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Requirements and Logical Data Model for a Physical Storage Format (PSF) and an Application Program Interface (API) and Logical Data Organization for PSF used in Intelligent Transport Systems (ITS) Database Technology

Exigences et modèle de données logiques pour un format de stockage physique (PSF), une interface de programme d'application (API) et une organisation de données logiques pour un PSF utilisé dans la technologie de base de données des systèmes de transport intelligents (ITS)

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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.

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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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

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An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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

ISO/TS 20452 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

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Introduction

ISO/NP 14826, *Physical Storage for TICS Database Technology*, was introduced into ISO/TC 204 with the objective of standardizing a physical storage format (PSF) for navigation map data and related information stored on physical media used by in-vehicle navigation systems. The intent was to facilitate an interoperable in-vehicle navigation market environment by developing a standard PSF that would enable navigation media offered by different providers to be used by any navigation system and navigation systems made by any developer to be able to read the same media.

There was widespread international participation in this effort. Many of the different companies within the different participating national delegations possessed their own respective formats[1)] that were commercially available. It was decided early on that since none of these existing formats would be adopted wholesale as the standard physical storage format, the functional requirements of these existing systems would be submitted and consolidated into a universal set and organized into the major categories of application functionality predominantly used by in-vehicle navigation systems.

This gathering of market-driven requirements was the first step of an agreed development process that would proceed according to a top-down development approach. A sequential work plan was defined which included a logical data model based on the requirements, followed by the development of a logical organization of the data types used in the model. This logical data organization (LDO) would be used as a basis for the definition of a physical data organization (PDO), which would be defined to a sufficient level of granularity to specify a single standard PSF.

It took several years to develop and gain consensus on the requirements, the logical data model, and the logical data organization. During the development there were several input documents submitted by various national delegations. At the beginning of the development of the PDO it was decided to use a Japanese PDO input document[2)] as a framework for the PDO discussion.

Shortly after the PDO discussion began, the project ISO/NP 14826 expired and there was not sufficient international support for resubmitting a new work item proposal to continue the work, nor was there consensus that the PDO work could be finished within an acceptable time frame. Consequently, a standard PSF as envisioned within the scope of the work item would not be realized.

However, the requirements, logical data model, and logical data organization documents developed in this process reflect international consensus and still provide value for the navigation system market and other emerging products and services which use navigation map data. Thus it was agreed to convert these documents into a Technical Specification which could be used for future developments.

This Technical Specification can help developers of applications that use map databases to realize efficiencies by providing guidelines on setting up an appropriate architecture for navigation systems. This provides a potential benefit to the developer's ability to develop systems in a shorter timeframe, thereby shortening time-to-market for products. Although this Technical Specification was originally developed for navigation system applications, it may also facilitate other market development activities by providing insight into solving common data modelling and organization issues in the fields of telematics and location-based services.

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1) These formats are identified in the Bibliography of this Technical Specification.

2) Kiwi Format Specification version 1.2.2 (see Bibliography).

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1 Scope

This Technical Specification describes the functional requirements and Logical Data Model for PSF and API and the Logical Data Organization for PSF that were completed under ISO/NP 14826. It does not specify a Physical Data Organization.

2 Normative references

The following referenced documents are indispensable for the application 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.

ISO 14825, *Intelligent transport systems — Geographic Data Files (GDF) — Overall data specification*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
Address Location
application category that deals with the task of expressing a real-world position in terms of the PSF data representation

NOTE Address Location is one of the six application categories supported by the PSF and the API.

3.2
address type
attribute of road section entity, specifying the type of house number ranges

EXAMPLE distinction between base address, county address, commercial address, etc., or no address.

3.3
application category
basic sub-function within the set of functionality for vehicle navigation and traveller information system applications

NOTE This Technical Specification identifies six application categories: Positioning, Route Planning, Route Guidance, Map Display, Address Location, Services and POI Information Access.

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