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AMENDMENT 1
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Information technology — Multimedia framework (MPEG-21) —

Part 3: Digital Item Identification

AMENDMENT 1: Related identifier types

Technologies de l'information — Cadre multimédia (MPEG-21) —

Partie 3: Identification des éléments numériques

AMENDEMENT 1: Types d'identificateurs liés

Reference number
ISO/IEC 21000-3:2003/Amd.1:2007(E)

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Foreword

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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.

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.

Amendment 1 to ISO/IEC 21000-3:2006 was prepared by Technical Committee ISO/IEC/TC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

This Amendment provides the ability to express the relationship between different identifiers in the context of MPEG-21 Digital Items and contains information on how to deal with varying levels of functional granularity with respect to the identification of Digital Items.

The Amendment also updates information on ISO 15706-2 (ISAN), which has recently been approved as an International Standard.

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Information technology — Multimedia framework (MPEG-21) —

Part 3:
Digital Item Identification

AMENDMENT 3: Related identifier types

In Clause 1, insert new bullet between the 2nd and 3rd bullet with the following text:

— How to express the relationship between the two above identifiers;

— How to deal with varying levels of functional granularity for Digital Item identifiers;

Replace the entire text of subclause 1.1 with the following text:

This specification contains five Clauses and five Annexes:

The remainder of this Clause 1 contains an overview of MPEG-21 Digital Items and the relation between parts 2 and 3 of ISO/IEC 21000. Clauses 2 and 3 contain normative references and a list of applicable terms and definitions.

Clause 4 specifies how to uniquely identify Digital Items, how to associate related identifiers with Digital Items and how to identify different types of Digital Items. Clause 5 then specifies how to associate metadata with Digital Items by using description scheme identifiers.

Annex A contains criteria that need to be fulfilled by a Registration Authority that is required for the identification of Digital Items and their parts as specified in ISO/IEC 21000-3. Annex B contains an example of how to resolve a unique identifier to appropriate metadata. Annex C contains a list of existing identification schemes that can be used by this specification. Annex D provides an approach to dealing with varying functional granularities for identifying Digital Items. Finally, Annex E contains information of patent statements relating to ISO/IEC 21000-3. While Annex A is normative, Annexes B, C, D and E are informative.

In Clause 2, insert the following reference:

ISO/IEC 21000-6, *Information technology — Multimedia framework (MPEG-21) — Rights Data Dictionary*

In subclause 3.1, insert definition for the term "Functional Granularity" as follows:

The principle of Functional Granularity states that it shall be possible to uniquely identify a Digital Item whenever it needs to be distinguished from another Digital Item. Functional Granularity of identification can differ from User to User.

In subclause 3.1, insert definition for the term "Relator" as follows:

A term that describes the relationship between two entities.

NOTE This definition is equivalent to the definition in ISO/IEC 21000-6.

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Replace the entire text of subclause 4.2 with the following text:

4.2 `RelatedIdentifier` Element

While the `Identifier` element is intended to enable the unique identification of Digital Items (or parts thereof), the `RelatedIdentifier` element conveys identification information that is related to the Digital Item (or parts thereof) which may be required by certain Users. This relationship is expressed through the use of Relators as defined in ISO/IEC 21000-6.

One example of this is the identification of an abstraction of the work (e.g. composition used when creating a sound recording).

4.2.1 Syntax

```
<xsd:element name="RelatedIdentifier">
  <xsd:complexType>
    <xsd:simpleContent>
      <xsd:extension base="xsd:anyURI">
        <xsd:attribute name="relationshipType" type="xsd:anyURI"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
</xsd:element>
```

4.2.2 Semantics

The `RelatedIdentifier` element allows associating identifiers that are related to the Digital Item, *container*, *component*, and/or *fragment* thereof but do not directly identify the Digital Item (or part thereof). The value shall be in the form of a URI.

A Registration Authority is set up for maintaining a list of identification schemes to be used within ISO/IEC 21000-3. Requirements for the Registration Authority can be found in Annex A of ISO/IEC 21000-3.

Values of the `RelatedIdentifier` element are not required to be registered with the Registration Authority to be conformant to Clause 4.2 of ISO/IEC 21000-3.

The `RelatedIdentifier` element shall not be used for identifying the Digital Item (or part thereof) itself. This shall be done using the Identifier element.

The `relationshipType` attribute enables expressing the relationship of the Resource identified by a RelatedIdentifier to the Digital Item (or part thereof) bearing the RelatedIdentifier. The value shall be in the form of a URI. A Relator shall be identified with a URI of the form `urn:mpeg:mpeg21:2002:01-RDD-NS:x`, as specified in ISO/IEC 21000-6.

4.2.3 Example

See Figure 7 for a specific example for the `RelatedIdentifier` element.

Replace the text of subclause 4.3.1 by the following text:

```
<--! ################################
   ISO/IEC 21000-3 Type Element
   ################################ --!>

<xsd:element name="Type" type="xsd:anyURI"/>
```


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The `Type` element shall only appear as a child element of a `Statement` that shall appear as a child element of a `Descriptor` that shall appear as a child element of an `Item`.

Replace the text of subclause 4.3.2 by the following text:

The `Type` element will allow identifying special types of Digital Items. Such types can be defined, for example, by different parts of ISO/IEC 21000 or ISO/IEC 23000.

In subclause 4.4, replace schema definition by the following Schema text:

```
<?xml version="1.0"?>
<!--################################################################-->
<!--                                                                -->
<!--             XML Schema for ISO/IEC 21000-3                     -->
<!--                                                                -->
<!--################################################################-->

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns="urn:mpeg:mpeg21:2002:01-DII-NS"
  targetNamespace="urn:mpeg:mpeg21:2002:01-DII-NS"
  version="0.02">

  <!--########################################
      ISO/IEC 21000-3 Identifier Element
      ########################################-->

  <xsd:element name="Identifier" type="xsd:anyURI"/>

  <!--##############################################
      ISO/IEC 21000-3 Related Identifier Element
      ##############################################-->

  <xsd:element name="RelatedIdentifier">
    <xsd:complexType>
      <xsd:simpleContent>
        <xsd:extension base="xsd:anyURI">
          <xsd:attribute name="relationshipType" type="xsd:anyURI"/>
        </xsd:extension>
      </xsd:simpleContent>
    </xsd:complexType>
  </xsd:element>

  <!--##############################################
      ISO/IEC 21000-3 Type Element
      ##############################################-->

  <xsd:element name="Type" type="xsd:anyURI"/>
</xsd:schema>
```

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In subclause 4.5.4, replace the example by the following:

```
<?xml version="1.0"?>
<DIDL xmlns="urn:mpeg:mpeg21:2002:02-DIDL-NS"
  xmlns:dii="urn:mpeg:mpeg21:2002:01-DII-NS">
  <Item>
    <Descriptor>
      <Statement mimeType="text/xml; charset=UTF-8">

<dii:Identifier>urn:mpegRA:mpeg21:dii:doi:10.1000/123456789</dii:Identifier>
      </Statement>
    </Descriptor>
      <Statement mimeType="text/xml; charset=UTF-8">
        <dii:relatedIdentifier
            relationshipType="urn:mpeg:mpeg21:2002:01-RDD-NS:IsAbstractionOf">
          urn:mpegRA:mpeg21:dii:iswc:T-034.524.680-1</dii:relatedIdentifier>
      </Statement>
    </Descriptor>
    <Component>
      <Resource mimeType="audio/mpeg" ref="123456789.mp3"/>
    </Component>
  </Item>
</DIDL>
```

Replace C.7 with the following text:

ISO 15706-2 was developed within Technical Committee ISO/TC 46, Information and Documentation, Subcommittee SC 9, Identification and Description. The project was initiated by the Society of Motion Picture and Television Engineers (SMPTE) and developed originally as ISO 20925 but has now been standardised as ISO 15706-2.

This International Standard specifies a system for version identification of audiovisual works to be used in conjunction with the International Standard Audiovisual Number (ISAN) defined in ISO 15706[1)]. An ISAN combined with the version identifier specified in Clause 4 of the ISAN Standard shall be known as a V-ISAN. A V-ISAN shall be a registered, globally unique identifier of a version of an audiovisual work.

A V-ISAN identifies a specific version of an audiovisual work throughout its life and is intended for use wherever precise and unique identification of a specific version of an audiovisual work would be desirable, such as in audiovisual production and distribution systems and in broadcasting applications. A V-ISAN identifies a specific version of an audio-visual work as the unique compound of its component elements (e.g. its artistic content, languages, editing, and technical format) throughout its life and independent of any physical form in which the version is distributed.

The assignment of a V-ISAN to a version of an audiovisual work shall not be used as evidence of the ownership of rights to either that version or to the audiovisual work itself."

1) Originally known as ISO 15706:2002. The standard will be renamed ISO 15706-1 in the next version.

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Add a new informative Annex D between current Annexes C and D as follows. Renumber Annex D as Annex E and change all references accordingly:

Annex D
(informative)

Using ISO/IEC 21000-3 in the MPEG-21 Multimedia Framework

D.1 Overview

The Digital Item is the fundamental unit of distribution and transaction within the MPEG-21 Multimedia Framework. As such it is axiomatic that it must meet the requirements of those wishing to use Digital Items as part of their distribution and usage processes.

When a User creates a Digital Item containing a set of Digital Resources, a unique identifier for the Item is assigned. Following the assignment of the identifiers, it is intended that other Users should always identify the Digital Item by its originally assigned identifier. However, in some environments, some Users may need to distinguish between different "variants" of a single Digital Item that are identified by a single Digital Item Identifier. Thus, a single Digital Item Identifier will not be sufficient for all Users on its own – even if, for the creator of the Item, the different variants represent exactly the same Digital Item.

Concrete Specific examples of this generic problem are given below.

Example 1 – Libraries

A text publisher creates an eBook with one resource (e.g. a PDF file) and assigns a unique identifier for this eBook. An electronic library, responsible for preserving this eBook, creates a Digital Item (by generating a Digital Item Declaration file containing relevant metadata and, a reference to the PDF file) and adds the publisher-generated identifier – say a DOI – as the Digital Item Identifier).

Following the removal of a couple of typographic errors in the original resource, the library receives an updated version of the eBook – albeit with the same DOI. This is, from the publisher's perspective, correct as the "new version" is commercially the same entity – it is the same "fundamental unit of transaction and distribution"; there is no reason to the publisher to distinguish between the "old version" and the "new version". Thus, for the publisher no new identifier is required.

For the library, however, which has the obligation to preserve both versions in order to provide a complete historical record of publication, a problem arises: When following the same method of creating the Digital Item as described above, the library has to deal with two entities with the same DII but with different content.

Example 2 – Codecs

Assume a Digital Item containing a set of sound recordings is collated into a Digital Item identified by a DII. When this Item gets distributed and adapted for different devices – e.g. by using ISO/IEC 21000-7 methods to change the codecs used – the enclosed intellectual property will not change.

If the commercial details under which the Item is marketed (such as the retail price) remain unchanged, there is no need for the original creator of the Digital Item to differentiate between different variants. Applications and devices – and possibly Users – however, will need to be able to distinguish between, say, an AAC variant and an MP3 variant of the Digital Item.

Example 3 – Picture Resolution

The same problems arise when a film is to be made available in different resolutions. The content, identified for example by an International Standard Audio-visual Number (ISAN), remains the same, but there is need for some Users to distinguish between a high-resolution and a low-resolution "variant".

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D.2 Expressing Varying Functional Granularity

The two elements `dii:Identifier` and `dii:RelatedIdentifier`, the latter with its `dii:RelationshipType` attribute as defined in Clause 4.2 of this specification, can be used to differentiate identifiers for the different variants of a Digital Item from the identifier for the "class" of Digital Items all variants belong to. The exact nature of the relationship can be expressed through Relators defined in ISO/IEC 21000-6. The diagrams below show this approach when implementing the third example above.

Assume a User *A* creates a Digital Item and assigns an identifier to this item. This identifier is then embedded into the Digital Item Declaration using the `dii:Identifier` element. *A* also provides the Digital Item, along with a second Digital Item in a different screen resolution, to a content distributor *B*. Both items bear the same Digital Item Identifier as they both represent the same Digital Item for *A*. For *B* and its customers, however, the two items are different and need to be distinguished. When Users *C* and *D* request the Item for their respective screen sizes, *B* needs to be able to return the appropriate variant Item to each requestor. This can be done using descriptive metadata (as shown in Figure D.1 below), though the process is not efficient.

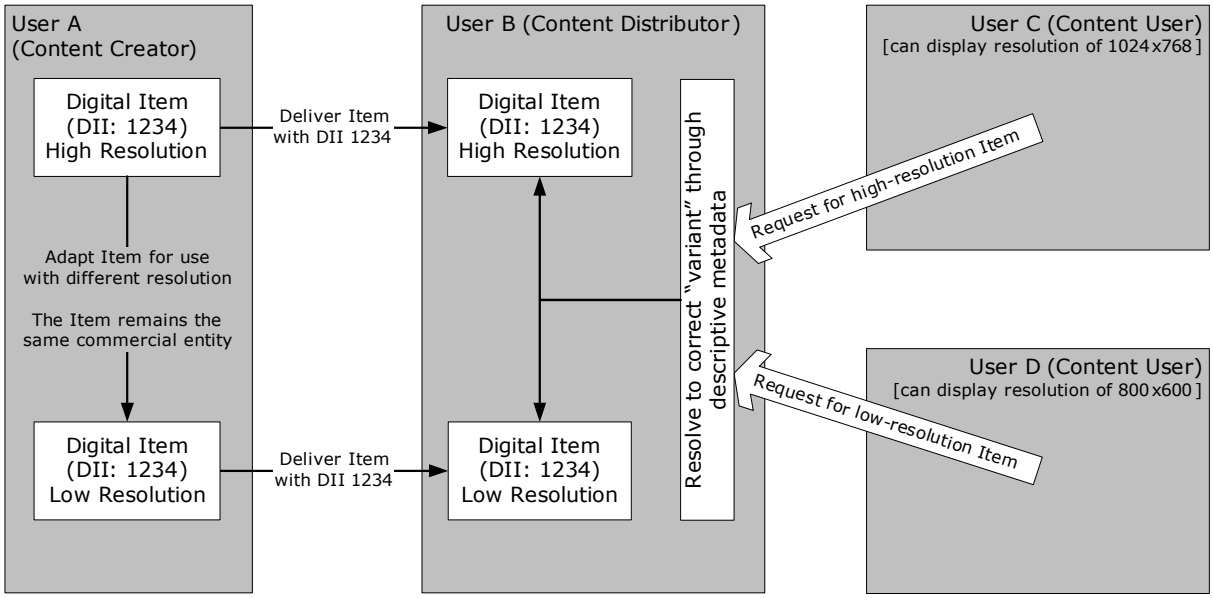

Figure D.1 — Varying Levels of Granularity of Identification without `RelatedIdentifier`

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However, by giving each of the variants a separate identifier, the process becomes more efficient. This is shown in Figure D.2 below.

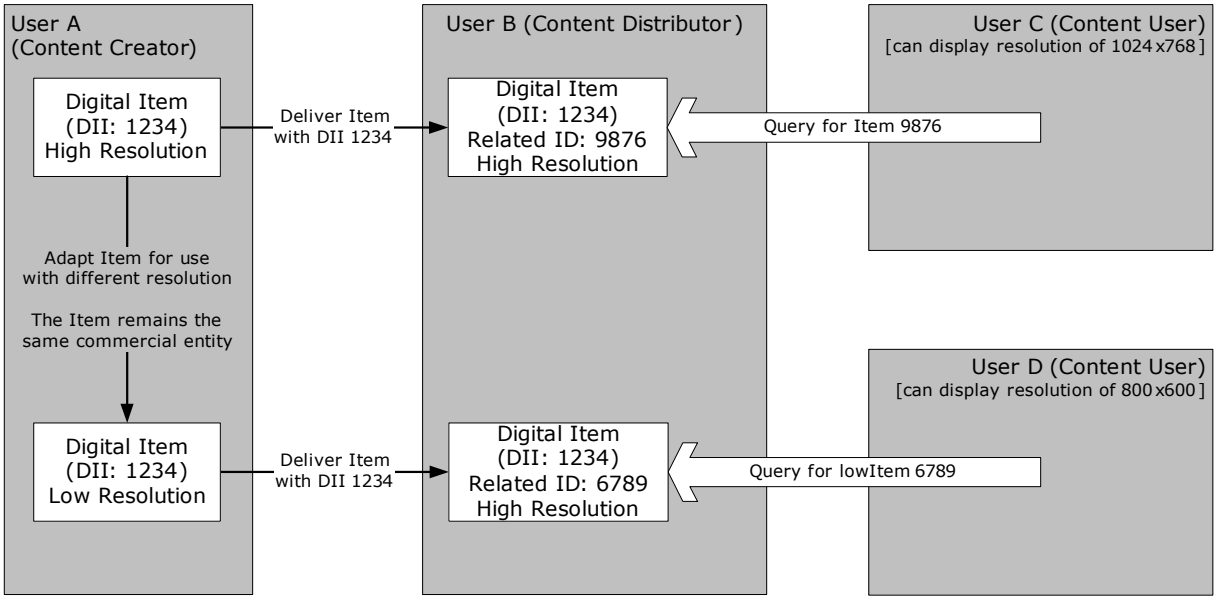

Figure D.2 — Varying Levels of Granularity of Identification with `RelatedIdentifier`

In Figure D.2 the Digital Item Identifier (1234), by definition, constitutes a "class" identifier – albeit of a class with only one member. Only if User *B* requires a second variant in that class (here to deal with different screen resolutions) would a `dii:RelatedIdentifier` be added into the Digital Item Declaration. An appropriate relationship description, as described in Annex D.3 below, would be added into the `RelationshipType` attribute of the `dii:RelatedIdentifier`.

D.3 Relationship Types

The following relationship types are included into ISO/IEC 21000-6 (as amended through ISO/IEC 21000-6:2004/Amd.1):

— HasComponent/IsComponentOf

— HasMember/IsMemberOf

— IsAbstractionOf/IsSourceOfAbstraction

— IsAdaptationOf/HasAdaptation

— IsDiminutionOf/HasDiminution

— IsEnhancementOf/HasEnhancement

— IsTransformationOf/HasTransformation

— IsTranslationOf/HasTranslation

— IsManifestationOf/IsManifestIn

Additional relationship types can be added by registering them with the Registration Authority for ISO/IEC 21000-6.

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Replace item [15] in the Bibliography with:

[15] ISO 15706-2, *Information and documentation — International Standard Audiovisual Number (ISAN) — Part 2: Version identifier*

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