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Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 7: Common data elements

Intelligente Verkehrssysteme - DATEX II Datenaustauschspezifikation für Verkehrsmanagement und Verkehrsinformation - Teil 7: Gemeinsame Datenelemente

Systèmes de transport intelligents - Spécifications DATEX II d'échange de données pour la gestion du trafic et l'information routière - Partie 7: Éléments de données communs

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35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport
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Intelligente Verkehrssysteme - DATEX II Datenaustauschspezifikation für Verkehrsmanagement und Verkehrsinformation - Teil 7: Gemeinsame Datenelemente

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 278.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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prEN 16157-7:2017 (E)**European foreword**

This document (prEN 16157-7:2017) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

This document, together with prEN 16157-1, will supersede CEN/TS 16157-1:2011.

It covers the pre-defined model elements in the 'Common' namespace.

prEN 16157-7 is a part under the general title “*Intelligent transport systems — DATEX II data exchange specifications for traffic management and information*”, the other parts being:

- Part 1: Context and framework
- Part 2: Location referencing
- Part 3: Situation publication

Other parts will be developed in the future.

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<https://standards.iteh.ai/catalog/standards/sist/87dbad5b-b315-42f2-9607-9e154c9f9840/sist-en-16157-7-2019>

Introduction

This European Standard 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 interoperability, reduction of risk, reduction of the cost base, promotion of open marketplaces and many social, economic and community benefits to be gained from 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 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 European Standard includes the framework and context for exchanges, the modelling approach, data content, data structure and relationships, communications specification.

This European Standard supports a methodology that is extensible.

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.

This part of prEN 16157 is targeted to deal with the common data elements that are used in more than one publication. It specifies reused structures and definitions of information that may be exchanged to convey information described in the other parts of this EN. The elements described in this document have their own namespace "Common".

prEN 16157-7:2017 (E)**1 Scope**

This European Standard specifies and defines component facets required to support 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 data content, data structure and relationships, communications specification.

This European Standard 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);
- Traffic and travel information in the case of Cooperative intelligent transport systems (C-ITS).

This European Standard 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 European Standard may be applicable for use by other actors.

This European Standard covers, at least, the following types of informational content:

- Road traffic event information – planned and unplanned occurrences both on the road network and in the surrounding environment;
- Information about operator initiated actions – including both advisory and mandatory measures;
- 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 information and advice relating to use of the road network.

This part of prEN 16157 specifies common informational structures, relationships, roles, attributes and associated data types required for publishing information within the DATEX II framework. This is specified as a DATEX II sub-model which is part of the DATEX II platform independent model, but this Part only covers common elements that are used by more than one publication. It excludes those elements that relate to location information which are specified in part 2 of prEN 16157.

2 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.

prEN 16157-1:2017, *Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 1: Context and Framework*

EN ISO 3166-1, *Codes for the representation of names of countries and their subdivisions - Part 1: Country codes (ISO 3166-1)*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 16157-1 and the following apply.

3.1

basic data

data that is either measured or calculated (elaborated) data

3.2

data value

value of something that can be measured or calculated

3.3

extension

data model content that is not part of the DATEX II Level A model and that is added in the container package "Extension" (e.g. for project specific purposes)

3.4

fault

information about a malfunction relating to a specific piece of equipment or process

3.5

generic publication

DATEX II publication without predefined content used to make extensions at the publication level

3.6

payload publication

traffic related information or associated management information created at a specific point in time that can be exchanged via a DATEX II interface.

Note 1 to entry: The "PayloadPublication" class is the top level root class for DATEX II Level A.

3.7

validity

time period specification for which the exchanged DATEX II information is valid

3.8

weather data

collection of information related to measured or derived (usually transport related) weather conditions at a specified location

3.9

vehicle characteristics

collection of parameters that characterise a vehicle

4 Abbreviations

For the purposes of this document, the following abbreviations apply.

prEN 16157-7:2017 (E)

GUID – Globally Unique identifier

UML – Unified Modeling Language

XMI – XML Metadata Interchange

XML – eXtensible Markup Language

XSD – XML Schema Definition

5 Conformance

The DATEX II platform independent data model of which the common data sub-model is a part, corresponds to the Level A model as defined in prEN 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 prEN 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.

It is in principle possible to create models in accordance to clauses 6 and 7 of prEN 16157-1 (general and platform independent model related clauses) – even including the mapping to XML Schema Definition described in prEN 16157-1:2017, A.3 – that do not comply with clause 6 of this document. Nevertheless, note that such a model cannot claim full compliance with this European Standard and thus shall not work with tools requiring full compliance.

6 Predefined model elements**6.1 General**

Besides regulations for the use of UML constructors and a UML profile providing additional meta information via tagged values and stereotypes, the DATEX II modelling methodology furthermore stipulates a certain top level model structure for all compliant UML models. These clauses are mainly motivated by the need to create a well-defined structure for DATEX II tools aiming at supporting users.

The types of attributes and the enumerations specific to this part are defined in the normative Annex A.

The XML subschema corresponding to this part of prEN 16157 is provided in the normative Annex B.

6.2 Top level model packages and classes

The following rules apply for top level model packages and classes:

- a) DATEX II compliant UML models shall have one single top level UML package named "D2Payload" of stereotype "D2Namespace".

- b) The DATEX II top level package "D2Payload" shall have four sub-packages with the following names:
- 1) "Common" of stereotype "D2Namespace"
 - 2) "Extension" of stereotype "D2Namespace"
 - 3) "LocationReferencing" of stereotype "D2Namespace"
 - 4) "PayloadPublication" of stereotype "D2Package"
- c) The "PayloadPublication" package may contain several sub-packages of stereotype "D2Namespace".
prEN 16157-3 specifies the sub-package "Situation" and its content. The standardisation of further sub-packages may follow in the future.
- d) The usage of the "Extension" package for creating customised DATEX extensions is specified in prEN 16157-1.
- e) The "Common" package shall have three sub-packages with the following names:
- 1) "Classes" of stereotype "D2Package" - see 7
 - 2) "DataTypes" of stereotype "D2Package" - see 6.3
 - 3) "Enumerations" of stereotype "D2Package" - see 6.4
- The further content of these packages is specified in the further chapters of this document.
- f) The "Common::Classes" package shall contain one abstract UML Class named "PayloadPublication" of stereotype "D2ModelRoot". It may contain further packages and classes.
- g) The tagged value "rootElement" of the DATEX II class "PayloadPublication" shall be set to "payload".
- h) The tagged value "modelBaseVersion" of the DATEX II class "PayloadPublication" shall be set to "3" which is current DATEX II model version identifier. The tagged value "version" of the DATEX II class "PayloadPublication" shall be set to "3.n" where "n" is the minor version number.

NOTE The model base version "3" denotes the third iteration of the second generation of DATEX specifications, denoted "DATEX II". The Arabic version number "3" is different from the Roman "II", used to give this generation a name that distinguishes it from the EDIFACT-based "DATEX" standard developed in the 1990ies, finally resulting in the meanwhile withdrawn CEN ENs 13106:2000 and 13777:2000.

- i) The tagged values "extensionName" and "extensionVersion" of the DATEX II class "PayloadPublication" shall contain the name of the extension(s) contained in the model and a corresponding version identifier in the case that the "Extension" package is non-empty. These values shall be provided by the creator of the model - see also Figure 1.

These rules provide a well-defined entry structure into a DATEX II XML publication, which always starts at top level with one concrete instance of a class specialized from "PayloadPublication".

prEN 16157-7:2017 (E)

Tag	Value
definition	A payload publication of traffic related information or associated management information created at a specific point in time that can be exchanged via a DATEX II interface.
extensionName	
extensionVersion	
modelBaseVersion	3
version	3.0 <i>(minor version is exemplary only)</i>

Figure 1 — Tagged Values of top level class "PayloadPublication"

j) The class "PayloadPublication" shall have the following structure.

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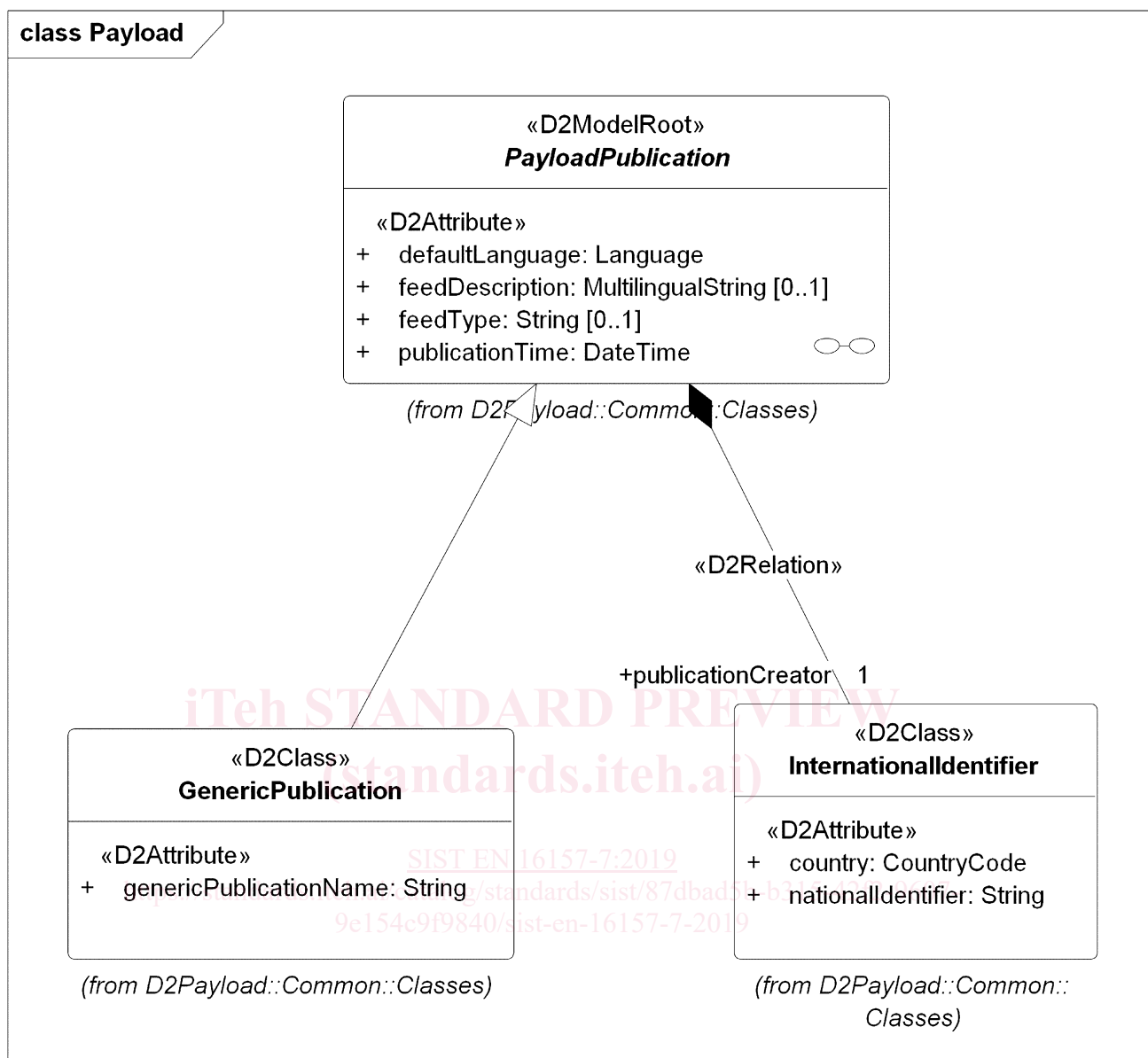


Figure 2 — Top level class "PayloadPublication"

The class "PayloadPublication" shall have a "D2Relation" composition to the "InternationalIdentifier" class.

The "GenericPublication" class (see Figure 2) is a specific realisable case of a "PayloadPublication" and used to make level B extensions at the publication level. Its attribute "genericPublicationName" is used to specify a name for any level B extended publication.

The "InternationalIdentifier" class (see Figure 2) shall provide an identifier/name whose range is specific to the particular country.

NOTE The possible upper case two-letter codes related to the "country" attribute of class "InternationalIdentifier" are specified in EN ISO 3166-1 and can be obtained from the Online Browsing Platform of ISO¹.

¹ <https://www.iso.org/obp/ui/#search/code/>.