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Data Model and Exchange Working Group

Data Model and Exchange Working Group (DMEWG)
And the Common Data Model

Ryan Augsburger
The Boeing Company
Leif Gyllström
Saab Support & Services

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Vienna, 2013-09-19

AIA

ASD

Agenda

1. DMEWG Charter
2. Common Data Model
3. S9000D Dictionary
4. Supporting Public Deliverables

DMEWG Charter

Purpose

- The purpose of the Data Model and Exchange Working Group (DMEWG) is to coordinate data modeling activities that are performed within the respective ASD ILS Specification, and to harmonize and consolidate data requirements into one common ASD data model, using UML.

- The common data model must include all data elements that are common to more than one ASD/AIA S-series specification. Data that are just delivered from one spec to the customer, but are neither used by another spec nor matches any feedback data, can be excluded.

DMEWG Charter

Purpose

- Data elements and business terms defined within any ASD/AIA S-Series specification shall be published by the DMEWG as a separate specification, S9000D (Dictionary).

DMEWG Charter

Purpose

- The DMEWG shall also be responsible for the governance, review and publication of Aerospace and Defense Data Exchange Specifications (AD DEXs), using ISO 10303:239 Product Life Cycle Support (PLCS). Initiation to develop or enhance the capability of a specific DEX is under the responsibility of the respective ILS specification. Development of DEXs, or the enhanced capability, is managed by DMEWG but is tasked to a dedicated multi-discipline Task Teams.

Common Data Model
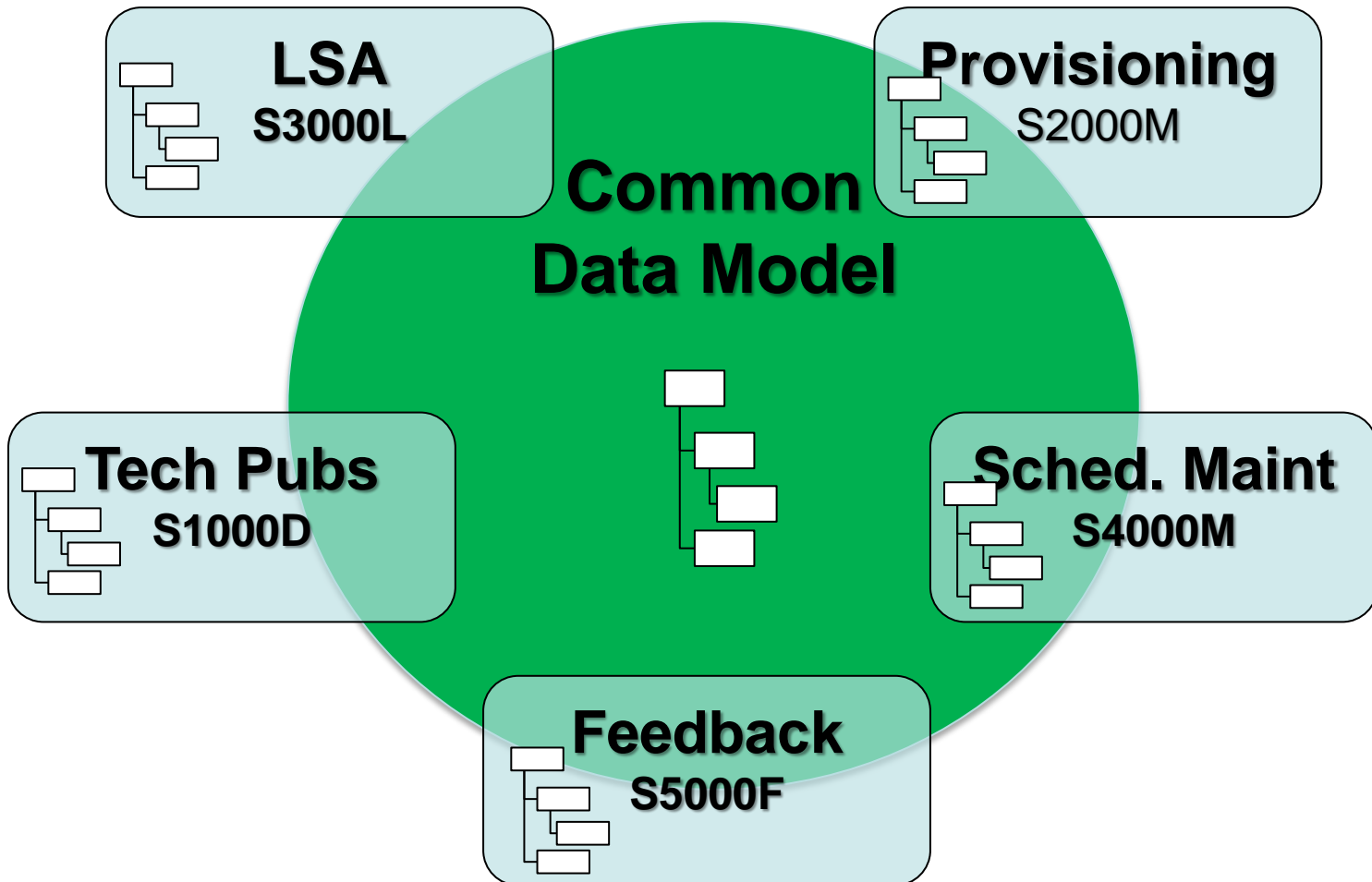
Common Data Model

Common Data Model

- Common Data Model in UML to be used by the respective S-Specification

Published representations of the Common Model

- How to read and use the model (reusable in each of the S-Specs)
- The Common Model in a format(s) for people without UML tools

Common Data Model

Important Decisions

- The CDM represents the harmonized end-state terminology/model for all the S-Specs, not the current individual terminology/models used in the respective S-Specs. The aim is to have the S-Specs adopt the harmonized CDM terminology/model in future releases

- Use Enterprise Architect for documenting the Common Data Model. Ideally we would like to use the latest version, but need to verify compatibility with older versions before approving use of a later version

- Predicated upon ISO 10303:239 Product Life Cycle Support (PLCS) to enable easy mappings to PLCS Data Exchange Specifications (DEXs) and PLCS based Data Consolidation

Common Data Model Plan

Issue 0.1

- To be published at the end of year 2013
- Based upon common data elements between S1000D and S3000L as defined in S1003X
- The first release of the data model will be labeled 0.1 (for internal use only).
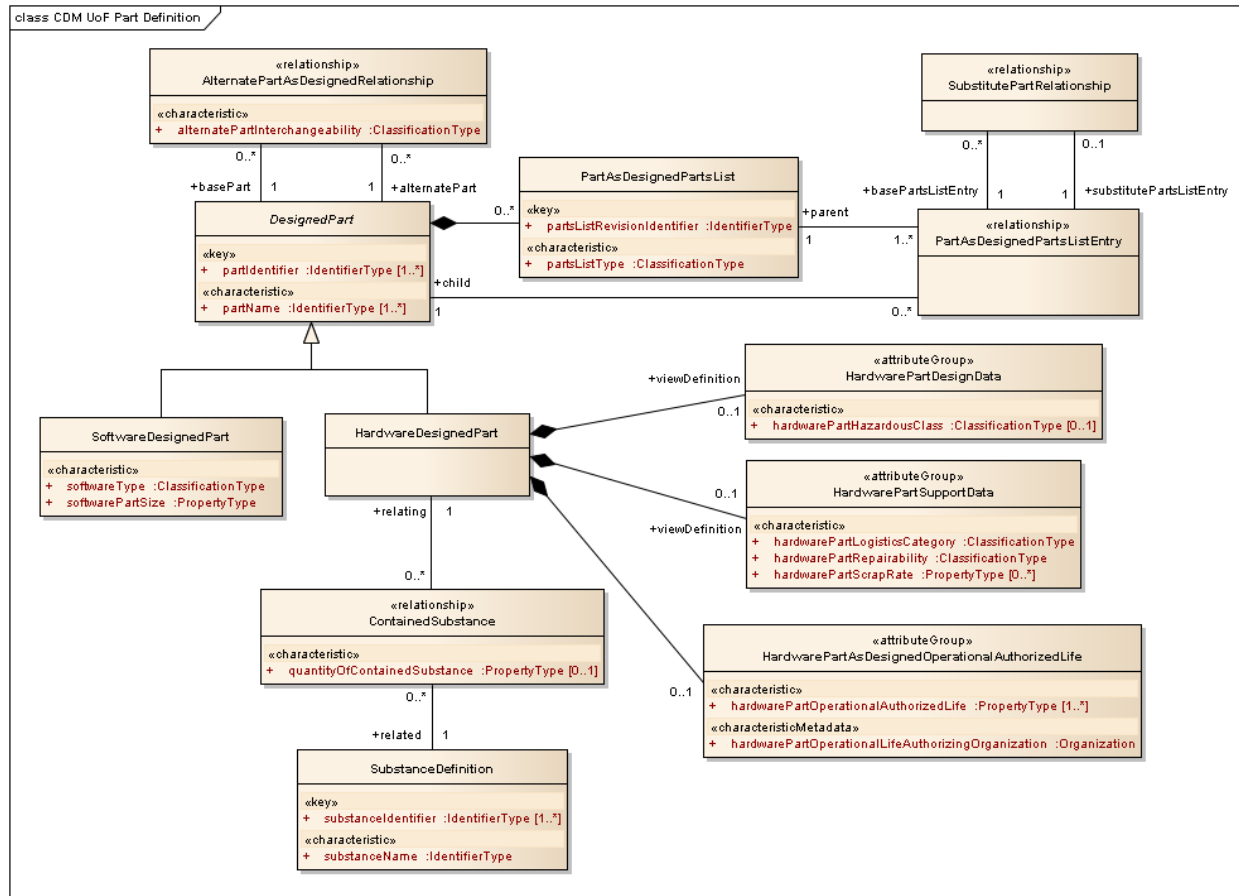
Common Data Model Plan

Issue 0.1

- The scope will consist of the following UoFs:
  - Project
  - Breakdown Structure
  - Part Definition
  - Breakdown Element Realization
  - Breakdown Zone Element
  - Product Variant Applicability (Allowed Product Configuration)
  - Security Classification
  - Applicability Statement
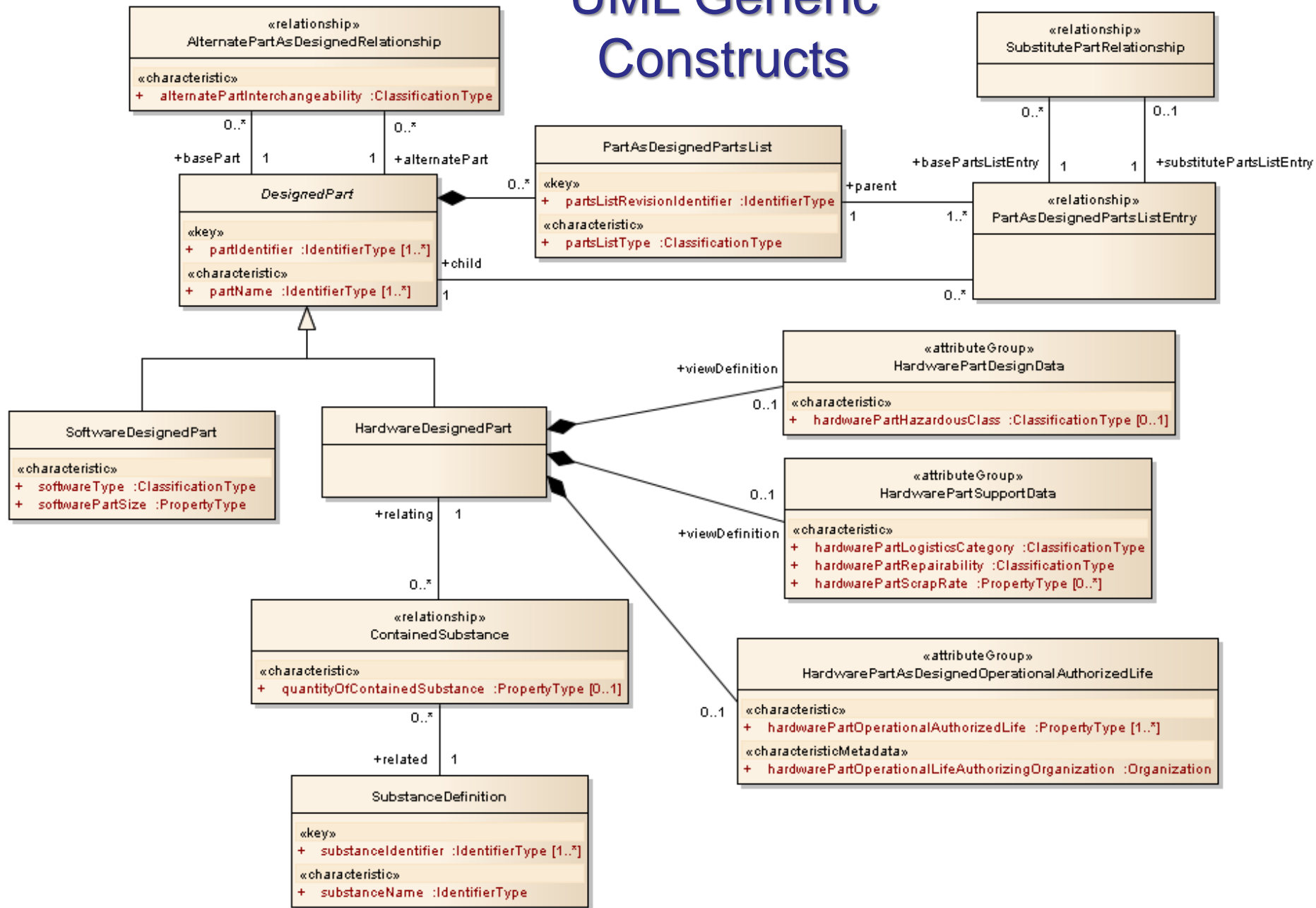 - Change Information

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UoF Part Definition

UML Generic Constructs

«relationship»
AlternatePartAsDesignedRelationship

«characteristic»
+   alternatePartInterchangeability :ClassificationType

«relationship»
SubstitutePartRelationship

0..*   0..*

+basePart   1   1   +alternatePart

PartAsDesignedPartsList

«key»
+   partsListRevisionIdentifier :IdentifierType

«characteristic»
+   partsListType :ClassificationType

0..*

+basePartsListEntry   1   1   +substitutePartsListEntry

+parent

DesignedPart

«key»
+   partIdentifier :IdentifierType [1..*]

«characteristic»
+   partName :IdentifierType [1..*]

0..*

1

«relationship»
PartAsDesignedPartsListEntry

+child

1

1..*

0..*

SoftwareDesignedPart

«characteristic»
+   softwareType :ClassificationType
+   softwarePartSize :PropertyType

HardwareDesignedPart

+viewDefinition

0..1

«attributeGroup»
HardwarePartDesignData

«characteristic»
+   hardwarePartHazardousClass :ClassificationType [0..1]

0..1

«attributeGroup»
HardwarePartSupportData

«characteristic»
+   hardwarePartLogisticsCategory :ClassificationType
+   hardwarePartRepairability :ClassificationType
+   hardwarePartScrapRate :PropertyType [0..*]

+viewDefinition

+relating   1

0..*

«relationship»
ContainedSubstance

«characteristic»
+   quantityOfContainedSubstance :PropertyType [0..1]

0..1

«attributeGroup»
HardwarePartAsDesignedOperationalAuthorizedLife

«characteristic»
+   hardwarePartOperationalAuthorizedLife :PropertyType [1..*]

«characteristicMetadata»
+   hardwarePartOperationalLifeAuthorizingOrganization :Organization

0..*

+related   1

SubstanceDefinition

«key»
+   substanceIdentifier :IdentifierType [1..*]

«characteristic»
+   substanceName :IdentifierType

DMEWG UML Writing Rules

«relationship»
AlternatePartAsDesignedRelationship

«characteristic»
+   alternatePartInterchangeability :ClassificationType

«relationship»
SubstitutePartRelationship

PartAsDesignedPartsList

«key»
+   partsListRevisionIdentifier :IdentifierType

«characteristic»
+   partsListType :ClassificationType

0..*   0..*

+basePart   1   1   +alternatePart

+basePartsListEntry   1   1   +substitutePartsListEntry

0..*   0..1

DesignedPart

«key»
+   partIdentifier :IdentifierType [1..*]

«characteristic»
+   partName :IdentifierType [1..*]

0..*   +parent

1   1..*

«relationship»
PartAsDesignedPartsListEntry

+child

1   0..*

SoftwareDesignedPart

«characteristic»
+   softwareType :ClassificationType
+   softwarePartSize :PropertyType

HardwareDesignedPart

+viewDefinition

«attributeGroup»
HardwarePartDesignData

0..1

«characteristic»
+   hardwarePartHazardousClass :ClassificationType [0..1]

«attributeGroup»
HardwarePartSupportData

0..1

«characteristic»
+   hardwarePartLogisticsCategory :ClassificationType
+   hardwarePartRepairability :ClassificationType
+   hardwarePartScrapRate :PropertyType [0..*]

+viewDefinition

+relating   1

0..*

«relationship»
ContainedSubstance

«characteristic»
+   quantityOfContainedSubstance :PropertyType [0..1]

0..*

+related   1

SubstanceDefinition

«key»
+   substanceIdentifier :IdentifierType [1..*]

«characteristic»
+   substanceName :IdentifierType

0..1

«attributeGroup»
HardwarePartAsDesignedOperationalAuthorizedLife

«characteristic»
+   hardwarePartOperationalAuthorizedLife :PropertyType [1..*]

«characteristicMetadata»
+   hardwarePartOperationalLifeAuthorizingOrganization :Organization
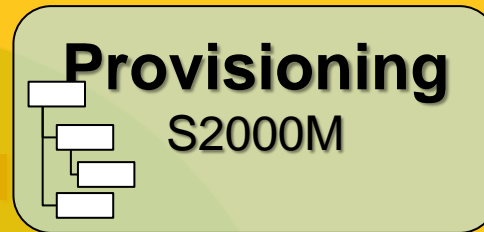
S9000D Dictionary
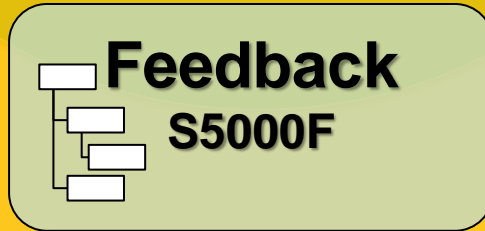
- Terms/Abreviations/Acronyms and definitions
- All S-Spec data elements/attributes and definitions

S9000D Dictionary

dmewg — Data Model and Exchange Working Group

LSA S3000L

Provisioning S2000M

S9000D Dictionary

Common UML Model

Tech Pubs S1000D

Sched. Maint S4000M

Feedback S5000F

S9000D Dictionary

Decisions

- S9000D will NOT include terms and definitions from past issues of the respective ILS S-Specs UNLESS the respective spec committee requests inclusion of a past issue and provides the required information.

- The S9000D Dictionary will be published as an electronic product, it will not be published as a paper-based publication (although the electronic product may have a print capability).

S9000D Dictionary - Plan

Issue 0.1

- To be published at the end of year 2013
- Contains definitions for Classes and attributes used in the Common Data Model Issue 0.1

S9000D Dictionary
Writing Rules for Definitions

Layout: Each definition must have 3 parts

1. The term (phrase) to be defined
2. The class of object or concept
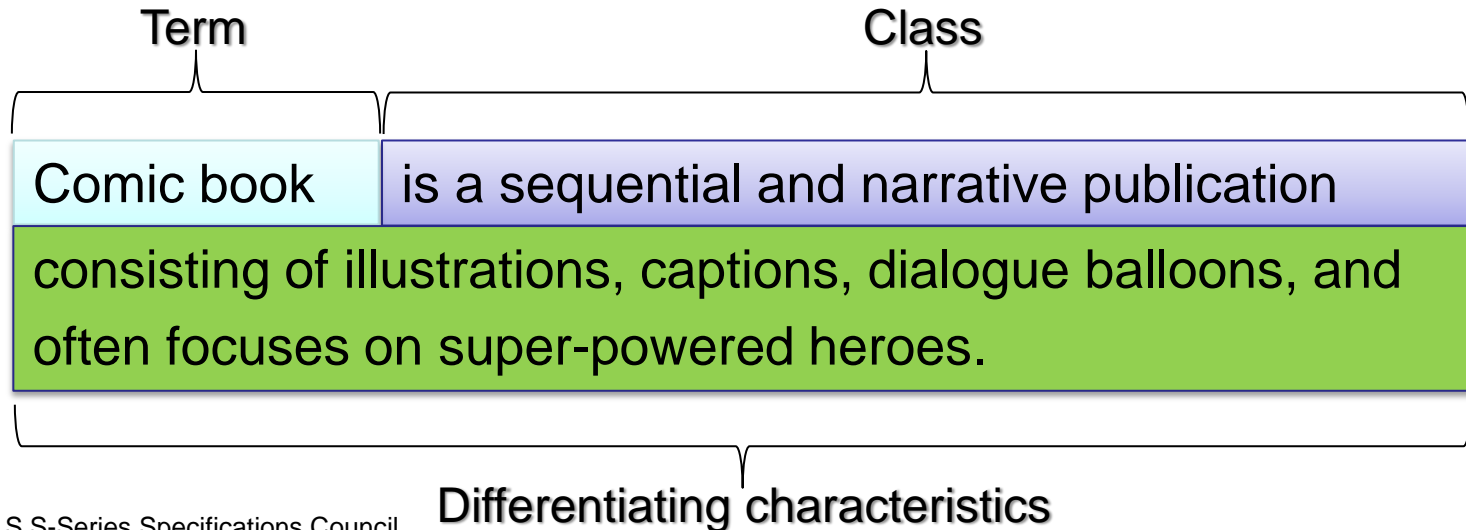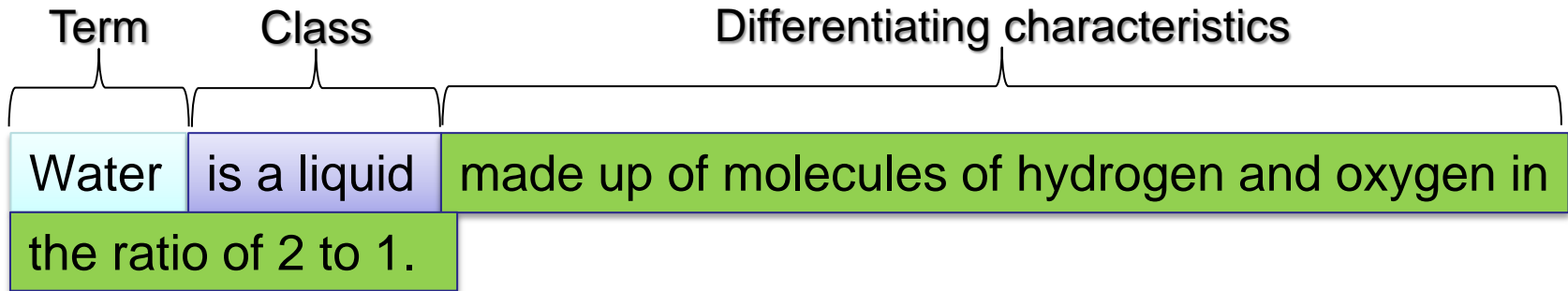3. The differentiating characteristics that distinguish it from all others in its class

Selected Writing Tips

- The definition must not be circular; the term must not be part of the definition
- The definition should be clear to allow only one interpretation
- Avoid definitions like "X is when" and "X is where"
- Define a term in simple and familiar words
- A definition should be expressed in the singular
- Avoid adding personal details to definitions

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Generic Examples:

Term | Class | Differentiating characteristics

| Water | is a liquid | made up of molecules of hydrogen and oxygen in the ratio of 2 to 1. |

Term | Class

| Comic book | is a sequential and narrative publication |

consisting of illustrations, captions, dialogue balloons, and often focuses on super-powered heroes.

Differentiating characteristics

DMEWG Examples

1. **partIdentifier**
   The partIdentifier is a string of characters that are unique to the issuing organization which is used to designate a part as designed and to differentiate it from other parts as designed.

2. **partName**
   The partName is a word or phrase by which the part as designed is known and can be easily referenced.

3. **AlternatePartAsDesignedRelationship**
   The AlternatePartAsDesignedRelationship is an interchangeability relationship where one (the "relating") as designed part can replace another (the "related") as designed part in all it's uses, is context independent, and is fit, form and function equivalent.

Supporting Public Deliverables

UML Writing Rules and Style Guide

- Version of UML
- Naming conventions of models and elements within models
- UML tools
- UML writing rules (how to write definitions, relationships, etc)
- Stereotypes and predefined classes documentation
- Modelling conventions

UML profile

- Set of stereotypes
- Predefined classes

Supporting Public Deliverables

DEX Writing Rules and Style Guide

- Version of PLCS and S-Specs
- DEX development tool set
- Rules for use of OWL
- Guidance in addition to OASIS
- (Set of basic building blocks/templates)

S9000D Dictionary Style Guide

- Data structure requirements
  - Ex: OWL file with mandatory and optional fields
- Content requirements
  - Included / excluded content
  - References where used (internal/external)?
- Revision process

Questions?