Technical Report

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Geographic information — Securing interoperability among heterogeneous city domain information models

Information géographique — Sécuriser l'interopérabilité entre des modèles d'information hétérogènes dans le domaine de la ville

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Foreword

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Introduction

Local governments are actively implementing various smart city services. The heterogeneity of private and public data generated from the smart city services is one of the major concerns standard development organizations (SDOs) are actively proceeding to solve for interoperability. Information modelling fields are moving towards integrated geospatial information environments, such as digital twins, cyber-physical systems and the meta-verse. These trends have produced new needs for standards in both private and public sectors that enable effective information sharing in terms of the geospatial context for smart city services. Building efficient and effective interconnectedness and sharing information between silo data models across domain fields and cities is one of the major concerns to make seamless smart city services operational.

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Geographic information — Securing interoperability among heterogeneous city domain information models

1 Scope

This document analyses a feasible way to accommodate interoperability elements for the data component of a spatial data infrastructure (SDI) and extend the meta model framework for interoperability (MFI) in securing interoperability among heterogeneous domain information models under the smart city context.

This document:

a) outlines the interoperability issues for city domain information models;

b) reviews relevant standards and best practices and examines methodologies or solutions to tackle the interoperability issues;

c) supposes a use case and provides an example to secure interoperability among different domain information models using model registry;

d) specifies technical requirements in concern about how to apply the interoperability elements of the meta model framework to support the interoperability of smart city services;

e) highlights the standardization items to be developed to secure interoperability.

2 Normative references

There are no normative references in this document.

3 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 Terms and definitions

3.1.1
information model
graphical and textual representation of entities and the relationships between them

Note 1 to entry: May also be known as a data *model* (3.1.5), a conceptual data model, a logical data model, an entity relationship model, an object class diagram or a database definition.

[SOURCE: ISO/IEC 19763-1:2023, 3.17]

3.1.2
interoperability
capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units

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