OSLC PLM Workgroup

Working meeting

Aug 24th 2010

open-services.net

V0.2

Organisers today

- Workgroup lead: Rainer Ersch, Siemens
- Coordinator: Gray Bachelor, IBM

Today's agenda

- Roll call and brief introductions - welcome new members
- Objective for today's meeting - Discuss support for the traceability scenarios within the SE Scenario #1
- Overview and discussion on representation of context and implementation using core of STEP
- Discuss traceability scenarios within SE Scenario #1
- Overview and discussion representing STEP as resources
- Next steps for working with the OSLC SPECS
- Dates of next meetings- proposed a Sept 7th and Sept 21st
- AOB
- Summary and close

Today's objectives

1. To discuss the product context and implementation based upon STEP
2. To agree an approach to define an initial resource definition for context and implementation

A note about today's materials

- For discussion
  - These materials may not fully represent the state of the art
 - Gathered from public web sources

Discussion for today

- How to represent the context and implementation in the Scenario #1 ?
- What aspect of STEP to focus on ?
- Which standard is most useful ?
- What representation is most useful ?
- What work has been done that we can build off ?
- What do we need to achieve ?
  - Using RDF ?
  - Using OWL ?
- How to use the SUV model as an example ?
- What about the traceability scenarios ?

STEP Key Product Structure Concepts

- Acknowledgement: Mike Loeffler
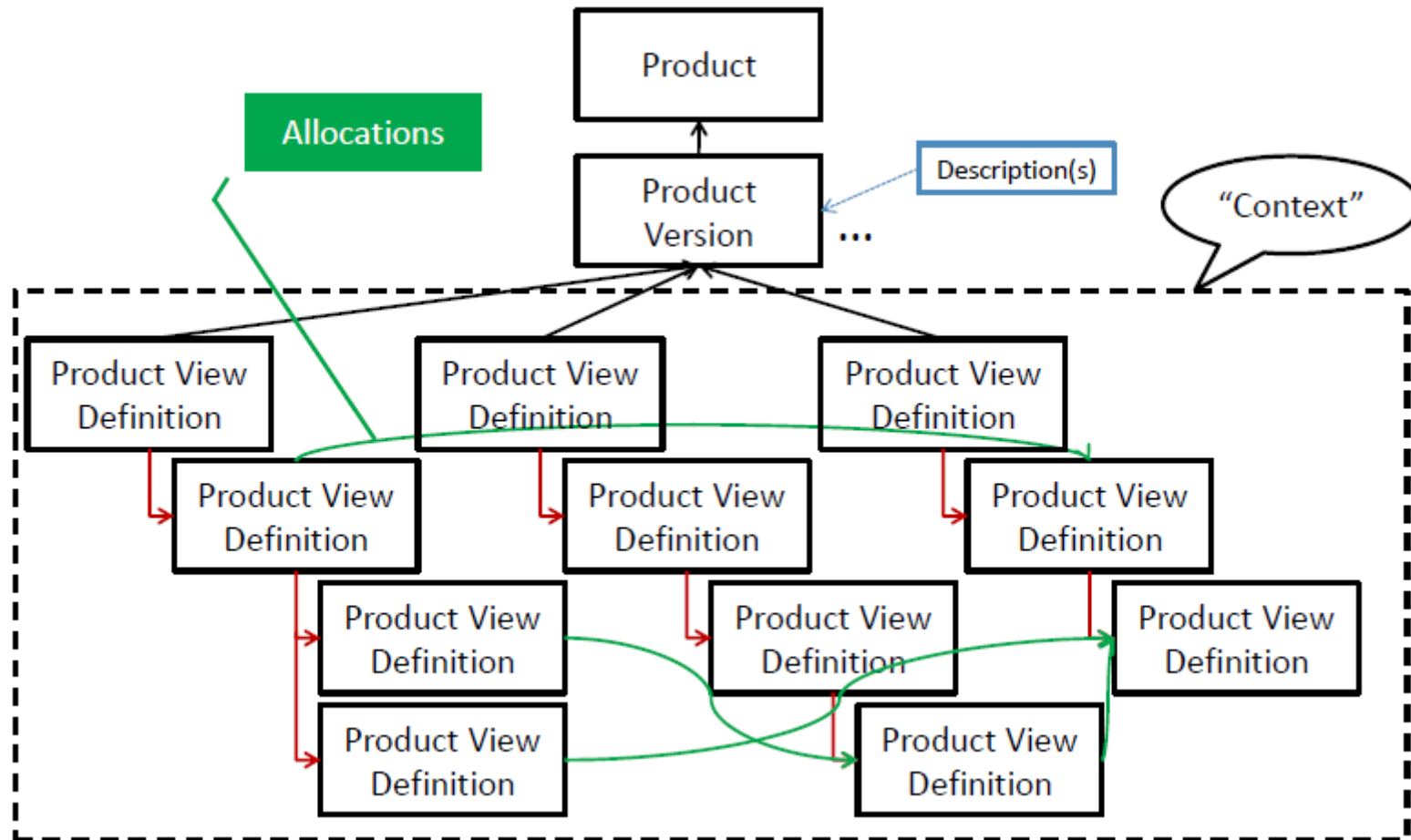
STEP Key Product Structure Concepts

- Acknowledgement: Mike Loeffler

- Product (also known as "Item") is root of whole structure, can represent a single product design or a whole family or product line, has minimal identification metadata

- •Each Product Version (there can be many) can have both Product View Definition(s) and one or more Descriptions (files or other data representations)

- •Product View Definition (or DDID) is the "Context", the root of the breakdown structure that describes the internal construction of the Product Version

- •Product View Definition can be multiple, each has a qualification of what type of view it represents (i.e. mechanical, electrical, hydraulic, software, etc.)

- •Each different Product View Definition can have a completely different structure as appropriate to describe the viewpoint it represents

- •Allocations, traces, connectivity definitions and other cross cutting relationships can be made within and between the different views

- •Product View Definitions consist of pointers to the child Product View Definition(s) that make up the top level Product Version being defined; the assembly relationships are configured (turned on or off) by variant and effectivity functions
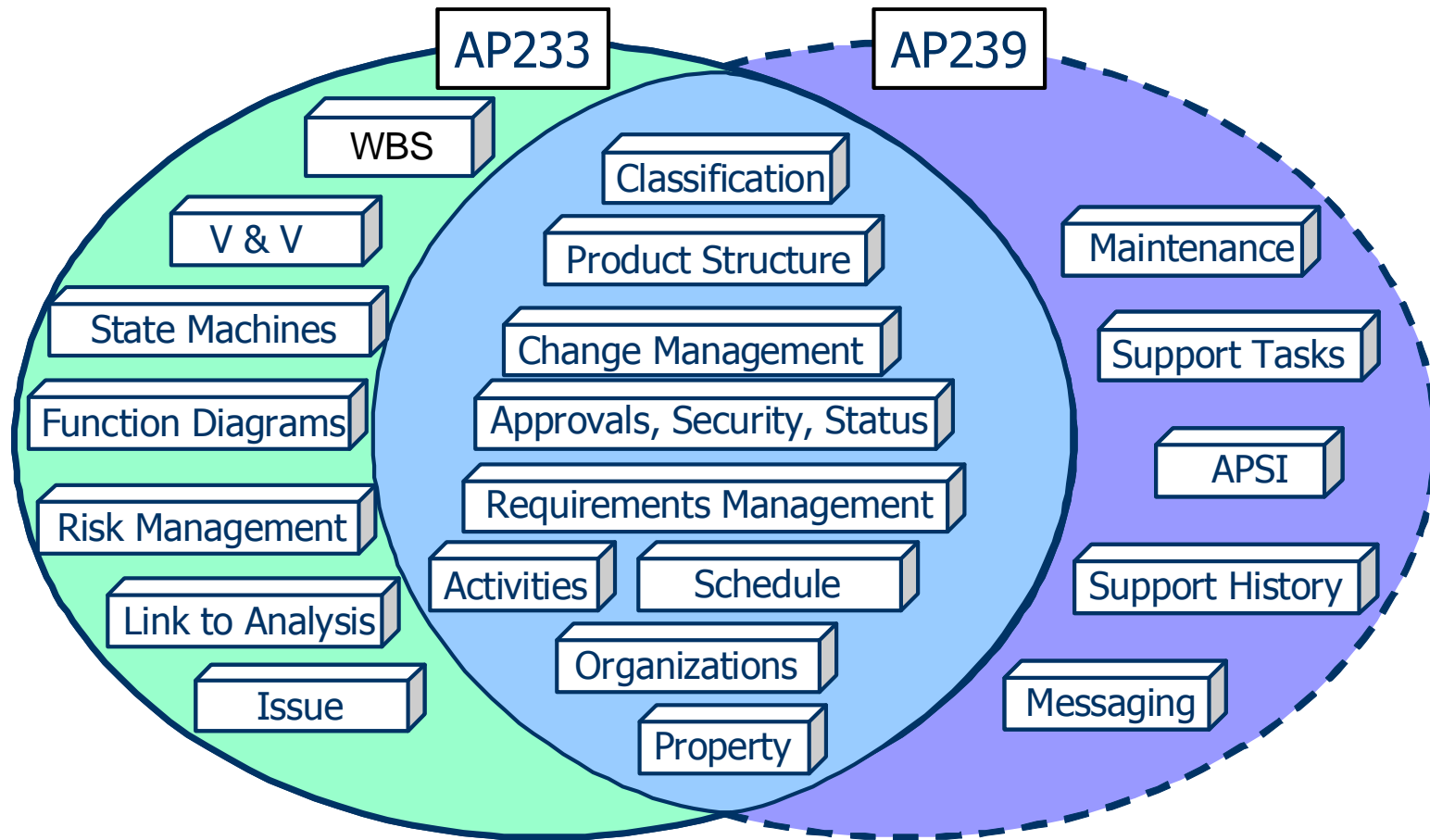
ISO 10303
Relevant STEP standard

- AP 203, *Configuration controlled 3D designs of mechanical parts and assemblies*.
- AP 210, *Electronic assembly, interconnect and packaging design*
- AP212, *Electrotechnical Design and Installation*
- AP 214, *Core data for automotive mechanical design processes*
- AP 233, *Systems engineering data representation*
- AP 239, *Product life cycle support* (aka Product Lifecycle Support (PLCS)
- PDM Schema. Intersection between AP-203 and AP-214 from an initiative of PDES Inc. and ProSTEP
  - http://pdesinc.aticorp.org/
  - http://www.prostep.com/?L=1

Where to start ?
AP239 and AP233 overlaps

AP233

AP239

WBS

V & V

State Machines

Function Diagrams

Risk Management

Link to Analysis

Issue

Classification

Product Structure

Change Management

Approvals, Security, Status

Requirements Management

Activities

Schedule

Organizations

Property

Maintenance

Support Tasks

APSI

Support History

Messaging

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Where to start ?
SysML and AP233 overlaps

SysML/AP233 Data Overlaps

http://www.omgwiki.org/OMGSysML/doku.php?id=sysml-ap233:mapping_between_sysml_and_ap233
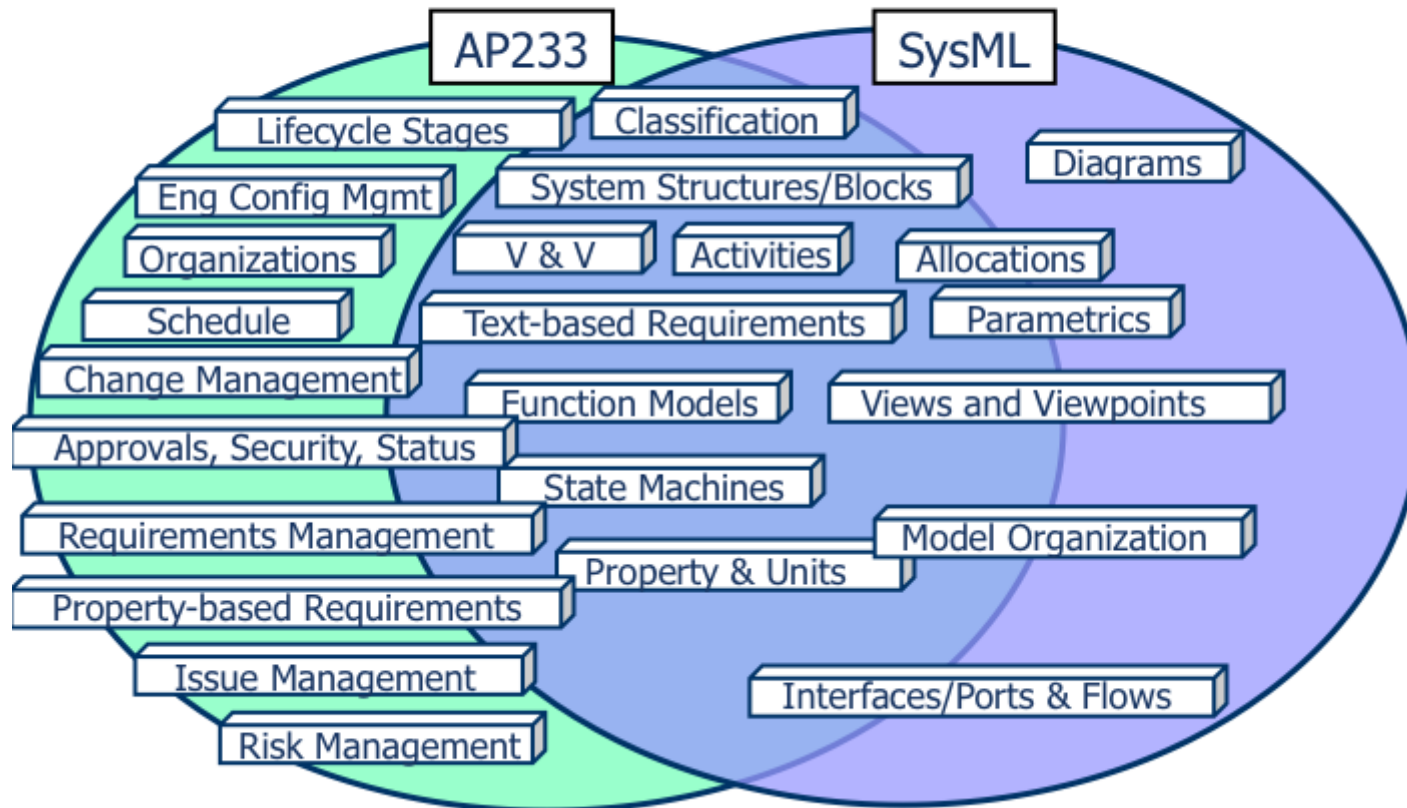
AP233 positioning (source DOD

AP233 - SysML - OWL
Languages with Common Semantics

P R E S E N T A T I O N

OWL
Ontology Modeling
Language

SysML
Graphical Modeling
Language

STEP AP233
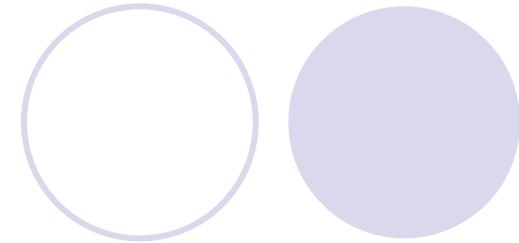Information Modeling
Language

R E P R E S E N T A T I O N
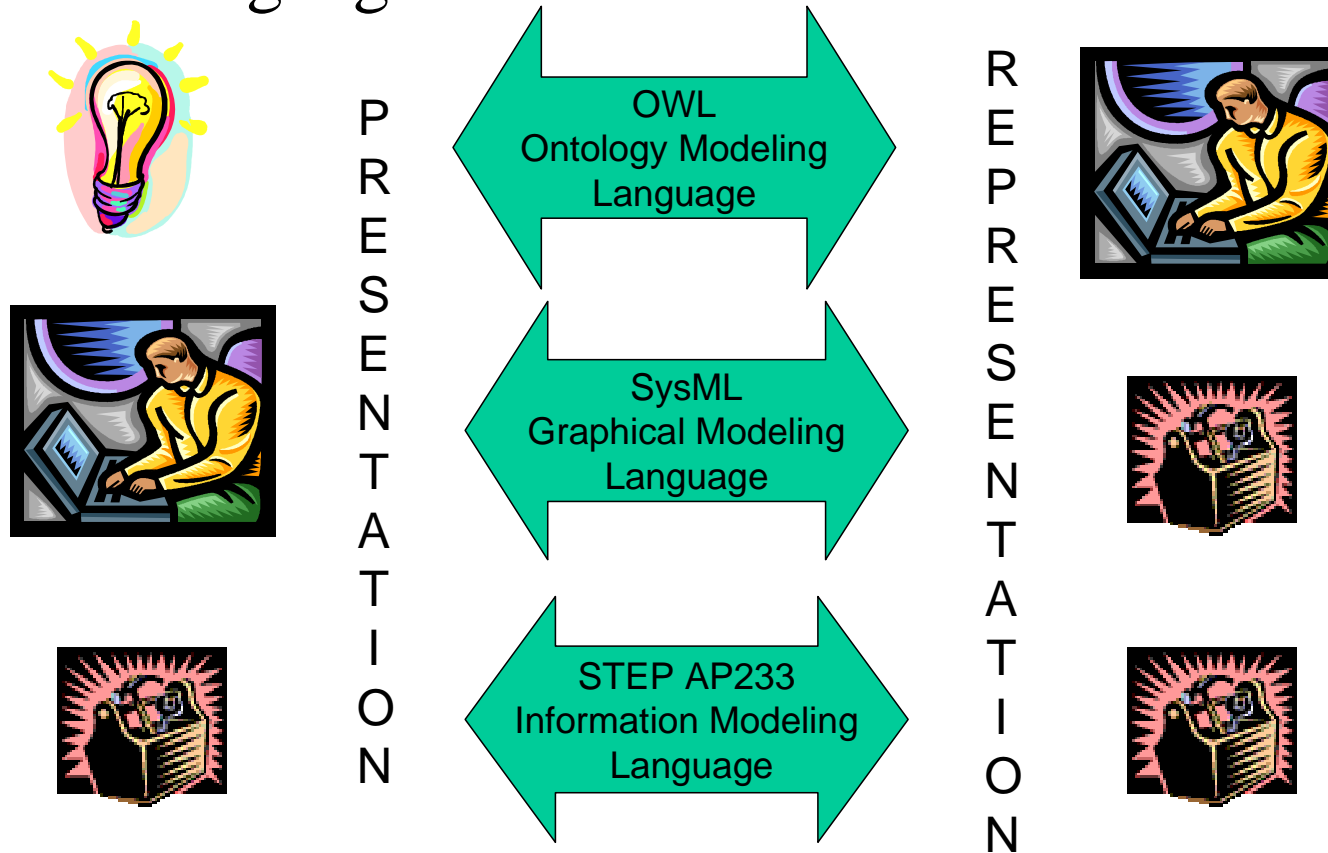
Traceability enabled by Interfacing Core Capabilities (AP233.org)
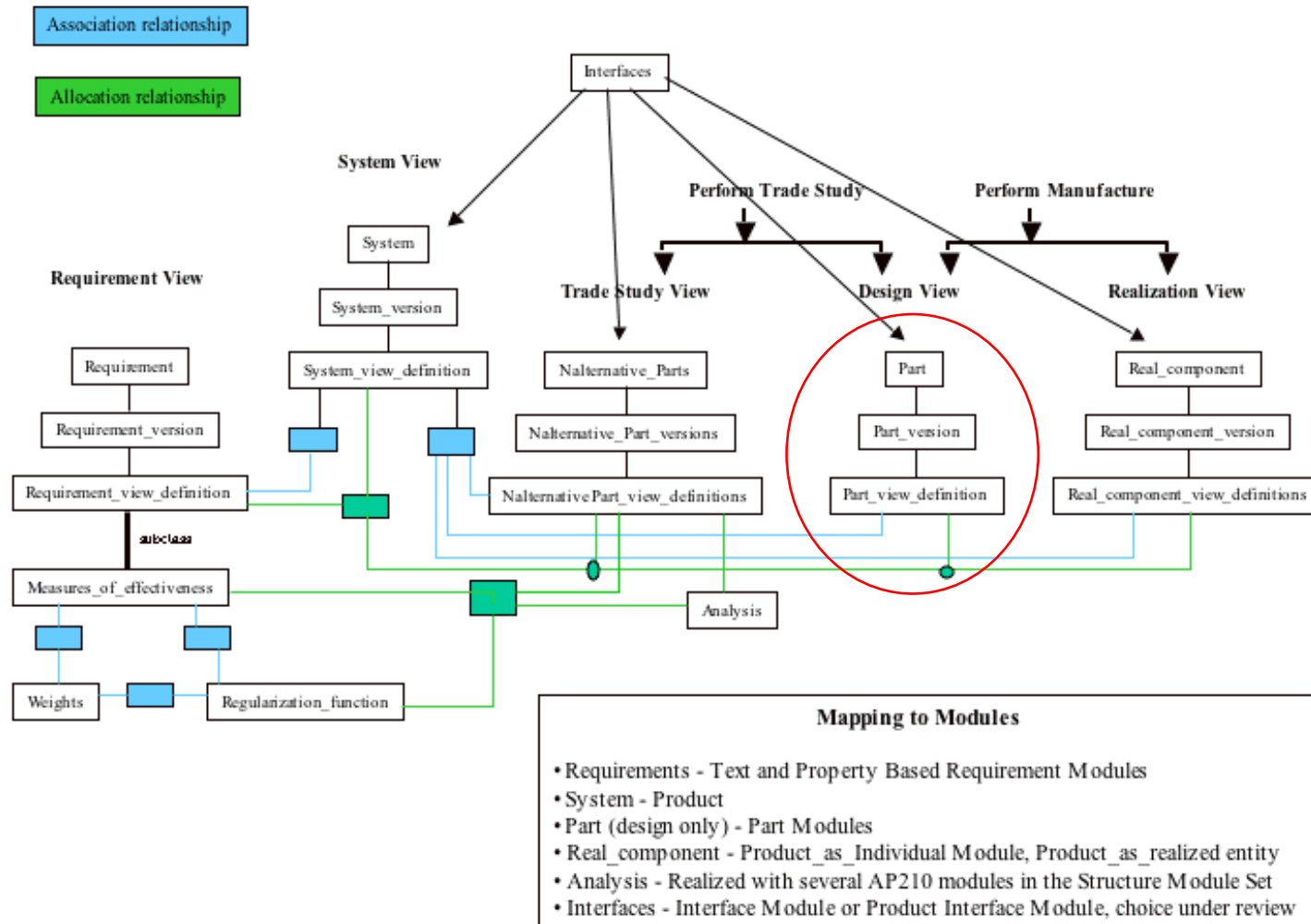
What is the core construct ? For example from AP233

- SCHEMA Ap233_systems_engineering_arm_excerpt;
- ENTITY Product;
- id : STRING;
- name : STRING;
- description : OPTIONAL STRING;
- END_ENTITY;

- ENTITY Product_version;
- id : STRING;
- description : OPTIONAL STRING;
- of_product : Product;
- END_ENTITY;

- ENTITY Product_view_definition;
- id : OPTIONAL STRING;
- name : OPTIONAL STRING;
- additional_characterization : OPTIONAL STRING;
- initial_context : View_definition_context;
- additional_contexts : SET [0:?] OF View_definition_context;
- defined_version : Product_version;
- WHERE
- WR1: NOT (initial_context IN additional_contexts);
- WR2: EXISTS(id) OR (TYPEOF(SELF\Product_view_definition) <> TYPEOF(SELF));
- END_ENTITY;

SysML > AP233 Mapping

Blocks

SysML	AP233
Block	System _view_definition → System_version → System
Composition Association	Assembly_component_relationship relating two System_view_definitions
Generalization	View_definition_relationship + Classification ('Generalization')
Part/Part Definition	View_definition_relationship
Nested Part	Component_upper_level_identification
Multiplicity	Next_assembly_usage.quantity
Connector	Interface_connection
Port/Port Definition	Interface_connector
Delegation Port	Hierarchical_interface_connector

http://www.omgwiki.org/OMGSysML/doku.php?id=sysml-ap233:mapping_between_sysml_and_ap233

+ Value-properties, Constraints, Activities, State-machines, Use-cases Requirements, Packages, metadata,

Using SysML and STEP/AP214/233

○ STEP has implemented EXPRESS as a representation

○ SysML > xmi exists

- http://www.omg.org/spec/SysML/20080501/SysML-profile.xmi

○ SysML / AP233 mapping incomplete

- Requirements, System
- http://www.omgwiki.org/OMGSysML/doku.php?id=sysml-ap233:mapping_between_sysml_and_ap233

○ Preferred approach ?

- SysML > xmi
- Xmi > AP233 represented in xml
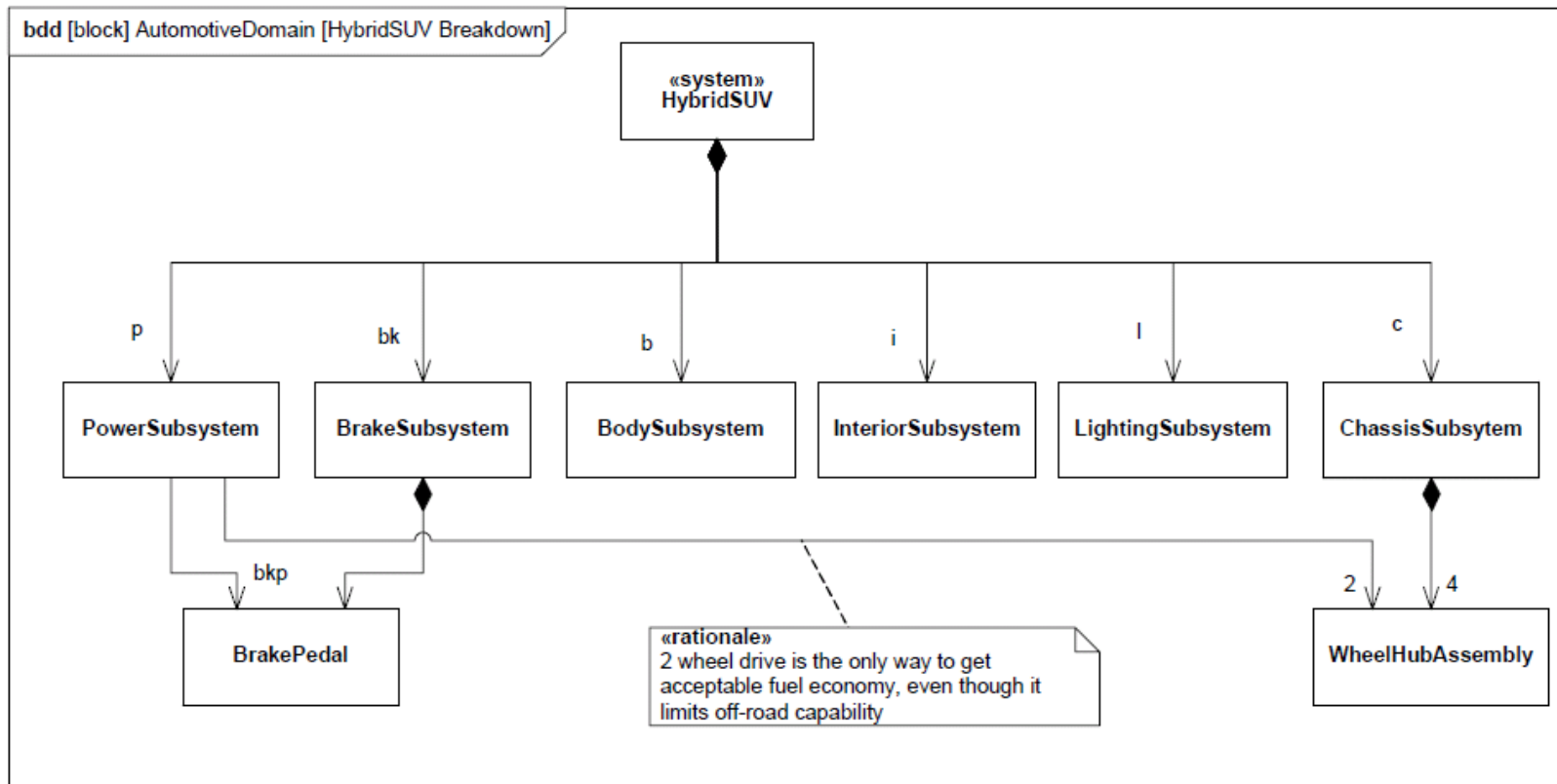
An example to use ....?
Hybrid SUV SysML model

Figure 16 - Defining Structure of the Hybrid SUV System (Block Definition Diagram)

http://www.sysml.org/
http://www.omg.org/cgi-bin/doc?formal/2010-01-01

….SUV Power Subsystem
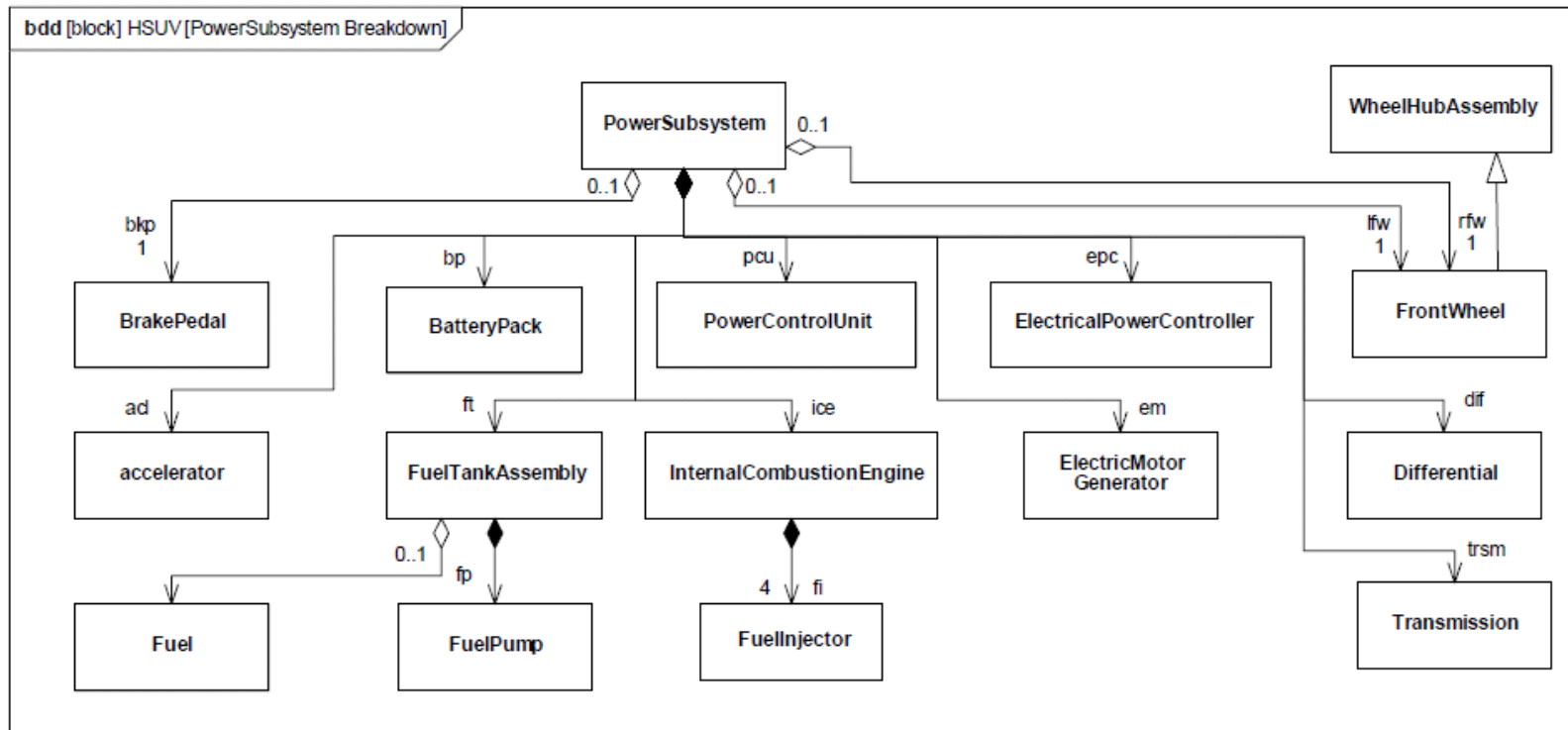
Figure 18 - Defining Structure of Power Subsystem (Block Definition Diagram)

http://www.sysml.org/
http://www.omg.org/cgi-bin/doc?formal/2010-01-01
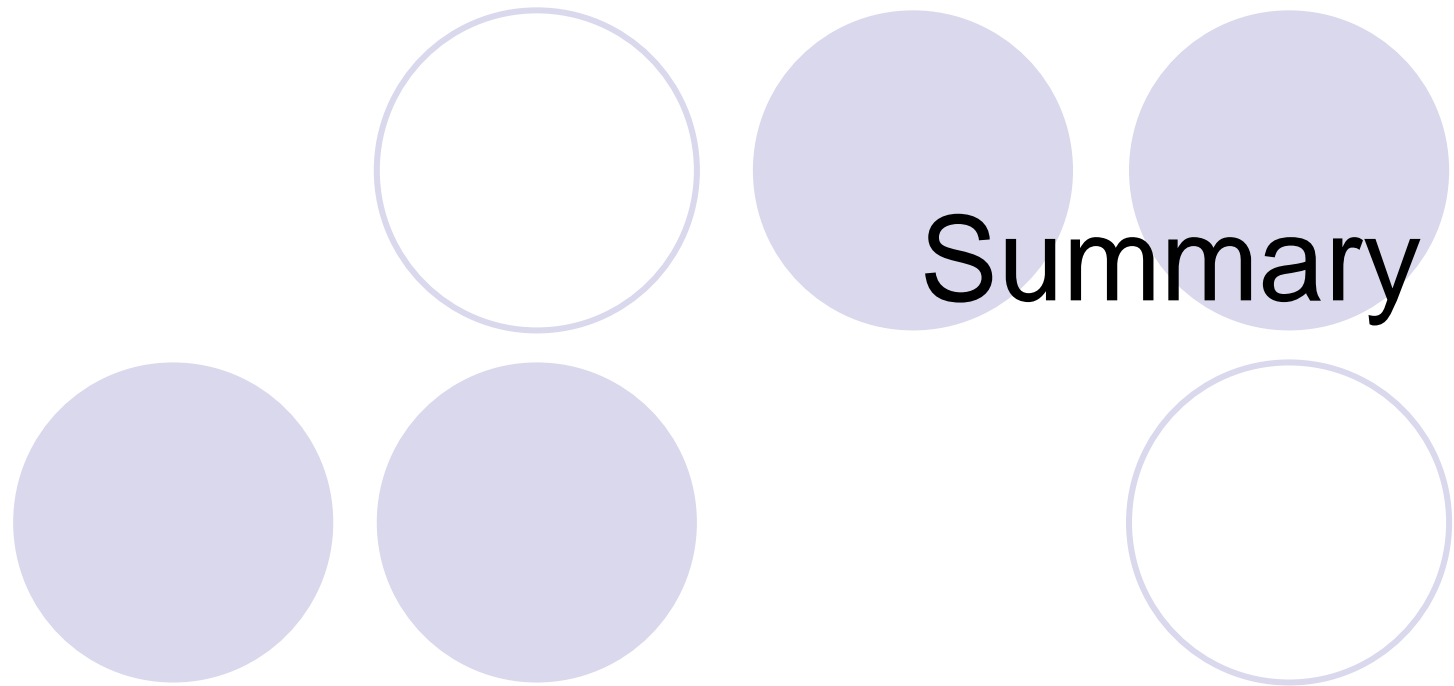
Next meeting

- **Propose**
  - ○ PLM Resource definition working session
    - Sept 7th
  - ○ Spec alignment working meeting
    - Sept 21st

Any other business ?

Summary

Thank you

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