
**Information technology — JPSearch —
Part 2:
Registration, identification and
management of schema and ontology**

Technologies de l'information — JPSearch —

*Partie 2: Enregistrement, identification et gestion des schémas et de
l'ontologie*

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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.

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

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

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

ISO/IEC 24800-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

ISO/IEC 24800 consists of the following parts, under the general title *Information technology* — *JPSearch*:

- *Part 1: System framework and components*
- *Part 2: Registration, identification and management of schema and ontology*
- *Part 3: Query format*
- *Part 4: File format for metadata embedded in image data (JPEG and JPEG 2000)*
- *Part 5: Data interchange format between image repositories*
- *Part 6: Reference software*

Introduction

This part of ISO/IEC 24800 provides a standardized set of technologies for metadata representation, querying and management of images. It specifies the JPSearch's Core Metadata Schema as the cornerstone of metadata interoperability in ISO/IEC 24800. It also specifies the structure and rules to which any metadata annotation of images must conform in order to be considered valid within a JPSearch compliant system.

In addition to the definition of JPSearch Core Metadata Schema, ISO/IEC 24800 provides a mechanism which allows a JPSearch compliant system taking profit from proprietary or community-specific metadata schemas. A translation rules language is defined, allowing the publication of machine-readable translations between metadata terms belonging to proprietary metadata schemas and metadata terms in the JPSearch Core Metadata Schema. Users can choose which metadata language to use in a JPSearch-based interaction (annotation, querying, etc.) if the proper translations are available.

In order to specify the issues in a detailed manner in this document, this part of ISO/IEC 24800 first provides the fundamental information including scope definition, description of terms and definitions, and conventions that are necessary to understand this document. The definition of JPSearch Core Metadata Schema is described in the context of XML structure. Management of information regarding other metadata schema is also described in respect of registration, maintenance, and translation rules.

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Information technology — JPSearch —

Part 2:

Registration, identification and management of schema and ontology

1 Scope

This part of ISO/IEC 24800 specifies a series of interfaces to allow disparate systems an interoperable management of image repositories. It also specifies the general rules which govern the usage of metadata in JPSearch and provides a specification which

- provides rules for the representation of image metadata descriptions, consisting of the definition of the JPSearch Core Metadata Schema,
- provides rules for the publication of machine-readable translations between metadata terms belonging to proprietary metadata schemas and metadata terms in the JPSearch Core Metadata Schema, and
- provides rules for the registration and request of metadata schemas and its translation rules or links to them.

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JPSearch is an extensible standard. The normative method of extending the structures and rules beyond the JPSearch Core Metadata Schema is provided in this part of ISO/IEC 24800.

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.

XML, Extensible Markup Language (XML) 1.0 (Fifth Edition), 26 November 2008, available at <http://www.w3.org/TR/xml/>

XML Schema Part 1: Structures Second Edition, W3C Recommendation, 28 October 2004, available at <http://www.w3.org/TR/xmlschema-1/>

XML Schema Part 2: Datatypes Second Edition, W3C Recommendation, 28 October 2004, available at <http://www.w3.org/TR/xmlschema-2/>

XPath, XML Path Language, W3C Recommendation, 16 November 1999, available at <http://www.w3.org/TR/xpath>

NOTE These documents are maintained by the W3C (<http://www.w3.org>).

3 Terms and definitions

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

3.1

Core schema

metadata basis supporting interoperability during search among multiple image retrieval systems

NOTE The core schema is used by clients to formulate in combination with the JPEG Query Format search requests to JPSearch compliant search systems. Note, that only metadata described by the core schema is guaranteed to be processed by JPSearch compliant systems.

3.2

Translation rules

machine-readable declaration of the semantic and syntactic mappings between a proprietary metadata schema and the JPSearch's core metadata schema

3.3

JPSearch registration authority

Organization that supports the registration and request of metadata schemas and its translation rules or links to them

NOTE It is necessary that every participating content provider registers their schema and translation rules or a link to them at this authority. In case the JPSearch compliant retrieval system is operated in offline mode, the necessary information (target schema, translation rules, etc.) should be available at the respective system itself.

4 Conventions

4.1 Naming convention

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In order to specify the JPSearch Core metadata description scheme, this Part of ISO/IEC 24800 uses constructs provided by XML such as "element" and "complexType." The names associated to these constructs are created on the basis of the following conventions:

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If the name is composed of multiple words, the first letter of each word is capitalized, with the exception that the capitalization of the first word depends on the type of construct and is described below.

- Element naming: the first letter of the first word is capitalized (e.g. Identifier element of JPSearchCoreType).
- Attribute naming: the first letter of the first word is not capitalized (e.g. jpsearchID attribute of ManagementType type).
- complexType naming: the first letter of the first word is capitalized, and the suffix "Type" is used at the end of the name (e.g. JPSearchCoreType).
- simpleType naming: the first letter of the first word is not capitalized, the suffix "Type" may be used at the end of the name (e.g. XPathType).

4.2 Document convention

The syntax of each description is specified using the constructs provided by XML as defined in XML, XML Schema Part 1, and XML Schema Part 2, and is presented in this document using a specific font and background as shown in the following example:

```
<complexType name="ExampleType">
  <sequence>
    <element name="Element1" type="string"/>
  </sequence>
  <attribute name="attribute1" type="string" default="attrvalue1"/>
</complexType>
```


The semantics of each description tool is specified in text using a table format, where each row contains the name and a definition of a type, element or attribute as shown in the following example:

Name	Definition
ExampleType	Specifies an ...
element1	Describes the ...
attribute1	Describes the ...

4.3 Wrapper of the schema

The description examples and syntax of description tools specified in this document assume that a schema wrapper is provided which identifies the XML Schema namespace (XML Schema) and JPSearch namespace:

```
<schema xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:JPCore="JPSearch:schema:coremetadata"
  targetNamespace="JPSearch:schema:coremetadata"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">
```

The following tag is used to close the schema:

```
</schema>
```

5 JPSearch Core Metadata Schema

5.1 General

This clause targets on the definition of the complex types for the registration process of the schema, its translation rules and contact information. The process of registration is mandatory for all schemas that can be addressed within a retrieval operation. The standard supports two scenarios. First, a global authority for schemas and their translation rules will be established where all JPSearch compliant retrieval applications can obtain the necessary information. The list of ISO registration authorities is listed at http://www.iso.org/iso/maintenance_agencies. Second, in case the retrieval application operates in offline mode, the schema and their translation rules shall be located at the application itself.

JPSearch Core Metadata Schema contains four types: `PersonNameType`, `SourceType`, `PublisherType` and `JPSearchCoreType`. Moreover, in order to support `JPSearchCoreType`, several types are defined: `RightsDescriptionType`, `PlaceType`, `PersonType`, `OrganizationType`, `EventType`, `ObjectType`, `RegionOfInterestType`, `RegionLocatorType`, `ExternalDescriptionType`, `ControlledRatingTermType`, `ImageIdentifierType` and `GPSPositionType`.

5.2 JPSearchCoreType

5.2.1 Introduction

The `JPSearchCoreType` type is devised in order to describe the information about an image in metadata layer. At the same time, as JPSearch core metadata is utilized for image search among the set of images that are described by using heterogeneous metadata schemes, `JPSearchCoreType` contains the most important fields in JPSearch core metadata.

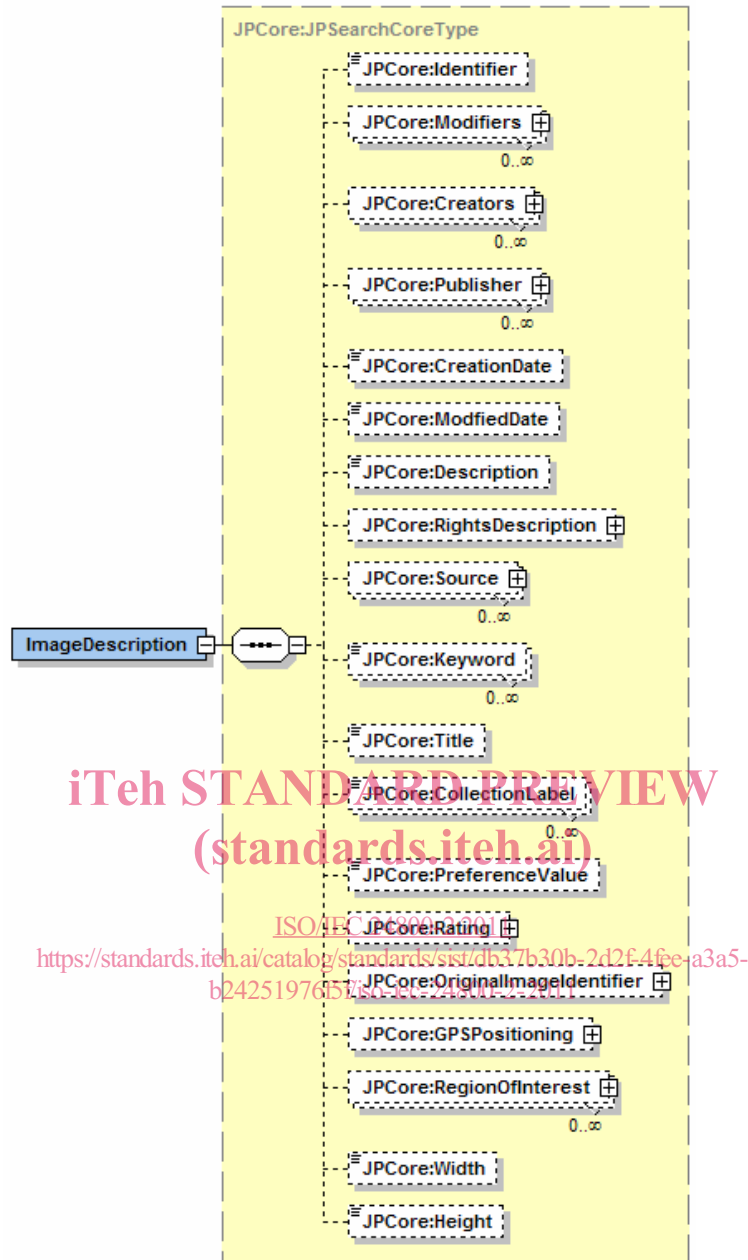


Figure 1 — Diagram representing the JPSearchCoreType

5.2.2 Syntax

```

<element name="ImageDescription" type="JPCore:JPSearchCoreType" />
<complexType name="JPSearchCoreType">
  <sequence>
    <element name="Identifier" type="anyURI"
      minOccurs="0" />
    <element name="Modifiers" type="JPCore:PersonNameType"
      minOccurs="0" maxOccurs="unbounded" />
    <element name="Creators" type="JPCore:PersonNameType"
      minOccurs="0" maxOccurs="unbounded" />
    <element name="Publisher" type="JPCore:PublisherType"
      minOccurs="0" maxOccurs="unbounded" />
    <element name="CreationDate" type="dateTime"
  
```

```

        minOccurs="0" />
    <element name="ModifiedDate" type="dateTime"
        minOccurs="0" />
    <element name="Description" type="string"
        minOccurs="0" />
    <element name="RightsDescription"
type="JPCore:RightsDescriptionType"
        minOccurs="0" />
    <element name="Source" type="JPCore:SourceType"
        minOccurs="0" maxOccurs="unbounded" />
    <element name="Keyword" type="string" minOccurs="0"
        maxOccurs="unbounded" />
    <element name="Title" type="string" minOccurs="0" />
    <element name="CollectionLabel" type="string" minOccurs="0"
        maxOccurs="unbounded" />
    <element name="PreferenceValue" type="integer"
        minOccurs="0" />
    <element name="Rating"
        type="JPCore:ControlledRatingTermType"
        minOccurs="0" />
    <element name="OriginalImageIdentifier"
type="JPCore:ImageIdentifierType" minOccurs="0" />
    <element name="GPSPositioning"
        type="JPCore:GPSPositioningType" minOccurs="0" />
    <element name="RegionOfInterest"
        type="JPCore:RegionOfInterestType" minOccurs="0"
        maxOccurs="unbounded" />
    <element name="Width" type="int" />
    <element name="Height" type="int" />
</sequence>
</complexType>

```

5.2.3 Semantic

Semantics of the JPSearchCoreType type:

Name	Definition
JPSearchCoreType	Specifies information for an image.
Identifier	Describes an identifier of the image in the form of a URI. The identifier must be unique.
Modifiers	Describes a modifier's name or a list of names who changed the original image resulting in the creation of the image (optional).
Creators	Describes a person's name or a list of the names who created the image or made contributions in the creation of the image (optional).
Publisher	Describes information about the publishing people or organization of the image

CreationDate	Describes the date when the image is created.
ModifiedDate	Describes the date when the image is modified.
Description	Specifies the content of the image in the form of text.
RightsDescription	Describes the right related information by providing information about existing rights description standard, explanation concerning the standard in free text, and rights description in the form of external information or string value.
Source	Describes a source of the image. It can be another image or an object in the form of such as painting, book and so on.
Keyword	Describes a list of keywords that characterize the image (optional).
Title	Describes the title of the image (optional).
CollectionLabel	Describes user provided labels that can be used for the purpose of collection and categorization of images (optional).
PreferenceValue	Describes the value of the preference of the image in the form of integer value.
Rating	Describes the rating results that should be one of the corresponding controlled terms. The definition of the terms is provided by JPSearch. https://standards.iteh.ai/catalog/standards/sist/db37b30b-2d2f-4fee-a3a5-2011
OriginalImageIdentifier	Describes the identifier of the original image from which the image is created. Moreover, it can be used for the identifiers that can be created by a particular organization or method.
GPSPositioning	Describes the location of the place shown in the image
RegionOfInterest	Describes the information (e.g., content description, keywords, etc.) of a certain region within the image. Note, the whole image itself can also be described by one RegionOfInterest.

5.2.4 Example

This example shows a complete description of an imaginary image. It has a unique ID, some modifier, creator and publisher information. In addition, the creation and modification date have been annotated. Please note, that subparts of this example are reused at the corresponding type definitions and explained in detail there.

```
<?xml version="1.0" encoding="UTF-8"?>
<ImageDescription xmlns="JPSearch:schema:coremetadata"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="JPSearch:schema:coremetadata jpcore.xsd">
  <Identifier>urn:unique:identifier:1:2:3
  </Identifier>
  <Modifiers>
```

```

    <GivenName>Jonh</GivenName>
    <FamilyName>Smith</FamilyName>
  </Modifiers>
  <Creators>
    <GivenName>Jonh</GivenName>
    <FamilyName>Smith</FamilyName>
  </Creators>
  <Publisher>
    <PersonName>
      <GivenName>Jonh</GivenName>
      <FamilyName>Smith</FamilyName>
    </PersonName>
    <OrganizationInformation>
      <Name>University of Passau</Name>
      <Address>
        <Name>Innstrasse 43, 94034 Passau, Germany
          </Name>
        <Description>
          Small city at the border to Austria surrounded
          by three rivers
        </Description>
      </Address>
    </OrganizationInformation>
  </Publisher>
  <CreationDate>2001-12-17T09:30:47.0Z</CreationDate>
  <ModifiedDate>2001-12-17T09:30:47.0Z</ModifiedDate>
  <Description>This is a sample description and this part can contain
    an arbitrary unstructured text according to the image
  </Description>
  <RightsDescription>
    <RightsDescriptionInformation>
      <URL>http://www.rdstandard.org
      </RightsDescriptionInformation>
    <Description>
      Provides a standard for rights description.
    </Description>
    <ActualRightsDescriptionReference>
http://www.rdstandard.org/particulaValueRD
    </ActualRightsDescriptionReference>
  </RightsDescription>
  <Source>
    <SourceElementType>Oil Painting</SourceElementType>
    <SourceElement>
      <SourceElementTitle>Monna Lisa</SourceElementTitle>
      <SourceElementDescription>Leonardo da Vinci, Louvre, France
    </SourceElementDescription>
    </SourceElement>
    <CreationMethod>Photographing</CreationMethod>
    <CreationDescription>CN 450D</CreationDescription>
  </Source>
  <Keyword>Sardinia</Keyword>
  <Keyword>Italy</Keyword>
  <Keyword>50th JPEG meeting</Keyword>
  <Title>Example Instance document of the JPSearch core schema</Title>
  <CollectionLabel>JPEG Meetings</CollectionLabel>
  <PreferenceValue>1</PreferenceValue>
  <Rating>
    <LabelDefinition>urn:ratingtable:quality</LabelDefinition>
    <LabelValue>urn:ratingtable:perfect</LabelValue>
  </Rating>

```

```

<GPSPositioning latitude="34" longitude="34" altitude="10"/>
<RegionOfInterest>
  <RegionLocator>
    <Region dim="2"> 0 0 100 100</Region>
  </RegionLocator>
  <Description>A short description about the selected region
    </Description>
  <Keyword>plenary meeting</Keyword>
  <Title>plenary meeting</Title>
  <ContentDescription>
    <Person>
      <Name>
        <GivenName>Jonh</GivenName>
        <FamilyName>Smith</FamilyName>
      </Name>
    </Person>
    <Object>
      <Name>Laptop</Name>
      <Description>running laptop of UoP
        </Description>
      <Label>urn:laptop:id:1:2:3</Label>
    </Object>
    <Place>
      <Name>meeting room xyz</Name>
      <Description>meeting room at the sardinia JPEG meeting
        </Description>
    </Place>
    <Event>
      <Label>urn:writing:event:1:2</Label>
      <Description>writing some document
        </Description>
    </Event>
  </ContentDescription>
  <ExternalDescription>
    <TagName fromNamespace="urn:mpeg:mpeg7:schema:2004"
fromNamespacePrefix="mpeg7">mpeg7:ColorLayout</TagName>
    <StructuredValue fromNamespace="urn:mpeg:mpeg7:schema:2004">
      <mpeg7:Mpeg7 xmlns:mpeg7="urn:mpeg:mpeg7:schema:2004"
xsi:schemaLocation="urn:mpeg:mpeg7:schema:2004 M7v2schema.xsd">
        <mpeg7:DescriptionUnit xsi:type="mpeg7:ColorLayoutType">
          <mpeg7:YDCCoeff>1</mpeg7:YDCCoeff>
          <mpeg7:CbDCCoeff>2</mpeg7:CbDCCoeff>
          <mpeg7:CrDCCoeff>3</mpeg7:CrDCCoeff>
          <mpeg7:YACCCoeff2>1 2</mpeg7:YACCCoeff2>
          <mpeg7:CbACCCoeff2>1 2</mpeg7:CbACCCoeff2>
          <mpeg7:CrACCCoeff2>1 2</mpeg7:CrACCCoeff2>
        </mpeg7:DescriptionUnit>
      </mpeg7:Mpeg7>
    </StructuredValue>
  </ExternalDescription>
  <ExternalDescription>
    <TagName/>
    <LiteralValue/>
  </ExternalDescription>
</RegionOfInterest>
<Width>640</Width>
<Height>480</Height>
</ImageDescription>

```

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5.3 PersonNameType

5.3.1 Introduction

The `PersonNameType` type support the description of human beings within images or image regions. The information that can be provided is simplified to `GivenName` and `FamilyName`.

5.3.2 Syntax

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

5.3.3 Semantic

Semantics of the `PersonNameType` type:

Name	Definition
<code>PersonNameType</code>	Specifies a list of names that consist of given names or family names. The constituent names for a person's name should be described by using the same language.
<code>GivenName</code>	Describes a given name. A number of given names can be defined, if necessary.
<code>FamilyName</code>	Describes a family name(optional). A number of family names can be defined, if necessary.
<code>xml:lang</code>	Describes the language used for defined names(optional).

5.3.4 Example

Instances of the `PersonNameType` are used on several places within the core schema. The following example shows its use by the `Modifiers` tag. In general the `PersonNameType` allows the description of family- and given names of human beings.

```
<?xml version="1.0" encoding="UTF-8"?>
<ImageDescription xmlns="JPSearch:schema:coremetadata"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="JPSearch:schema:coremetadata jpcore.xsd">
  <Identifier>urn:unique:identifier:1:2:3
  </Identifier>
  <Modifiers>
    <GivenName>Jonh</GivenName>
    <FamilyName>Smith</FamilyName>
  </Modifiers>
</ImageDescription>
```