CCS A 75

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 41472.2-2022

Geographic information - Ontology - Part 2: Rules for developing ontologies in the Web Ontology Language (OWL)

Issued on: April 15, 2022 **Implemented on: April 15, 2022**

Issued by: State Administration for Market Regulation, China National Standardization Administration

Table of Contents

foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1.Structure and Drafting Rules of Standardization Documents"

drafted.

This document is part 2 of GB/T 41472 "Geographic Information Ontology". GB/T 41472 has published the following parts.

--- Part 2.Ontology development rules for Web Ontology Language (OWL).

This document is equivalent to ISO 19150-2.2015 "Geographic Information Ontology Part 2.Web Ontology Language (OWL) Ontology Development

rule".

The following minimal editorial changes have been made to this document.

--- Incorporated the amendments to ISO 19150-2.2015/AMD1.2019, and the outer margins of the clauses involved use vertical

A straight double line (||) is marked.

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

Fundamentally speaking, ontology originates from philosophy and refers to the study of the nature of the world itself. The information technology and artificial intelligence community borrows the ontology

Terminology translates a concept into a detailed description [16]. The information technology and artificial intelligence community believes that the real world may be abstracted into different intrinsic

It depends on different people's understanding of the context of the perceived "thing". Therefore, multiple ontologies may exist in the same part of the real world. exist

In the field of geographic information, ontology refers to the formalized representation of the cosmic phenomena discussed using basic vocabulary, including definitions and axioms, which

Meanings and axioms clarify the intended meaning and describe phenomena and their interrelations [1]. Ontologies can go from weak to strong semantics in different ways

To formalize, including classification, thesaurus, conceptual model and logical theory, etc. [16].

Ontology is a basic concept of semantic interoperability in the Semantic Web, which defines the meaning of data and expresses it in terms of machines.

and describes the data in a format that the application can read. Likewise, an application that uses data can also

The associated ontology acquires its inherent semantics. Therefore, ontology supports the integration of heterogeneous data obtained by different user groups, and is related by semantic similarity.

Author ontologies characterized by formal semantics. [20]

Semantics is an important topic in the field of geographic information. The meaning of geographic information is critical to their discovery, sharing, integration and use

important. The geographic information standard has promulgated standard rules for application schemas (ISO 19109) and feature cataloging methods (ISO 19110) [17], which

They are all based on the Generic Factor Model (GFM). Basically, semantics uses the way concepts (such as data) combine phenomena and symbols that represent them

Get in touch. Typically, concepts are maintained in repositories called ontologies.

The ISO family of standards for geographic information chose the Unified Modeling Language (UML) [19, 21] for the formal representation of real-world abstractions. like

ISO /T S19150-1.2012, the need to provide a form of real-world abstraction in OWL to support the Semantic Web. This document of ISO 19150

Defines the rules for converting UML static views and application schemas of geographic information into OWL ontologies, which can benefit from and support the Semantic Web

Interoperability of geographic information. These rules apply to.

--- the integrity of the ontology description;

--- Consistency of geographic information across a range of OWL ontologies;

---Consistency of converting UML diagrams to OWL ontology;

---Cohesion and unity between UML models and ontologies.

These rules are based on and extend OMG's ontology definition metamodel [20]. OWL ontologies are complementary to UML static views, and

for different purposes.

GB/T 41472 "Geographic Information Ontology" is intended to consist of the following two parts.

--- Part 1.Framework;

--- Part 2.Ontology development rules for Web Ontology Language (OWL).

Geographic Information Ontology Part 2.Web Ontology

Language (OWL) Ontology Development Rules

1 Scope

This document defines rules and guidelines for ontology development to better support the interoperability of geographic information in the Semantic Web. Web Ontology Language

(OWL) is the language to which the ontology applies.

This document defines the conversion of UML static view modeling elements used in the Geographic Information Standard to OWL and further defines the base

Rules for converting application schemas to OWL for the generic feature model.

This document does not define rules for semantic operators and service ontologies, nor does it develop any ontologies.

2 Consistency

Any application ontology or specific standard that claims to conform to this document shall pass the requirements of the abstract test suite provided in Appendix A.

The abstract test suite consists of the following two conformance classes.

--- Convert the UML package from the coordination model of the GIS series standard to the conformance class of OWL. 19150-2owl-conf;

--- OWL-based application schema formalized conformance class. 19150-2app-conf.

3 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, dated citations

documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to

this document.

GB/T 22022-2008 Geographic Information Time Mode (ISO 19108.2002, IDT)

GB/T 23707-2009 Geographic Information Spatial Schema (ISO 19107.2003, IDT)

GB/T 33185-2016 Spatial reference of geographic information based on geographic identifiers (ISO 19112.2003, IDT)

GB/T 35647-2017 Geographic Information Conceptual Schema Language (ISO 19103.2015, IDT)

ma)

Part 1.Fundamentals)

ments)

GenericSyntax]

NF)