

Airline Industry Data Model

Information Physical Model Guidelines

Date: 14 Feb 2019

Document Status: Draft

V1.2

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**Revision History**

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| --- | --- | --- | --- |
| **Version** | **Date** | **Name** | **Description of change** |
| 0.1 | 11 Sep 2014 | Michael Thomas | First draft |
| 1.0 | 29 Sep 2014 | Michael Thomas | Renamed to V1.0 following PADIS MW approval |
| 1.1 | 29 Feb 2016 | Michael Thomas | Replaced section “Object Library XML Schema Transformation from the Logical Model” by a reference to T3 guidelines, which describe how to use our customized Transformation tool.  Updated various details in other sections. |
| 1.2 | 25 Feb 2019 | Graham Ferguson | Incorporated changes to organization structure. |

# Introduction

## Document Purpose and Intended Audience

|  |  |  |
| --- | --- | --- |
| The purpose of this document is to describe how to develop the Object Library XML Schema model, i.e. the physical layer of the information pillar (partition “I4”), of the airline industry data model. |  |  |

The intended audience of this document are individuals involved in developing the physical model :

* because object libraries are cross business domain workgroups, their generation and modeling may be centralized – according to governance yet to be defined – with the Data Model administrator, or also be done by the individuals below,
* members of PSC (Passenger Services Conference) Standards work-groups developing or expanding the data model as part of BRD development,
* Change Management and AIDM Integration Group members developing or expanding the data model as part of modeling “core objects” or reverse-engineering existing standards.

These individuals have a variety of profiles including Airline and IT supplier Business Analysts, Enterprise Architects, Data Modelers, XML developers.

## Document Context

The Airline industry data model is to be published by IATA as a foundational layer for the development of airline messaging standards in XML or any other data format that may emerge in the future.

The data model is structured in 3 pillars (Business, Information, Technology), 4 layers (Contextual, Conceptual, Logical, Physical), and operational stakeholder views. A separate guideline document will exist for each of the 12 partitions defined by the pillar and layer.

The data model uses UML and as a tool Sparx Enterprise Architect (EA). The first 3 layers are platform-independent. The partition addressed by the present guidelines (I4) is part of the 4th layer which is platform-specific. In the long run, it might hold models for multiple platforms, depending on business needs. Presently, we are only targeting XML. The guidelines will therefore be specific to the XML platform, as well as to the EA tool.

We are generating two types of XML schemas:

1. Message Schemas: those are out of scope of the present document because they are modeled and generated in partition T4.
2. Object Library Schemas: are the ones addressed by this document.

Object Library schemas will provide type libraries of all objects (XML complex types and their underlying elements) of the data model. Each object will have the complete set of all attributes used across all domains, business functions, or messages.

Object Library schema models in I4 are almost entirely generated through EA “Model Transformation” from the Logical Data Model in I3. Ideally none – and in practice very few aspects are specified and maintained at the I4 level. The present guidelines will consequently be short.

Upon completion, the Object Library schema models in I4 are used to generate the actual Object Library XSD files using EA “Code Engineering”.

# Modeling Object Library XML Schemas

## Object Library XML Schema Usage

A definition of objects with all their attributes, i.e. “complete” views of objects are useful for developers of applications exchanging multiple types of messages involving the same objects. Such an applica-tion might want to define and manage the superset of all attributes of an object in its working storage.

|  |  |  |
| --- | --- | --- |
| There is one Object Library Schema per Information Domain. Classification by Information Domains is reproduced from the previous (I3 / Logical) layer.  As a reminder, the list of Information Domains is the set of blue items in the chart to the right. |  |  |

The Object Library Schema contains the artifacts listed in the below table.

|  |  |  |
| --- | --- | --- |
| **Meta-Class** | **Stereotype** | **Description** |
| Class | XSDcomplexType | Grouping of multiple elements |
| Class | XSDchoice | Grouping of alternative elements |
| Class attribute | XSDelement,  XSDattribute | Part of a complex type |
| Class | XSDsimpleType |  |
| Enumeration | XSDenumeration | Defines a list of acceptable values. |
| Class attribute | CodelistEntry | Part of an Enumeration ; one of the acceptable values. |

## Object Library XML Schema Transformation from the Logical Model

For the content of this section, please refer to T3 Guidelines, section “XML Message Schema Transformation from the Logical Model”.

Because the transformation tool is the same for XML Message Schema Transformation (T4) and XML Library Schema Transformation (I4), one common description has been included with T4.

## Object Library XML Schema Properties

The vast majority of the properties of the artifacts in the Object Library Schemas (see list in section 2.1) must not be modified at this (I4) level. This applies to standard EA properties as well as to tagged values added for our Industry Data Model such as references back to sources. All these attributes are maintained at the upper layers and derived from the logical model.

The only properties maintained at I4 level are:

* Introduce Choice structures where needed (not supported by EA at logical / PIM level).

Note: when repeating “Model Transformation” after some changes have been made to the source (logical) model, EA will “synchronize” i.e. merge changes made in the source and changes already made in the target models.

## Object Library XML Schema Namespaces

Object Library Schemas have:

* a different XMLNS for each schema,
* *no* Target Namespace specified (Chameleon approach).

XMLNS and Target Namespace are properties of the package holding the schema model. They are set up once for all for the 10 Information Domain packages.

## Object Library XML Schema Quality Assurance

* All parts of the model created through model transformation other than the items listed as being maintained in section 2.3 must remain unchanged at this level.

# Views / Diagrams

No diagrams will be used at this stage.

Model Transformation will automatically create a diagram with all artifacts. However this diagram is not needed for generation of the XSD file, nor particularly useful for comprehension or documentation.

# Package Structure

There is one package under the Governance View per Information Domain, representing its Object library schema.

|  |
| --- |
| I4 Information Physical Models  Governance View  I4-1 XML Object Library Model  <<IATA\_XSDschema>> Parties  <<IATA\_XSDschema>> Items  <<IATA\_XSDschema>> Events  <<IATA\_XSDcomplexType>> Movement  <<IATA\_XSDschema>> Places |

# Forward Engineering / Object Library XSD File Generation

|  |  |  |
| --- | --- | --- |
| To generate the XSD file, right-click on the package representing the schema in I4, then select :  Code Engineering / Generate XML Schema …  Note : this tool is a native, non-customized EA tool. |  |  |

On the “Generate XML Schema” window :

* un-check “Generate global element for all global ComplexTypes (‘Garden of Eden’ style)”,
* un-check “Generate XSD for Referenced packages”,
* un-check “Generate XSD for Child packages”,
* click on “Generate”.

No post-generation adjustments are made to the XSD file.

# Annexes

## Annex A: Glossary of this document

|  |  |
| --- | --- |
| Term | Description |
| ABIE | Aggregated Business Information Entity (LDM artifact, see I3 guidelines) |
| AIDM | Airline Industry Data Model |
| ASBIE | Association Business Information Entity (LDM artifact, see I3 guidelines) |
| BBIE | Basic Business Information Entities (LDM artifact, see I3 guidelines) |
| BDT | Business Data Type (LDM artifact, see I3 guidelines) |
| LDM | Logical Data Model |
| PRIM | Primitive Data Type (logical level artifact, see I3 guidelines) |
| Tagged Value | “Custom” properties added to the standard set of information stored with each artifact in EA, either through adding a certain “profile” (e.g. UPCC) or defined and added by the data model team. |