SLOVENSKI STANDARD
SIST EN ISO 19101:2005

01-april-2005

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Geographic information - Reference model (ISO 19101:2002)

Geoinformation - Referenzmodell (ISO 19101:2002)

Information géographique - Modele de réference (ISO 19101:2002)

Ta slovenski standard je istoveten z: **EN ISO 19101:2005**

ICS:

07.040	Astronomija. Geodezija. Geografija	Astronomy. Geodesy. Geography
35.240.70	Uporabniške rešitve IT v znanosti	IT applications in science

SIST EN ISO 19101:2005 **en**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 19101

January 2005

ICS 35.240.70

English version

Geographic information - Reference model (ISO 19101:2002)

Information géographique - Modèle de réference (ISO 19101:2002)

Geoinformation - Referenzmodell (ISO 19101:2002)

This European Standard was approved by CEN on 24 December 2004.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Ref. No. EN ISO 19101:2005: E

EN ISO 19101:2005 (E)

Foreword

The text of ISO 19101:2002 has been prepared by Technical Committee ISO/TC 211 "Geographic information/Geomatics" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 19101:2005 by Technical Committee CEN/TC 287 "Geographic Information", the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2005, and conflicting national standards shall be withdrawn at the latest by July 2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

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The text of ISO 19101:2002 has been approved by CEN as EN ISO 19101:2005 without any modifications.

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INTERNATIONAL STANDARD

ISO
19101

First edition
2002-07-01

Geographic information — Reference model

Information géographique — Modèle de référence

Reference number
ISO 19101:2002(E)

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ISO 19101:2002(E)

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Contents

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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

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

ISO 19101 was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

Annexes A and B of this International Standard are for information only.

ISO 19101:2002(E)

Introduction

Every comprehensive standardization effort needs a reference model to ensure an integrated and consistent approach. This International Standard is a guide to structuring geographic information standards in a way that will enable the universal usage of digital geographic information. This reference model describes the overall requirements for standardization and the fundamental principles that apply in developing and using standards for geographic information. In describing these requirements and principles, this reference model provides a vision of standardization in which geographic information can be integrated with existing and emerging digital information technologies and applications. This International Standard is intended to be used by information system analysts, program planners and developers of geographic information standards that are related to geographic information standards, as well as others in order to understand the basic principles of this series of standards and the overall requirements for standardization of geographic information.

Beyond the needs within traditional applications of digital geographic information, there is a growing recognition among users of information technology that indexing by location is a fundamental way to organize and to use digital data. Increasingly, digital data from a wide variety of sources is being referenced to locations for use in a diversity of applications. Consequently, there is an increasing need for standardization of geographic information and services for processing this information. To meet this need, the ISO 19100 series standardizes relevant aspects of the description and management of geographic information and geographic information services. This standardization will:

— increase the understanding and usage of geographic information;

— increase the availability, access, integration and sharing of geographic information;

— promote the efficient, effective and economic use of digital geographic information and associated hardware and software systems;

— contribute to a unified approach to addressing global ecological and humanitarian problems.

To achieve these goals, standardization of geographic information in the ISO 19100 series is based on the integration of the concepts of geographic information with those of information technology. The development of standards for geographic information must consider the adoption or adaptation of generic information technology standards whenever possible. It is only when this cannot be done that geographic information standards need to be developed.

This International Standard identifies a generic approach to structuring the ISO 19100 series of standards. This reference model uses concepts obtained from the ISO/IEC Open Systems Environment (OSE) approach for determining standardization requirements described in ISO/IEC TR 14252, the IEC Open Distributed Processing (ODP) Reference Model described in ISO/IEC 10746-1 and other relevant ISO standards and technical reports. This International Standard does not prescribe any specific products or techniques for implementing geographic information systems.

INTERNATIONAL STANDARD

ISO 19101:2002(E)

Geographic information — Reference model

1 Scope

This International Standard defines the framework for standardization in the field of geographic information and sets forth the basic principles by which this standardization takes place.

This framework identifies the scope of the standardization activity being undertaken and the context in which it takes place. The framework provides the method by which what is to be standardized can be determined and describes how the contents of the standards are related.

Although structured in the context of information technology and information technology standards, this International Standard is independent of any application development method or technology implementation approach.

2 Conformance

General conformance and testing requirements for the ISO 19100 series of geographic information standards are described in ISO 19105. Specific conformance requirements are described in individual standards in the ISO 19100 series.

3 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO/IEC 19501-1:—[1]), *Information technology — Unified Modeling Language (UML) — Part 1: Specification*

4 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply. Sources of term definitions not defined in this International Standard are provided.

NOTE   Throughout this document, certain terms are italicized. These terms are defined either in this clause or in the terms and definitions clause of another part of ISO 19100, as indicated.

4.1
application
manipulation and processing of data in support of user requirements

4.2
application schema
conceptual schema for data required by one or more applications

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1)   To be published.

ISO 19101:2002(E)

4.3
conceptual formalism
set of modelling concepts used to describe a conceptual model

EXAMPLE   UML meta model, EXPRESS meta model.

NOTE   One conceptual formalism can be expressed in several conceptual schema languages.

4.4
conceptual model
model that defines concepts of a universe of discourse

4.5
conceptual schema
formal description of a conceptual model

4.6
conceptual schema language
formal language based on a conceptual formalism for the purpose of representing conceptual schemas

EXAMPLE   UML, EXPRESS, IDEF1X

NOTE   A conceptual schema language may be lexical or graphical. Several conceptual schema languages can be based on the same conceptual formalism.

4.7
dataset
identifiable collection of data

4.8
data level
level containing data describing specific instances

4.9
data quality element
quantitative component documenting the quality of a dataset

NOTE   The applicability of a data quality element to a dataset depends on both the dataset's content and its product specification; the result being that all data elements may not be applicable to all datasets.

4.10
data quality overview element
non-quantitative component documenting the quality of a dataset

NOTE   Information about the purpose, usage and lineage of a dataset is non-quantitative information.

4.11
feature
abstraction of real world phenomena

NOTE   A feature may occur as a type or an instance. Feature type or feature instance shall be used when only one is meant.

4.12
feature attribute
characteristic of a feature

EXAMPLE 1   A feature attribute named "colour" may have an attribute value "green" which belongs to the data type "text".

EXAMPLE 2   A feature attribute named "length" may have an attribute value "82.4" which belongs to the data type "real".

2

NOTE 1   A feature attribute has a name, a data type and a value domain associated to it. A feature attribute for a feature instance also has an attribute value taken from the value domain.

NOTE 2   In a feature catalogue, a feature attribute may include a value domain but does not specify attribute values for feature instances.

4.13
feature catalogue
catalogue containing definitions and descriptions of the feature types, feature attributes and feature relationships occurring in one or more sets of geographic data, together with any feature operations that may be applied

4.14
feature operation
operation that every instance of a feature type may perform

EXAMPLE 1   An operation upon the feature type "dam" is to raise the dam. The result of this operation is to raise the level of water in a reservoir.

EXAMPLE 2   An operation by the feature type "dam" might be to block vessels from navigating along a watercourse.

NOTE   Feature operations provide a basis for feature type definition.

4.15
functional standard
existing geographic information standard, in active use by an international community of data producers and data users

NOTE   GDF, S-57 and DIGEST are examples of functional standards.

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4.16
geographic information
information concerning phenomena implicitly or explicitly associated with a location relative to the Earth

4.17
geographic information service
service that transforms, manages, or presents geographic information to users

4.18
geographic information system
information system dealing with information concerning phenomena associated with location relative to the Earth

4.19
graphical language
language whose syntax is expressed in terms of graphical symbols

4.20
lexical language
language whose syntax is expressed in terms of symbols defined as character strings

4.21
metadata schema
conceptual schema describing metadata

NOTE   ISO 19115 describes a standard for a metadata schema.

ISO 19101:2002(E)

4.22
profile
set of one or more base standards and — where applicable — the identification of chosen clauses, classes, options and parameters of those base standards that are necessary for accomplishing a particular function

NOTE   A base standard is any ISO 19100 series standard or other Information Technology standard that can be used as a source for components from which a profile or product specification may be constructed (see ISO/IEC TR 10000-1).

4.23
quality
totality of characteristics of a product that bear on its ability to satisfy stated and implied needs

4.24
quality schema
conceptual schema defining aspects of quality for geographic data

4.25
schema
formal description of a model

4.26
service
capability which a service provider entity makes available to a service user entity at the interface between those entities

4.27
service interface
shared boundary between an automated system or human being and another automated system or human being

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4.28
spatial object
instance of a type defined in the spatial schema

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46a9fd8e5a08/sist-en-iso-19101-2005

4.29
universe of discourse
view of the real or hypothetical world that includes everything of interest

5   Symbols and abbreviated terms

5.1   Abbreviations

CSMF   Conceptual Schema Modelling Facility

ECMA   European Computer Manufacturers Association

GIS   Geographic Information System

IDL   Interface Definition Language

IRDS   Information Resource Dictionary System

ISP   International Standardized Profiles

IT   Information Technology

NIST   National Institute of Standards and Technology

OCL   Object Constraint Language

ODP   Open Distributed Processing

OMG   Object Management Group

OSE   Open Systems Environment

UML   Unified Modelling Language

5.2   UML notation

The diagrams that appear in this International Standard are presented in accordance with the Unified Modelling Language (UML) specified in ISO/IEC 19501-1:—[1]. The UML notation is described in Figure 1.

Figure 1 — UML notation
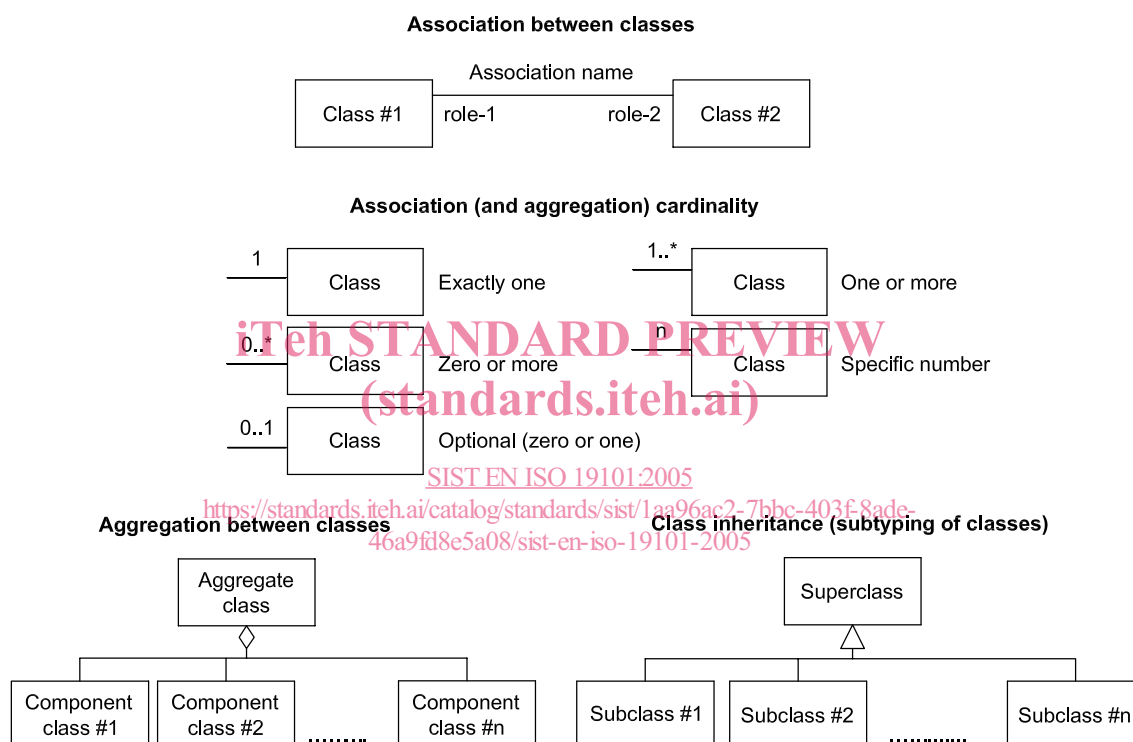
6   Concepts and organization of the reference model

6.1   Integration of geographic information with information technology

The ISO 19100 is a series of standards for defining, describing and managing geographic information. This International Standard defines the architectural framework of the ISO 19100 series of standards and sets forth the principles by which this standardization takes place.

Standardization of geographic information can best be served by a set of standards that integrates a detailed description of the concepts of geographic information with the concepts of information technology. A goal of this standardization effort is to facilitate interoperability of geographic information systems, including interoperability in distributed computing environments. Figure 2 depicts this approach.