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Information and documentation — A reference ontology for the interchange of cultural heritage information

Information et documentation — Une ontologie de référence pour l'échange d'informations du patrimoine culturel

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 ISO 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).

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This document was prepared by Technical Committee ISO/TC 46, *Information and documentation*, Subcommittee SC 4, *Technical interoperability,* in collaboration with the International Committee for Documentation (CIDOC).

This third edition cancels and replaces the second edition (ISO 21127:2014), which has been technically revised.

The main changes are as follows:

— deprecated 13 overspecialised classes and 15 overspecialized properties;

— added 8 properties to replace 8 deprecated properties in order to support chronological reasoning;

— added 4 (sub)classes and 17 properties to align with OCG standards for geospatial data;

— added 4 (sub)classes and 12 properties for more detailed conceptualizations of existing concepts;

— provided further clarification of concepts through the addition real-life examples, references, and first order logic axioms;

— extended explanatory introductory sections to clarify the standard and its maintained scope.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document is the culmination of more than a decade of standards development work by the International Committee for Documentation (CIDOC) of the International Council of Museums (ICOM). Work on this document began in 1996 under the auspices of the ICOM-CIDOC Documentation Standards Working Group. The document[1)] provided by CIDOC formed the basis for ISO 21127 which was first published in 2006. While the initial impetus for the work came from the museum community, it has since spread to encompass other types of cultural heritage institution. This document has been appropriated and extended to meet the needs of other institutions dealing with cultural heritage.

The primary purpose of this document is to offer a conceptual basis for the integration, mediation, and exchange of information between cultural heritage organizations such as museums, libraries, and archives. This document aims to provide a common reference point against which divergent and incompatible sources of information can be compared and, ultimately, harmonized.

ISO 21127 is an ontology[2)] for cultural heritage information: a formal representation of the conceptual scheme, or "world view", underlying the database applications and documentation systems that are used by cultural heritage institutions. It is important to note that this document aims to clarify the logic of what cultural heritage institutions do in fact document; it is not intended as a normative specification of what they should document. The primary role of this document is to enable information exchange and integration between heterogeneous sources of cultural heritage information. It aims to provide the semantic definitions and clarifications needed to transform disparate, localized information sources into a coherent global resource, be it within an institution, an intranet, or on the Internet.

The specific aims of this document are to:

— serve as a common language for domain experts and IT developers when formulating requirements;

— serve as a formal language for the identification of common information contents in different data formats; in particular to support the implementation of automatic data transformation algorithms from local to global data structures without loss of meaning. These transformation algorithms are useful for data exchange, data migration from legacy systems, data information integration, and mediation of heterogeneous sources;

— support associative queries against integrated resources by providing a global model of the basic classes and their associations to formulate such queries; and

— provide developers of information systems with a guide to good practice in conceptual modelling.

The ISO 21127 ontology is expressed as a series of interrelated concepts with definitions. This presentation is similar to that used for a thesaurus. However, the ontology is not intended as a terminology standard and does not set out to define the terms that are typically used as data in cultural heritage documentation. Although the presentation provided here is complete, it is an intentionally compact and concise presentation of the ontology's 81 classes and 160 unique properties. It does not attempt to articulate the inheritance of properties by subclasses throughout the class hierarchy. However, this definition does contain all the information needed to infer and automatically generate a full declaration of all properties, including inherited properties.[3)]

1) The CIDOC CRM Special Interest Group continues to maintain a version of this original document, usually known as the "CIDOC Conceptual Reference Model" or CIDOC CRM[15].

2) In the sense used in computer science, i.e. it describes in a formal language the relevant explicit and implicit concepts and the relationships between them.

3) A class and property reference hierarchy can be found in Reference [15].