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Inteligentni transportni sistemi - Specifikacije za izmenjavo podatkov DATEX II pri upravljanju prometa in informiranju - 3. del: Objava situacije

Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 3: Situation Publication

Intelligente Verkehrssysteme - DATEX II Datenaustauschspezifikation für Verkehrsmanagement und Verkehrsinformation - Teil 3: Publikation von Verkehrssituationen

Systèmes de transport intelligents - Spécifications DATEX II d'échange de données pour la gestion du trafic et l'information routière - Partie 3: Publication de situations

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English Version

Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 3: Situation Publication

Systèmes de transport intelligents - Spécifications DATEX II d'échange de données pour la gestion du trafic et l'information routière - Partie 3: Publication de situations

Intelligente Transportsysteme - DATEX II Datenaustausch Spezifikationen für Verkehrsmanagement und Informationen - Teil 3: Situationsveröffentlichungen

This Technical Specification (CEN/TS) was approved by CEN on 10 April 2011 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (CEN/TS 16157-3:2011) has been prepared by Technical Committee CEN/TC 278 “Road transport and traffic telematics”, the secretariat of which is held by NEN.

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

This document supersedes ENV 13106:2000, ENV 13777:2000.

As a user of the standard, attention is drawn to the resources of www.datex2.eu. This web site contains related software tools and software resources that aid the implementation of CEN/TS 16157 DATEX II.

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

Introduction

This Technical Specification defines a common set of data exchange specifications to support the vision of a seamless interoperable exchange of traffic and travel information across boundaries, including national, urban, interurban, road administrations, infrastructure providers and service providers. Standardisation in this context is a vital constituent to ensure that interoperability, reduction of risk, reduction of the cost base and promotion of open marketplace objectives are achieved that will lead to many social, economic and community benefits as a result of more informed travellers, network managers and transport operators.

Delivering European Transport Policy in line with the White Paper issued by the European Commission requires co-ordination of traffic management and the development of seamless pan European services. With the aim to support sustainable mobility in Europe, the European Commission has been supporting the development of information exchange mainly between the actors of the road traffic management domain for a number of years. In the road sector, DATEX II has been long in fruition, with the European Commission being fundamental to its development through an initial contract and subsequent co-funding through the Euro-Regional projects. With this standardisation of DATEX II there is a real basis for common exchange between the actors of the traffic and travel information sector.

This Technical Specification includes the framework and context for exchanges, the modelling approach, data content, data structure and relationships and communications specification.

This Technical Specification supports a methodology that is extensible.

The third part of this Technical Specification deals with the publication of situation information. It specifies the structures and definitions of information that may be exchanged to convey situation information relating to a road network, both from a road network manager and road user point of view.

The European Committee for Standardisation (CEN) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning procedures, methods and/or formats given in this document.

CEN takes no position concerning the evidence, validity and scope of patent rights.

1 Scope

This Technical Specification (CEN/TS 16157-3) specifies and defines component facets supporting the exchange and shared use of data and information in the field of traffic and travel.

The component facets include the framework and context for exchanges, the modelling approach, the data content, the data structure and relationships and the communications specification.

This Technical Specification is applicable to:

— traffic and travel information which is of relevance to road networks (non urban and urban);

— public transport information that is of direct relevance to the use of a road network (e.g. road link via train or ferry service).

This Technical Specification establishes specifications for data exchange between any two instances of the following actors:

— Traffic Information Centres (TICs);

— Traffic Control Centres (TCCs);

— Service Providers (SPs).

Use of this Technical Specification may be applicable for use by other actors.

This Technical Specification includes the following types of information content:

— road traffic event information – planned and unplanned occurrences both on the road network and in the surrounding environment;

— operator initiated actions;

— road traffic measurement data, status data and travel time data;

— travel information relevant to road users, including weather and environmental information;

— road traffic management information and instructions relating to use of the road network.

This part of the CEN/TS 16157 specifies the informational structures, relationships, roles, attributes and associated data types required for publishing situation traffic and travel information within the DATEX II framework. This is specified as a DATEX II Situation Publication sub-model which is part of the DATEX II platform independent model, but this Part excludes those elements that relate to location information which are specified in CEN/TS 16157-2 and those elements that relate to VMS settings which are specified in Part 4 of CEN/TS 16157 [4].

2 Conformance

The DATEX II platform independent data model of which the Situation Publication sub-model is a part, corresponds to the Level A model as defined in CEN/TS 16157-1.

Conformance with this Part shall require platform independent models from which platform specific models are generated to comply with the UML modelling rules defined in CEN/TS 16157-1 and with the following requirements of this sub-model which are expressed in this part:

— comply with all stipulated minimum and maximum multiplicity requirements for UML elements and relationships;

— comply with all definitions, types and ordering;

— employ optional elements as specified;

— comply with all expressed constraints.

It should be noted that conformance of a publication service with all the structural requirements stated above does not necessarily ensure that the informational content of that service will be semantically comprehensible.

3 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.

CEN/TS 16157-1:2011, *Intelligent transport systems — DATEX II data exchange specifications for traffic management and information — Part 1: Context and framework*

CEN/TS 16157-2, *Intelligent transport systems — DATEX II data exchange specifications for traffic management and information — Part 2: Location referencing*

ISO 639-2: 1998, *Codes for the representation of names of languages — Part 2: Alpha-3 code*

4 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TS 16157-1:2011 and the following apply.

4.1
destination
specification of the end point of a defined route or itinerary

NOTE This may be either a location on a road network or an area location.

4.2
location
identifiable geographic place

NOTE It is either on a road network (as a point or a linear location) or as an area. This may be provided in one or more referencing systems.

[EN ISO 19112:2005]

4.3
Itinerary
route
navigable ordered sequence of locations with a start point and an end point

4.4
RSS
really simple syndication
Really Simple Syndication comprises a Web feed format used to publish frequently updated sources of information

4.5
situation
identifiable occurrence in the real world comprising one or more traffic/travel circumstances which are linked by one or more causal relationships. Each Situation has its own life-cycle which encompasses the life-cylcles of its component circumstances

4.6
situation element
identifiable occurrence in the real world comprising one traffic/travel circumstance which has its own life-cycle

NOTE Details of each situation element are mapped into a single data record.

5 Symbols and abbreviations

For the purposes of this document, the abbreviation of terms given in CEN/TS 16157-1 and the following apply.

ADR European Agreement concerning the International Carriage of Dangerous Goods by Road

ETRS89 European Terrestrial Reference System 1989

GUID Globally Unique IDentifier

HTML Hyper Text Mark-up Language

IATA International Air Transport Association

ICAO International Civil Aviation Organization

IMO International Maritime Organization

IMDG International Maritime Dangerous Goods (code)

IP Internet Protocol

LPG Liquid Petroleum Gas

PDF Portable Document Format

TREM Transport Emergency Card

UML Unified Modeling Language

UNDG United Nations Dangerous Goods (number)

URL Uniform Resource Locator

VIP Very Important Person

VMS Variable Message Sign

6 UML notation

The UML notation used in these Technical Specifications shall be as described in ISO/IEC 19501. A short summary explaining the notation used in this Technical Specification is provided in Annex A of the Part 1 of CEN/TS 16157.

7 The Situation Publication model

7.1 Overview of the Situation Publication model

The Situation Publication model shall comprise a number of packages, with the “SituationPublication” package providing the entry to the model and the subordinate “SituationRecord” package modelling the individual elements of situations. The “SituationPublication” package shall be one of several packages which are immediately subordinate to the “PayloadPublication” package and hence forms the top of the hierarchy in the Situation Publication model. The “SituationRecord” package shall make use of a number of packages from within the “ReusableClasses” package thus invoking a hierarchy of packages.

Each “SituationPublication” instance shall specify any number of individual situations in the real world, each of which shall comprise separate, but related, elements which are modelled in DATEX II as “SituationRecords”.

A “SituationRecord” shall be further specialised as being either of type “NonRoadEventInformation”, “TrafficElement”, “OperatorAction” or “GenericSituationRecord”. The “GenericSituationRecord” is provided purely for user extension of the model.

“NonRoadEventInformation”, as the name suggests, models events and information which are not occurring directly on or related to the road itself, but may still indirectly affect the operation of the road network, e.g. a road side service area is closed or a ferry service is not operating.

“TrafficElement” models events, activities and conditions which are occurring on the road network or are directly affecting the operation of the road network, e.g. an accident, an obstruction on the road or bad weather.

“OperatorAction” models actions or initiatives that a traffic operator may implement (either manually or automatically) to mitigate dangerous or poor driving conditions, and maintain optimal efficiency and safety of the road network which may include maintenance of the road infrastructure.

The entry class of each of the “NonRoadEventInformation”, “TrafficElement”, “OperatorAction” or “GenericSituationRecord” sub-packages shall be a class in the higher level package. The hierarchy of packages shall be strictly linear without any circular referencing.

Some of the packages and individual classes used within the “SituationPublication” package reside in a “ReusableClasses” package because they can be used in different places within this package or by other packages either now or in the future. The “ReusableClasses” package shall be a container for a number of sub-packages and individual reusable classes. Those sub-packages and classes which are contained in the “ReusableClasses” package are identified in the following clauses. The use of individual classes from the “ReusableClasses” package are described each time they are used in the “SituationPublication” since their context may affect their semantics.

7.2 The “SituationPublication” package

7.2.1 Overview of the “SituationPublication” package

The “SituationPublication” package shall be immediately subordinate to the “PayloadPublication” package and comprises a sub-model for defining publishable “Situations”, each of which may comprise one or more elements (see Figure 1). Each element of a “Situation” shall be modelled as an individual “SituationRecord”.

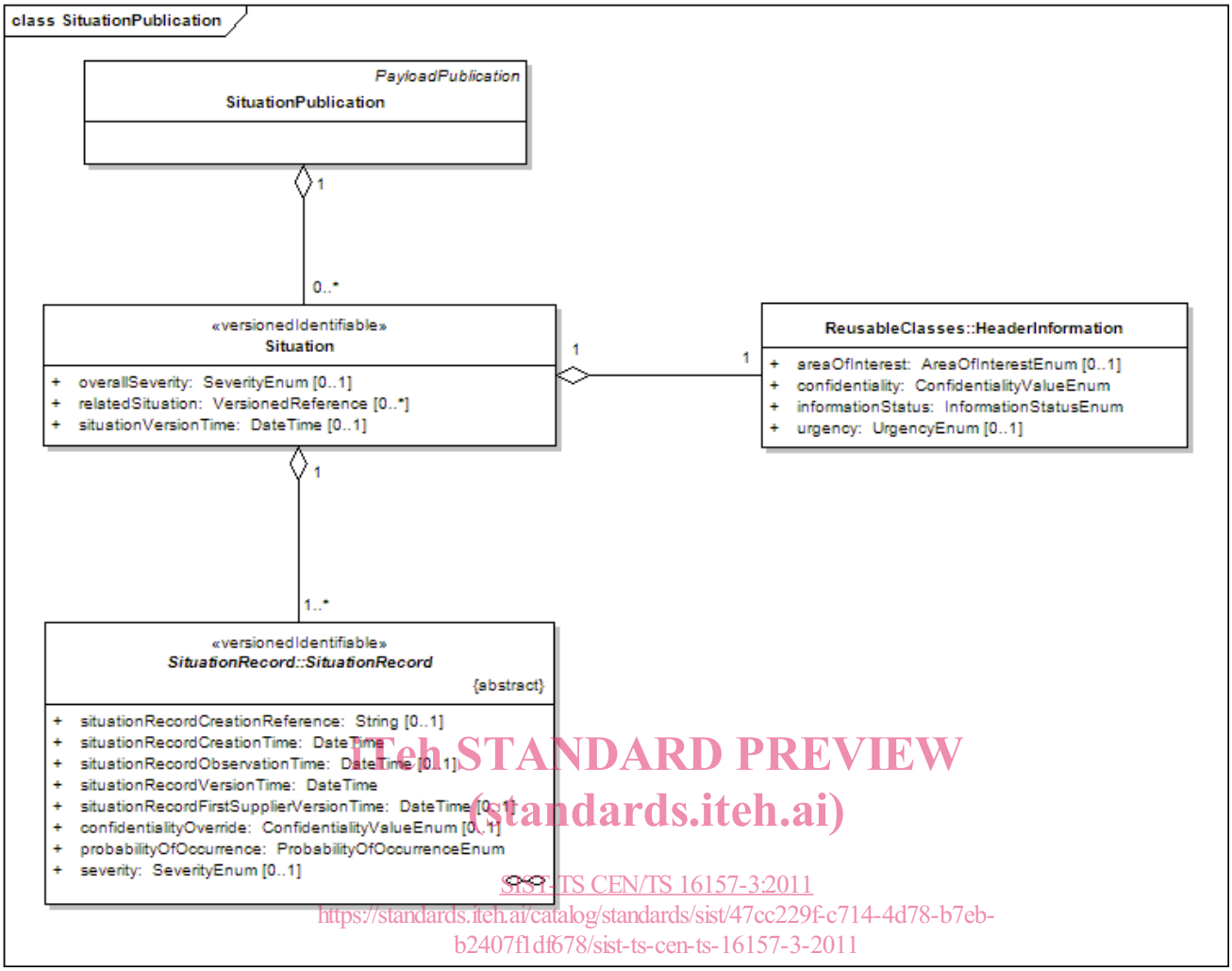

Figure 1 — The "SituationPublication" package class model

7.2.2 Semantics of the "SituationPublication" package

7.2.2.1 "SituationPublication" package semantics – general

The "SituationPublication" class shall be the only entry point of the package and is a specific realisable case of a "PayloadPublication". Each "SituationPublication" may contain any number of separate situations each of which themselves may comprise one or more elements. Each element of a "Situation" shall be modelled as a "SituationRecord" in DATEX II.

The modelling of each situation and each component situation element represented by an instance of a "SituationRecord" class shall be uniquely identifiable for the particular DATEX II service and have its own lifecycle. Also since each may iterate through different time-stamped versions all instances of the "Situation" and "SituationRecord" classes shall have an assigned version. Hence both classes have an assigned stereotype of <<versionedIdentifiable>> (see Part 1 of CEN/TS 16157 for how the implementation of this stereotype in the PSM allows identity and version to be represented in a data exchange).

7.2.2.2 "Situation" class

The "Situation" class shall be the base class for detailing a situation that may affect traffic on the roads.

— **Attribute "relatedSituation"** may provide a reference to any other versioned "Situation" that is published by the same publication creator which is related to this "Situation". There may be any number of related "Situations". For instance a "Situation" containing an "Accident" element and a resulting "AbnormalTraffic" element (e.g. indicating queuing traffic) could be related to a "Situation" containing an "AbnormalTraffic" element on the opposite carriageway.

7.2.2.3 "HeaderInformation" class

(from "ReusableClasses" package)

Each instance of a "Situation" shall have associated metadata contained in the "HeaderInformation" class which allows the supplier of the publication to specify how the recipient should treat the information contained in the "Situation".

7.3 The "SituationRecord" package

7.3.1 Overview of the "SituationRecord" package

The package, "SituationRecord", shall comprise a sub-model for defining an individual element of a "Situation" as a single identifiable, version managed record (see Figure 2).