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**Information technology — Multimedia
content description interface —**

**Part 5:
Multimedia description schemes**

**AMENDMENT 5: Quality metadata,
multiple text encodings, extended
classification metadata**

*Technologies de l'information — Interface de description du
contenu multimédia —*

Partie 5: Schémas de description multimédia

*AMENDEMENT 5: Métadonnées de qualité, encodages de texte
multiples, métadonnées de classification étendues*



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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

Introduction

The Multimedia Preservation Application Format (MP-AF, ISO/IEC 23000-15) makes use of MPEG-7 MDS for descriptive and technical metadata. The following gaps in MPEG-7 MDS for preservation applications are addressed by this amendment:

- Support for identifying the script of a string. This is useful in cases where a language can be represented in multiple scripts (e.g., Japanese, Bulgarian). While the script identifier according to ISO 15924 can be represented as part of the language tag, introducing a separate attribute improves the modularity of the metadata to represent it separately.
- Support for multiple string encodings in a single XML document. In some cases strings (e.g., identifiers, file names) need to be kept in their original character encoding different to the encoding of the metadata document. In order to enable this and avoid problems with XML parsing, the content of the string is then base64 or percent encoded and the original character encoding is identified.
- Extended classification metadata, i.e. increasing the cardinality of some classification metadata elements and adding the option to identify the version of the content.
- Metadata for quality control. Detailed quality descriptors are only available for audio (MPEG-7 part 4/AMD 2), while similar tools for format/wrapper and visual quality checks and defects are missing. A representation compatible with the European Broadcasting Union's (EBU) Quality Control data model is needed.

This amendment defines solutions for filling these gaps in MDS. These extensions are expected to be useful also for applications beyond preservation.

The extensions are all optional, thus descriptions conforming to a version of MPEG-7 MDS prior to this amendment are valid against a version including this amendment.

STANDARDSISO.COM : Click to view the full PDF of ISO/IEC 15938-5:2003/AMD5:2015

Information Technology — Multimedia content description interface — Part 5: Multimedia description schemes, AMENDMENT 5: Quality metadata, multiple text encodings, extended classification metadata

1 Scope

This amendment extends text and classification descriptors for descriptive metadata for audiovisual content making use of existing datatypes and adding some elements and attributes, and adds support for quality metadata. A first extension improves internationalization for text-based metadata by identifying the script(s) used and enables carrying encoded strings represented in multiple character sets in the same XML document. A second improvement extends classification metadata in order to: (a) improve interoperability with existing metadata formats used in professional media production, (b) increase cardinality of some elements and (c) add attributes and a version element. Finally a third extension improves the tools for describing profiles for quality control of audiovisual media, as well as the results of quality analysis on wrapper, bitstream and baseband level.

NOTE The XML schema implementing this amendment as well as a consolidated XML schema for MPEG-7 including this amendment are contained in the electronic attachment.

2 Multiple Text Encodings

In 7.2.2, replace the entire text of the subclause with the following text:

7.2.2 Textual datatypes

7.2.2.1 Introduction

The TextualBase datatype provides a base from which other kinds of textual description tools are derived. It can also be used in the definitions of tools that contain textual descriptions. An optional attribute, xml:lang, is used to specify the language of the contained text.

The Textual datatype, derived from the TextualBase datatype, is a non-abstract type that is used for simple textual descriptions.

In cases where textual elements need to be stored in their native character set (different from the encoding of the XML document), the character set can be specified using the charset attribute. In order to allow for correct parsing of the document, the content of the textual element must be encoded in this case (using base64 or percent encoding).

7.2.2.2 Textual datatypes syntax

```
<!-- ##### -->
<!-- Definition of Textual datatypes (7.2.2) -->
<!-- ##### -->
<!-- Definition of TextualBase datatype -->
<complexType name="TextualBaseType" abstract="true">
```

```

<simpleContent>
  <extension base="string">
    <attribute ref="xml:lang" use="optional"/>
    <attribute name="phoneticTranscription" use="optional">
      <simpleType>
        <list itemType="mpeg7:PhoneType"/>
      </simpleType>
    </attribute>
    <attribute name="phoneticAlphabet" type="mpeg7:phoneticAlphabetType"
      use="optional" default="sampa"/>
    <attribute name="charset" type="string" use="optional"/>
    <attribute name="encoding" type="string" use="optional"/>
    <attribute name="script" type="string" use="optional"/>
  </extension>
</simpleContent>
</complexType>

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

```

7.2.2.3 Textual datatypes semantics

Semantics of the TextualBaseType:

Name	Definition
TextualBaseType	Abstract base type for textual descriptions. This type includes the xml:lang attribute for identifying the language in which the description is written and can contain a phonetic transcription of the text
xml:lang	Indicates the language in which the textual description is written (optional). If no value is specified for this attribute, the value of the xml:lang attribute is inherited from the closest containing element that specifies a value for xml:lang.
phoneticTranscription	Describes a phonetic transcription of the text using a phonetic alphabet. The transcription is represented as a list of phones (i.e. PhoneType). The definition for PhoneType is given in ISO/IEC 15938-4.
phoneticAlphabet	Describes the phonetic alphabet that is used for the transcription in phoneticTranscription, e.g. IPA (International Phonetic Association alphabet). The specification of the phoneticAlphabetType is given in ISO/IEC 15938-4.
charset	Specifies the character set of the string, if it does not conform to the character set of the XML document. In this case, the content of TextualBaseType must be encoded, and the encoding attribute must be present.
encoding	The encoding used to represent string in a charset different than the global character set of the XML document. Recommended

Name	Definition
	encodings are base64 or percent.
script	Specifies the script used for representing the string, using the values defined in ISO 15924. This allows the correct identification of the script being used for languages that can be represented in multiple scripts. For modularity of representation, a separate attribute is provided as an alternative to coding the script in the <code>xml:lang</code> attribute. It is recommended to use the script attribute.

Semantics of the TextualType:

Name	Definition
TextualType	Describes a textual description. TextualType that extends the abstract TextualBaseType. This type includes the <code>xml:lang</code> attribute for identifying the language in which the description is written and can contain a phonetic transcription of the text

7.2.2.4 Textual datatypes example (informative)

The following example description excerpt shows the use of Textual datatype for describing the free text in English: "The Giants win the pennant."

```
<Textual xml:lang="en">
  The Giants win the pennant.
</Textual>
```

The following example description excerpt shows the use of Textual datatype for describing the name of the city of Moscow in Russian, using Cyrillic script.

```
<Textual xml:lang="ru" script="Cyril">Москва</Textual>
```

3 Extended Classification Metadata

In 9.2.3, replace the entire text of the subclause with the following text:

9.2.3 Classification DS

9.2.3.1 Introduction

The Classification DS describes the classification of the multimedia content. The resulting descriptions facilitate searching and filtering of multimedia content based on user preferences (e.g. language, style, genre, and so forth) and service-oriented classifications (e.g. purpose, parental guidance, market segmentation, media review, and so forth).

9.2.3.2 Classification DS syntax

```
<!-- ##### -->
<!-- Definition of Classification DS (9.2.3) -->
```

```

<!-- ##### -->

<!-- Definition of Classification DS -->
<complexType name="ClassificationType">
  <complexContent>
    <extension base="mpeg7:DSType">
      <sequence>
        <element name="Form" type="mpeg7:ControlledTermUseType" minOccurs="0"
          maxOccurs="unbounded" />
        <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>
                <attribute name="confidence" use="optional"
                  type="mpeg7:zeroToOneType" />
              </extension>
            </complexContent>
          </complexType>
        </element>
        <element name="Subject" type="mpeg7:TextAnnotationType"
          minOccurs="0" maxOccurs="unbounded"/>
        <element name="Purpose" type="mpeg7:ControlledTermUseType"
          minOccurs="0" maxOccurs="unbounded"/>
        <element name="Language" type="mpeg7:ExtendedLanguageType"
          minOccurs="0" maxOccurs="unbounded"/>
        <element name="CaptionLanguage" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <simpleContent>
              <extension base="language">
                <attribute name="closed" type="boolean" use="optional"
                  default="true"/>
                <attribute name="supplemental" type="boolean"
                  use="optional" default="false"/>
              </extension>
            </simpleContent>
          </complexType>
        </element>
        <element name="SignLanguage" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <simpleContent>
              <extension base="language">
                <attribute name="primary" type="boolean" use="optional"/>
                <attribute name="translation" type="boolean"
                  use="optional"/>
              </extension>
            </simpleContent>
          </complexType>
        </element>
        <element name="Release" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <sequence>
              <element name="Region" type="mpeg7:regionCode"

```

```

        minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
    <attribute name="date" type="mpeg7:timePointType"
        use="optional"/>
</complexType>
</element>
<element name="Target" minOccurs="0">
    <complexType>
        <sequence>
            <element name="Market" type="mpeg7:ControlledTermUseType"
                minOccurs="0" maxOccurs="unbounded"/>
            <element name="Age" minOccurs="0">
                <complexType>
                    <attribute name="min" type="nonNegativeInteger"
                        use="optional"/>
                    <attribute name="max" type="nonNegativeInteger"
                        use="optional"/>
                </complexType>
            </element>
            <element name="Region" type="mpeg7:regionCode"
                minOccurs="0" maxOccurs="unbounded"/>
        </sequence>
    </complexType>
</element>
<element name="ParentalGuidance" type="mpeg7:ParentalGuidanceType"
    minOccurs="0" maxOccurs="unbounded"/>
<element name="MediaReview" type="mpeg7:MediaReviewType"
    minOccurs="0" maxOccurs="unbounded"/>
<element name="Version" type="mpeg7:TextAnnotationType" minOccurs="0" />
</sequence>
</extension>
</complexContent>
</complexType>

<!-- Definition of ExtendedLanguage datatype -->
<complexType name="ExtendedLanguageType">
    <simpleContent>
        <extension base="language">
            <attribute name="type" use="optional" default="original">
                <simpl
                    <restriction base="NMTOKEN">
                        <enumeration value="original"/>
                        <enumeration value="dubbed"/>
                        <enumeration value="background"/>
                    </restriction>
                </simpl
            </attribute>
            <attribute name="supplemental" type="boolean"
                use="optional" default="false"/>
        </extension>
    </simpleContent>
</complexType>

<!-- Definition of ParentalGuidance datatype -->
<complexType name="ParentalGuidanceType">
    <sequence>
        <choice>
            <element name="ParentalRating" type="mpeg7:ControlledTermUseType"/>
            <element name="MinimumAge" type="nonNegativeInteger"/>
        </choice>
    </sequence>
</complexType>

```

```

        <element name="Region" type="mpeg7:regionCode"
            minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
</complexType>

<!-- Definition of MediaReview datatype -->
<complexType name="MediaReviewType">
    <sequence>
        <element name="Rating" type="mpeg7:RatingType" minOccurs="0"/>
        <element name="FreeTextReview" type="mpeg7:TextualType"
            minOccurs="0" maxOccurs="unbounded"/>
        <element name="ReviewReference" type="mpeg7:RelatedMaterialType"
            minOccurs="0"/>
        <element name="Reviewer" type="mpeg7:AgentType" minOccurs="0"/>
    </sequence>
</complexType>

```

9.2.3.3 Classification DS semantics

Semantics of the ClassificationType:

Name	Definition
ClassificationType	Describes the classification of the multimedia content.
Form	Describes the production type of the document, such as, film, news program, magazine, documentary, etc (optional). An example of CS is FormatCS.
Genre	Describes what the multimedia content is about (broad classification), such as sports, politics, economics, etc (optional). An example of CS is the GenreCS.
type	Indicates the type of the genre of the multimedia content. The types of genres are defined as follows. • <i>main</i> – The specified genre is the main, or primary. This is the default value. • <i>secondary</i> – The specified genre is a secondary genre, such as a subgenre.
confidence	Confidence of determined genre (optional).
Subject	Describes the subjects (specific classifications) of the multimedia content (optional). The subjects allows a textual annotation to classify the multimedia content.
Purpose	Describes one or more purposes for which the multimedia content was created (optional). An example of CS is IntentionCS.
Language	Describes one or more languages of the spoken audio of the program (optional).
CaptionLanguage	Describes one or more languages of the caption information included with the program (optional). The type of the caption information associated with the program is denoted by the closed attribute. Closed

Name	Definition
	captions can be turned on or off by the user, while open captions (or subtitles) are part of the picture itself and remain visible.
closed	Indicates whether the specified caption is closed. Default value of the attribute is true; if the attribute is set to false, then the provided caption description refers to open captions/subtitles.
supplemental	Indicates whether the captions provide descriptions of the scene for the benefit of hearing or visually impaired, in addition to a direct translation of the spoken words. Closed captions may include such descriptive information, such as speaker identification, and non-speech sounds that would be missed. Default value of this attribute is false.
SignLanguage	Specifies the audio sign language provided for the multimedia content, and, optionally, qualifies the use of signing as a primary language or as a translation of the spoken dialogue (optional).
primary	Indicates if the sign language is the primary language of the content or not, i.e. if the content is produced specifically for the hearing impaired or not (optional).
translation	Indicates if the sign language is a translation of the spoken dialogue or not (optional).
Release	Describes the release date and region of the multimedia content (optional).
Region	Indicates the countries or regions in which the multimedia content was first released (optional). This locator may be different than the location where it was created.
date	Indicates the date on which the multimedia content was first released. This date may be different than the date(s) when it was created (optional).
Target	Describes the target of the multimedia content in terms of market classification, age and country or region (optional).
Market	Describes targeted markets of the multimedia content (optional). An example of CS is TargetGroupCS.
Age	Describes the targeted age range of the multimedia content (optional).
min	Indicated the minimum age of the targeted age range (optional).
max	Indicated the maximum age of the targeted age range (optional).
Region	Describes target countries or regions for the multimedia content (optional).
ParentalGuidance	Describes parental guidance classification of the multimedia content (optional).
MediaReview	Describes media reviews about the multimedia content (optional).

Name	Definition
Version	The version of the content (optional).

Semantics of the ExtendedLanguageType:

Name	Definition
ExtendedLanguageType	Specifies the language of spoken audio of the multimedia content.
type	Indicates whether the spoken language is the original language of the content, or has been dubbed. The following values are allowed. • <i>original</i> – The specified language is an original language of the spoken content. This is the default value. • <i>dubbed</i> – The specified language is a dubbed language of the spoken content. • <i>background</i> – The specified language is the original language heard in the background, while another (dubbed) language is heard in the foreground. Other values that are datatype-valid with respect to <code>mpeg7:termReferenceType</code> are reserved.
supplemental	Indicates whether the specified language exclusively provides an audio description of the multimedia content, for the benefit of the visually impaired. Default value of this attribute is false.

Semantics of the ParentalGuidanceType:

Name	Definition
ParentalGuidanceType	Describes parental guidance classification.
ParentalRating	Indicates the rating value according to the rating scheme. Examples of CSs are JapanRatingCS, ICRAParentalRatingCS, MPAAParentalRatingCS, ICRAParentalRatingNudityCS, RIAAParentalRatingCS, ICRAParentalRatingSexCS, MPAAParentalRatingTVCS, and IRCAParentalRatingViolenceCS.
MinimumAge	Indicates the minimum recommended age in years of the end user.
Region	Indicates the country or region for which the parental guidance description is specified (optional). If not specified, the parental guidance applies worldwide.

Semantics of the MediaReviewType:

Name	Definition
MediaReviewType	Describes the Media Review about the multimedia content.
Rating	Specifies the rating value and criterion used in the review (optional).
FreeTextReview	Describes a free-text review of the multimedia content without reference to a rating scheme (optional). There can be multiple instances of the review in different languages.
ReviewReference	Describes the Media Locator of the material from where the review may have been extracted or quoted (optional). For example, the TV magazine that published the review, the Films Guide from where the review was quoted, an interview from where the review was transcribed.
Reviewer	Describes the reviewer/critic of the multimedia content (optional). Since it is defined as AgentType, this field can describe a person, a group of persons or an organization.

4 Quality Control Metadata

Replace subclause 8.2.6 with the following text (allowing QualityRating to be optional):

8.2.6 Media Quality D

8.2.6.1 Introduction

The MediaQuality D describes quality rating information of multimedia content. The quality of AV content may decrease when the signal is compressed, transmitted, or converted. The MediaQuality D describes both subjective and objective quality ratings.

8.2.6.2 MediaQuality D syntax

```

<!-- ##### -->
<!-- Definition of MediaQuality D (8.2.6) -->
<!-- ##### -->
<!-- Definition of MediaQuality D -->
<complexType name="MediaQualityType">
  <complexContent>
    <extension base="mpeg7:DType">
      <sequence>
        <element name="QualityRating" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <complexContent>
              <extension base="mpeg7:RatingType">
                <attribute name="type" use="required">
                  <simpleType>
                    <restriction base="NMTOKEN">
                      <enumeration value="subjective"/>
                      <enumeration value="objective"/>
                    </restriction>
                  </simpleType>
                </attribute>
              </extension>
            </complexContent>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

```

```

        </simpleType>
      </attribute>
    </extension>
  </complexContent>
</complexType>
</element>
<element name="RatingSource" type="mpeg7:AgentType" minOccurs="0"/>
<element name="RatingInformationLocator" type="mpeg7:ReferenceType"
  minOccurs="0" maxOccurs="unbounded"/>
<element name="PerceptibleDefects" minOccurs="0">
  <complexType>
    <sequence>
      <element name="VisualDefects" type="mpeg7:ControlledTermUseType"
        minOccurs="0" maxOccurs="unbounded"/>
      <element name="AudioDefects" type="mpeg7:ControlledTermUseType"
        minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
  </complexType>
</element>
</sequence>
</extension>
</complexContent>
</complexType>
<!-- Definition of Rating datatype -->
<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>

```

8.2.6.3 MediaQuality D semantics

Semantics of the MediaQualityType:

Name	Definition
MediaQualityType	Describes the media quality of the Media Profile.
QualityRating	Describes the rating values and the criterion used to create the media quality ratings (optional).
type	Describes the type of media quality rating. The types of quality rating are defined as follows.

Name	Definition
	• subjective – The rating is subjective, that is, it is provided by human viewers. • objective – The rating is objective, that is, it is acquired using computational means.
RatingSource	Describes the source that provides the ratings (optional).
RatingInformationLocator	Indicates the locator for additional information about the quality rating method (optional).
PerceptibleDefects	Describes defects that are perceived in the media (optional).
VisualDefects	Describes the visual errors perceived in the media (optional). Errors are listed in the order of descending severity. An example of CS is VisualDefectsCS.
AudioDefects	Describes the audio errors perceived in the media (optional). Errors are listed in the order of descending severity. An example of CS is AudioDefectsCS.

Semantics of the RatingType:

Name	Definition
RatingType	Describes the rating value and the criterion used to create the ratings. For example, media quality rating and media reviews.
RatingValue	Indicates the actual numerical rating values assigned to the multimedia content.
RatingScheme	Describes the name of the rating method used to obtain the quality rating. An example of CS for media quality rating is QualityRatingSchemeCS.
best	Indicates the numerical rating value that means the best rating (optional).
worst	Indicates the numerical rating value that means the worst rating (optional).
style	Describes the relationship between the numerical rating values and media quality. The types of rating styles are defined as follows. • higherBetter – The rating style indicates that a higher value means better. • lowerBetter – The rating style indicates that a lower value means better.

Add the following subclause after 8.2.8:

8.2.9 Extended Media Quality Description Tools

This subclause describes a framework for representing metadata related to automatic or semi-automatic quality control. It provides tools for representing profiles specifying quality control steps to be performed as well as tools for describing results of quality control of media.

8.2.9.1 ExtendedMediaQuality D

8.2.9.1.1 Introduction

The extended media quality D is the container for a list of quality analysis item descriptors. It is proposed as an extension to MediaQualityD, in order to enable attaching it to any element of SegmentType or its derived types.

8.2.9.1.2 ExtendedMediaQuality datatype syntax

```
<!-- ##### -->
<!-- Definition of ExtendedMediaQuality D -->
<!-- ##### -->
<complexType name="ExtendedMediaQualityType">
  <complexContent>
    <extension base="mpeg7:MediaQualityType">
      <sequence>
        <element name="QCProfile" type="mpeg7:QCProfileType" minOccurs="0"
          maxOccurs="1" />
        <element name="QCItemResult" type="mpeg7:QCItemResultType" minOccurs="0"
          maxOccurs="unbounded" />
        <element name="Operator" type="mpeg7:PersonType" minOccurs="0"/>
        <element name="UsedTool" type="mpeg7:CreationToolType" minOccurs="0"/>
        <element name="Annotation" type="mpeg7:TextAnnotationType" minOccurs="0"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>
```

8.2.9.1.3 ExtendedMediaQuality datatype semantics

Semantics of the ExtendedMediaQualityType:

Name	Definition
ExtendedMediaQualityType	Describes results for quality analysis items for the segment.
QCProfile	The profile describing what to analyze and providing the inputs for this QC process. It is recommended to include the used profile instance at least once in a document, preferably at the ExtendedMediaQualityType descriptor closest to the root element. At least one QCProfile or QCItemResult element shall be present.
QCItemResult	Result description for a single quality analysis item (e.g. Video Noise).
Operator	Identifies the operator who created or validated the quality description (optional).
UsedTool	Describes the tool that has been used for creating the quality

Name	Definition
	description (optional).
Annotation	Textual annotation about the quality analysis.

8.2.9.2 QC Profile Tools

8.2.9.2.1 Introduction

The quality control profile type specifies the set of QC items (e.g. Audio Noise and Audio Clicks) and their input parameters.

8.2.9.2.2 QC Profile description tools syntax

```

<!-- ##### -->
<!-- Definition of QCProfile DS -->
<!-- ##### -->
<complexType name="QCProfileType">
  <complexContent>
    <extension base="mpeg7:DSType">
      <sequence>
        <element name="Name" type="mpeg7:ControlledTermUseType" />
        <element name="Description" type="mpeg7:TextualType" minOccurs="0" />
        <element name="QCItem" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <sequence>
              <element name="Name" type="mpeg7:ControlledTermUseType" minOccurs="1"
                maxOccurs="unbounded"/>
              <element name="Layer" minOccurs="0">
                <simpleType>
                  <restriction base="string">
                    <enumeration value="wrapper"/>
                    <enumeration value="bitstream"/>
                    <enumeration value="baseband"/>
                  </restriction>
                </simpleType>
              </element>
              <element name="Category" minOccurs="0">
                <simpleType>
                  <restriction base="string">
                    <enumeration value="regulatory"/>
                    <enumeration value="absolute"/>
                    <enumeration value="objective"/>
                    <enumeration value="subjective"/>
                  </restriction>
                </simpleType>
              </element>
              <element name="Severity" type="nonNegativeInteger" minOccurs="0" />
              <element name="EssenceType" minOccurs="0" maxOccurs="unbounded">
                <simpleType>
                  <restriction base="string">
                    <enumeration value="video"/>
                    <enumeration value="audio"/>
                    <enumeration value="subtitle"/>
                    <enumeration value="metadata"/>
                  </restriction>
                </simpleType>
              </element>
              <element name="InputParameter" minOccurs="0" maxOccurs="unbounded"

```

```

        type="mpeg7:QCValueType" />
        <element name="ItemScope" type="mpeg7:SpatioTemporalLocatorType" minOccurs="0"
            maxOccurs="unbounded"/>
    </sequence>
</complexType>
</element>
<element name="CheckResultRule" minOccurs="0">
    <simpleType>
        <restriction base="string">
            <enumeration value="AND"/>
            <enumeration value="OR"/>
            <enumeration value="MinimumRelevance"/>
        </restriction>
    </simpleType>
</element>
<element name="ProfileScope" type="mpeg7:SpatioTemporalLocatorType" minOccurs="0"
    maxOccurs="unbounded"/>

<element name="RelevanceLevel" minOccurs="0">
    <simpleType>
        <restriction base="integer">
            <minInclusive value="0"/>
            <maxInclusive value="10"/>
        </restriction>
    </simpleType>
</element>
</sequence>
</extension>
</complexContent>
</complexType>

<!-- Definition of QCValue -->
<complexType name="QCValueType">
    <simpleContent>
        <extension base="string">
            <attribute name="name" type="string" use="required" />
            <attribute name="unit" type="string" use="optional" />
            <attribute name="track" use="optional">
                <simpleType>
                    <union memberTypes="string nonNegativeInteger" />
                </simpleType>
            </attribute>
            <attribute name="valueRange" type="string" use="optional" />
            <attribute name="type" type="string" use="optional" />
            <attribute name="representation" type="string" use="optional" />
        </extension>
    </simpleContent>
</complexType>

<!-- Definition of SegmentQCValue -->
<complexType name="SegmentQCValueType">
    <simpleContent>
        <extension base="mpeg7:QCValueType">
            <attribute name="start" type="mpeg7:mediaTimePointType" />
            <attribute name="duration" type="mpeg7:mediaDurationType" />
        </extension>
    </simpleContent>
</complexType>

```