CATENA-X
STANDARD

CX - 0091 Aspect Model Fleet Vehicles v.1.0.0

Contact: standardisierung@catena-x.net

Table of Contents

ABOUT THIS DOCUMENT & MOTIVATION

Catena-X is the first open and collaborative data ecosystem. The goal is to provide an environment for the creation, operation, and joint use of end-to-end data chains along the entire automotive value chain. All partners are on an equal ground, have sovereign control over their data and no lock-in effects occur. This situation provides a sustainable solution for the digitalization of supply chains, especially for medium-sized and small companies, and supports the cooperation and collaboration of market participants and competitors.

The ever-growing Catena-X ecosystem will enable enormous amounts of data to be integrated and collaboratively harnessed. To ensure that these complex data volumes can be sent, received, and processed smoothly across all stages of the value chain, one language for all players: common standards. The standards of the Catena-X data ecosystem define how the exchange of data and information in our network works. They are the basis for ensuring that the technologies, components, and processes used are developed and operated according to uniform rules.

Common standards create added value for all partners: Within our network, data flows more smoothly through interfaces. In addition, we avoid cumbersome individual IT solutions for sharing data with other partners. In the field of international standardization, Catena-X follows the proven international standardization institutions: ISO/IEC/ITU and CEN-CENELC/ETSI.

For users and data providers, implementation of standards will reduce the costs that would arise from adapting different systems. In addition, no important data is lost. On the contrary, it even becomes easier to collect data across companies. For

operators and developers, standards will create a framework that provides reliable orientation and planning security.

The following document describes one of the standards used in the Catena-X ecosystem and the requirements needed to implement it. Here, it serves as main resource to illustrate the following data model. It contains information starting from the format of the model, up to the conceptual and physical model. The standardisation of the data model will enable faster information sharing and homogeneity throughout the entire Catena-X ecosystem.

DISCLAIMER & LIABILITY

The present document and its contents are provided "AS-IS" with no warranties whatsoever.

The information contained in this document is believed to be accurate and complete as of the date of publication, but may contain errors, mistakes or omissions.

The Catena-X Automotive Network e.V. ("Catena-X") makes no express or implied warranty with respect to the present document and its contents, including any warranty of title, ownership, merchantability, or fitness for a particular purpose or use. In particular, Catena-X does not make any representation or warranty, and does not assume any liability, that the contents of the document or their use (i) are technically accurate or sufficient, (ii) conform to any law, regulation and/or regulatory requirement, or (iii) do not infringe third-party intellectual property or other rights.

No investigation regarding the essentiality of any patents or other intellectual property rights has been carried out by Catena-X or its members, and Catena-X does not make any representation or warranty, and does not assume any liability, as to the non-infringement of any intellectual property rights which are, or may be, or may become, essential to the use of the present document or its contents.

Catena-X and its members are subject to the IP Regulations of the Association Catena-X Automotive Network e.V. which govern the handling of intellectual property rights in relation to the creation, exploitation and publication of technical documentation, specifications, and standards by Catena-X.

Neither Catena-X nor any of its members will be liable for any errors or omissions in this document, or for any damages resulting from use of the document or its contents, or reliance on its accuracy or completeness. In no event shall Catena-X or any of its members be held liable for any indirect, incidental or consequential damages, including loss of profits. Any liability of Catena-X or any of its members, including liability for any intellectual property rights or for non-compliance with laws or regulations, relating to the use of the document or its contents, is expressly disclaimed.

REVISIONS & UPDATE

The present document may be subject to revision or change of status. Catena-X reserves the right to adopt any changes or updates to the present document as it deems necessary or appropriate.

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be copied or modified without the prior written authorization of Catena-X. In case of any existing or perceived difference in contents between any versions and/or in print, the prevailing version of the present document is the one made publicly available by Catena-X in PDF format.

If you find any errors in the present document, please send your comments to: standardisierung@catena-x.net

COPYRIGHT & TRADEMARKS

1. Introduction

This document describes the semantic model "Vehicle Product Description" used in the Catena-X network.

1.1 Audience & Scope

This section is non-normative

The described semantic model is relevant for :

Data Provider / Consumer

Business Application Provider

1.2 Context

This section is non-normative

The Catena-X use case "Quality" (QAX) uses multiple data models to exchange data between automotive manufacturer (OEM) and component supplier (TIER1). Each of these data models can be supplied independently.

The Vehicle.ProductDescription data model is a representation of one vehicle affected by one or more QualityTask. The data model represents the vehicle when it was sold to the end-customers from an end-customers point of view: Which standard equipment was installed in the vehicle and which extra equipment was installed in the vehicle.

1.3 Conformance

As well as sections marked as non-normative, all authoring guidelines, diagrams, examples, and notes in this specification are non-normative. Everything else in this specification is normative.

The key words MAY, MUST, MUST NOT, OPTIONAL, RECOMMENDED, REQUIRED, SHOULD and SHOULD NOT in this document are to be interpreted as described in [BCP 14](#) [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

1.4 Proof of conformity

This section is non-normative

All participants and their solutions will need to prove they conform with the Catena-X standards. To validate that the standards are applied correctly, Catena-X employs Conformity Assessment Bodies (CABs).

For Data Provider: To prove conformity you have to fulfill all MUST criteria mentioned in chapter [Normative criteria for data provider](#).

There is no proof of conformity necessary for Data Consumer.

For Business Application Provider: To prove conformity you have to fulfill all MUST criteria mentioned in chapter [Normative criteria for Business Application Provider](#).

A model validator must be created, to prove the correctness of the data model. A generic test set created for the model must prove the expected results.

1.5 Examples

Example payload in JSON format:

```json
{
  "listOfVehicles" : [ {
    "catenaXId" : "580d3adf-1981-44a0-a214-13d6ceed9379",
    "modelIdentifier" : "689-G8",
    "emptyWeight" : 2000.0,
    "production" : {
      "plantIdentifier" : "4711",
      "productionDate" : "2018-01-15T00:00:00",
      "plantDescription" : "Wolfsburg"
    },
    "driveType" : "All-Wheel Drive",
    "fuel" : {
      "kbaFuelType" : "Unbekannt",
      "nhtsaFuelType" : "Compressed Hydrogen/Hydrogen"
    },
    "steeringPos" : "Left-Hand Drive",
    "hybridizationType" : "battery electric vehicle",
    "body" : {
      "numberOfDoors" : 5,
      "kbaBody" : "Limousine",
      "nhtsaBody" : "Cargo Van",
      "colorId" : "LY7W ",
      "colorDescription" : "Light grey"
    },
    "anonymizedVin" : "3747429FGH382923974682",
    "modelDescription" : "Golf VIII",
    "equipments" : [ {
      "equipmentIdentifier" : "S248A",
      "equipmentDescription" : "Seat heating front",
      "group" : "Interior"
    } ],
    "sale" : {
      "soldDate" : "2018-02-03T00:00:00",
      "countryCode" : "DEU",
      "countryGroup" : "Europe"
```

```
    },
    "vehicleSeries" : "Golf",
    "softwareCategory" : "TZGH64738",
    "oem" : {
      "wmiCode" : "WBA",
      "cxBPN" : "BPN-811",
      "wmiDescription" : "BMW AG"
    },
    "engines" : [ {
      "serialNumber" : "3434937GJJG3738",
      "size" : 1968,
      "installDate" : "2018-01-10T00:00:00",
      "engineDescription" : "2.0 TDI",
      "power" : 110,
      "engineId" : "CKBY",
      "engineSeries" : "EA189",
      "engineProductionDate" : "2017-10-20T00:00:00"
    } ],
    "systemPower" : 110,
    "class" : "A",
    "softwareVersion" : "3.4.9837.567"
  } ]
}
```

1.6 Terminology

Business Partner Number (BPN)**

A BPN is the unique identifier of a partner within Catena-x.

2. Aspect Model Vehicle Product Description

2.1 Introduction

Catena-X use case ""Quality"" (QAX) uses several Catena-X standardized data models to exchange data:

[Aspect models used in QAX](#)

Figure 1: Hierarchy of Catena-X data models used in QAX

Data models in QAX and their content:

QualityTask is the root element and describes why companies are working together on a quality topic and what they want to do. All involved companies and their contact people are named. In addition, a flag tells what should be done with exchanged data after a QualityTask is closed.

Vehicle.ProductDescription: This data model is a representation of one vehicle affected by this QualityTask. The model represents the vehicle when it was sold to the end-customers from an end-customers point of view: Which standard equipment was installed in the vehicle and which extra equipment was installed in the vehicle.

Fleet.DiagnosticData: Diagnostic data coming from multiple vehicles that are affected by this QualityTask + Diagnostic data from similar vehicles that are not affected by this QualityTask.

Fleet.ClaimData: Customer complaints that are linked to this QualityTask + Data about the exchange of potentially faulty parts

ManufacturedPartsQualityInformation: A selection of manufacturing-related parameters that help to solve the QualtiyTask

PartsAnalyses: Analyses results of replaced and potentially faulty parts that are linked to this QualityTask

2.2 Normative Criteria

The usage of the described semantic model "Vehicle Product Description" is a MUST for Data Provider and Data Consumer that want to work together on a quality topic over Catena-X automotive network.

2.2.1 Normative criteria for Data Provider

Every data provider MUST provide the data conformant to the semantic model specified in CX-0091 and CX-0037.

It is a MUST to provide oem entity with property "wmiCode" and Catena-X business partner number properties.

It is a MUST to provide property "anonymizedVin" of entity Vehicle.

If available catenaXId of entity Vehicle (unique Catena-X digital twin ID of the vehicle) SHOULD be provided.

In the Catena-X data space "Vehicle Product Description" data MUST be exchanged via Eclipse Dataspace Connector (EDC) conformant to CX-0018 and CX-0002..

It is RECOMMEND to use Apache parquet^3 file format together with EDC S3 data plane for file data exchange "Vehicle Product Description" data. Apache parquet allows to transfer bigger amount of data in one file compared to JSON format.

2.2.2 Normative criteria for Business Application Provider

It is a MUST for Business Application Provider to support at least 2 standardized Catena-X QAX aspect models from Catena-X Release 3.2 (2 out of Catena-X standards CX - 0036, CX - 0037, CX - 0038, CX - 0039, CX - 0040, CX - 0041, CX - 0091) to get the label "Catena-X Certified Solution" for their quality application.

It is RECOMMENDED for Business Application Provider to be able to read the semantic model "Vehicle Product Description".

2.3 License

This Catena-X data model is an outcome of Catena-X use case group Live Quality Loops (QAX). This Catena-X data model is made available under the terms of the Creative Commons Attribution 4.0 International (CC-BY-4.0) license, which is available at Creative Commons^4.

The license information is available in github.

In case of doubt the license, copyright and authors information in github overwrites the information in this specification document.

2.4 Identifer of Semantic Model

This semantic model has the unique identifier:
urn:samm:io.catenax.fleet.vehicles:1.0.0

This model has an external reference to
CX - 0037 Aspect Model Vehicle Product Description v.2.0.0
with unique identifier urn:samm:io.catenax.vehicle.product_description:3.0.0

2.5 Formats of Semantic Model

2.5.1 RDF Turtle

The rdf turtle file, adhering to the Semantic Aspect Meta Model, is the master for generating additional file formats and serializations. It is provided here:

https://github.com/eclipse-tractusx/sldt-semantic-models/tree/main/io.catenax.fleet.vehicles/1.0.0

The referenced aspect model is provided here:
https://github.com/eclipse-tractusx/sldt-semantic-models/tree/main/io.catenax.vehicle.product_description/3.0.0

The open source command line tool of the Eclipse Semantic Modeling Framework^5 is used for generation of other file formats like for example a JSON Schema, aasx for Asset Administration Shell Submodel Template or a HTML documentation.

2.5.2 JSON Schema

A JSON Schemaas well as an example JSON payload can be generated from the RDF Turtle file using the Eclipse ESMF tooling.

If present, example JSON-payloads MUST validate against the generated JSON schema.

3. References

3.1 Normative References

CX - 0018 EclipseDataConnector (EDC)
CX - 0036 Aspect Model: QualityTask
CX - 0037 Aspect Model: Vehicle.ProductionData
CX - 0038 Aspect Model: Fleet.DiagnosticData
CX - 0039 Aspect Model: Fleet.ClaimData
CX - 0040-Aspect Model: PartAnalyses
CX - 0041-Aspect Model: ManufacturedPartsQualityInformation
CX - 0091 Aspect Model: Fleet.Vehicles
CX - 0092 Aspect Model: QualityTaskAttachment