INTERNATIONAL STANDARD

**ISO
14817-2**

First edition
2015-10-15

Intelligent transport systems — ITS central data dictionaries —

Part 2:
Governance of the Central ITS Data Concept Registry

Systèmes intelligents de transport — Dictionnaires de données centrales des ITS —

Partie 2: Gouvernance du registre central de concept des données des ITS

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ISO 14817-2:2015
https://standards.iteh.ai/catalog/standards/sist/31fea1f7-d82c-4f97-999c-
8ccfec4c99c9/iso-14817-2-2015

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 documents 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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.

This first edition of ISO 14817-2, together with ISO 14817-1, cancels and replaces ISO 14817:2002, which has been technically revised.

ISO 14817 consists of the following parts, under the general title *Intelligent transport systems — ITS central data dictionaries*:

— *Part 1: Requirements for ITS data definitions*

— *Part 2: Governance of the Central ITS Data Concept Registry*

— *Part 3: Object identifier assignments for ITS data concepts*

Introduction

Background

This International Standard has been developed by ISO/TC 204, in order to provide a framework for the documentation and registration of data that passes through system interfaces within the Intelligent transport systems (ITS) domain. It is designed to maximize interoperability and facilitate information re-use across system interfaces.

Vision statement

This International Standard envisions a harmonized approach to ITS data concepts to promote maximum interoperability of data within the ITS sector by the creation and maintenance of the "Central ITS Data Concept Registry" (CIDCR), supported by interface and application specific ITS data dictionaries, created and maintained in a common and interoperable form, and to ensure the minimization of duplication by clear rules for data concept definition and data concept registry management.

Mission statement

The mission is to develop tools that will promote a holistic, integrated approach involving vehicle technology, infrastructure, and the road user to increase transport safety and efficiency. Specifically, this International Standard defines the principles and concepts; scope; field of application; rules and procedures; definition and concept of operation for the CIDCR and ITS functional data dictionaries; and makes provision for the migration of data concepts from ITS functional data dictionaries to the CIDCR so as to maximize interoperability and minimize proliferation of similar (but inconsistently defined) data concept entries.

This International Standard defines the framework, formats, and procedures used to define information and information exchanges within the ITS sector. This International Standard is designed to be used by the ITS community at large, but should be of special interest to application developers, equipment providers, and data concept registry managers.

This International Standard specifies a set of meta-attributes for ITS data concepts, as well as associated conventions and schemes that enable the description, standardization and management of all exchanged ITS data. Through consistent use of these common structures and associated conventions and schemes, interchange of data and information among the various ITS functional subsystems via their specific application systems can be maximized. This International Standard also supports re-use of data elements and other data concepts across various ITS functional subsystems and their specific application systems

The formats and processes defined within this International Standard are consistent with implementation(s) of the ISO ITS System Architecture defined in the ISO 14813 Standardization deliverables, particularly parts that discuss core TICS reference architecture and example elaboration. This does not preclude the application of data concept registries using alternative international, regional or national system architecture methodologies or techniques, indeed, common formats and processes will ease migration and interoperability between such approaches.

The ITS data concepts that populate the CIDCR or data dictionary may originate from a 'Computer-Aided Software Engineering' (CASE) tool implementation of the ISO 14813 ITS Reference Architecture, from International Standards for ITS, from National implementations for ITS, or from the submission by relevant users. Data dictionary entries are not limited to those generated by object oriented methodologies.

Overview of Central ITS Data Concept Registry

The scope of ITS applications covers numerous ISO/TC 204 functional areas as well as national and regional ITS organizations, each having an established group of stakeholders. The international integration of ITS applications is one of the major development issues, so that data defined and gathered in one of these functional areas (e.g. traffic management, traveller information) can be applied

in another. For this type of interoperability the definition of data that can persist across different functional areas must be standardized. The CIDCR meets this requirement.

The CIDCR supports the standardization and harmonization of data concepts (e.g. data elements) from different stakeholder groups. The ITS stakeholder community is large and diverse as evidenced by the number of working groups within ISO/TC 204 and the number of national or regional ITS bodies participating. The definition of key data elements will arise from numerous sources. Moreover different groups will have an interest in the definition of the same data concept, which could lead to the prospect of duplicate or similar definitions being developed. The CIDCR will assist in promoting the reuse of previously defined data and minimizing data duplication.

The complete ITS distributed system will be very large, both in geographic extent and in the number and diversity of the application areas, inevitably leading to the independent development of sub-systems. In this context, a second major purpose of the CIDCR is to document and register interface dialogues. This process provides the main foundation for interoperability, by also focusing on those data concepts which cross an interface, but which are not necessarily harmonized throughout ITS. The semantics of data concepts may be documented by recording the associations of the data models in which they participate.

The operational concept of the data concept registration is described in the following subclauses. See Annex A for specific procedural details.

Document overview

This clause provides an overview of this International Standard. Clause 1 identifies the scope of this part of ISO 14817. Clause 2 identifies requirements for conformance to this part of ISO 14817. Clause 3 identifies references required for proper implementation of this part of ISO 14817. Clause 4 defines terms used in this part of ISO 14817 and Clause 5 lists the abbreviations.

The requirements for the CIDCR begin in Clause 6 with an overview of the concept of operations. A framework describing the registration of different types of data concepts in the CIDCR and the registration status levels are presented.

Clause 7 identifies the management of the CIDCR and identifies the major actors that interface with the registry and their responsibilities. Clause 8 then identifies the administrative meta-attributes associated with each data concept.

The annexes to this part of ISO 14817 describe the specific details for implementing the requirements introduced in Clause 6 to Clause 8. Annex A details when specific meta-attributes are required for each type of data concept. Annex B defines the process used for quality control within the CIDCR, Annex C defines the registration status levels and Annex D defines the rules for version control. Finally, Annex E defines guidelines for harmonization.

The Bibliography includes a list of documents related to this part of ISO 14817.

Intelligent transport systems — ITS central data dictionaries —

Part 2:
Governance of the Central ITS Data Concept Registry

1 Scope

This part of ISO 14817 specifies the registration process to enter data concepts into the Central ITS Data Concept Registry (CIDCR).

The CIDCR is designed to include data concepts that conform to ISO 14817-1. These data concepts may be derived from the system architecture defined in ISO 14813, but may also support data concepts using alternative International, Regional or National System Architecture methodologies or techniques.

2 Conformance

This part of ISO 14817 prescribes a conceptual model, but not a physical implementation. Therefore, the meta model need not be physically implemented exactly as specified. However, it should be possible to map unambiguously to and from the implementation and the meta model.

A conforming implementation shall support all processes defined by this part of ISO 14817.

3 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14817-1, *Intelligent transport systems — ITS central data dictionaries — Part 1: Requirements for ITS data definitions*

ISO 14817-3, *Intelligent transport systems — ITS central data dictionaries — Part 3: Object identifier assignments for ITS data concepts*

4 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14817-1, ISO 14817-3 and the following apply.

4.1
data concept registration process
process by which data is formally described and provided to an approved location in the data concept registry

Note 1 to entry: This process is effected under the control of the "ITS Registrar", in accordance with the requirements of this part of ISO 14817.

4.2
ITS registrar
organizational element or an individual appointed by ISO/TC 204 to undertake the day-to-day management of the data concept registry process

5   Symbols and abbreviated terms

ASN.1	Abstract Syntax Notation One
ANSI	American National Standards Institute
CASE	Computer-Aided Software Engineering
CCC	Change Control Committee
CIDCR	Central ITS Data Concept Registry
DCI	Data concept identifier
DD	Data Dictionary
DCR	Data Concept Registry
ExCom	Executive Committee
ID	identification
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
ITS	Intelligent transport system(s)
N/A	not applicable
OID	object identifier
OSI	Open System Interconnection
RA	Registration Authority
TC	Technical Committee
UML	Unified Modelling Language
URL	Uniform Resource Locator

6   Framework of Central ITS Data Concept Registry

The overall framework for the CIDCR is presented in <u>Figure 1</u>. It illustrates the relationships among the following:

— ITS architectures (and data models);

— ITS data dictionaries (that are intended to include all data concepts);

— CIDCR;

— ITS Applications.
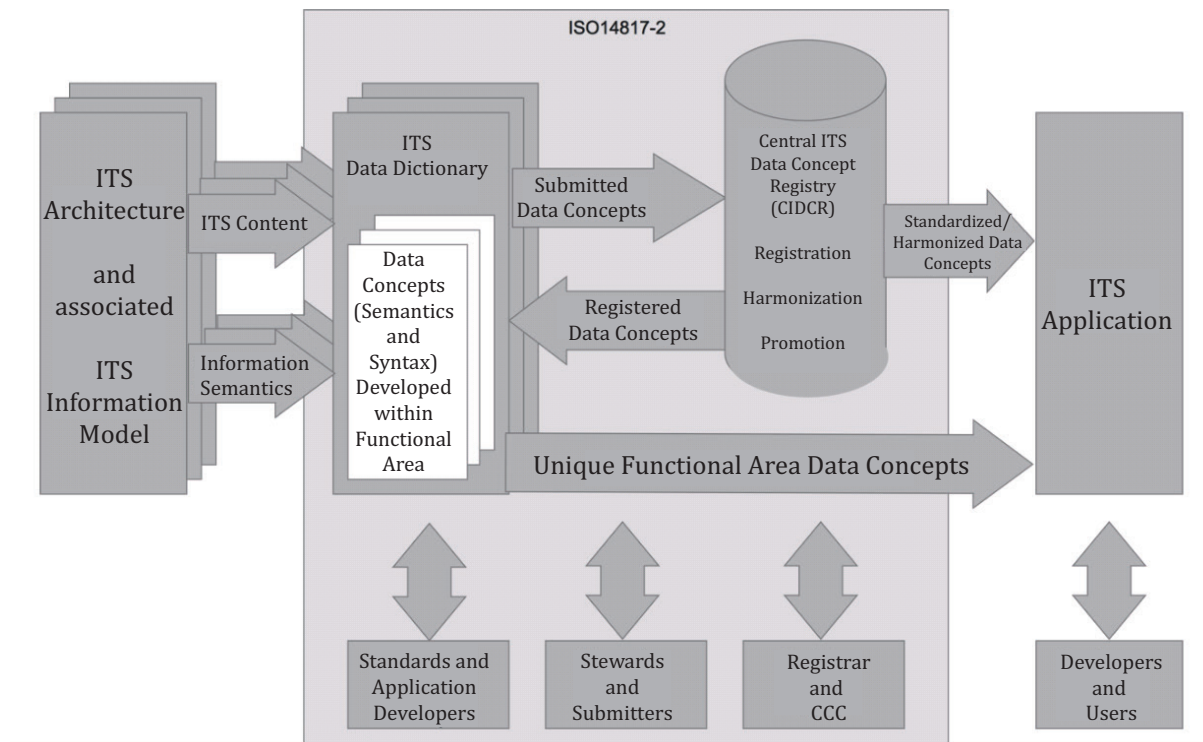
Figure 1 — CIDCR operational framework

For each of these elements, Figure 1 also lists their key functions. For data dictionaries, the CIDCR, and the applications it further identifies the key stakeholders or stakeholder groups that participate in or manage their operations. Finally, Figure 1 illustrates the information exchanged between these operational elements.

The ITS data dictionaries contain data concepts based on information flows documented in an ITS Architecture.

NOTE   There may be multiple architectures, each with multiple versions that are referenced.

The data dictionaries in Figure 1 may be developed, for example, by ISO/TC 204 or regional or National "Standards Development Organizations" (SDOs), public agencies, or private companies. These data dictionaries are the responsibility of their respective SDOs, regional or National bodies. Each data dictionary shall be associated with a data steward and/or data submitter, using the process defined in this part of ISO 14817, to submit data concepts from their respective data dictionaries to the CIDCR. Furthermore, these data dictionaries should use registered data concepts from the CIDCR rather than invent new data concepts. The use of such registered data concepts will help to avoid redundancy in data concepts.

The CIDCR shall be the repository for submitted data concepts. Through the efforts of the data stewards, the registrar and the CIDCR change control committee (CCC) support identification of harmonization opportunities, recommendations for harmonization, and promotion of data concepts to higher quality levels where warranted. Finally, the CIDCR can provide data concepts to developers and other users for use in ITS applications.

Developers and other users should use data concepts from the CIDCR at the highest ("*Preferred*") quality level. The data concepts at this level are described unambiguously, harmonized across ITS sectors, and are considered representative of published data standards.

Table 1 presents a summary of the distinguishing characteristics between a data dictionary and the CIDCR.

Table 1 — Distinguishing characteristics of data dictionaries and the CIDCR

ITS Data Dictionary	CIDCR
Multiple data dictionaries	One (International) data concept registry
Covers single functional area	Covers multiple functional areas
Managed by a functional area steward	Managed by the CCC
Harmonized within the functional area	Harmonized across the ITS sector

7   Management of the Central ITS Data Concept Registry

7.1   Overview

Organizational roles associated with the ITS data concept registration process shall be established. The organizational roles for the CIDCR shall include the Executive Committee (ExCom), the Change Control Committee (CCC), the Registrar, Stewards, Submitters, and Read-only Users. A summary of each role is provided in this Clause. Clause 8 provides a description of the purpose, specific responsibilities, and membership or selection criteria for each role.

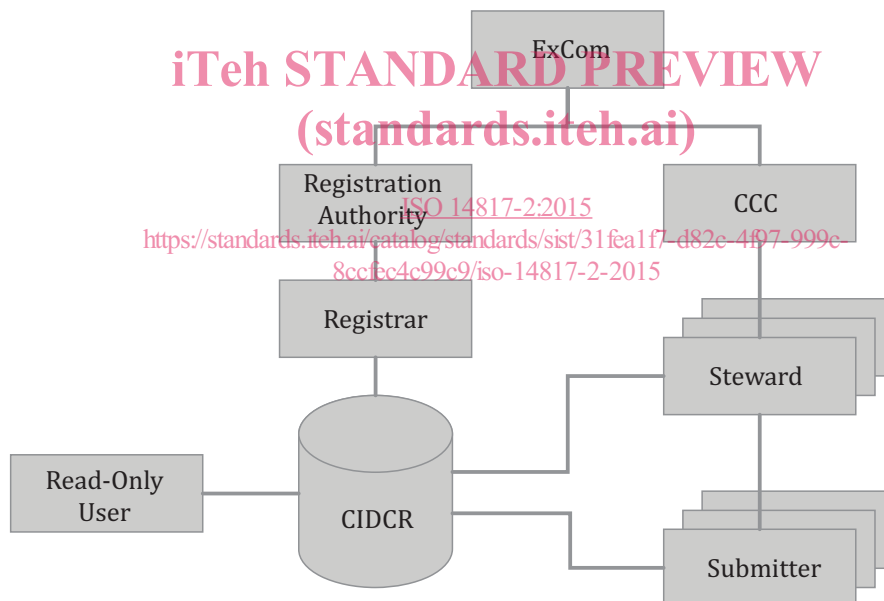Figure 2 provides a high level view of how these organizational roles are related within the context of the CIDCR.

Figure 2 — Organizational chart for the CIDCR

7.2   ITS executive committee

The CIDCR Executive Committee (ExCom) shall be an organization established by ISO/TC 204. It shall be responsible for administering responsibilities and authority delegated by ISO/TC 204 in relation to the CIDCR. TC 204 shall specify precise reporting responsibilities for the ExCom. ExCom procedures and practices shall be subject to review and approval by TC 204 or its designated organizational component.

The ITS ExCom shall be responsible for overall policy and business direction for the CIDCR, to include the following.

a)   Establishing overall registry policies, such as the application process for Submitters.

b) Resolution of all business management issues pertaining to the registry, including, but not limited to:

  1) addressing copyright issues;

  2) appointing representatives to the CCC;

  3) appointing stewards;

  4) selecting the registration authority;

  5) addressing funding issues;

  6) defining ExCom membership.

c) Ensuring the long-term success and performance of the registry.

d) Establishing and updating the registry charter and strategic plans.

e) Meeting at least semi-annually in face-to-face meetings, with additional meetings and/or teleconferences held as needed.

The ExCom will normally fulfil its responsibilities via consensus building. Intransigent issues may be resolved by ISO/TC 204, and whenever deemed appropriate in consultation with CEN/TC 278.

7.3 Change control committee

The CIDCR Change Control Committee (CCC) shall be the organization that is constituted to provide overall technical direction of the CIDCR and its contents, and its operation. The structure, staffing, procedures, and membership of the CCC are determined by the CIDCR ExCom. The membership of the CCC should include the Stewards.

The CCC is responsible for the following:

a) overall conduct of ITS registration operations;

b) promoting the reuse and sharing of data in the CIDCR within and across ITS functional-areas, and among external interested parties to the ITS enterprise;

c) progressing data concepts through registry registration "Qualified" and "Preferred" quality levels;

d) identifying data concepts to be registered from external data concept registries or data dictionaries;

e) resolving technical issues associated with registered data concepts, e.g. overlap, duplication, etc;

f) approving updates to data concepts previously placed in the registry in the "Qualified" or "Preferred" registration quality levels;

g) proposing registry policies to the ExCom for approval;

h) approving registry content, procedures, and formats;

i) submitting management-related recommendations and issues to the ExCom;

j) acting on directions from the ExCom;

k) meeting periodically in face-to-face meetings, with additional meetings and teleconferences held as needed.

The CCC will normally fulfil its responsibilities via consensus building in accordance with a procedure established by the ExCom. Intransigent issues may be resolved by a procedure established by the ExCom.

7.4 Registration Authority

The designated CIDCR Registration Authority (RA) shall be responsible for

a) nominating a registrar for approval by the ExCom, and

b) Hosting the CIDCR.

The CIDCR ExCom shall appoint the RA for defined durations, subject to their ability to provide an acceptable Registrar.

7.5 Registrar

The CIDCR Registrar shall be an approved representative of the RA who has expertise in data concept registration processes. The Registrar shall be responsible for facilitating the registration of ITS data concepts and making those data concepts widely accessible and available to the ITS community through the CIDCR. The RA shall appoint the Registrar with the approval of the CIDCR ExCom.

The Registrar provides a single point-of-contact responsible for managing and maintaining information about ITS data in the registry, under the authority of the RA. The Registrar is responsible for the following:

a) monitoring and managing the registry/data dictionary contents (Note: The registry is established, operated, and maintained by the RA);

b) enforcing policies, procedures, and formats for populating and using the registry;

c) proposing procedures and standard formats for the registry to the CCC for consideration;

d) recording current registration status and quality levels for data concepts in the registry;

e) ensuring access for authorized users to contents in the registry;

f) assisting in the progression of data concepts through the registration quality levels;

g) assisting in the identification and resolution of duplicate or overlapping data concepts in the registry;

h) acting on direction from the CCC;

j) maintaining the CIDCR software, within defined budgets;

k) maintaining contact information for all members of the CCC and the ExCom;

l) providing access to the CIDCR for authorized users;

m) maintaining controlled word lists of the CIDCR, such as, but not limited to

    1) status levels (as described in 8.2.7 and Annex C), and

    2) organization identifiers (as described in ISO 14817-1, B.1.5).

7.6 Steward

A CIDCR Steward shall be an ITS domain expert with current knowledge of standardization efforts in one or more sectors of the ITS domain. Stewards are responsible for the accuracy, reliability, and currency of descriptive metadata for data concepts at a registration quality level of "Qualified" or above within an assigned functional, regional or national area. Each ITS sector should be associated with at least one primary Steward, but a Steward may have responsibilities that cut across multiple ITS functions (e.g. value domains such as date, time, location, codes of the countries of the world). Stewards are appointed by the ExCom.