

Airline Industry Data Model

Information Contextual Model Guidelines

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Table of Contents

[1 Introduction 4](#_Toc11133065)

[1.1 Document Purpose and Intended Audience 4](#_Toc11133066)

[1.2 Document Context 4](#_Toc11133067)

[2 Overall Approach to defining Terms 5](#_Toc11133068)

[2.1 Approach 5](#_Toc11133069)

[3 Developing the Business Glossary 6](#_Toc11133070)

[3.1 Meta-Classes and Usage 6](#_Toc11133071)

[3.2 Document Analysis / Design Methodology 6](#_Toc11133072)

[3.3 Function and Process Model Analysis / Design Methodology 7](#_Toc11133073)

[3.4 Business Term / Class Properties 7](#_Toc11133074)

[3.5 Associations 10](#_Toc11133075)

[3.6 Views / Class Diagrams 10](#_Toc11133076)

[3.7 Rules and Quality Assurance 11](#_Toc11133077)

[3.8 Package Structure 12](#_Toc11133078)

[4 Developing Abbreviations & Acronyms 13](#_Toc11133079)

[4.1 Acronyms 13](#_Toc11133080)

[4.2 Abbreviations 13](#_Toc11133081)

[Annexes 14](#_Toc11133082)

[Annex A: References 14](#_Toc11133083)

[Annex B: Glossary 15](#_Toc11133084)

**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Date** | **Name** | **Description of change** |
| 0.1 | 27 May 2014 | Michael Thomas | Draft |
| 0.2 | 22 Jun 2014 | Michael Thomas | Incorporated answers on questions submitted to Gurpinder Gill |
| 0.3 | 09 Jul 2014 | Michael Thomas | Some minor enhancements |
| 0.5 | 02 Sep 2014 | Michael Thomas | Added picture in 2.1 Approach ;  Grouped “Rules and QA” in dedicated sections |
| 1.0 | 29 Sep 2014 | Michael Thomas | Added “New object terms must be approved by business” in two sections on Rules and QA ; Added annex “Glossary of this document” ;  Renamed to V1.0 following PADIS MW approval |
| 1.2 | 09 Mar 2015 | Michael Thomas | Changes due to integrating the Glossary into EA :  - filled in sections 3.4 - 3.9 except “Rules & QA”  - updated 2.2 Metadata Diagram  - added “Promoting Bus. Terms to Object Terms”  - changed 4.4 Taxonomy Term / Class Properties  to show only the difference with Business Terms  Refined the qualification of “nouns” in 3.1 and 4.1. |
| 1.3 | 31 Aug 2015 | Michael Thomas | Added points in 3.7 Rules and Quality Assurance  Added sections: - “Creating Objects with the right Stereotype  - “Naming Rules applying to all Objects”  Added details on changing stereotypes in 4.3  Added details on customizing the Business Glossary List View (sect.3.6) |
| 1.4 | 30 Aug 2017 | Michael Thomas | Tweaking lists of sample concepts in Annex A  (Info Domain Descriptions),  Explanation of #EndOfDef# in section 3.4,  Handling of Abbreviations & Acronyms, section 3.7  Additions to Rules and Quality Assurance, sect.4.7 |
| 1.5 | 3 Dec 2018 | Graham Ferguson | Added Abbreviations & Acronym section.  Align document with EA content |
| 1.6 | 16 Jan 2019 | Graham Ferguson | Removed references to Subject, Predicate & Object and removed Annex A. |
| 1.7 | 06 Feb 2019 | Graham Ferguson | Updated diagrams and changed fluidity of some text.  Removed Annex A - Information Domain Descriptions  Removed Annex B - Sample Taxonomy of Terms |
| 1.8 | 25 Feb 2019 | Graham Ferguson | Incorporated changes to organization structure. |
| 1.9 | 9 Apr 2019 | Graham Ferguson | Revised Terms Venn Diagram.  Removed references to Taxonomy Section. |
| 2.0 | 10 Jun 2019 | Graham Ferguson | Moved sections relating to the entire AIDM to AIDM Guidelines. |

# Introduction

## Document Purpose and Intended Audience

The purpose of this document is to describe how to develop the contextual layer of the information pillar (partition “I1”), of the AIDM (Airline Industry Data Model).

Partition I1 has 4 parts: Archetype Model, Business Glossary, Abbreviations, and Acronyms. The definition of the Archetype Model has been done once and for all, thus does not require guidelines for additional modeling. The present document will therefore address the latter three parts.

The intended audiences of this document are all individuals involved in defining terms:

* members of PSC (Passenger Services Conference) Standards application work-groups defining terms as part of BRD development,

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

This document is owned by the Methodology Group operating under the Architecture, Technology & Strategy Board.

## 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, which include “I1”, are platform-independent. The present guidelines will therefore be (partly) EA specific, but agnostic to the target messaging standard (e.g. XML).

The present guidelines are for manual definition of terms. They do not make usage of algorithms or specialized tools for word extraction and tagging from large texts, which is not envisaged for now within the Data Model activities.

# Overall Approach to defining Terms

## Approach

The Business Glossary holds the noun concept and primary construct terms obtained from analysis of the vocabulary of the industry, these Business Terms are words or symbols used to describe a thing or concept of interest to an organization. The glossary also holds traceability references back to Resolutions/RPs, and/or sources in general.

Sources of terms may include Resolution and Recommended Practice manuals, any other documents that describe the business, BRDs, business function and process models, existing standards (XSDs, EDIFACT, Implementation Guides), or airline or IT supplier Data Models that we leverage as an input.

Business Terms from the glossary in conjunction with external sources are then analyzed to enable the creation of a target, hierarchical, consistent, and controlled vocabulary, the Taxonomy of Terms, organized in the Generalization / Specialization hierarchy of the Integrated LDM (Logical Data Model, see partition “I3”).

Definitions of Business Terms in the Business Glossary will generally be copied from their sources.   
A given Business Term can occur several times with different definitions from different sources, contexts, resolutions, etc. or corresponding to a new proposed version. Definitions of terms in the Taxonomy need to be thoroughly defined and approved, leveraging public dictionaries (for upper level terms), Resolutions, RPs and existing standards, and adding clarifications and examples as appropriate.   
The definition of a Term in the Taxonomy will be the one elected amongst all definitions of this term in the Glossary and in other recognized external sources.

One special RP is RP1008 which actually holds a glossary of terms, without including all domain specific variations though. Our aim (endorsed by PSC in 2014) is that RP1008 be a subset of the Business Glossary, with matching definitions. As such RP1008 is mastered and maintained in the AIDM from which it is published. The below picture depicts how the Business Glossary, RP1008, and the Taxonomy relate to each other.

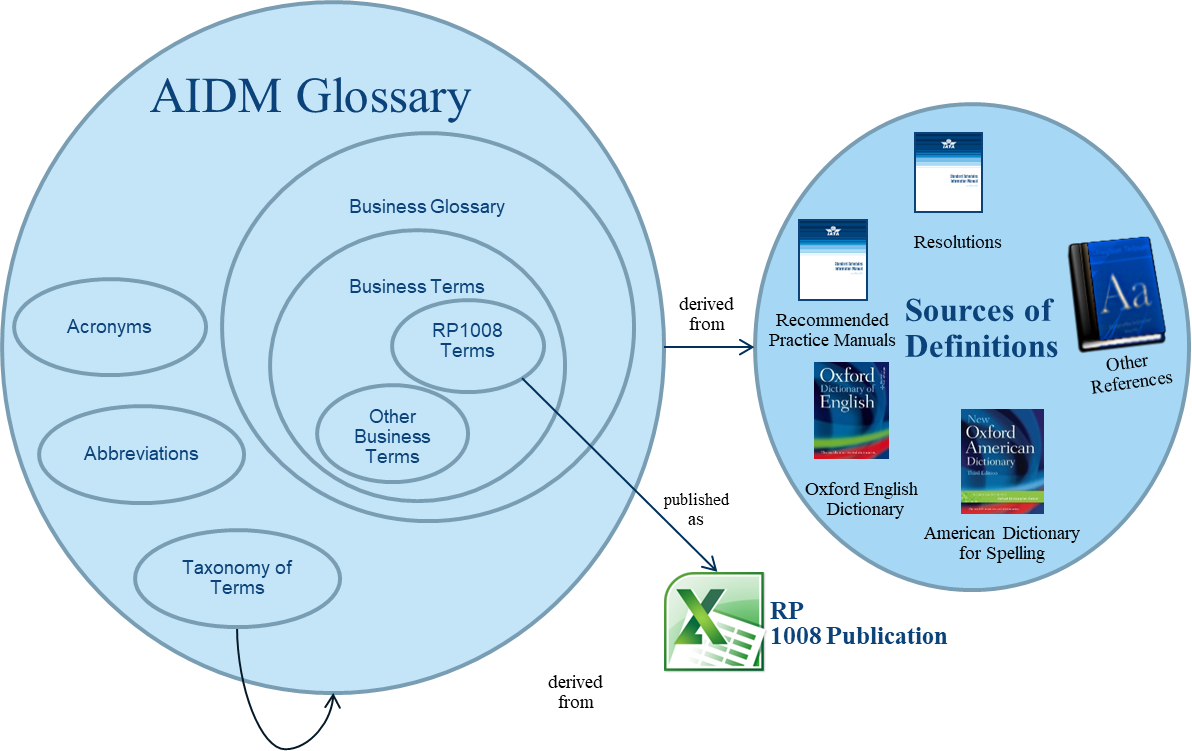


Figure - Relationship between sets of Terms

# Developing the Business Glossary

## Meta-Classes and Usage

Business Terms should be nouns. They may be composite nouns and they can also include words other than nouns, for example:

* Bag Tag (composite term with two nouns),
* Operating Carrier (composite term with a noun qualified and preceded by an adjective).

The Business Glossary will contain all relevant terms used by the business, including:

* Names of concepts
* Terms simply used in descriptions
* Terms that reflect or appear in an attribute but not an object class
* Conflicting terms used by different business domains yet falling into the same subject domain (not allowed in the taxonomy).
* Terms used in existing Resolutions and RPs.

The Business Glossary is a flat list of “class” items:

|  |  |  |
| --- | --- | --- |
| **Meta-Class** | **Stereotype** | **Description** |
| Class | IATA\_ BusinessTerm | Noun concept and primary construct terms obtained from analysis of the vocabulary of the industry e.g. Passenger, Airline Designator, and Bag Tag. |

## Document Analysis / Design Methodology

Document analysis relies on the fact that written sentences have a structure, namely the parts of sentences that include the subject, predicate and object parts. The subject and object parts of sentences are often Nouns and the predicate parts are Verbs. The parts of sentences are manually or electronically tagged.

Terms are extracted from business documents that describe domain activities using term extraction tools. Some ontology modelling tools have technology extensions that provide term extraction functionality. The scope of this document is on the manual extraction of terms and so the procedure for doing this will be described here.

|  |  |
| --- | --- |
| For example, in the text below, one may manually tag the parts of sentences highlighted in red as follows:  “A Passenger arrives at the Airport to board a Flight. The Passenger purchased a ticket that entitles her to a flight experience and a boarding pass that is permission to board an Aircraft. The Passenger checks-in a luggage and board the Flight with her handbag” |  |

## Function and Process Model Analysis / Design Methodology

Function maps, use case diagrams and process diagrams are also useful sources of terms. Activities in function/process models are named according to the pattern “verb object”. The names of the functions are sources of candidate nouns and verbs.

For example, in the function map (Passenger Journey) and use case diagram below, using the naming format above enables the identification of terms. The terms include Ticket, Airport, Purchase, Travel, Luggage, Flight, Check-In and Board. The Nouns are labels for concepts while the verbs are used to relate the concepts in the concept layer.

## Business Term / Class Properties

|  |  |  |
| --- | --- | --- |
| Business Terms are created using the diagram “Glossary of Terms”; which displays in a “List View”. When opening this list, the appropriate toolbox is automatically displayed.  To create a new term, drag and drop “Business Term” from the toolbox into the list. To modify an existing term, double-click on it or modify directly the values from the list (see section Views / Class Diagrams for limitations). |  |  |

Unlike terms in the Taxonomy, Business Terms are not categorized by Information Domains.

The table below shows how to fill the fields in each tab (light blue lines) of the EA Properties window.

| **Property** | **M/O** | **Constraints & Rules** | **Usage/Comment** | **Example** |
| --- | --- | --- | --- | --- |
| *General :* |  |  |  |  |
| Name | M | Noun(s), Blanks between words,  US English spelling |  | Passenger, Airline Designator,  Baggage Tag |
| Stereotype | D | IATA\_BusinessTerm | is set automatically by drag & dropping from the toolbox |  |
| Alias | – |  | not used |  |
| Keywords | – |  | not used |  |
| Author | D | “user name of author” |  |  |
| Language | D | Always : <none> | not used / PIM |  |
| Status | M | Proposed  Validated  Approved  On Hold | = initial  = by Change Management and AIDM Integration Group  = by ATS Board  = collected but put on hold until later design |  |
| Complexity | D | Always : Easy | not used |  |
| Version | D | Always : 1.0 | not used |  |
| Phase | D | Always : 1.0 | not used |  |
| Notes | M | US English spelling,  When a word in the Notes text is to be put between quotes, use single quotes (‘) rather than double quotes. | Plain English definition of the term. See “Specific Convention on Cut-off point” below this table. |  |
| *Details :* |  |  |  |  |
| (entire Tab) | – |  | not used |  |
| *Templates :* |  |  |  |  |
| (entire Tab) | – |  | not used |  |
| *Advanced :* |  |  |  |  |
| (entire Tab) | – |  | not used |  |
| *IATAProfile :* |  |  |  |  |
| IATA Terms Source :  - Src Organization  - Src Reso/RP Nb  - Src Doc & Version  - Src Location in Doc | M | At least the source organization should be filled in (e.g. Oxford Dictionary) | Source used for the definition:  IATA Resolution or RP,  IATA other source, other Organization, Dictionary.  When a definition is created from scratch for the AIDM, indicate ”AIDM” in Src Org. | IATA  Reso 740  PSCRMe34  Attachment A |
| IATA Terms Other : |  |  |  |  |
| - Business Domain | M | Select one from drop-down menu | Stakeholder View or “cross-domain” | Passenger Services |
| - Part of ToT | (M) | Y or N | Should this term be part of the Taxonomy of terms. May be blank as long as a project has not decided. |  |
| - Equivalent in ToT | O |  | Equivalent term when a “competing term” has been preferred over the present one, for the target vocabulary in the taxonomy |  |
| - Related terms  (type of relation) | O | types of relation :  synonym, hyponym, hypernym, abbreviation, expansion | List of related term(s), each followed by type of relation between parentheses. | for “Passenger” :  Traveler(synonym) |
| - Projects | O |  | Comma-separated list of pro-jects for which the term should be included in any reports. | Flight, Pax |
| - RP1008 current | M | Y or N | Is this term and definition currently part of RP1008 ? |  |
| - RP1008 proposed | M | Y or N | Are we proposing to make this new or changed definition part of RP1008 ? |  |
| *Tagged Values :* |  |  |  |  |
| (entire Tab) | – |  | not used |  |
| *Requirements :* |  |  |  |  |
| (entire Tab) | – |  | not used |  |
| *Constraints :* |  |  |  |  |
| (entire Tab) | – |  | not used |  |
| *Scenarios :* |  |  |  |  |
| (entire Tab) | – |  | not used |  |
| *Files :* |  |  |  |  |
| (entire Tab) | – |  | not used |  |
| *Links :* |  |  |  |  |
| (entire Tab) | – |  | not used |  |

D= Default ; M= Mandatory ; O= Optional ; – = Leave empty ; grey = no need to touch

Specific Convention on Cut-off point for term notes / definitions:

It is sometimes desirable to document key considerations or rules in addition to the core definition of a term. In this case, the cut-off symbol **#EndOfDef#** can be used to indicate the end of the core definition. The text following the symbol will be:

* included and printed into the RP1008 Glossary of terms and BRD documents;
* carried forward into concept and logical model entity definitions;
* excluded from UN/CEFACT tagged value “Definition” when populated from the logical model entities. Note these definitions are limited to 255 chars so it is recommended to place the cut-off symbol at most at 255 characters for any notes exceeding 255 in total, so as to avoid arbitrary truncation;
* excluded from XML annotations generated from the above, thereby ensuring “reasonable” size annotations.

Example: Definition of IATA Aircraft Type:

|  |
| --- |
| Grouping of aircrafts with the same form, function and specification, currently flown, or soon to be flown. Possible types are defined in the IATA SSIM.  #EndOfDef#  The same type may include aircrafts with different technical specifications such as engines, range, cockpit or configuration. |

## Associations

No associations are used between Business Terms.

## Views / Class Diagrams

There is one List View for the Business Glossary in the AIDM, both for viewing and editing terms; based on an underlying diagram (which by default opens in “List View”) that contains all Business Terms. The screen-shot below shows a sample extract.



Note the following Display features:

* In case they are not already open in your Enterprise Architect workspace, it is recommended to open the “Notes” as well as the “Tag Values” windows through the main menu bar View button. The “Notes” window will then display the definition of the term currently selected (see bottom left side on the screen-shot), and the “Tag Values” window will display all the tagged values such as reference back to IATA Resolutions.
* Additional columns can be added to the List View from the:
  + standard fields; by right-clicking on the column headings bar then select Field Chooser.
  + tagged values; by right-clicking on one of the terms in the list then select Add Tag Value Column.

Changes made to the layout of the List View are recorded for the specific user and will come up automatically next time the user opens the list again.

* All terms including certain letters can extremely easily be short-listed by typing the letters in the filter line below name.

Note the following Edit features and restrictions:

* When adding terms, always add while on the diagram, using the associated IATA toolbox. This will make sure the term belongs to the diagram and appears in the List View.
* Changes can be made by double-clicking hence opening a term. For the fields in the lists that are not tagged values (Name, Notes, Author), changes can also be made directly on the list.
* Terms cannot be locked from the List View. This needs to be done from the EA project browser before modifying a term.

## Rules and Quality Assurance

1. Terms are in singular form (unless the concept itself is plural, e.g. “Maximum Weights” because there are different types of Maximum Weights).
2. No Abbreviations are used in terms and in the platform independent models in general.   
   Note that a list of approved abbreviations defined in guideline document “AIDM Guidelines - Standard Abbreviations and Acronyms.xlsx” will be automatically applied upon generation of XML schema tags (e.g. Information is substituted by Info). See also next point: “acronyms”.
3. The list of approved acronyms in EA package “AIDM Development.I1 Information Contextual Models.Governance View.I1-4 Abbreviations & Acronyms.Acronyms” must be used where the words appear. For each acronym, the spelled out term must be created as well, with the definition simply referring to the acronym term. E.g. EMD, ISO, PTC, URL. See definition of “Acronym” in Annex B.
4. Terms start with an upper case character followed by lower case characters; unless they are an acronym (see Section 6 Naming Rules applying to all Objects).
5. Terms may encompass multiple words, in which case each word should start with a Capital letter.
6. Definitions of Terms should not repeat the term in its beginning (e.g. the definition of “Flight Designator” should not say “Flight designator is an identifier that consists of the airline code, the flight number and an optional operational suffix”, but rather “an identifier that consists …”)
7. Definitions of Terms should be understandable by someone non expert in the specific domain (e.g. Ticketing) yet expert in the airline industry. Note that definitions can reference other terms defined in the Business Glossary.
8. The Business Glossary may have multiple versions of the same term related to multiple domains, with domain-specific definitions.
9. If a term is flagged to be or become part of the Taxonomy of Terms, then it should have a definition appropriate for all domains that the term is applicable to.
10. For traceability back to source of terms, the highest priority reference only should be recorded. Priorities by decreasing preference are :
    1. Resolution
    2. RP other than 1008
    3. RP 1008
    4. BRD
    5. Implementation Guide
    6. Non IATA sources
    7. Definition created by the AIDM modeler

Note: A reference to source of terms should be made only when the term has the same name, AND when the definition was “largely” copied from that source. When the definition from the source was changed, the words “enhanced” or “expanded” should be added to the name of Resolution or RP referenced (e.g. “RP766 expanded”).

1. The following categories of terms should be excluded from the Business Glossary :
   * Terms relevant for Teletype or Edifact implementation only of message standards
   * Names of countries and regions.
2. Traceability Reference back to source is mandatory. The highest level reference information may indicate IATA or other organizations, e.g. :
   * IATA
   * UN/CEFACTBA
   * Oracle
   * AIDM (Airline Industry Data Model initiative)
3. New business terms must be reviewed and approved by airline business experts.

## Package Structure

|  |  |  |
| --- | --- | --- |
| The Business Glossary diagram (diagram) List View, as well as the individual terms, are located in EA package “AIDM Development.I1 Information Contextual Models.Governance View.I1-2 Business Glossary”. |  |  |

# 

# Developing Abbreviations & Acronyms

## Acronyms

Approved acronyms must be used in all platform independent models and by corollary all platform dependent models. As acronyms affect the names referenced in software due consideration must be given to the impact of introducing new or changing existing acronyms.

|  |  |
| --- | --- |
| C:\Users\Ferguson\AppData\Local\Microsoft\Windows\INetCache\IE\SZEB1L7C\gnome-dictionary_lucid_00[1].png | *An Acronym is a word formed from the initial letters or groups of letters of words in a set phrase or series of words and pronounced as a separate word.* |

The list of allowable abbreviations can be found in the package “I1-4 Abbreviations & Acronyms” in the AIDM.

## Abbreviations

Abbreviations must not be used in a platform independent model. They are only used in platform dependent models to reduce the length of names of data elements and serve no other purpose. As abbreviations affect the names referenced in software due consideration must be given to the impact of abbreviating a word or phrase already in use, or altering or removing an existing abbreviation.

|  |  |
| --- | --- |
| C:\Users\Ferguson\AppData\Local\Microsoft\Windows\INetCache\IE\SZEB1L7C\gnome-dictionary_lucid_00[1].png | *An Abbreviation is a shortened form of a word or phrase.* |

Abbreviations are applied automatically to XSD schema tags by the XSD Transformation script in the AIDM Tool.

The list of allowable abbreviations can be found in the package “I1-4 Abbreviations & Acronyms” in the AIDM Repository.

# Annexes

## Annex A: References

1. ISO 704:2009. Terminology work -- Principles and methods
2. ISO 860:2007. Terminology work -- Harmonization of concepts and terms
3. ISO 1087:2000. Terminology Work – Vocabulary. Part 1. Theory and Applications.
4. ISO 1087:2000. Terminology Work – Vocabulary. Part 2. Computer Applications.
5. ISO 24156: 2008. Guidelines for Using UML Notation in Terminology Work
6. Business Rule Concepts. Getting to the Point of Knowledge. Ronald Ross.
7. Building Enterprise Information Architectures. Reengineering Information Systems. Melissa Cook (Chapters 4 & 6)
8. A Concept Map-Based Knowledge Modeling Approach to Expert Knowledge Sharing by [John W. Coffey](http://www.ihmc.us/users/user.php?UserID=jcoffey), [Robert R. Hoffman](http://www.ihmc.us/users/user.php?UserID=rhoffman), [Alberto J. Cañas](http://www.ihmc.us/users/acanas) & [Kenneth M. Ford](http://www.ihmc.us/users/user.php?UserID=kford)
9. The Theory Underlying Concept Maps and How to Construct and Use Them by [Joseph D. Novak](http://www.ihmc.us/users/user.php?UserID=jnovak) & [Alberto J. Cañas](http://www.ihmc.us/users/acanas)
10. <http://wordnetweb.princeton.edu/perl/webwn?s=wordnet>
11. The W5H interrogatives for Knowledge and Fact finding and organizing : Where, What, Who, Why, When and How. Used as perspectives in the Zachman enterprise architecture frame-work. Also used for building effective object models (see Java Design by Peter Coad for a pragmatic agile usage. See introduction in <https://en.wikipedia.org/wiki/Object_Modeling_in_Color>.

## Annex B: Glossary

|  |  |
| --- | --- |
| Term | Description |
| Acronym | Initialism; often pronounced as a word (e.g. ICAO, ISO). |
| AIDM | Airline Industry Data Model. |
| Hypernym | A word with a broad meaning constituting a category into which words with more specific meanings fall; a superordinate. For example, color is a hypernym of red. Contrasted with hyponym. |
| Hyponym | A word of more specific meaning than a general or superordinate term applicable to it. |
| Metadata | A set of data that describes and gives information about other data. In our case, all contents of the Data Model repository are metadata. |
| Package | A package is a container for the definitions of elements such as classes, use cases, and components. A package can also contain other packages. Packages are represented in UML 2.1 as folders and contain the elements that share a namespace. |
| Ontology | In computer and information science, ontologies are used to formally represent knowledge within a domain. An ontology is defined as a formal, explicit specification of a shared conceptualization. It provides a common vocabulary to denote the types, properties and interrelationships of concepts in a domain.  Ontologies are the structural frameworks for organizing information and are used in artificial intelligence, the Semantic Web, systems engineering, software engineering, biomedical informatics, library science, enterprise bookmarking, and information architecture as a form of knowledge representation about the world or some part of it. The creation of domain ontologies is also fundamental to the definition and use of an enterprise architecture framework. |
| RP | IATA Recommended Practice |
| Tagged Value | A field added to the Enterprise Architect tool, through the modeling profile created for the AIDM, appearing in the Properties window of model artifacts, or also on the list view of diagrams. |
| UML | Unified Modeling Language |
| XSD | An XML Schema |