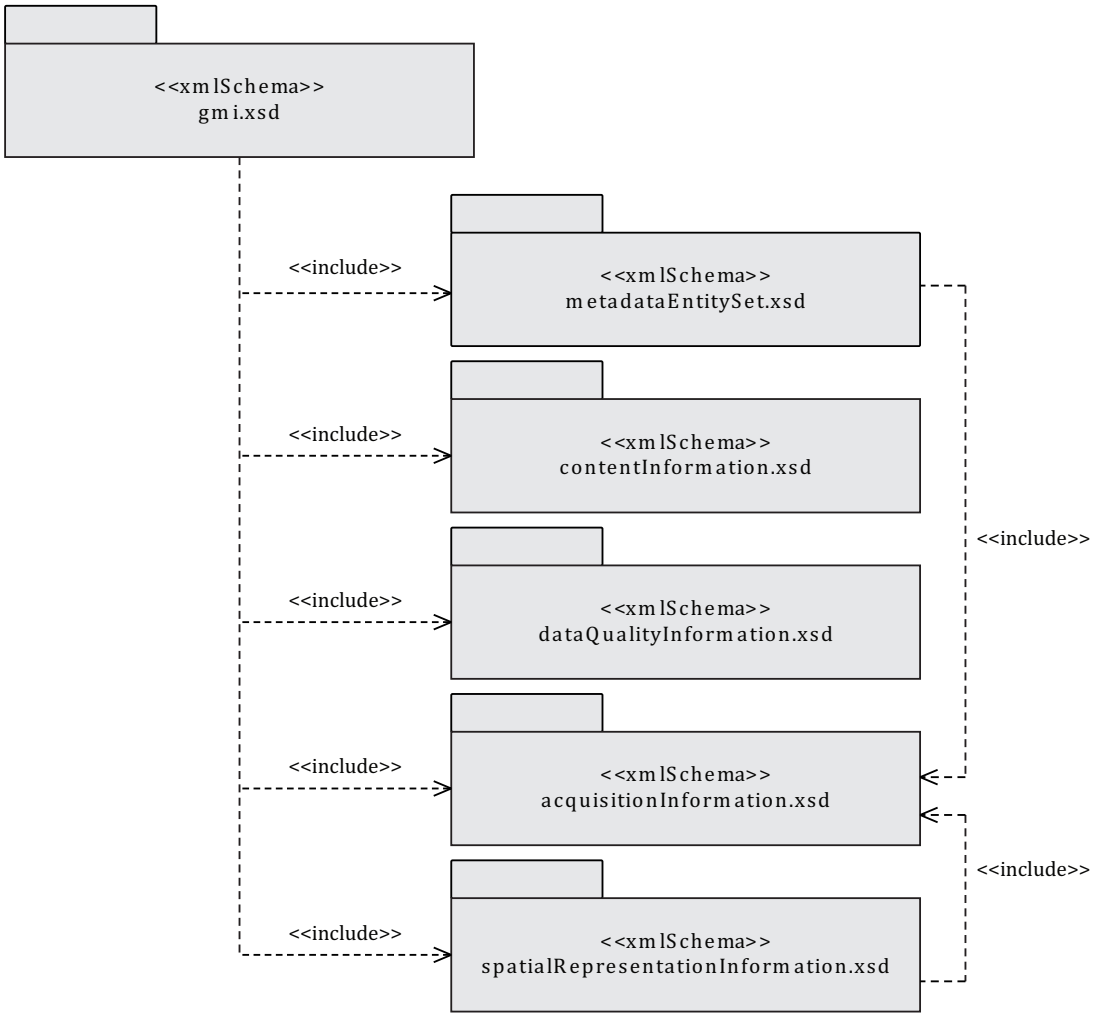

Figure 2 — Organization of gmi namespace

6.3.2 gmi.xsd

As described in Figure 2, this XML Schema document shall directly include the XML Schema documents implementing all the concepts of the gmi namespace. It shall not contain the declaration of any type or element.

6.3.3 metadataEntitySet.xsd

As described in Figure 3, this XML Schema document shall import the gco and gmd namespaces using their respective root XML Schema document as defined in ISO/TS 19139. It is highly recommended to express the location of these root XML Schema documents using an absolute URL. As described in Figure 2, this XML Schema document shall also directly include the acquisitionInformation.xsd XML Schema document.

This XML Schema document shall implement the UML conceptual schema defined in ISO 19115-2:2009, A.2.1, i.e. MI_Metadata (which inherits from ISO 19115 MD_Metadata class).

The classes implemented in this XML Schema document shall follow the encoding rules defined in Clause 8 of ISO/TS 19139:2007.

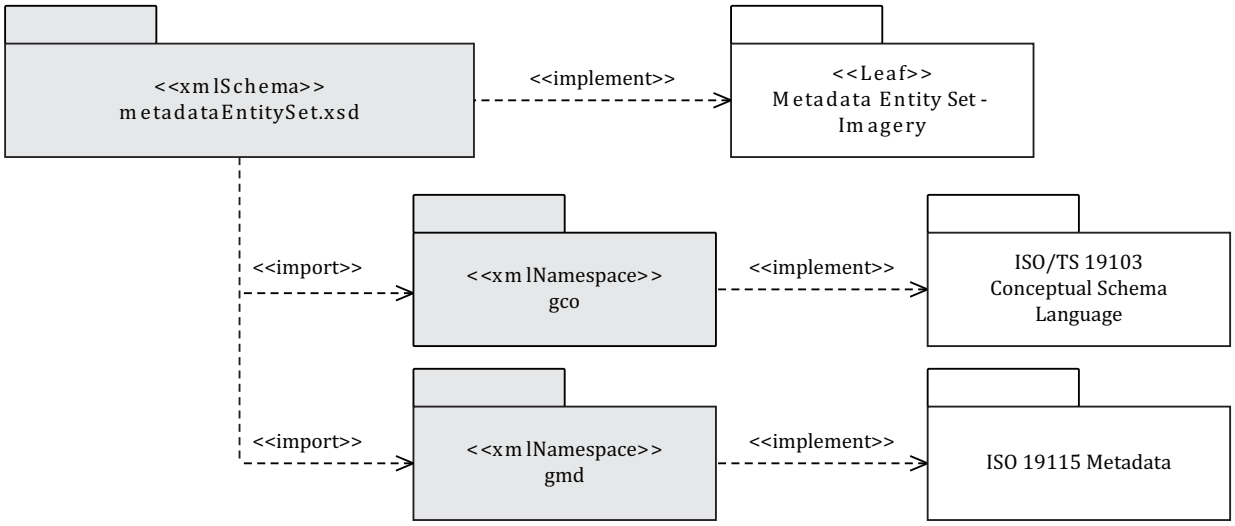

Figure 3 — Metadata Entity Set dependencies

6.3.4 contentInformation.xsd

As described in Figure 4, this XML Schema document shall import the gco and gmd namespaces using their respective root XML Schema document as defined in ISO/TS 19139. It is highly recommended to express the location of these root XML Schema documents using an absolute URL.

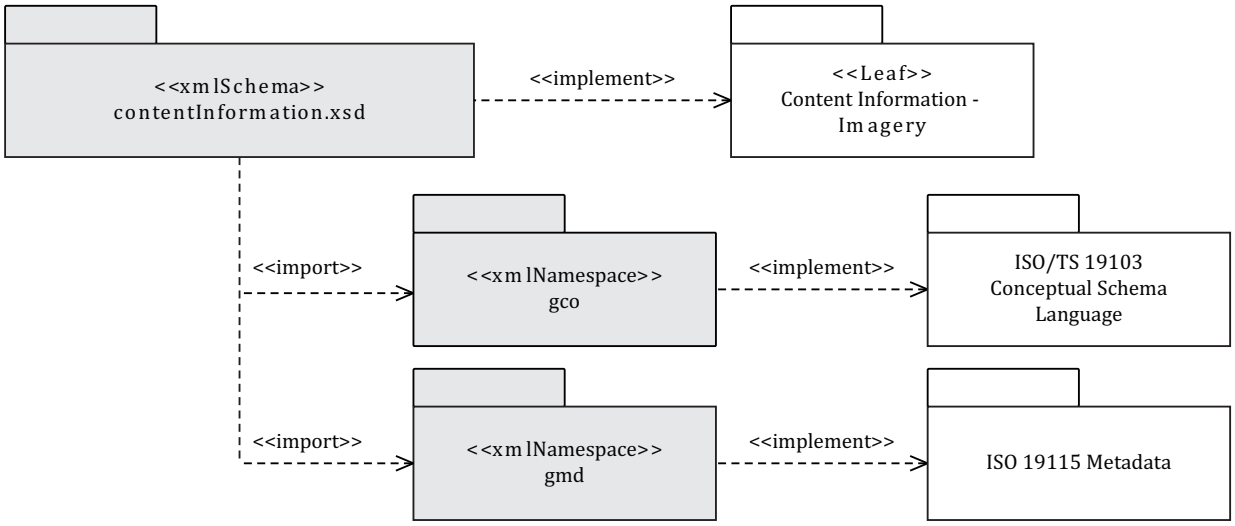

Figure 4 — Content information dependencies

This XML Schema document shall implement the UML conceptual schema defined in ISO 19115-2:2009, A.2.4.

It shall contain the implementation of the following classes: MI_Band (which inherits from MD_Band defined in ISO 19115), MI_PolarisationOrientationCode, MI_BandDefinition, MI_TransferFunctionTypeCode, MI_ImageDescription, MI_RangeElementDescription and MI_CoverageDescription (which inherits from ISO 19115 MD_CoverageDescription class).

The classes implemented in this XML Schema document shall follow the encoding rules defined in Clause 8 of ISO/TS 19139:2007.

6.3.5 dataQualityInformation.xsd

As described in Figure 5, this XML Schema document shall import the gco and gmd namespaces using their respective root XML Schema document as defined in ISO/TS 19139. It is highly recommended to express the location of these root XML Schema documents using an absolute URL.

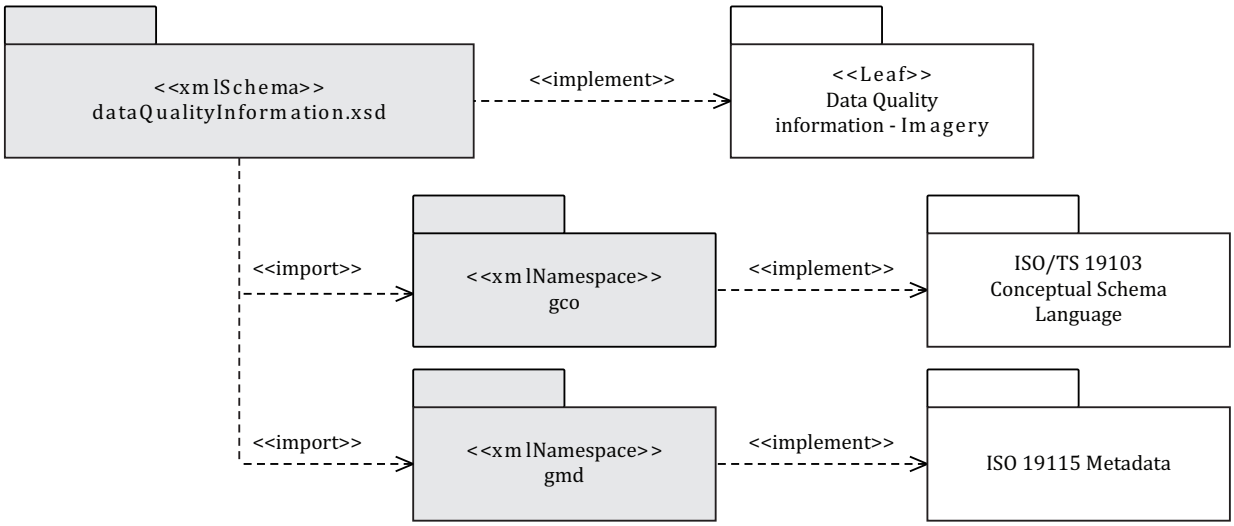

Figure 5 — Data quality information dependencies

This XML Schema document shall implement the UML conceptual schema defined in ISO 19115-2:2009, A.2.2.

It shall contain the implementation of the following classes: LE_ProcessStep (which inherits from LI_ProcessStep defined in ISO 19115), LE_Source, LE_ProcessStepReport, LE_Processing, LE_Algorithm, LE_NominalResolution, QE_CoverageResult and QE_Usability.

The classes implemented in this XML Schema document shall follow the encoding rules defined in Clause 8 of ISO/TS 19139:2007.

6.3.6 spatialRepresentationInformation.xsd

As described in Figure 6, this XML Schema document shall import the gco, gml and gmd namespaces using their respective root XML Schema document as defined in ISO/TS 19139. It is highly recommended to express the location of these root XML Schema documents using an absolute URL. As described in Figure 2, this XML Schema document shall also directly include the acquisitionInformation.xsd XML Schema document.

This XML Schema document shall implement the UML conceptual schema defined in ISO 19115-2:2009, A.2.3.

It shall contain the implementation of the following classes: MI_Georectified (which inherits from ISO 19115 MD_Georectified class), MI_GCP, MI_GCPCollection, MI_GeolocationInformation and MI_Georeferenceable (which inherits from ISO 19115 MD_Georeferenceable class). All those classes shall be implemented in XML Schema following the encoding rules defined in Clause 8 of ISO/TS 19139:2007.

As stated in Figure 6, this XML Schema document shall also contain a property type definition corresponding to the DirectPosition class defined in ISO 19107.

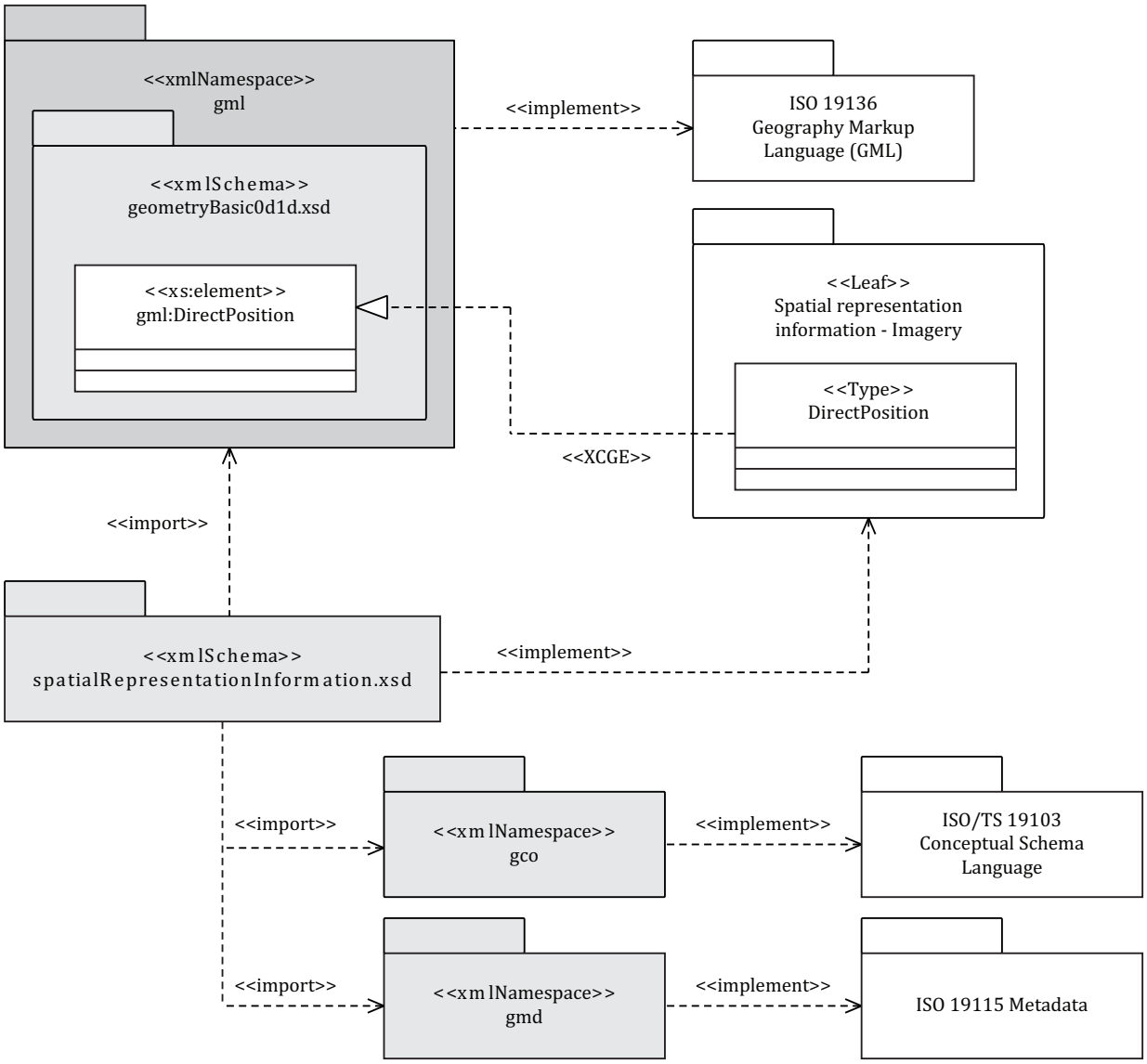

Figure 6 — Spatial representation information dependencies

6.3.7 acquisitionInformation.xsd

According to Figure 7, this XML Schema document shall import the gco, gss and gmd namespaces using their respective root XML Schema document as defined in ISO/TS 19139. It is highly recommended to express the location of these root XML Schema documents using an absolute URL.

This XML Schema document shall implement the UML conceptual schema defined in ISO 19115-2:2009, A.2.5.

It shall contain the implementation of the following classes: MI_AcquisitionInformation, MI_Platform, MI_Plan, MI_Operation, MI_Instrument, MI_Objective, MI_Requirement and MI_EnvironmentalRecord.

The classes implemented in this XML Schema document shall follow the encoding rules defined in Clause 8 of ISO/TS 19139:2007.

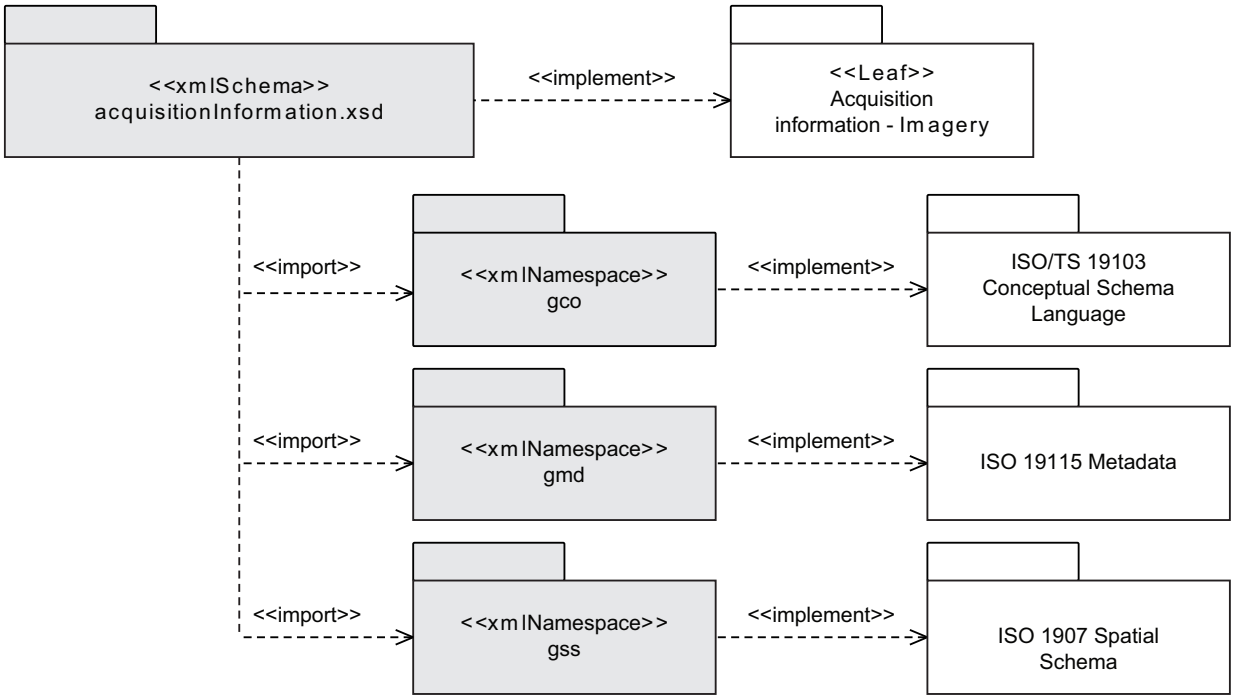

Figure 7 — Acquisition information dependencies

7 XML document requirements

7.1 Introduction

Since XML is a flexible file format, it is difficult to anticipate the many possible alternatives of packaging of ISO 19115-2 metadata sets into XML documents. The conformance of a full ISO 19115-2 metadata set, i.e. a full instance of MI_Metadata, may involve many XML documents while a single XML document can contain part or whole of one or many instances of ISO 19115-2 concepts. For practical reasons, the requirements expressed herein relate to a single candidate XML document, leaving to the user communities the management of the effective packaging of ISO 19115-2 metadata sets into XML documents.

7.2 XML document and gmi namespace

In order to conform to this Technical Specification, an XML document candidate shall contain at least one XML element in the gmi namespace.

7.3 XML validation

The XML document shall be "well-formed" and shall be valid with respect to the types and definitions of a conformant XML Schema implementation of the gmi namespace and the types and definitions of conformant implementations of the namespaces imported by gmi namespace.

The XML document shall more generally conform to the requirements expressed in ISO/TS 19139 and ISO 19136 with respect to XML instances of the imported namespace.

7.4 Requirements not enforceable with XML Schema

Some of the requirements expressed in the base standard (typically, ISO 19115-2 cannot be enforced with XML Schema, but shall be met by candidate XML Document. Table 1 shows the affected classes and expresses the requirements of ISO 19115-2 not enforceable with XML Schema.

Table 1 — Requirement not enforceable with XML Schema

Affected class	Requirement
LE_Source.scaleDenominator	If LE_Source.resolution.scanningResolution is specified, then LE_Source.scaleDenominator (inherited from LI_Source) is required.
Distance	The uom element of the Distance Type must be instantiated using the Uom-Length_PropertyType

Due to the inheritance design of XML Schema, some inheritance principles are not enforced but need to be properly recognized. The requirements of ISO 19115 not enforceable with XML Schema are also applicable to XML elements implementing a class of ISO 19115-2 inheriting from a class of ISO 19115 to which the requirement is applicable.

7.5 By-value or by-reference or expressing a NULL reason

As stated in ISO/TS 19139:2007, 8.4 a property element following the default XCPT pattern is designed to have content (by-value) or attributes (by-reference or NULL with reason). A property of an ISO 19115-2 class, inherited or not, shall be exclusively implemented by-value, or by-reference, or expressing a NULL reason.

7.6 ISO 19115-2 completeness

Validation of the XML document against a conformant XML Schema implementation of the gmi namespace guarantees that the properties are implemented in conformance to ISO 19115-2 cardinality requirements. If the expression of NULL reasons is fully conformant to ISO/TS 19139-2 XML Schema implementation, it also indicates a completeness deficiency with respect to ISO 19115-2.

Annex A
(normative)

Abstract test suite

A.1 Introduction

This normative annex presents the abstract test suite for evaluating conformance to this Technical Specification. This abstract test suite contains two test modules:

— a test module for the conformance of the XML Schema implementation (A.2);

— a test module for the conformance of an XML document (A.3).

Test cases are based for each test module on the requirements expressed in Clauses 6 and 7, respectively.

A.2 Test module: Conformance of an XML Schema implementation

A.2.1 Test case: Root XML Schema document

a) Test Purpose: to determine the conformance of the root XML Schema document.

b) Test Method: load the root gmi.xsd XML Schema document and check:

   1) the destination namespace URI,

   2) the conformance of the "import" statement,

   3) the conformance of the "include" statement including the availability of the referenced XML Schema documents,

   4) the absence of any type or element definition.

c) Reference: 6.3.1 and 6.3.2.

d) Test Type: Basic.

A.2.2 Test case: Included XML Schema documents

a) Test Purpose: to determine the conformance of the included XML Schema documents.

b) Test Method: load the included XML Schema documents and check:

   1) the destination namespace URI,

   2) the conformance of the include statement including the availability of the referenced XML Schema documents,

   3) the presence and conformance (with respect to ISO/TS 19139 encoding rules) of the expected type and element definitions.

c) Reference: 6.3.3 to 6.3.7.

d) Test Type: Basic.

A.3 Test module: Conformance of an XML document

A.3.1 Test case: Applicability of gmi namespace

a) Test Purpose: to determine that the XML document contains XML instances within the gmi namespace and that the XML document conforms to ISO/TS 19139.

b) Test Method:

1) load the XML document

2) check the presence of at least one element pertaining to the gmi namespace.

c) Reference: 7.2.

d) Test Type: Basic.

A.3.2 Test case: XML document validation

a) Test Purpose: to determine that the XML document is well formed and valid.

b) Test Method:

1) load the XML document with an XML Parser;

2) check that the XML document is “well formed”;

3) check the XML document is valid with respect to the types and definitions of a conformant XML Schema implementation of the gmi namespace and other imported namespaces;

4) check the XML document satisfies the requirements expressed in ISO/TS 19139 and ISO 19136 with respect to XML instances of the imported namespace.

c) Reference: 7.3.

d) Test Type: Basic.

NOTE While many tools are available to test validation of XML documents against XML Schema implementations, it is important to understand that not all validation tools implement the full W3C XML Schema recommendation and not all validation tools interpret the W3C XML Schema recommendation in the same manner. It is recommended that a tool with strict interpretation of XML Schema and full support for the W3C XML Schema recommendation be used to ensure conformance.

A.3.3 Test case: Requirements not enforceable with XML Schema

a) Test Purpose: to determine that the requirements not enforceable with XML Schema are met by the XML document.

b) Test Method: Load the XML document and check that it satisfies the requirements expressed in Table 1 which are applicable to instances of affected classes.

c) Reference: 7.4.

d) Test Type: Basic.

A.3.4 Test case: by-value, or by-reference, or expressing a NULL reason

a) Test Purpose: to determine that the properties of ISO 19115-2 classes, inherited or not, are properly implemented by-value, or by-reference, or expressing a NULL reason.

b) Test Method: Load the XML document and check that each property is exclusively implemented by-value, or by-reference, or expressing a NULL reason.

c) Reference: 7.5.

d) Test Type: Basic.

A.3.5 Test case: ISO 19115-2 Completeness

a) Test Purpose: to determine that the ISO 19115-2 class instances contained in the XML document are complete.

b) Test Method: Load the XML document and check that each property of ISO 19115-2 class is not expressed with a NULL reason.

c) Reference: 7.6.

d) Test Type: Basic.

Annex B
(informative)

XML Resources related to Geographic Metadata for imagery and gridded data

B.1 XML Schema documents defined in this Technical Specification

This Technical Specification defines the content of one XML Namespace commonly identified using the gmi prefix. This namespace prefix is appended to http://www.isotc211.org/2005/ to make a complete namespace identifier. The XML Schema documents associated with this namespace are:

— gmi.xsd root XML Schema document, i.e. the XML Schema document to be referenced by XML documents containing XML element in the gmi namespace or by XML Schema documents importing the gmi namespace,

— metadataEntitySet.xsd,

— contentInformation.xsd,

— dataQualityInformation.xsd,

— spatialRepresentationInformation.xsd, and

— acquisitionInformation.xsd.

More information about these XML Schemas including their effective location is found at the location related to their namespace URI: http://www.isotc211.org/2005/gmi.

B.2 XML Schema documents defined in ISO/TS 19139

This Technical Specification is Part 2 of ISO/TS 19139. As such, it is based on the XML Schema implementation and encoding rules provided in ISO/TS 19139:2007. To locate these XML Schema documents please refer to ISO/TS 19139:2007, Annex C.

B.3 XML Schema documents defined outside this Technical Specification

In addition to the namespace listed above, this Technical Specification makes use of the Geography Markup Language or http://www.opengis.net/gml/3.2 namespace. To locate the authoritative XML Schema documents associated with this namespace please refer to ISO 19136.

B.4 Additional Resources

To ease the use of this Technical Specification, several XML files are provided along with the XML Schemas. They are organized into the following categories: codelist and example. More information about these XML files is also found at http://www.isotc211.org/2005/gmi.

Similar additional resources are provided along with ISO/TS 19139 XML Schema Documents. Please refer to ISO/TS 19139:2007, Annex C.

Annex C
(informative)

Implementation examples

C.1 Introduction

The following XML documents illustrate some aspects of the XML Schema encoding of ISO 19115-2. The values provided for the different elements are intended to be realistic, but they should not serve as a reference to determine the proper way of using ISO 19115-2 conceptual schemas.

C.2 Example of acquisition information

```
<?xml version="1.0" encoding="UTF-8"?>
<gmi:MI_AcquisitionInformation xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:gco="http://www.isotc211.org/2005/gco" xmlns:gmd="http://www.isotc211.org/2005/gmd"
xmlns:gmi="http://www.isotc211.org/2005/gmi" xsi:schemaLocation="http://www.isotc211.org/2005/gco
http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/gco/gco.xsd http://www.
isotc211.org/2005/gmd http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/
gmd/gmd.xsd http://www.isotc211.org/2005/gmi../../gmi/gmi.xsd" id="C_1">
  <gmi:instrument>
    <gmi:MI_Instrument uuid="8293FAD4B86475F2E040AC8C5AB4576F">
      <gmi:citation>
        <gmd:CI_Citation>
          <gmd:title>
            <gco:CharacterString>The Advanced Very High Resolution Radiometer</gco:CharacterString>
          </gmd:title>
          <gmd:date>
            <gmd:CI_Date>
              <gmd:date>
                <gco:Date>1997</gco:Date>
              </gmd:date>
              <gmd:dateType>
                <gmd:CI_DateTypeCode codeList="http://standards.iso.org/ittf/
PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodelists.xml#CI_DateTypeCode" cod
eListValue="publication">publication</gmd:CI_DateTypeCode>
              </gmd:dateType>
            </gmd:CI_Date>
          </gmd:date>
          <gmd:identifier>
            <gmd:MD_Identifier>
              <gmd:code>
                <gco:CharacterString>gov.noaa.ngdc.fgdccitation:26722</gco:CharacterString>
              </gmd:code>
            </gmd:MD_Identifier>
          </gmd:identifier>
          <gmd:citedResponsibleParty>
            <gmd:CI_ResponsibleParty>
              <gmd:individualName>
                <gco:CharacterString>Doe, Jane</gco:CharacterString>
              </gmd:individualName>
              <gmd:role>
                <gmd:CI_RoleCode codeList="http://standards.iso.org/ittf/
PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodelists.xml#CI_RoleCode" codeLis
tValue="originator">originator</gmd:CI_RoleCode>
              </gmd:role>
            </gmd:CI_ResponsibleParty>
          </gmd:citedResponsibleParty>
        </gmd:CI_Citation>
      </gmi:citation>
      <gmi:identifier>
        <gmd:MD_Identifier>
          <gmd:code>
            <gco:CharacterString>AVHRR/3 &gt; Advanced Very High Resolution Radiometer/3</
gco:CharacterString>
          </gmd:code>
        </gmd:MD_Identifier>
      </gmi:identifier>
```

```
      <gmi:type>
        <gco:CharacterString>imager</gco:CharacterString>
      </gmi:type>
      <gmi:description>
        <gco:CharacterString>Instrument Type: imager, Operational Mode: cross-track, Collection Type:
whiskbroom, Other Information:</gco:CharacterString>
      </gmi:description>
    </gmi:MI_Instrument>
  </gmi:instrument>
  <gmi:operation>
    <gmi:MI_Operation>
      <gmi:description>
        <gco:CharacterString>The polar orbiting satellites are able to collect global data on a daily
basis for a variety of land, ocean and atmospheric applications. Data from the POES series supports a
broad range of environmental monitoring applications including weather analysis and forecasting,
climate research and prediction, global sea surface temperature measurements, atmospheric soundings
of temperature and humidity, ocean dynamics research, volcanic eruption monitoring, forest fire
detection, global vegetation analysis, search and rescue, and many other applications.</
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C.3 Example of ISO 19115-2 process step

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org/2005/gco http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/gco/gco.xsd
http://www.isotc211.org/2005/gmd http://standards.iso.org/ittf/
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ICS 35.240.70

Price based on 22 pages