IEC 62656-8

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Standardized product ontology register and transfer by data parcels – Part 8: Web service interface for data parcels

Enregistrement d'ontologie de produits normalisés et transfert par paquets de données – Partie 8: Interface de service Web pour les paquets de données

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STANDARDIZED PRODUCT ONTOLOGY REGISTER AND TRANSFER BY DATA PARCELS –

Part 8: Web service interface for data parcels

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62656-8 has been prepared by subcommittee 3D: Classes, Properties and Identification of products – Common Data Dictionary (CDD), of IEC technical committee 3: Documentation, graphical symbols and representations of technical information.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
3D/342/FDIS	3D/346/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62656 series, published under the general title *Standardized product ontology register and transfer by data parcels*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

For a description of products and services throughout their lifecycle, an enhanced data interoperability with reduced human interventions is an ultimate goal of developing international standards for intelligent production systems. In attaining this goal, an industrial ontology is expected to play a significant role by allowing components of systems to talk to each other, namely machine-machine understanding, about their functions, capabilities, structures and their configurations.

The parcellized ontology model defined in IEC 62656-1, also known by its acronym "POM", is a generic ontology model with quadruple layers to capture different types of ontology models by sorting elements into categories of homogeneous collection of ontological entities, such as classes (concepts), properties, relations, enumerations, terms (constants), data types, etc. At the second layer from the top, named the Meta-Ontology (MO) layer, 11 types of category are defined. Each layer is a collection of categories, while each category is represented by a relational table-like matrix called "data parcel" whose meta data (attributes) are embodied as a selection of instances of the immediate upper layer. The top layer of the POM, named the Axiomatic Ontology (AO) layer, comprises two data parcels only, which conjointly define the "concept of concepts" by classes and properties, which is an information technology (IT) embodiment of the math-logical notion of the class (i.e., "concept") itself.

Other parts of the IEC 62656 series, which are collectively known as "parcel standards", are intended as a specialization of the POM for a specific purpose.

IEC 62656-2 [1][1] is a guide for domain experts to apply the POM in order to capture a data dictionary from the definitions available in product standards in a form conformant to the IEC 61360-2 [2] and ISO 13584-42 [3] dictionary schema (i.e., common data dictionary model, or CDDM) and using the specification of a part of IEC 62656-1 as an official data interface for the IEC 61360-4 database known as the IEC CDD (Common Data Dictionary), enabling the uploading and downloading of the dictionary to and from the IEC CDD. A referential implementation of IEC 62656-1 is available as a tool, free of charge for standardization purposes.

IEC 62656-3 is intended as a mapping specification between a standard data model of the "Smart-Grid" domain, with acronym CIM (Common Information Model), and an extended, or rather generalized data model of the IEC CDD, namely, the POM. The CIM comprises the IEC 61968/IEC 61970/IEC 62325 series of International Standards. Thus, the IEC CDD can accommodate the CIM provided the IEC CDD sufficiently implements the POM as the data interface or database. Alternatively, this mapping inevitably entails a small but significant extension of the IEC CDD without which the accommodation of the CIM into the IEC CDD is infeasible. Nevertheless, nothing needs to be added to or subtracted from the tool which is currently used as a data interface for the IEC CDD and which fully embodies IEC 62656-1.

IEC 62656-5 is intended as an interface for the description of activities as an ontology conformant to IEC 62656-1, thus opening a way to store definitions available from activity-centric International Standards, for instance IEC 62224-3, as an ontology. IEC 62656-5 can also be applied to the description of non-manufacturing use scenarios, such as for the description of activities of natural hazard management or electronic tourist guidance or navigation, with a harmonious integration of activities with related products and services.

This means a common ontology repository ("COR") based on the POM can store both IEC CDD and CIM types of data dictionaries or ontologies. Furthermore it can smoothly bridge the differences and fill the gaps covering ontologies of different provenances.

[1] Numbers in square brackets refer to the Bibliography.

Future parts of the IEC 62656 series are expected to shed light on a new spectrum of applications for the COR based on the POM.

Above all, this document specifies a description of basic web services for semantic repositories based on the POM, whilst an advanced type of web interface, including complex enquiry about products as well as query forwarding to another repository, is left to a future part of the series, to be developed.

STANDARDIZED PRODUCT ONTOLOGY REGISTER AND TRANSFER BY DATA PARCELS –

Part 8: Web service interface for data parcels

1 Scope

This part of IEC 62656 specifies a web service interface to exchange data parcel(s) conformant to IEC 62656-1, between a parcel server and a parcel client or between parcel servers. This interface comprises three basic services: a registration service, resolution service and subscription service.

This document includes the following:

– holistic use scenario;

– detailed specification of the three basic services;

– JSON [1] and XML [5] notation schemas for data parcel(s).

The following items are outside the scope of this document:

– user identification and authorization;

– query language for a data parcel;

– transportation protocol;

– data and communication security techniques.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 62656-1:2014, *Standardized product ontology register and transfer by spreadsheets – Part 1: Logical structure for data parcels*

ISO/IEC 21778, *Information technology – The JSON data interchange syntax*

ISO 639-1, *Codes for the representation of names of languages – Part 1: Alpha-2 code*

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

ISO 8601-1, *Date and time – Representations for information interchange – Part 1: Basic rules*

ISO 8601-2, *Date and time – Representations for information interchange – Part 2: Extensions*

ISO 13584-32, *Industrial automation systems and integration – Parts library – Part 32: Implementation resources: OntoML: Product ontology markup language*