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Geographic information — Land Administration Domain Model (LADM) —

Part 1: Generic conceptual model

Information géographique — Modèle du domaine de l'administration des terres (LADM) —

Partie 1: Modèle conceptuel générique

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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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For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 287, *Geographic Information,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This edition of ISO 19152-1, together with all other parts of the ISO 19152 series, cancels and replaces the first edition (ISO 19152-2:2012), which has been technically revised.

The main changes are as follows:

— This document defines fundamental terms, basic components and relationships related to land administration/georegulation objects. A general overview of the model has been presented in its individual packages, and a more detailed overview of the LA_Source and VersionedObject classes has been included.

— The terms, although unchanged in principle, have been defined more rigorously (i.e. basic administrative unit, land, party, right, restriction, responsibility, source, spatial unit), enriched with examples and notes, and new terms have been introduced, such as "georegulation", "regulation" and "fraction". Updates in other ISO/TC 211 documents (i.e. definitions, data types) have been reflected, and corresponding adjustments have been made where necessary.

— With the association relationships between VersionedObject and LA_Source, instances of sources have now been versioned, in contrast to ISO 19152:2012. Constraints have been introduced for the relationships to ensure that dates and times in VersionedObject and LA_Source correspond. In addition, VersionedObject and LA_Source have a second set of optional temporal attributes (beginRealWorldLifespanVersion, endRealWorldLifespanVersion, and acceptance) representing the corresponding valid times in the real world. The bi-temporal model with intervals for both system and real-world time is now supported with the addition of temporal attributes to VersionedObject. The multiplicity of the beginLifespanVersion attribute has been changed from mandatory [1] to optional [0..1] and the initial value for this attribute has been set to "realWorldTime". The initial value of availabilityStatus attribute of LA_Source has been set to "documentAvailable".

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— Requirements to which a land administration/georegulation system can conform have been formulated.

— Generic definitions for code list values have been provided.

— An overview of all parts in the ISO 19152 series has been provided.

— The bibliography has been revised to include additional references and has been reformatted.

A list of all parts in the ISO 19152 series can be found on the ISO website.

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.

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Introduction

To achieve public policy objectives, authorities establish rules for mandating or enabling particular behaviours or outcomes. Some of these rules use territorial strategies. In the previous edition of this document, ISO 19152:2012, the term "land administration" was used in the broad sense. In this new edition of the document, ISO 19152-1:2023, a new term, with a wider meaning is introduced: "georegulation". This is defined as an activity to delimit and assert control over geographical spaces through regulations.

Through land administration/georegulation, it is possible to create a multitude of geographic spaces serving multiple functions in the contexts of international law, constitutional law, administrative law, private law and customary law. Land administration/georegulation can potentially be used, for example, to delegate powers regionally, to control accessibility to a territory for security or health reasons, to organize the circulation of people, goods and information, to manage resources or for conservation purposes. These geographic spaces are juxtaposed or overlap, producing a complex legal spatial configuration.

The purpose of this document is to present the fundamental notions and define the basic components and relations shared by all objects created by land administration/georegulation.

The first goal of this document is to enable involved parties, both within one country and between different countries, to communicate, based on the shared vocabulary implied by the model. This document does not aim to replace existing systems, but rather to provide a formal language (the Unified Modelling Language, UML) for describing them, so that their similarities and differences can be better understood.

The second goal is to provide an extensible basis for the development and refinement of land administration systems, based on a Model Driven Architecture (MDA). This document is relevant for creating standardized information services in a national or international context, where land administration domain semantics have to be shared between organizations, regions or countries, in order to enable necessary translations. Four considerations during the design of the model were:

1) it will cover common aspects shared by objects created by land administration/georegulation;

2) it will be based on the conceptual framework of "Cadastre 2014" of the International Federation of Surveyors (FIG);[14]

   NOTE 1 The principle of legal independence from Cadastre 2014 can be implemented with complete separate LADM implementations of Cadastre 2014 per layer or with only the spatial unit package of LADM per layer.

3) it will be as simple as possible in order to be useful in practice;

4) the geospatial aspects will follow the ISO/TC 211 conceptual model, i.e. basic types are defined in ISO 19103, geometric elements are defined in ISO 19107 and the General feature model used in this document is defined in ISO 19109.

This document defines the Land Administration Domain Model (LADM). It allows different types of systems to be described but in the same notation. Other parts of the ISO 19152 series will address specific areas of the land administration paradigm, building upon the common core schema defined in this document. The previous edition of this document, ISO 19152:2012, concentrated on land registration. This subject is now contained in ISO 19152-2. This document provides the general reference model for all objects of land administration/georegulation and also provides an overview of all parts. Additional parts are planned to align with the model defined in this document, addressing the following topics:

— Land registration (ISO 19152-2:—[1)])

— Marine georegulation (ISO 19152-3:—[2)])

— Valuation information (ISO 19152-4:—[3)])

1) Under preparation. Stage at the time of publication: ISO/CD 19152-2:2023.

2) Under preparation. Stage at the time of publication: ISO/FDIS 19152-3:2023.

3) Under preparation. Stage at the time of publication: ISO/CD 19152-4:2023.

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— Spatial plan information (ISO 19152-5:—[4])

This document is backwards compatible to the ISO 19152:2012 version of the LADM. Any country profile established using the elements defined in accordance with ISO 19152:2012 remains compliant with this edition of ISO 19152-1, as the main changes do not affect the main structure of the model given in ISO 19152:2012.

4) Under preparation. Stage at the time of publication: ISO/CD 19152-5:2023.

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Geographic information — Land Administration Domain Model (LADM) —

Part 1: Generic conceptual model

1 Scope

This document:

— defines a reference Land Administration Domain Model (LADM) covering basic information-related components of land administration/georegulation;

— provides an abstract, conceptual model with packages related to:

  — parties (people and organizations),

  — basic administrative units, rights, responsibilities and restrictions (RRRs),

  — spatial units,

  — a generic conceptual model (sources and versioned object);

— provides terminology for land administration/georegulation, based on various national and international systems, that is as simple as possible in order to be useful in practice. The terminology allows a shared description of different formal or informal practices and procedures in various jurisdictions;

— provides a content model independent of encoding, allowing for the support of various encodings;

— provides a basis for national and regional profiles;

— enables the combining of land administration/georegulation information from different sources in a coherent manner.

The following are outside the scope of this document:

— interference with (national) land administration/georegulation laws with potentially legal implications due to the possibility of describing different types of systems but in the same notation;

— construction of external databases with party data, address data, land cover data, physical utility network data, archive data and taxation data. However, the LADM provides stereotype classes for these data sets to indicate which data set elements the LADM expects from these external sources, if available.

This document provides the concepts and basic structure for standardization in the land administration/georegulation domain. It defines a general schema that permits regulatory information to be described. It also allows for the relationship to multiple parties and groups to be expressed together with a referencing structure so that sourcing of all information systems can be maintained. This document establishes the common elements and basic schema upon which more detailed schema can be established.

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.

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ISO 19103, *Geographic information — Conceptual schema language*

ISO 19105, *Geographic information — Conformance and testing*

ISO 19107, *Geographic information — Spatial schema*

ISO 19109, *Geographic information — Rules for application schema*

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 terminology databases for use in standardization at the following addresses:

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

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

3.1.1
abstract test suite
set of conformance classes that define tests for all requirements of a specification

[SOURCE: ISO 19105:2022, 3.3, modified — Note 1 to entry removed.]

3.1.2
basic administrative unit
BAUnit
administrative entity which can be subject to registration (by law) or recordation (by informal right, or customary right, or another social tenure relationship), consisting of zero or more spatial units, and against which one or more unique and homogeneous rights, responsibilities or restrictions are associated, as included in a land administration system

EXAMPLE 1 Ownership right or land use right are examples of homogeneous rights.

EXAMPLE 2 A condominium unit comprising two spatial units (e.g. an apartment and a garage), a farm lot comprising one spatial unit (e.g. parcel of land), a servitude comprising one spatial unit (e.g. the road representing the right-of-way), a land consolidation area, or a right-of-use unit with several right holders and restricted objects.

EXAMPLE 3 A windmill farm on the sea as one spatial unit combined with cable to the land as another spatial unit together form one BAUnit.

Note 1 to entry: "Unique" means that a right, restriction or responsibility is held by one or more parties (e.g. owners or users) for the whole basic administrative unit. "Homogeneous" means that a right, restriction or responsibility (ownership, use, social tenure, lease, or easement) affects the whole basic administrative unit. For a restriction, zero parties are a possibility.

Note 2 to entry: A BAUnit may be a proxy party where it is used to hold a right on behalf of its associated party. This is a legal pattern which can be used to register a right (e.g. easement) which is held as an appurtenance to another BAUnit.

Note 3 to entry: A BAUnit should be assigned a unique identifier when registered or recorded.

Note 4 to entry: A BAUnit can consist of zero spatial units when a registry exists, and not a cadastral (spatial unit) map.

Note 5 to entry: There are countries with a registry without a cadastral map. Access to the registry is based on party identifier or on BAUnit identifier (optional). Spatial units are not explicitly represented in the land administration because there is no cadastral map.

Note 6 to entry: Rights, restrictions and responsibilities are collectively referred to as RRRs.

Note 7 to entry: Restrictions and responsibilities can be associated with their own BAUnits, each with their own type of spatial unit.

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