

Australian Standard™

**Information technology—Multimedia
content description interface**

Part 11: MPEG-7 profile schemas



This Australian Standard was prepared by Committee IT-029, Coded Representation of Picture, Audio and Multimedia/Hypermedia Information. It was approved on behalf of the Council of Standards Australia on 14 February 2006.
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**Information technology—Multimedia
content description interface**

Part 11: MPEG-7 profile schemas

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PREFACE

This Standard was prepared by the Standards Australia Committee IT-029, Coded Representation of Picture, Audio and Multimedia/Hypermedia Information.

This Standard is identical with, and has been reproduced from ISO/IEC TR 15938-11:2005, *Information technology—Multimedia content description interface, Part 11: MPEG-7 profile schemas*.

The objective of this Standard is to provide the Australian multimedia and broadcasting industry with the schemas in XSD form for each of the ISO/IEC 15938-9 standard description profiles, namely the Simple Metadata Profile (SMP), User Description Profile (UDP), and the Core Description Profile (CDP).

Standards Australia is in the process of adopting most of ISO/IEC 15938 series Standards. Refer to the website for current list.

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- (a) Its number appears on the cover and title page while the international standard number appears only on the cover.
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References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>		<i>Australian Standard</i>	
ISO/IEC		AS ISO/IEC	
15938	Information technology — Multimedia content description interface	15938	Information technology — Multimedia content description interface
15938-9	Part 9: Profiles and levels	15938.9	Part 9: Profiles and levels

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INTRODUCTION

This Technical Report, also known as “Multimedia Content Description Interface”, provides a standardized set of technologies for describing multimedia content. It addresses a broad spectrum of multimedia applications and requirements by providing a metadata system for describing the features of multimedia content.

The following are specified in this International Standard:

Description schemes (DS) describe entities or relationships pertaining to multimedia content. Description schemes specify the structure and semantics of their components, which may be Description Schemes, descriptors, or datatypes.

Descriptors (D) describe features, attributes, or groups of attributes of multimedia content.

Datatypes are the basic reusable datatypes employed by description schemes and descriptors

Systems tools support delivery of descriptions, multiplexing of descriptions with multimedia content, synchronization, file format, and so forth.

This International Standard is subdivided into 10 parts:

Part 1 – Systems: specifies the tools for preparing descriptions for efficient transport and storage, compressing descriptions, and allowing synchronization between content and descriptions.

Part 2 – Description definition language: specifies the language for defining the International Standard set of description tools (DSs, Ds, and datatypes) and for defining new description tools.

Part 3 – Visual: specifies the description tools pertaining to visual content.

Part 4 – Audio: specifies the description tools pertaining to audio content.

Part 5 – Multimedia description schemes: specifies the generic description tools pertaining to multimedia including audio and visual content.

Part 6 – Reference software: provides a software implementation of the International Standard.

Part 7 – Conformance testing: specifies the guidelines and procedures for testing conformance of implementations of the International Standard.

Part 8 – Extraction and use of MPEG-7 descriptions: provides guidelines and examples of the extraction and use of descriptions.

Part 9 – Profiles and levels: provides guidelines and standard profiles.

Part 10 – Schema definition: specifies the schema using description definition language.

Part 11 – Profile Schemas: listing of profile schemas using description definition language.

AUSTRALIAN STANDARD

Information technology — Multimedia content description interface —**Part 11:
MPEG-7 profile schemas****1 Scope**

This Technical Report specifies the actual schema in XSD form for each of the ISO/IEC 15938-9 standard description profiles, namely the Simple Metadata Profile (SMP), User Description Profile (UDP), and the Core Description Profile (CDP).

2 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/IEC 15938-9, *Information technology — Multimedia content description interface — Part 9: Profiles and levels*

3 Description Profile Schema**3.1 General**

This clause contains actual schema in XSD form for each of the ISO/IEC 15938-9 standard profiles.

3.2 SMP Profile Schema

```
<?xml version="1.0" encoding="iso-8859-1"?>
<!-- *****
This XML document was originally developed in the course of development of the
ISO/IEC 15938 standard (MPEG-7). This XML document contains either a part of
the MPEG-7 schema implementation for one or more MPEG-7 tools as specified by
the MPEG-7 Requirements or MPEG-7 description examples conformant to the
MPEG-7 schema.

ISO/IEC gives users of MPEG-7 free license to this XML document or modifications
Thereof for use in hardware or software products claiming conformance to MPEG-7.

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products.
*****
```

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This notice must be included in all copies or derivative works.

```

***** -->
<!-- ##### -->
<!-- ISO/IEC 15938 Information Technology-Multimedia Content Description Interface -->
<!-- Part 9: MPEG-7 Profiles and Levels (ISO/IEC 15938-9) -->
<!-- Simple Metadata Profile -->
<!-- -->
<!-- Last updated: 22 July 2004 -->
<!-- ##### -->

<!-- SMP-Light, version:1, date:July 23, 2003 -->
<schema targetNamespace="urn:mpeg:mpeg7:schema:2001"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:mpeg7="urn:mpeg:mpeg7:schema:2001"
  xmlns:xml="http://www.w3.org/XML/1998/namespace"
  elementFormDefault="qualified" attributeFormDefault="unqualified">
  <annotation>

    <documentation>
      This document contains MDS tools defined in ISO/IEC 15938-5
    </documentation>
  </annotation>
  <!-- ##### -->
  <!-- import xml components -->
  <!-- ##### -->
  <import namespace="http://www.w3.org/XML/1998/namespace"
    schemaLocation="xml-1998.xsd"/>
  <!-- ##### -->
  <!-- include MPEG-7 specific extensions for DDL (ISO/IEC 15938-2) -->
  <!-- ##### -->

  <element name="Mpeg7">
    <complexType>
      <complexContent>
        <extension base="mpeg7:Mpeg7Type">
          <choice>
            <element name="Description" type="mpeg7:CompleteDescriptionType"
minOccurs="1" maxOccurs="unbounded"/>
          </choice>
        </extension>
      </complexContent>
    </complexType>
  </element>

  <!-- Definition of Mpeg7Type datatype -->
  <complexType name="Mpeg7Type" abstract="true">
    <sequence>
      <!-- DescriptionProfile element added per ISO/IEC 15938 Part 5 Cor1 - July 2004 -->
      <element name="DescriptionProfile" type="mpeg7:DescriptionProfileType"
minOccurs="0"/>
    </sequence>
    <attribute ref="xml:lang" use="optional"/>
  </complexType>

  <!-- DescriptionProfileType datatype added per ISO/IEC 15938 Part 5 Cor1 - July 2004 -->
  <!-- Definition of DescriptionProfileType datatype -->
  <complexType name="DescriptionProfileType">
    <attribute name="profileAndLevelIndication" use="required">
      <simpleType>
        <list itemType="anyURI"/>
      </simpleType>
    </attribute>
  </complexType>

  <complexType name="Mpeg7BaseType" abstract="true">

```

```

    <complexContent>
      <restriction base="anyType"/>
    </complexContent>
  </complexType>

  <simpleType name="timePointType">
    <restriction base="mpeg7:basicTimePointType">
      <pattern value="(\\-?\\d+(\\-\\d{2}(\\-\\d{2})?)?)?(T\\d{2}(:\\d{2}(:\\d{2}(:\\d+)?))?)?(F\\d+)?((\\-|\\+)?\\d{2}:\\d{2})?" />
    </restriction>
  </simpleType>

  <simpleType name="basicTimePointType">
    <restriction base="string">
      <pattern value="(\\-?\\d+(\\-\\d{2}(\\-\\d{2})?)?)?(T\\d{2}(:\\d{2}(:\\d{2}(:\\d+\\.\\d{2})?)?)?)?(F\\d+)?((\\-|\\+)?\\d{2}:\\d{2})?" />
    </restriction>
  </simpleType>

  <complexType name="TextAnnotationType">
    <choice minOccurs="1" maxOccurs="unbounded">
      <element name="FreeTextAnnotation" type="mpeg7:TextualType"/>
      <element name="StructuredAnnotation" type="mpeg7:StructuredAnnotationType"/>
    </choice>
    <attribute ref="xml:lang"/>
  </complexType>

  <complexType name="TextualType">
    <complexContent>
      <extension base="mpeg7:TextualBaseType"/>
    </complexContent>
  </complexType>

  <complexType name="TextualBaseType" abstract="true">
    <simpleContent>
      <extension base="string">
        <attribute ref="xml:lang" use="optional"/>
      </extension>
    </simpleContent>
  </complexType>

  <complexType name="StructuredAnnotationType">
    <sequence>
      <element name="Who" type="mpeg7:TermUseType" minOccurs="0" maxOccurs="unbounded"/>
      <element name="WhatObject" type="mpeg7:TermUseType" minOccurs="0" maxOccurs="unbounded"/>
      <element name="WhatAction" type="mpeg7:TermUseType" minOccurs="0" maxOccurs="unbounded"/>
      <element name="Where" type="mpeg7:TermUseType" minOccurs="0" maxOccurs="unbounded"/>
      <element name="When" type="mpeg7:TermUseType" minOccurs="0" maxOccurs="unbounded"/>
      <element name="Why" type="mpeg7:TermUseType" minOccurs="0" maxOccurs="unbounded"/>
      <element name="How" type="mpeg7:TermUseType" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
    <attribute ref="xml:lang" use="optional"/>
  </complexType>

  <complexType name="TermUseType">
    <complexContent>
      <extension base="mpeg7:InlineTermDefinitionType">
        <attribute name="href" type="mpeg7:termReferenceType" use="optional"/>
      </extension>
    </complexContent>
  </complexType>

  <complexType name="InlineTermDefinitionType" abstract="true">
    <sequence>

```

```

    <element name="Name" minOccurs="0" maxOccurs="unbounded">
      <complexType>
        <complexContent>
          <extension base="mpeg7:TextualType">
            <attribute name="preferred" type="boolean" use="optional"/>
          </extension>
        </complexContent>
      </complexType>
    </element>
    <element name="Definition" type="mpeg7:TextualType" minOccurs="0"
maxOccurs="unbounded"/>
  </sequence>
</complexType>

<simpleType name="termRelationQualifierType">
  <union>
    <simpleType>
      <restriction base="NMTOKEN">
        <enumeration value="NT"/>
        <enumeration value="BT"/>
        <enumeration value="RT"/>
        <enumeration value="US"/>
        <enumeration value="UF"/>
      </restriction>
    </simpleType>
    <simpleType>
      <restriction base="mpeg7:termReferenceType"/>
    </simpleType>
  </union>
</simpleType>

<simpleType name="termReferenceType">
  <union>
    <simpleType>
      <restriction base="NMTOKEN">
        <whiteSpace value="collapse"/>
        <pattern value=":[^:]+:[^:]+"/>
      </restriction>
    </simpleType>
    <simpleType>
      <restriction base="anyURI"/>
    </simpleType>
  </union>
</simpleType>

<complexType name="CreatorType">
  <complexContent>
    <extension base="mpeg7:MediaAgentType">
    </extension>
  </complexContent>
</complexType>

<complexType name="MediaAgentType">
  <sequence>
    <element name="Role" type="mpeg7:ControlledTermUseType"/>
    <choice>
      <element name="Agent" type="mpeg7:AgentType"/>
    </choice>
  </sequence>
</complexType>

<complexType name="ControlledTermUseType">
  <complexContent>
    <extension base="mpeg7:InlineTermDefinitionType">
      <attribute name="href" type="mpeg7:termReferenceType" use="required"/>
    </extension>
  </complexContent>
</complexType>

<complexType name="AgentType" abstract="true">
  <complexContent>

```

```

    <extension base="mpeg7:DSType">
      <sequence>
        <element name="Icon" type="mpeg7:MediaLocatorType" minOccurs="0"
maxOccurs="unbounded"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<complexType name="PersonType">
  <complexContent>
    <extension base="mpeg7:AgentType">
      <sequence>
        <choice minOccurs="1" maxOccurs="unbounded">
          <element name="Name" type="mpeg7:PersonNameType"/>
        </choice>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<complexType name="DSType" abstract="true">
  <complexContent>
    <extension base="mpeg7:Mpeg7BaseType">
      <attribute name="id" type="ID" use="optional"/>
    </extension>
  </complexContent>
</complexType>

<complexType name="MediaLocatorType">
  <sequence>
    <choice minOccurs="0">
      <element name="MediaUri" type="anyURI"/>
    </choice>
    <element name="StreamID" type="nonNegativeInteger" minOccurs="0"/>
  </sequence>
</complexType>

<complexType name="PersonNameType">
  <sequence>
    <choice minOccurs="1" maxOccurs="unbounded">
      <element name="GivenName" type="mpeg7:NameComponentType"/>
      <element name="FamilyName" type="mpeg7:NameComponentType" minOccurs="0"/>
    </choice>
  </sequence>
  <attribute ref="xml:lang" use="optional"/>
</complexType>

<complexType name="NameComponentType">
  <simpleContent>
    <extension base="mpeg7:TextualBaseType">
      <attribute name="initial" type="string" use="optional"/>
      <attribute name="abbrev" type="string" use="optional"/>
    </extension>
  </simpleContent>
</complexType>

<complexType name="CreationToolType">
  <sequence>
    <element name="Tool" type="mpeg7:TermUseType"/>
    <element name="Setting" minOccurs="0" maxOccurs="unbounded">
      <complexType>
        <attribute name="name" type="string" use="required"/>
        <attribute name="value" type="string" use="required"/>
      </complexType>
    </element>
  </sequence>
</complexType>

<complexType name="PlaceType">
  <complexContent>

```

```

<extension base="mpeg7:DSType">
  <sequence>
    <element name="GeographicPosition" minOccurs="0">
      <complexType>
        <sequence>
          <element name="Point" type="mpeg7:GeographicPointType"/>
        </sequence>
        <attribute name="datum" type="string" use="optional"/>
      </complexType>
    </element>
  </sequence>
  <attribute ref="xml:lang" use="optional"/>
</extension>
</complexContent>
</complexType>

<complexType name="GeographicPointType">
  <attribute name="longitude" use="required">
    <simpleType>
      <restriction base="double">
        <minInclusive value="-180.0"/>
        <maxInclusive value="180.0"/>
      </restriction>
    </simpleType>
  </attribute>
  <attribute name="latitude" use="required">
    <simpleType>
      <restriction base="double">
        <minInclusive value="-90.0"/>
        <maxInclusive value="90.0"/>
      </restriction>
    </simpleType>
  </attribute>
  <attribute name="altitude" type="double" use="optional"/>
</complexType>

<complexType name="CompleteDescriptionType" abstract="true">
  <sequence>
<!--
    <element name="DescriptionMetadata" type="mpeg7:DescriptionMetadataType"
minOccurs="0"/>
    <element name="Relationships" type="mpeg7:GraphType" minOccurs="0"
maxOccurs="unbounded"/>
    <element name="OrderingKey" type="mpeg7:OrderingKeyType" minOccurs="0"
maxOccurs="unbounded"/>
-->
  </sequence>
</complexType>

<complexType name="ContentManagementType" abstract="true">
  <complexContent>
    <extension base="mpeg7:CompleteDescriptionType"/>
  </complexContent>
</complexType>

<complexType name="RatingType">
  <sequence>
    <element name="RatingValue" type="float"/>
    <element name="RatingScheme">
      <complexType>
        <complexContent>
          <extension base="mpeg7:TermUseType">
            <attribute name="best" type="float" use="optional"/>
            <attribute name="worst" type="float" use="optional"/>
            <attribute name="style" use="required">
              <simpleType>
                <restriction base="NMTOKEN">
                  <enumeration value="higherBetter"/>
                  <enumeration value="lowerBetter"/>
                </restriction>
              </simpleType>
            </attribute>
          </extension>
        </complexContent>
      </complexType>
    </element>
  </sequence>
</complexType>

```

```

        </attribute>
      </extension>
    </complexContent>
  </complexType>
</element>
</sequence>
</complexType>

<complexType name="MediaInstanceType">
  <complexContent>
    <extension base="mpeg7:DSType">
      <sequence>
        <choice>
          <element name="MediaLocator" type="mpeg7:MediaLocatorType"/>
        </choice>
      </sequence>
    </extension>
  </complexContent>
</complexType>
<complexType name="CreationDescriptionType">
  <complexContent>
    <extension base="mpeg7:ContentManagementType">
      <sequence>
        <element name="CreationInformation" type="mpeg7:CreationInformationType"
minOccurs="1" maxOccurs="unbounded"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<complexType name="CreationInformationType">
  <complexContent>
    <extension base="mpeg7:DSType">
      <sequence>
        <element name="Creation" type="mpeg7:CreationType"/>
        <element name="Classification" type="mpeg7:ClassificationType"
minOccurs="0"/>
        <element name="RelatedMaterial" type="mpeg7:RelatedMaterialType"
minOccurs="0" maxOccurs="unbounded"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<complexType name="CreationType">
  <complexContent>
    <extension base="mpeg7:DSType">
      <sequence>
        <element name="Title" type="mpeg7:TitleType" minOccurs="1"
maxOccurs="unbounded"/>
        <element name="TitleMedia" type="mpeg7:TitleMediaType" minOccurs="0"/>
        <element name="Abstract" type="mpeg7:TextAnnotationType" minOccurs="0"
maxOccurs="unbounded"/>
        <element name="Creator" type="mpeg7:CreatorType" minOccurs="0"
maxOccurs="unbounded"/>
        <element name="CreationCoordinates" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <sequence>
              <element name="Location" type="mpeg7:PlaceType" minOccurs="0"/>
              <element name="Date" type="mpeg7:TimeType" minOccurs="0"/>
            </sequence>
          </complexType>
        </element>
        <element name="CreationTool" type="mpeg7:CreationToolType" minOccurs="0"
maxOccurs="unbounded"/>
        <element name="CopyrightString" type="mpeg7:TextualType" minOccurs="0"
maxOccurs="unbounded"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

```

```

<complexType name="TitleType">
  <simpleContent>
    <extension base="mpeg7:TextualBaseType">
      <attribute name="type" use="optional" default="main">
        <simpleType>
          <union>
            <simpleType>
              <restriction base="NMTOKEN">
                <enumeration value="main"/>
                <enumeration value="secondary"/>
                <enumeration value="alternative"/>
                <enumeration value="original"/>
                <enumeration value="popular"/>
                <enumeration value="opusNumber"/>
                <enumeration value="songTitle"/>
                <enumeration value="albumTitle"/>
                <enumeration value="seriesTitle"/>
                <enumeration value="episodeTitle"/>
              </restriction>
            </simpleType>
            <simpleType>
              <restriction base="mpeg7:termReferenceType"/>
            </simpleType>
          </union>
        </simpleType>
      </attribute>
    </extension>
  </simpleContent>
</complexType>

<complexType name="TitleMediaType">
  <sequence>
    <element name="TitleImage" type="mpeg7:ImageLocatorType" minOccurs="0"/>
  </sequence>
</complexType>

<complexType name="ImageLocatorType">
  <complexContent>
    <extension base="mpeg7:MediaLocatorType">
    </extension>
  </complexContent>
</complexType>

<complexType name="TimeType">
  <sequence>
    <choice>
      <element name="TimePoint" type="mpeg7:timePointType"/>
    </choice>
  </sequence>
</complexType>

<complexType name="ClassificationType">
  <complexContent>
    <extension base="mpeg7:DSType">
      <sequence>
        <element name="Genre" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <complexContent>
              <extension base="mpeg7:ControlledTermUseType">
                <attribute name="type" use="optional" default="main">
                  <simpleType>
                    <restriction base="NMTOKEN">
                      <enumeration value="main"/>
                      <enumeration value="secondary"/>
                    </restriction>
                  </simpleType>
                </attribute>
              </extension>
            </complexContent>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

```

```

        <element name="ParentalGuidance" type="mpeg7:ParentalGuidanceType"
minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
</extension>
</complexContent>
</complexType>

<complexType name="ParentalGuidanceType">
    <sequence>
        <choice>
            <element name="ParentalRating" type="mpeg7:ControlledTermUseType"/>
        </choice>
    </sequence>
</complexType>

<complexType name="RelatedMaterialType">
    <complexContent>
        <extension base="mpeg7:DSType">
            <sequence>
                <element name="DisseminationFormat" type="mpeg7:ControlledTermUseType"
minOccurs="0"/>
                <element name="MaterialType" type="mpeg7:TermUseType" minOccurs="0"/>
            </sequence>
        </extension>
    </complexContent>
</complexType>

<complexType name="ClassificationSchemeDescriptionType">
    <complexContent>
        <extension base="mpeg7:ContentManagementType">
            <choice>
                <element name="ClassificationScheme" type="mpeg7:ClassificationSchemeType"
minOccurs="1" maxOccurs="unbounded"/>
                <element name="ClassificationSchemeBase"
type="mpeg7:ClassificationSchemeBaseType" minOccurs="1" maxOccurs="unbounded"/>
            </choice>
        </extension>
    </complexContent>
</complexType>

<complexType name="ClassificationSchemeType">
    <complexContent>
        <extension base="mpeg7:ClassificationSchemeBaseType">
            <sequence>
                <element name="Term" type="mpeg7:TermDefinitionType" minOccurs="1"
maxOccurs="unbounded"/>
            </sequence>
        </extension>
    </complexContent>
</complexType>

<complexType name="ClassificationSchemeBaseType" abstract="true">
    <complexContent>
        <extension base="mpeg7:DSType">
            <attribute name="uri" type="anyURI" use="required"/>
            <attribute name="domain" use="optional">
        </attribute>
        </extension>
    </complexContent>
</complexType>

<complexType name="TermDefinitionType">
    <complexContent>
        <extension base="mpeg7:TermDefinitionBaseType">
            <sequence>
                <element name="Term" minOccurs="0" maxOccurs="unbounded">
                    <complexType>
                        <complexContent>
                            <extension base="mpeg7:TermDefinitionType">
                                <attribute name="relation" type="mpeg7:termRelationQualifierType"
use="optional" default="NT"/>

```

```

        </extension>
      </complexContent>
    </complexType>
  </element>
</sequence>
</extension>
</complexContent>
</complexType>

<complexType name="TermDefinitionBaseType" abstract="true">
  <complexContent>
    <extension base="mpeg7:DSType">
      <sequence>
        <element name="Name" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <simpleContent>
              <extension base="mpeg7:TextualType">
                <attribute name="preferred" type="boolean" use="optional"/>
              </extension>
            </simpleContent>
          </complexType>
        </element>
      </sequence>
      <attribute name="termID" type="NMTOKEN"/>
    </extension>
  </complexContent>
</complexType>
</schema>

```

3.3 UDP Profile Schema

```

<?xml version="1.0" encoding="UTF-8"?>
<!-- *****

```

This XML document was originally developed in the course of development of the ISO/IEC 15938 standard (MPEG-7). This XML document contains either a part of the MPEG-7 schema implementation for one or more MPEG-7 tools as specified by the MPEG-7 Requirements or MPEG-7 description examples conformant to the MPEG-7 schema.

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This notice must be included in all copies or derivative works.
***** -->
<!-- ##### -->
<!-- ISO/IEC 15938 Information Technology -Multimedia Content Description Interface -->
<!-- Part 9: MPEG-7 Profiles and Levels (ISO/IEC 15938-9) -->
<!-- User Description Profile -->
<!-- -->
<!-- Last updated: 2 July 2004 -->
<!-- Peter van Beek, Sharp Laboratories of America, pvanbeek@sharplabs.com -->
<!-- ##### -->

<schema targetNamespace="urn:mpeg:mpeg7:schema:2001"
xmlns="http://www.w3.org/2001/XMLSchema" xmlns:mpeg7="urn:mpeg:mpeg7:schema:2001"
xmlns:xml="http://www.w3.org/XML/1998/namespace" elementFormDefault="qualified"
attributeFormDefault="unqualified">

  <annotation>
    <documentation>
      This document contains MPEG-7 tools defined in ISO/IEC 15938 that are in the
User Description profile
    </documentation>
  </annotation>

  <!-- ##### -->
  <!-- Import xml tools not defined by MPEG-7 -->
  <!-- ##### -->

  <import namespace="http://www.w3.org/XML/1998/namespace" schemaLocation="./xml-
1998.xsd"/>

  <!-- ##### -->
  <!-- Tools from ISO/IEC 15938-2 (DDL) -->
  <!-- ##### -->

  <annotation>
    <documentation>
      This section contains tools defined in ISO/IEC 15938-2 (DDL)
    </documentation>
  </annotation>

  <!-- definition of listOfPositiveIntegerForDim datatype (DIA only) -->
  <simpleType name="listOfPositiveIntegerForDim">
    <list itemType="positiveInteger"/>
  </simpleType>

  <!-- definition of mpeg7:dim attribute (DIA only) -->
  <attribute name="dim">
    <simpleType>
      <restriction base="mpeg7:listOfPositiveIntegerForDim">
        <minLength value="1"/>
      </restriction>
    </simpleType>
  </attribute>

  <!-- definition of basicTimePoint datatype -->
  <simpleType name="basicTimePointType">
    <restriction base="string">
      <pattern value="\-?(\d+(\-\d{2}(\-
\d{2}))?)?(T\d{2}(:\d{2}(:\d{2}(:\d+(\.\d{2}))?)?)?)?(F\d+)?((\-|\+)\d{2}:\d{2}))?" />
    </restriction>
  </simpleType>

  <!-- definition of basicDuration datatype -->
  <simpleType name="basicDurationType">
    <restriction base="string">
      <pattern value="\-
?P(\d+D)?(T(\d+H)?(\d+M)?(\d+S)?(\d+N)?(\d{2}f)?)(\d+F)?((\-|\+)\d{2}:\d{2}Z)?" />
    </restriction>
  </simpleType>

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<!-- ##### -->
<!-- Tools from ISO/IEC 15938-5 (MDS) -->
<!-- ##### -->

<annotation>
  <documentation>
    This section contains tools defined in ISO/IEC 15938-5 (MDS)
  </documentation>
</annotation>

<!-- ##### -->
<!-- Tools from ISO/IEC 15938-5 (MDS) Clause 4 -->
<!-- ##### -->

<!-- Definition of MPEG-7 base type -->
<complexType name="Mpeg7BaseType" abstract="true">
  <complexContent>
    <restriction base="anyType"/>
  </complexContent>
</complexType>

<!-- Definition of generic D -->
<complexType name="DType" abstract="true">
  <complexContent>
    <extension base="mpeg7:Mpeg7BaseType"/>
  </complexContent>
</complexType>

<!-- Definition of generic DS -->
<complexType name="DSType" abstract="true">
  <complexContent>
    <extension base="mpeg7:Mpeg7BaseType">
      <sequence>
        <element name="Header" type="mpeg7:HeaderType" minOccurs="0"
maxOccurs="unbounded"/>
      </sequence>
      <attribute name="id" type="ID" use="optional"/>
      <attributeGroup ref="mpeg7:timePropertyGrp"/>
      <attributeGroup ref="mpeg7:mediaTimePropertyGrp"/>
    </extension>
  </complexContent>
</complexType>

<!-- Definition of Header datatype -->
<complexType name="HeaderType" abstract="true">
  <complexContent>
    <extension base="mpeg7:Mpeg7BaseType">
      <attribute name="id" type="ID" use="optional"/>
    </extension>
  </complexContent>
</complexType>

<!-- Definition of Mpeg7Type datatype -->
<complexType name="Mpeg7Type" abstract="true">
  <sequence>
    <!-- DescriptionProfile element added per ISO/IEC 15938 Part 5 Cor1 - July
2004 -->
    <element name="DescriptionProfile" type="mpeg7:DescriptionProfileType"
minOccurs="0"/>
    <!-- DescriptionMetadata element excluded
    <element name="DescriptionMetadata" type="mpeg7:DescriptionMetadataType"
minOccurs="0"/>
    -->
  </sequence>
  <attribute ref="xml:lang" use="optional"/>
  <attributeGroup ref="mpeg7:timePropertyGrp"/>
  <attributeGroup ref="mpeg7:mediaTimePropertyGrp"/>
</complexType>

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<!-- DescriptionProfileType datatype added per ISO/IEC 15938 Part 5 Cor1 - July
2004 -->
<!-- Definition of DescriptionProfileType datatype -->
<complexType name="DescriptionProfileType">
  <attribute name="profileAndLevelIndication" use="required">
    <simpleType>
      <list itemType="anyURI"/>
    </simpleType>
  </attribute>
</complexType>

<!-- Definition of Mpeg7 Element -->
<element name="Mpeg7">
  <complexType>
    <complexContent>
      <extension base="mpeg7:Mpeg7Type">
        <choice>
          <element name="DescriptionUnit" type="mpeg7:Mpeg7BaseType"/>
          <element name="Description" type="mpeg7:CompleteDescriptionType"
minOccurs="1" maxOccurs="unbounded"/>
        </choice>
      </extension>
    </complexContent>
  </complexType>
</element>

<!-- Definition of CompleteDescription Top-level Type -->
<complexType name="CompleteDescriptionType" abstract="true">
  <sequence>
    <!-- DescriptionMetadata element excluded
    <element name="DescriptionMetadata" type="mpeg7:DescriptionMetadataType"
minOccurs="0"/>
    -->
    <!-- Relationships element excluded
    <element name="Relationships" type="mpeg7:GraphType" minOccurs="0"
maxOccurs="unbounded"/>
    -->
    <!-- OrderingKey element excluded
    <element name="OrderingKey" type="mpeg7:OrderingKeyType" minOccurs="0"
maxOccurs="unbounded"/>
    -->
  </sequence>
</complexType>

<!-- Definition of ContentManagement Top-level Type -->
<complexType name="ContentManagementType" abstract="true">
  <complexContent>
    <extension base="mpeg7:CompleteDescriptionType"/>
  </complexContent>
</complexType>

<!-- Definition of UserDescription Top-level Type -->
<complexType name="UserDescriptionType">
  <complexContent>
    <extension base="mpeg7:ContentManagementType">
      <sequence>
        <element name="User" type="mpeg7:AgentType" minOccurs="0"/>
        <element name="UserPreferences" type="mpeg7:UserPreferencesType"
minOccurs="0" maxOccurs="unbounded"/>
        <element name="UsageHistory" type="mpeg7:UsageHistoryType"
minOccurs="0" maxOccurs="unbounded"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<!-- Definition of ClassificationSchemeDescription Top-level Type -->
<complexType name="ClassificationSchemeDescriptionType">
  <complexContent>
    <extension base="mpeg7:ContentManagementType">
      <choice>

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        <element name="ClassificationScheme"
type="mpeg7:ClassificationSchemeType" minOccurs="1" maxOccurs="unbounded"/>
        <!-- ClassificationSchemeBase element excluded
        <element name="ClassificationSchemeBase"
type="mpeg7:ClassificationSchemeBaseType" minOccurs="1" maxOccurs="unbounded"/>
        -->
    </choice>
</extension>
</complexContent>
</complexType>

<!-- ##### -->
<!-- Tools from ISO/IEC 15938-5 (MDS) Clause 5 -->
<!-- ##### -->

<!-- Definition of unsigned8 datatype (DIA only) -->
<simpleType name="unsigned8">
    <restriction base="nonNegativeInteger">
        <minInclusive value="0"/>
        <maxInclusive value="255"/>
    </restriction>
</simpleType>

<!-- Definition of unsigned12 datatype (DIA only) -->
<simpleType name="unsigned12">
    <restriction base="nonNegativeInteger">
        <minInclusive value="0"/>
        <maxInclusive value="4095"/>
    </restriction>
</simpleType>

<!-- Definition of zeroToOne datatype (DIA only) -->
<simpleType name="zeroToOneType">
    <restriction base="float">
        <minInclusive value="0.0"/>
        <maxInclusive value="1.0"/>
    </restriction>
</simpleType>

<!-- Definition of nonNegativeReal datatype -->
<simpleType name="nonNegativeReal">
    <restriction base="double">
        <minInclusive value="0.0"/>
    </restriction>
</simpleType>

<!-- Definition of integerVector datatype (DIA only) -->
<simpleType name="integerVector">
    <list itemType="integer"/>
</simpleType>

<!-- Definition of floatVector datatype (DIA only) -->
<simpleType name="floatVector">
    <list itemType="float"/>
</simpleType>

<!-- Definition of probabilityVector datatype (DIA only) -->
<simpleType name="probabilityVector">
    <list>
        <simpleType>
            <restriction base="float">
                <minInclusive value="0.0"/>
                <maxInclusive value="1.0"/>
            </restriction>
        </simpleType>
    </list>
</simpleType>

<!-- Definition of characterSetCode datatype (DIA only) -->
<simpleType name="characterSetCode">
    <restriction base="string"/>
</simpleType>

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<!-- Definition of mimeType datatype -->
<simpleType name="mimeType">
  <restriction base="string">
    <whiteSpace value="collapse"/>
    <pattern value=' [&#x21;-&#x7f;-[\(\)&lt;&gt;@,;:\\"/\[\]\?=?]]+ / [&#x21;-&#x7f;-[\(\)&lt;&gt;@,;:\\"/\[\]\?=?]]+' />
  </restriction>
</simpleType>

<!-- Definition of countryCode datatype -->
<simpleType name="countryCode">
  <restriction base="string">
    <whiteSpace value="collapse"/>
    <pattern value="[a-zA-Z]{2}" />
  </restriction>
</simpleType>

<!-- Definition of regionCode datatype -->
<simpleType name="regionCode">
  <restriction base="string">
    <whiteSpace value="collapse"/>
    <pattern value="[a-zA-Z]{2}(-[a-zA-Z0-9]{1,3})?" />
  </restriction>
</simpleType>

<!-- ##### -->
<!-- Tools from ISO/IEC 15938-5 (MDS) Clause 6 -->
<!-- ##### -->

<!-- Definition of referenceGrp attribute group -->
<attributeGroup name="referenceGrp">
  <attribute name="idref" type="IDREF" use="optional"/>
  <attribute name="xpath" type="mpeg7:xPathRefType" use="optional"/>
  <attribute name="href" type="anyURI" use="optional"/>
</attributeGroup>

<!-- Definition of Reference datatype -->
<complexType name="ReferenceType">
  <attributeGroup ref="mpeg7:referenceGrp"/>
</complexType>

<!-- Definition of xPath datatype -->
<simpleType name="xPathType">
  <restriction base="token"/>
</simpleType>

<!-- Definition of xPathRef datatype -->
<simpleType name="xPathRefType">
  <restriction base="mpeg7:xPathType">
    <pattern
value="/?(((child:)?((\i\c*:)?(\i\c*) (\[\d+\]))?)|\.|(\.\\.))/*(((child:)?((\i\c*:)?(\i\c*) (\[\d+\]))?)|\.|((attribute::|@) ((\i\c*:)?(\i\c*|*)))))"/>
  </restriction>
</simpleType>

<!-- Definition of xPathSelector datatype -->
<simpleType name="xPathSelectorType">
  <restriction base="mpeg7:xPathType">
    <pattern
value="(/(|((//|/)?(((child:)?((\i\c*:)?(\i\c*|*))|\.|\\.\\.))((//|/)?(((child:)?((\i\c*:)?(\i\c*|*))|\.|\\.\\.))*)|(|/|((//|/)?(((child:)?((\i\c*:)?(\i\c*|*))|\.|\\.\\.))((//|/)?(((child:)?((\i\c*:)?(\i\c*|*))|\.|\\.\\.))*)*)*)"/>
  </restriction>
</simpleType>

<!-- Definition of xPathAbsoluteSelector datatype -->
<simpleType name="xPathAbsoluteSelectorType">
  <restriction base="mpeg7:xPathSelectorType">
    <pattern
value="(/(|((//|/)?(((child:)?((\i\c*:)?(\i\c*|*))|\.|\\.\\.))*)|(|/|((//|/)?(((child:)?((\i\c*:)?(\i\c*|*))|\.|\\.\\.))*)*)*)"/>
  </restriction>
</simpleType>

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    </restriction>
  </simpleType>

  <!-- Definition of UniqueID datatype -->
  <complexType name="UniqueIDType">
    <simpleContent>
      <extension base="string">
        <attribute name="type" type="NMTOKEN" use="optional" default="URI"/>
        <attribute name="organization" type="NMTOKEN" use="optional"/>
        <attribute name="authority" type="NMTOKEN" use="optional"/>
        <attribute name="encoding" use="optional" default="text">
          <simpleType>
            <restriction base="string">
              <enumeration value="text"/>
              <enumeration value="base16"/>
              <enumeration value="base64"/>
            </restriction>
          </simpleType>
        </attribute>
      </extension>
    </simpleContent>
  </complexType>

  <!-- Definition of Time datatype -->
  <complexType name="TimeType">
    <sequence>
      <choice>
        <element name="TimePoint" type="mpeg7:timePointType"/>
        <element name="RelTimePoint" type="mpeg7:RelTimePointType"/>
        <element name="RelIncrTimePoint" type="mpeg7:RelIncrTimePointType"/>
      </choice>
      <choice minOccurs="0">
        <element name="Duration" type="mpeg7:durationType"/>
        <element name="IncrDuration" type="mpeg7:IncrDurationType"/>
      </choice>
    </sequence>
  </complexType>

  <!-- Definition of timePoint datatype -->
  <simpleType name="timePointType">
    <restriction base="mpeg7:basicTimePointType">
      <pattern value="(\\-?\\d+(\\-\\d{2}(\\-\\d{2})?)?(T\\d{2}(:\\d{2}(:\\d{2}(:\\d+)?)?)?(F\\d+)?((\\-|\\+)?\\d{2}:\\d{2})?)?"/>
    </restriction>
  </simpleType>

  <!-- Definition of duration datatype -->
  <simpleType name="durationType">
    <restriction base="mpeg7:basicDurationType">
      <pattern value="(\\-?P(\\d+D)?(T(\\d+H)?(\\d+M)?(\\d+S)?(\\d+N)?)?(\\d+F)?((\\-|\\+)?\\d{2}:\\d{2}Z)?)?"/>
    </restriction>
  </simpleType>

  <!-- Definition of IncrDuration datatype -->
  <complexType name="IncrDurationType">
    <simpleContent>
      <extension base="integer">
        <attribute name="timeUnit" type="mpeg7:durationType" use="optional"/>
      </extension>
    </simpleContent>
  </complexType>

  <!-- Definition of timeOffsetType datatype -->
  <simpleType name="timeOffsetType">
    <restriction base="mpeg7:basicDurationType">
      <pattern value="(\\-?P(\\d+D)?(T(\\d+H)?(\\d+M)?(\\d+S)?(\\d+N)?)?(\\d+F)?((\\-|\\+)?\\d{2}:\\d{2}Z)?)?"/>
    </restriction>
  </simpleType>

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<!-- Definition of RelTimePointType datatype -->
<complexType name="RelTimePointType">
  <simpleContent>
    <extension base="mpeg7:timeOffsetType">
      <attribute name="timeBase" type="mpeg7:xPathRefType" use="optional"/>
    </extension>
  </simpleContent>
</complexType>

<!-- Definition of RelIncrTimePointType datatype -->
<complexType name="RelIncrTimePointType">
  <simpleContent>
    <extension base="integer">
      <attribute name="timeUnit" type="mpeg7:durationType" use="optional"/>
      <attribute name="timeBase" type="mpeg7:xPathRefType" use="optional"/>
    </extension>
  </simpleContent>
</complexType>

<!-- Definition of timePropertyGrp attribute group -->
<attributeGroup name="timePropertyGrp">
  <attribute name="timeBase" type="mpeg7:xPathRefType" use="optional"/>
  <attribute name="timeUnit" type="mpeg7:durationType" use="optional"/>
</attributeGroup>

<!-- Definition of MediaTime datatype -->
<complexType name="MediaTimeType">
  <sequence>
    <choice>
      <element name="MediaTimePoint" type="mpeg7:mediaTimePointType"/>
      <element name="MediaRelTimePoint" type="mpeg7:MediaRelTimePointType"/>
      <element name="MediaRelIncrTimePoint"
type="mpeg7:MediaRelIncrTimePointType"/>
    </choice>
    <choice minOccurs="0">
      <element name="MediaDuration" type="mpeg7:mediaDurationType"/>
      <element name="MediaIncrDuration" type="mpeg7:MediaIncrDurationType"/>
    </choice>
  </sequence>
</complexType>

<!-- Definition of mediaTimePoint datatype -->
<simpleType name="mediaTimePointType">
  <restriction base="mpeg7:basicTimePointType">
    <pattern value="(\-?\d+(\-\d{2}(\-
\d{2})?)?(T\d{2}(:\d{2}(:\d+)?)?)(F\d+)?"/>
  </restriction>
</simpleType>

<!-- Definition of mediaDuration datatype -->
<simpleType name="mediaDurationType">
  <restriction base="mpeg7:basicDurationType">
    <pattern value="\-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+S)?(\d+N)?)(\d+F)?"/>
  </restriction>
</simpleType>

7
<!-- Definition of MediaIncrDuration datatype -->
<complexType name="MediaIncrDurationType">
  <simpleContent>
    <extension base="integer">
      <attribute name="mediaTimeUnit" type="mpeg7:mediaDurationType"
use="optional"/>
    </extension>
  </simpleContent>
</complexType>

<!-- Definition of mediaTimeOffset datatype -->
<simpleType name="mediaTimeOffsetType">
  <restriction base="mpeg7:basicDurationType">
    <pattern value="\-?P(\d+D)?(T(\d+H)?(\d+M)?(\d+S)?(\d+N)?)(\d+F)?"/>
  </restriction>

```

```

</simpleType>

<!-- Definition of MediaRelTimePoint datatype -->
<complexType name="MediaRelTimePointType">
  <simpleContent>
    <extension base="mpeg7:mediaTimeOffsetType">
      <attribute name="mediaTimeBase" type="mpeg7:xPathRefType"
use="optional"/>
    </extension>
  </simpleContent>
</complexType>

<!-- Definition of MediaRelIncrTimePoint datatype -->
<complexType name="MediaRelIncrTimePointType">
  <simpleContent>
    <extension base="integer">
      <attribute name="mediaTimeUnit" type="mpeg7:mediaDurationType"
use="optional"/>
      <attribute name="mediaTimeBase" type="mpeg7:xPathRefType"
use="optional"/>
    </extension>
  </simpleContent>
</complexType>

<!-- Definition of mediaTimePropertyGrp attribute group -->
<attributeGroup name="mediaTimePropertyGrp">
  <attribute name="mediaTimeBase" type="mpeg7:xPathRefType" use="optional"/>
  <attribute name="mediaTimeUnit" type="mpeg7:mediaDurationType" use="optional"/>
</attributeGroup>

<!-- Definition of MediaLocator datatype -->
<complexType name="MediaLocatorType">
  <sequence>
    <choice minOccurs="0">
      <element name="MediaUri" type="anyURI"/>
      <element name="InlineMedia" type="mpeg7:InlineMediaType"/>
    </choice>
    <element name="StreamID" type="nonNegativeInteger" minOccurs="0"/>
  </sequence>
</complexType>

<!-- Definition of InlineMedia datatype -->
<complexType name="InlineMediaType">
  <choice>
    <element name="MediaData16" type="hexBinary"/>
    <element name="MediaData64" type="base64Binary"/>
  </choice>
  <attribute name="type" type="mpeg7:mimeType" use="required"/>
</complexType>

<!-- Definition of TemporalSegmentLocator datatype -->
<complexType name="TemporalSegmentLocatorType">
  <complexContent>
    <extension base="mpeg7:MediaLocatorType">
      <choice minOccurs="0">
        <element name="MediaTime" type="mpeg7:MediaTimeType"/>
        <element name="BytePosition">
          <complexType>
            <attribute name="offset" type="nonNegativeInteger"
use="required"/>
            <attribute name="length" type="positiveInteger"
use="optional"/>
          </complexType>
        </element>
      </choice>
    </extension>
  </complexContent>
</complexType>

<!-- Definition of ImageLocator datatype -->
<complexType name="ImageLocatorType">
  <complexContent>

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        <extension base="mpeg7:MediaLocatorType">
            <choice minOccurs="0">
                <element name="MediaTimePoint" type="mpeg7:mediaTimePointType"/>
                <element name="MediaRelTimePoint" type="mpeg7:MediaRelTimePointType"/>
                <element name="MediaRelIncrTimePoint"
type="mpeg7:MediaRelIncrTimePointType"/>
                <element name="BytePosition">
                    <complexType>
                        <attribute name="offset" type="nonNegativeInteger"
use="required"/>
                        <attribute name="length" type="positiveInteger"
use="optional"/>
                    </complexType>
                </element>
            </choice>
        </extension>
    </complexContent>
</complexType>

<!-- ##### -->
<!-- Tools from ISO/IEC 15938-5 (MDS) Clause 7 -->
<!-- ##### -->

<!-- Definition of TextualBase datatype -->
<complexType name="TextualBaseType" abstract="true">
    <simpleContent>
        <extension base="string">
            <attribute ref="xml:lang" use="optional"/>
            <!-- phoneticTranscription attribute excluded -->
            <!--
            <attribute name="phoneticTranscription" use="optional">
                <simpleType>
                    <list itemType="mpeg7:PhoneType"/>
                </simpleType>
            </attribute>
            -->
            <!-- phoneticAlphabet attribute excluded -->
            <!--
            <attribute name="phoneticAlphabet" type="mpeg7:phoneticAlphabetType"
use="optional" default="sampa"/>
            -->
        </extension>
    </simpleContent>
</complexType>

<!-- Definition of Textual datatype -->
<complexType name="TextualType">
    <simpleContent>
        <extension base="mpeg7:TextualBaseType"/>
    </simpleContent>
</complexType>

<!-- Definition of ClassificationSchemeBase DS -->
<complexType name="ClassificationSchemeBaseType" abstract="true">
    <complexContent>
        <extension base="mpeg7:DSType">
            <sequence>
                <element name="Import" type="mpeg7:ReferenceType" minOccurs="0"
maxOccurs="unbounded"/>
            </sequence>
            <attribute name="uri" type="anyURI" use="required"/>
            <attribute name="domain" use="optional">
                <simpleType>
                    <list itemType="mpeg7:xPathAbsoluteSelectorType"/>
                </simpleType>
            </attribute>
        </extension>
    </complexContent>
</complexType>

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<!-- Definition of ClassificationScheme DS -->
<complexType name="ClassificationSchemeType">
  <complexContent>
    <extension base="mpeg7:ClassificationSchemeBaseType">
      <sequence>
        <element name="Term" type="mpeg7:TermDefinitionType" minOccurs="1"
maxOccurs="unbounded"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<!-- Definition of TermDefinitionBase DS -->
<complexType name="TermDefinitionBaseType" abstract="true">
  <complexContent>
    <extension base="mpeg7:DSType">
      <sequence>
        <element name="Name" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <simpleContent>
              <extension base="mpeg7:TextualType">
                <attribute name="preferred" type="boolean"
use="optional"/>
              </extension>
            </simpleContent>
          </complexType>
        </element>
        <element name="Definition" type="mpeg7:TextualType" minOccurs="0"
maxOccurs="unbounded"/>
      </sequence>
      <attribute name="termID" type="NMTOKEN"/>
    </extension>
  </complexContent>
</complexType>

<!-- Definition of TermDefinition DS -->
<complexType name="TermDefinitionType">
  <complexContent>
    <extension base="mpeg7:TermDefinitionBaseType">
      <sequence>
        <element name="Term" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <complexContent>
              <extension base="mpeg7:TermDefinitionType">
                <attribute name="relation"
type="mpeg7:termRelationQualifierType" use="optional" default="NT"/>
              </extension>
            </complexContent>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<!-- Definition of termRelationQualifier datatype -->
<simpleType name="termRelationQualifierType">
  <union>
    <simpleType>
      <restriction base="NMTOKEN">
        <enumeration value="NT"/>
        <enumeration value="BT"/>
        <enumeration value="RT"/>
        <enumeration value="US"/>
        <enumeration value="UF"/>
      </restriction>
    </simpleType>
    <simpleType>
      <restriction base="mpeg7:termReferenceType"/>
    </simpleType>
  </union>

```