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Information technology — Multimedia framework (MPEG-21) —

Part 21: Media contract ontology

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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 voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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

This second edition cancels and replaces the first edition (ISO/IEC 21000-21:2013), which has been technically revised with the following changes:

— some strengthening of the core contract part, some reordering within the extension for the exploitation of intellectual property rights have been provided;

— the set of facts available for specifying conditions has been completed;

— addition of a simple payment and notification extension;

— addition of a basic extension allowing the use within MCO of acts defined in ISO/IEC 21000-5 (REL);

— a clear mechanism for defining further future extensions is in place.

It also incorporates the Technical Corrigendum ISO/IEC 21000-21:2013/Cor 1:2015.

A list of parts in the ISO/IEC 21000 series can be found on the ISO website.

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Introduction

Today, many elements exist to build an infrastructure for the delivery and consumption of multimedia content. There was, however, no "big picture" to describe how these elements, either in existence or under development, relate to each other. The aim for the ISO/IEC 21000 series has been to describe how these various elements fit together. New standards as appropriate will be developed while other relevant standards may be developed by other bodies.

The result is an open framework for multimedia delivery and consumption, with both the content creator and content consumer as focal points. This open framework provides content creators and service providers with equal opportunities in the ISO/IEC 21000 series enabled open market. This will also be to the benefit of the content consumer providing them access to a large variety of content in an interoperable manner. The vision for ISO/IEC 21000 is to define a multimedia framework *to enable transparent and augmented use of multimedia resources across a wide range of networks and devices* used by different communities.

ISO/IEC 21000 series aims thus at defining an open framework for multimedia applications, where users distribute, consume, operate on and transact with content represented as Digital Items.

These transactions can be automatically governed by the Media Value Chain Ontology (MVCO) from ISO/IEC 21000-19. However, beyond the operative information present in a digital licence, the digital representation of the complete business agreements between the parties may prove useful for a number of purposes. The Media Contract Ontology (MCO) is the ISO/IEC ontology for expressing such contracts in a semantic representation. MCO may be used to represent contracts, for content directly, or for services on content based on MPEG-21 technologies. However, MCO may also be used as electronic format for contracts on the trade of media rights also beyond the MPEG framework.

The provided features include the identification of the contract itself and of its parties, and an unambiguous expression of the agreed permissions, obligations, and prohibitions, in a machine-readable way, so that their verification can be implemented in software.

In particular, the MCO deontic expressions address the rights for the exploitation of intellectual property entities, including the specification of the associated conditions, together with other contractual aspects, such as payments, notifications or material delivery.

The main aspect of MCO contracts are the operative clauses, represented as machine-readable deontic expressions, e.g. the agreed permissions, obligations, and prohibitions, and the associated terms.

Besides, the MCO contract includes the identification of the contract itself, its parties, and the possible relationships with other contracts.

Among the provided features, there is the possibility to insert the textual version of the contract and/or of specific clauses, in particular for the case in which the original contract is narrative, i.e. written in natural language. Also, it is possible to add metadata related to any contract entity and to have encryption of the whole contract, or any-sub-part of it. As electronic format for a contract document, the agreement of the parties can be proved by their digital signature.

Eventually, MCO provides to the media companies the basic means for the collection of knowledge on held rights, also derived from multiple contracts, as a rights portfolio, for business management purposes.

Various potential benefits can be associated with the use of MCO. Firstly, MCO can support the business of media companies, for product placement and maximising reuse of archive content, implying also cost reductions in all rights related activities, i.e. rights clearance. Afterwards, it supports the respect of copyright laws in relation to new exploitation technologies, also by contributing to the reduction of mistakes in relation to contract compliance, implying decreasing number of controversies and other cost reductions. In general, MCO aims at increasing the quality of rights information, which gets more reliable and can be integrated with other metadata in a standard way. This can even result in improvements to the working conditions and decision processes within media companies.

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Information technology — Multimedia framework (MPEG-21) —

Part 21: Media contract ontology

1 Scope

This document specifies an ontology for representing contracts in the Multimedia Framework formed for the transaction of MPEG-21 Digital Items or services related to the MPEG-21 Framework.

Media Contract Ontology (MCO) aims to digitally express agreements made in environments using ISO/IEC 21000. These agreements are contracts for transactions of content packed as Digital Items, as well as for services provided around this content by means of a sematic representation.

The range of contracts under scope are as follows:

— contracts about transactions on rights for the exploitation of content as MPEG-21 Digital Items;

— contracts about the provision of MPEG-21-based services, like delivery, identification, encryption, search and others.

However, MCO can also be used as electronic format for contracts on the trade of media rights beyond the MPEG framework.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 21000-5, *Information technology — Multimedia framework (MPEG-21) — Part 5: Rights Expression Language*

ISO/IEC 21000-19, *Information technology — Multimedia framework (MPEG-21) — Part 19: Media Value Chain Ontology*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

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3.1.1
action
something done or performed by a *party* (3.1.3) or anyone working on its behalf

Note 1 to entry: For the purposes of this document, an action represents the exercise of a right or duty.

3.1.2
data property
OWL property that links individuals to data values

3.1.3
deontic expression
generic entity encompassing the properties of an agreed machine-readable contract clause regulating the *actions* (3.1.1) of the parties

3.1.4
IP Entity
entity subject to Intellectual Property

3.1.5
MPEG-21 Contract
representation of agreements formed for the transaction of rights applied to MPEG-21 Digital Items, events or services related to the MPEG-21 Framework

3.1.6
MPEG-21 Service
system supplying utility in the Framework of MPEG-21

3.1.7
object property
OWL property that links individuals to individuals

3.1.8
obligation
deontic expression (3.1.3) binding one of the parties to execute an *action* (3.1.1)

3.1.9
party
organization or a user who accepts the respect the *deontic expressions* (3.1.3) defined in the contract and who expects the other parties in the same contract to do the same

3.1.10
permission
deontic expression (3.1.3) allowing one of the parties to execute an *action* (3.1.1)

3.1.11
prohibition
deontic expression (3.1.3) binding one of the parties not to execute an *action* (3.1.1)

3.2 Abbreviated terms

CEL	Contract Expression Language
IRI	Internationalized Resource Identifier (IETF Standard is RFC 3987)
MCO	Media Contract Ontology
MPEG	Moving Picture Experts Group
MPEG-21	ISO/IEC 21000

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MVCO	Media Value Chain Ontology
OWL	Web Ontology Language
RDF	Resource Description Framework
REL	Rights Expression Language
URI	Uniform Resource Identifier (IETF Standard is RFC 3986)
URL	Uniform Resource Locator (IETF Standard is RFC 1738)
URN	Uniform Resource Name (IETF Standard is RFC 2141)
W3C	World Wide Web Consortium
XML	Extensible Markup Language (W3C Recommendation)

4 Conventions

4.1 Document conventions

4.1.1 MCO OWL Representation

Along this document, OWL will be expressed with the RDF/XML [14] syntax and its excerpts will be boxed in grey text.

When diagrams are needed for representing models (or part of) with classes and related object properties, the notation of Figure 1 is used.

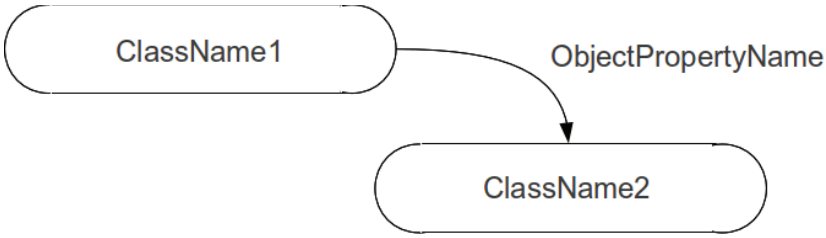


Figure 1 — Notation used for diagrams representing models with classes and related object properties

For representing examples, including class individuals (instances), the related object properties and data properties, we use the notation reported in Figure 2.

Notice that in these diagrams, negative object properties are represented in with a different shape of the arrow, depicted in red to make it more evident, while data type properties, including name and value, are represented in a grey box, linked to the balloon of the respective class individual. Some more complex examples using the notation of Figure 2 have the ellipses with various background colours for improving readability and making it easier to see which hierarchy of classes the individuals are member of. For example, cyan has been used for IPEntities, green for permissions, orange for parties, magenta for actions, and light yellow for facts.

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