DoDAF 2.0 Meta Model (DM2)

Walkthrough

DoD EA Conference

1 June 2009

Briefing Outline

- Background
  - Why an EA meta model?
  - History and Lessons Learned
  - So – DM2 Methodology
- Walkthroughs:
  - Conceptual Data Model
  - Logical Data Model
  - Physical Exchange Specification
- How to get engaged

Background

DoDAF 2 Goals

- Support the Department's core processes:
  1. Capabilities Integration and Development (JCIDS)
  2. Planning, Programming, Budgeting, and Execution (PPBE)
  3. Acquisition System (DAS)
  4. Systems Engineering
  5. Operations Planning
  6. Capabilities Portfolio Management (CPM)
- Establish guidance for architecture content as a function of purpose – "fit for purpose"
- Increase precision of architectures by defining architectures principally in terms of data with diagrams (presentations) related to the data – the DoDAF Meta Model (DM2)

DoDAF Meta Model (DM2)

- Purposes:
  - The ***vocabulary for description and discourse about DoDAF models*** (formerly “products”) and core process usage
  - The basis for generation of the “physical” exchange specification for exchange of data between architecture tools and databases.
  - Supports discovery and understandability of architecture datasets:
    - Discovery DM2 categories of information
    - Understandability thru precise semantics augmented with linguistic traceability
- Form:
  - VOLUME I, DoDAF Conceptual Data Model (CDM)
  - VOLUME II, DoDAF Logical Data Model (LDM)
  - VOLUME III, DoDAF Physical Exchange Specification (PES)

Volume II is Organized Around the DM2

Vol II

1. Perspectives
2. Metamodel Data Groups
3. Views

DM2 Data Groups

1. Performer
2. Resource Flow
3. Information & Data
4. Activity
5. Training / Skill / Education
6. Capability
7. Services
8. Project
9. Goals
10. Rules
11. Measures
12. Location

for each data group:

- *x.y.1 Data – what are the concepts and how are they related*
  - *–Diagram and definitions from DM2*
  - *–Discussion*
- *x.y.2 Method*
  - *– Data collection and model construction methods -- how is such information collected and assemble*
  - *– Usage in Core Processes – how is such information used in budgeting, acquisition, capabilities integration and development, systems engineering, capabilities portfolio management, and operations planning*
- *x.y.3 Presentation – what are ways this kind of information can be presented*

DM2 Workgroup

- Weekly Sessions on DCO
- Collaboration Site:
  - Current DM2 walkthru briefing
  - Baseline DM2 CDM, LDM, and PES
  - Developmental DM2
  - IDEAS Foundation
  - Reference and Research folders
- Now the DM2 Configuration Management (CM) body

DoDAF Metamodel Walkthrough 2009-04-17.ppt

Baseline

Description	Filename	File Size	Date Posted
Conceptual Data Model			
UML	CDM_DM2_EA_090330.zip	1,764 KB	24-April-09
HTML	CDM_DM2_HTML_090330.zip	1,517 KB	24-April-09
Logical Data Model			
Definitions, Semantic Research, Aliases, and Action Items	DM2_090421 DoDAF 2 Initial Baseline.xls	863 KB	24-April-09
UML	DM2_EA_090414 DoDAF 2 Initial Baseline.zip	2,021 KB	24-April-09
HTML	DM2_HTML_090414 DoDAF 2 Initial Baseline.zip	1,346 KB	24-April-09
XMI 2.1	DM2_XMI_090414 DoDAF 2 Initial Baseline.zip	347 KB	24-April-09
Physical Exchange Specification	DM2_Physical_Exchange_Specs_2_0.zip	567 KB	17-May-09
Archive			

Working Copy

Description	Filename	File Size	Date Posted
Conceptual Data Model			
UML	CDM_DM2_EA_090330.zip	1,764 KB	24-April-09
HTML	CDM_DM2_HTML_090330.zip	1,517 KB	24-April-09
Logical Data Model			
Definitions, Semantic Research, Aliases, and Action Items	DM2_090522.xls	857 KB	25-May-09
UML	DM2_EA_090522.zip	2,025 KB	25-May-09
HTML	DM2_HTML_090522.zip	1,369 KB	25-May-09
XMI 2.1	DM2_XMI_090522.zip	350 KB	25-May-09
Physical Exchange Specification	TBS mid-September	none	24-April-09

IDEAS Foundation 1.0

Description	Filename	File Size	Date Posted
UML Profile	setupEAIDEASAddin.zip	675 KB	24-April-09
UML	IDEAS Foundation v1_0 Released 2009-04-24.eap.zip	852 KB	24-April-09
HTML	http://www.ideasgroup.org/foundation	link	24-April-09
XMI 2.1	IDEAS Foundation v1_0 Released 2009-04-24.xmi.zip	326 KB	24-April-09

Miscellaneous

- Research folders for different topics the DM2 WG has researched
- Reference folders for many source models such as UPDM
- TWG Files and Briefings folder with latest DM2 and Data TWG briefings and meeting documents

Next meeting scheduled for:

Friday, May 29, 2009, 14:00-15:30 EDT
https://connect.dco.dod.mil/dm2twg
Conference Call: (215) 383-1004, access code 806-195-954
Meeting ID: 806-195-954

Other links:

- Download EALite, free read-only version of Enterprise Architect to read the DM2 EA Model (see near bottom of page)
- DARS website
- IDEAS Wiki Page (with links to IDEAS and BORO websites)
- Link to BORO methodology book, "Business Objects Re-engineering for Re-use" by Chris Partridge

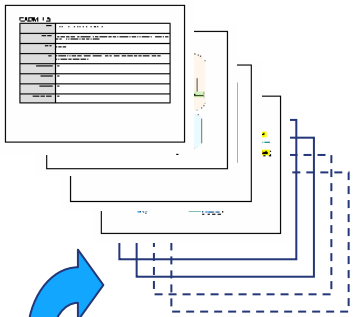
Coordination with many related activities

- Cross group coordination:
  - Object Management Group (OMG) Unified Profile for DoDAF and MODAF (UPDM) & System Modeling Language (SysML) teams
    - DM2 Coordination with teams in mutual telecons, OMG meetings, DM2 Working Group,…
    - Future – UPDM 2 based on DoDAF 2.0
  - Business Transformation Agency (BTA) Primitives and Lexicon
  - Core Enterprise Services – to – Tactical Edge (CES2TE)
  - ASN RDA and JFCOM Modeling and Simulation
  - Joint Test and Evaluation Methodology (JTEM)
  - DoD Meta Data Working Group (MDWG)
  - MODAF and NAF (via IDEAS)
- Pilots:
  - JFCOM JC2 Architecture and Capability Assessment Enterprise (JACAE) – MARCORSYSCOM MCAE – TRADOC Capabilities, Analysis, Development, and Integration Environment (CADIE) federated data exchange pilot
  - SPAWAR / ASN RDA Naval Architecture Elements Reference Guide (NAERG)
  - OPNAV N6 SoA “dashboard”
  - Army G6
  - Enhanced Information Support Plan (EISP)

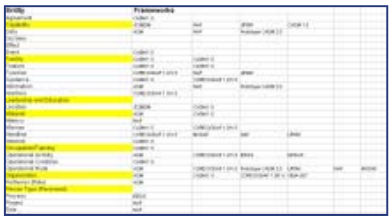
Conceptual Data Model

Conceptual Data Model Development Process

1. Overviews of Models

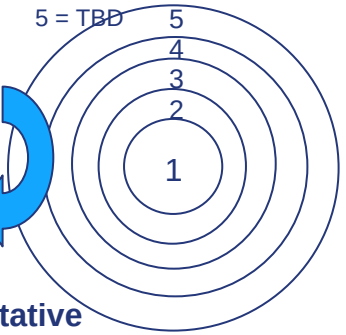


2. Collect the terms

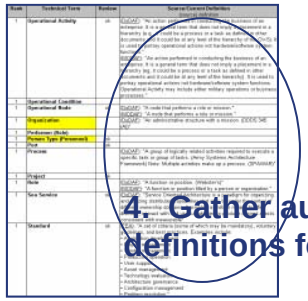


3. Make a pass on the "Core" Terms

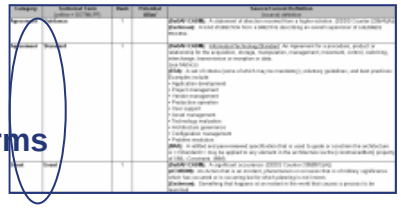
1 = Core, critical to process or very common in architectures
2 = Derived or less common
3 = TBD
4 = TBD
5 = TBD



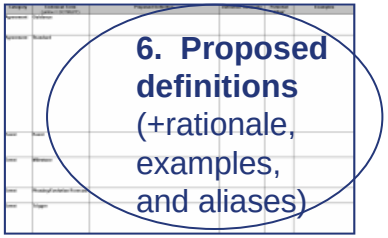
4. Gather authoritative definitions for "Core" terms



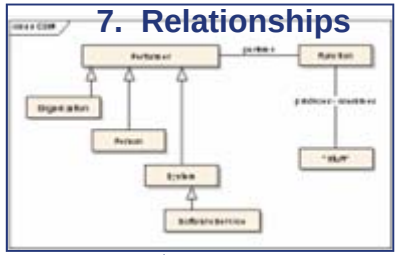
5. Group related terms



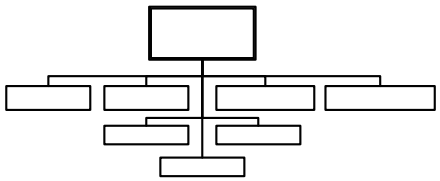
6. Proposed definitions (+rationale, examples, and aliases)



7. Relationships



8. Relationship Types



12/3
Strawman – list of important or recurring "core" words/terms/concepts with source definition(s)

1/3
Partial Draft – proposed definitions, some harmonization (e.g., via super/subtyping, determining aliases)

2/3
Interim Draft – Initial relationships (e.g., "performs", "part-of", ...)

3/3
CDM version 0.1
1. Concepts (defined)
2. Relationships (some typing, e.g., super/sub, cardinality)

Sources

Models

a. CADM 1.5
b. IDEAS
c. UPDM
d. BMM
e. Hay/Zachman
f. ASM
g. CRIS
h. Conceptual CADM in DoDAF 1.0 / prototype CADM 2.0
i. M3
j. NAF Meta Model
k. DoI Meta Model
l. JC3IEDM
m. GML
n. UCORE 1.1
o. GEIA 927
p. AP233
q. SUMO and ISO 15926 (via IDEAS)
r. FEA Reference Models
s. JFCOM JACAE

Definitions

1. IEEE
2. ISO
3. W3C
4. OMG
5. EIA
6. DODD & DODI
7. JCS Pubs, especially CJCSI's
8. Models in the Source_Candidates_071115.ppt
9. DoDAF
10. Other frameworks: Zachman, MODAF, TOGAF, NAF, ...
11. FEA
12. BMM
13. Wordnet
14. Wikipedia
15. English dictionaries
16. DoDAF Glossary

Modeling Principles

- Model Core Process (PPBE, DAS, JCIDS, CPM, SE, Ops) business objects
- Terms enter model through thorough semantic research:
  - Assignment to a researcher
  - Collection of authoritative definitions, documenting source
  - Assessment of redundant (alias) or composite terms
  - Formulation / selection of definition based on authoritative definitions
  - Examples
  - Outbrief to team
  - Recording of research and decision rationale
- No need to distinguish / label concepts that differ only in level of aggregation – e.g., subfunction – function. Whole-part relationship covers the need without different names for different types of wholes and parts. When a user has need to label, the naming pattern accommodates.
- Typed Relationships, e.g., using IDEAS
- No commitment to an implementation type. Support RDBMS, XSD, Java, etc. from core model
- Goal is a core that can be extended by user communities, not to try to cover all user detail. Extenders should be careful to not create redundant representations.
- Model will enter a CM process

Definitions and Aliases Record Excerpt

Technical Term	Composite Definition	Source/Current Definition (source) definition	Definition / Exclusion Rationale and other Comments	Examples	Potentially Related Terms or Aliases
System	A functionally, physically, and/or behaviorally related group of regularly interacting or interdependent elements.	**(DoDAF):** Any organized assembly of resources and procedures united and regulated by interaction or interdependence to accomplish a set of specific functions. **(DoDAF/CADM):** An organized assembly of interactive components and procedures forming a unit.(DDDS Counter (19607/1)(A)) **(MODAF):** Any organised assembly of resources and procedures united and regulated by interaction or interdependence to accomplish a set of specific functions. **(IEEE):** A collection of components organized to accomplish a specific function or set of functions. **(BEA):** Any organized assembly of resources and procedures united and regulated by interaction or interdependence to accomplish a set of specific functions. **(NAF):** A collection of components organized to accomplish a specific function or set of functions. (GEN TERM) **(NAF):** A coherent combination of physical artifacts, energy and information, assembled for a purpose. (MM) **(JCS 1-02):** A functionally, physically, and/or behaviorally related group of regularly interacting or interdependent elements; that	JP 1-02 is most authoritative. Agree we can use "system" for now; suggest we're going to need the other two Real Quick.	weapon system, UAV, GCSS, JOPES, GSORTS, GTN, any specific DCGS	
Facility	Real property, having a specified use, consisting of one or more of the following: a building, structure, or linear structure. Facilities are parts of Sites which are parts of Installations.	**(DoDAF/CADM):** Real property, having a specified use, that is built or maintained by people. (DDDS Counter (334/1)(A)). **(JC3IEDM):** An ObjectItem that built, installed or established to served some particular purpose and is identified by the service it provides rather than by its content. **(NAF):** Physical Asset: A <<Resource>> that can host systems and/or people. Note 1: synonyms for <<PhysicalAsset>>; would be "platform", "facility", or "host". This is the original intent for the SystemsNode" concept in DoDAF. (MM) **(JCS 1-02):** A real property entity consisting of one or more of the following: a building, a structure, a utility system, pavement, and underlying land. *See also air facility.* **(Webster's):** 1. Something designed, built, installed, etc., to serve a specific function affording a convenience or service. 2. Something that permits the easier performance of an action, course of conduct, etc. **(DoDI 4165.14):** A building, structure, or linear structure out to an imaginary line surrounding a facility at a distance of five feet from the foundation that, barring specific direction to the contrary such as	DDDS + JCS + 4165		

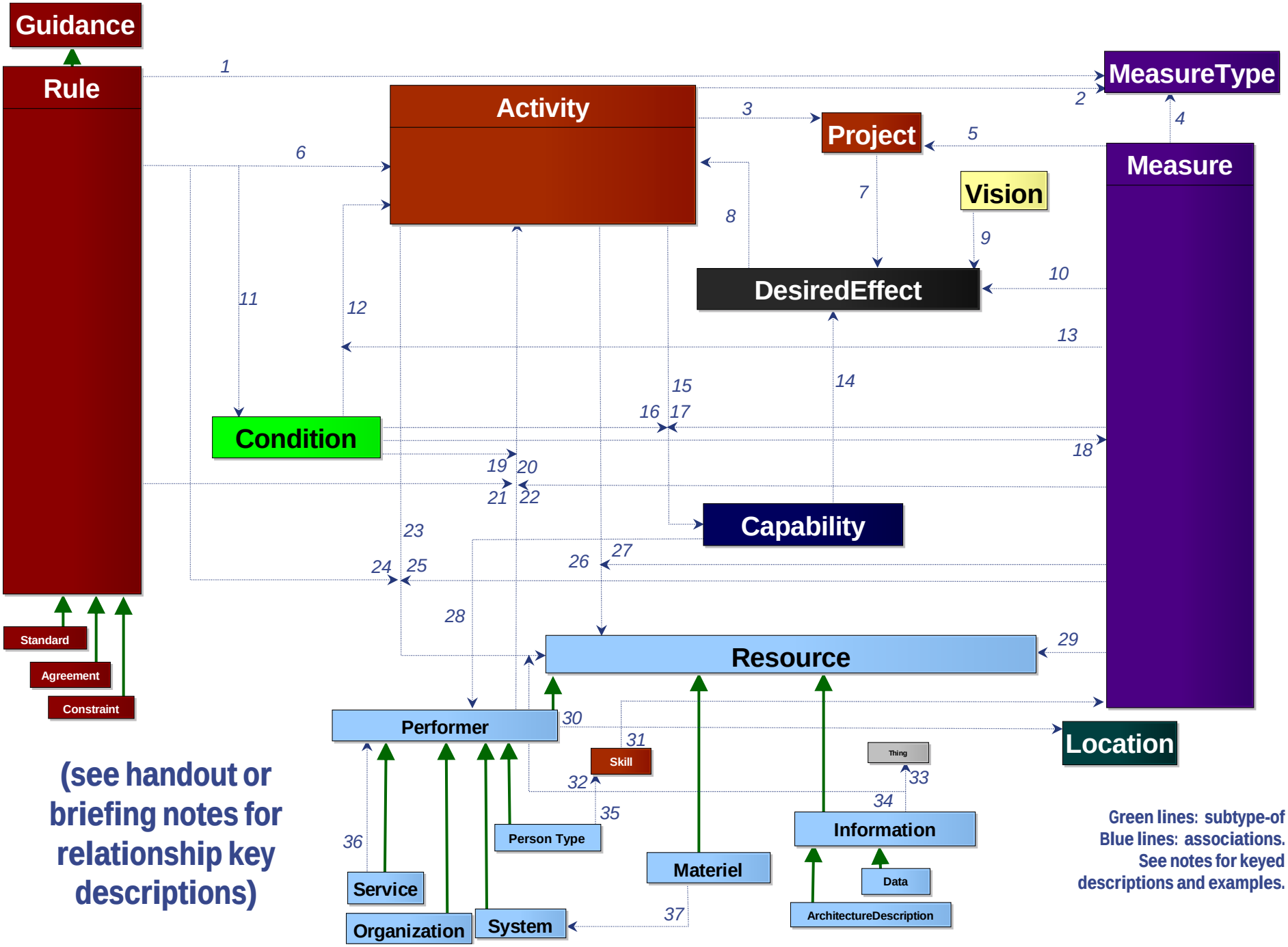
Definitions and Aliases Record Excerpt

Technical Term	Composite Definition	Source/Current Definition (source) definition	Definition / Exclusion Rationale and other Comments	Examples	Potentially Related Terms or Aliases
Actor	A performer that is external to and invokes the performer to be architected.	**(DoDAF):** A coherent set of roles that users of use cases play when interacting with these use cases. An actor has one role for each use case with which it communicates. **(NAF):** An actor is an implementation independent unit of responsibility that performs a certain role. (ARCH ELEM) **(Webster's):** 1. One who takes part; a participant. 2. A person who does something	Since we have "performer" to stand for the general concept, it makes sense to define "actor" iaw UML. Comment # 1: Since we don't need to support specific methodologies at this point, recommend delete. Comment # 2: I don't see ACTOR as a candidate. Because DoD is not in the movie, television or theatre business and because this term is used in the contex	A customer who triggers an organizational process ("end-to-end" or value chain); a user who invokes an automated function	User, customer, agent, performer
Role	A set of similar or otherwise logically related activities, implying a set of skills or capabilities, to which a performer may be assigned.	**(DoDAF):** A function or position. (Webster's) (DoDAF/CADM): OperationalRole: The specification of a set of abilities required for performing assigned activities and achieving an objective. (DDDS Counter (19607/1)(A)) **(MODAF):** A function or position filled by a person or organisation. **(NAF):** An aspect of a person or organisation that enables them to fulfill a particular function. (MM) **(IDEAS):** An AgentRole is an AgentState where the agent is conducting processes. **(Webster's):** 1. A function or position. 2. The actions and activities assigned to or required or expected of a person or group.	The role is not the performer, but we have other concepts to capture a logical structure of activities. Useful, however, to be able to extract activities by performer. Cross-reference between two more basic concepts is derivative; recommend delete until we go to logical.	Any set of activities to which a single performer may be assigned; an MOS or any other definition of a set of related skills that a single performer might have	composite term

Key Concepts

- Activity
- Agreement
- Architecture Description
- Capability
- Condition
- Constraint
- Data
- Desired Effect
- Guidance
- Information
- Location
- Materiel
- Measure
- Measure Type
- Organization
- Performer
- Person Type
- Port
- Project
- Resource
- Rule
- Service
- Skill
- Standard
- System
- Vision

(see handout or briefing notes for definitions)


Guidance
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MeasureType
Activity
Project
Measure
Vision
DesiredEffect
Condition
Capability
Resource
Performer
Location
Skill
Thing
Person Type
Materiel
Information
Data
ArchitectureDescription
Service
Organization
System
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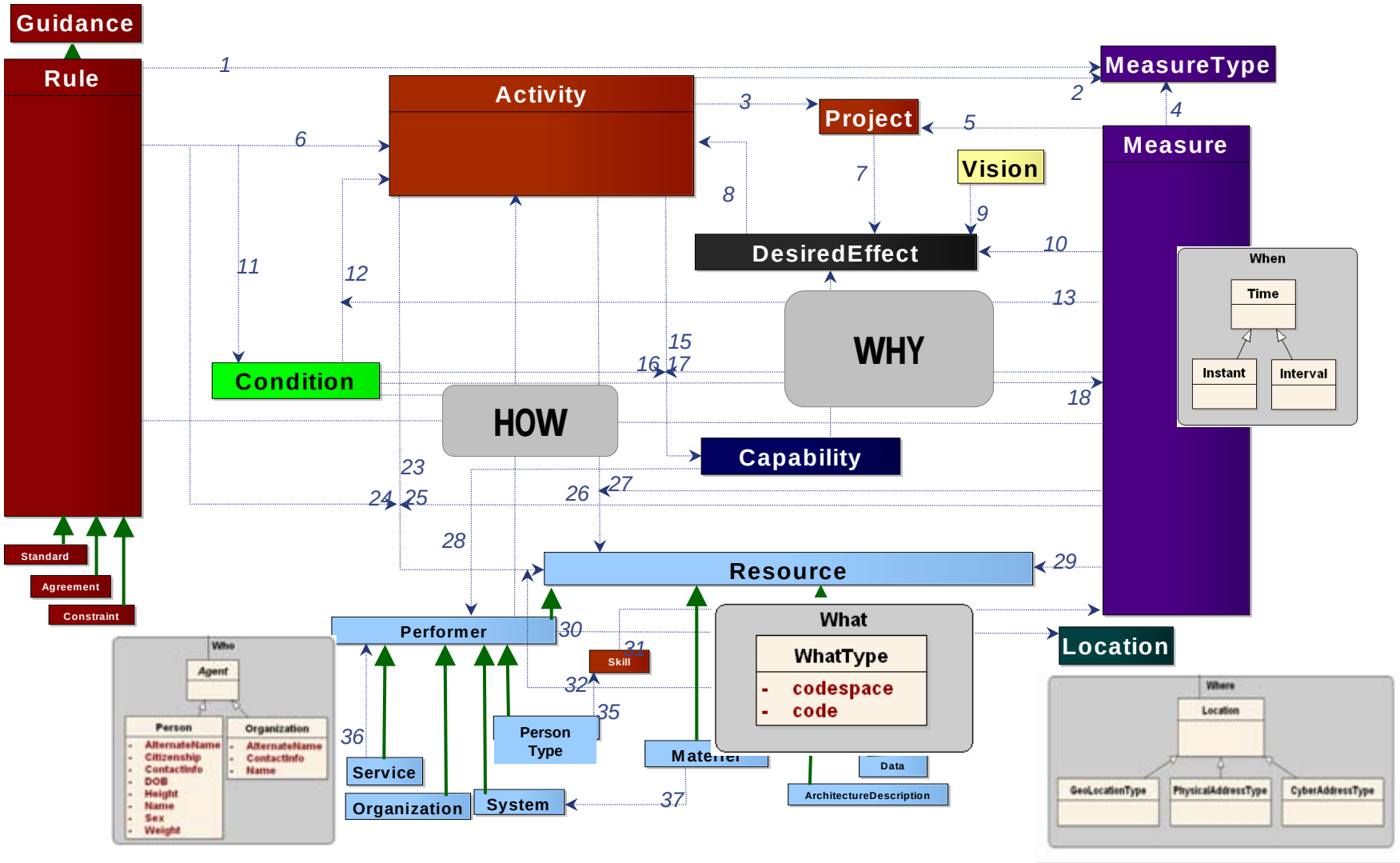
(see handout or briefing notes for relationship key descriptions)
Green lines: subtype-of
Blue lines: associations.
See notes for keyed descriptions and examples.

Interrogatives Relationship

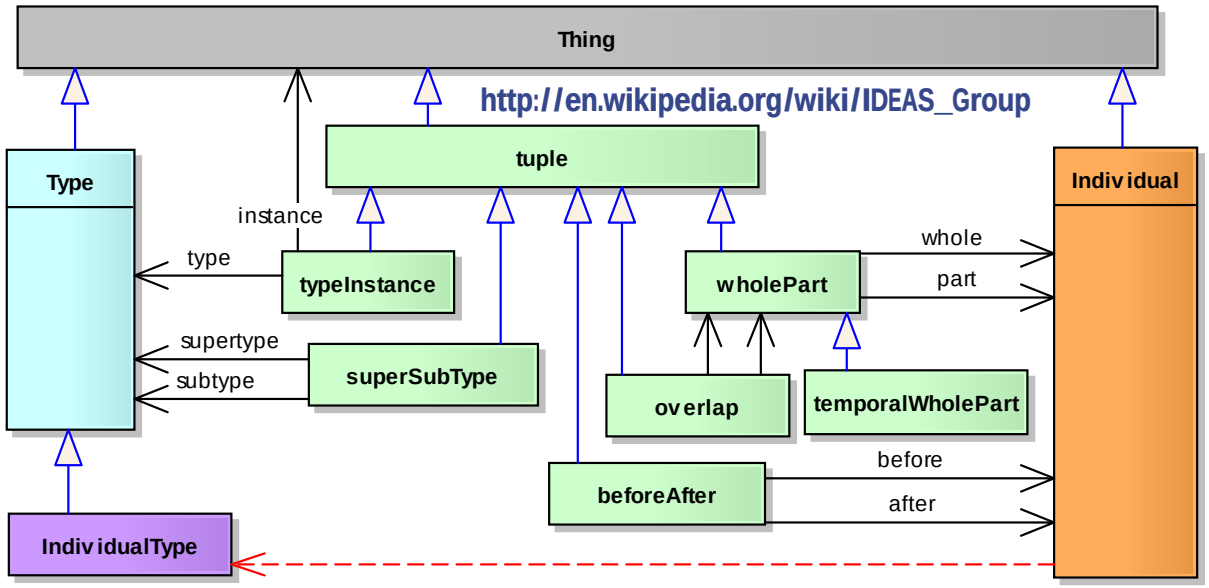
UCORE 2.0 Who, What, When, Where



Logical Data Model

Common Relationship Patterns Emerged

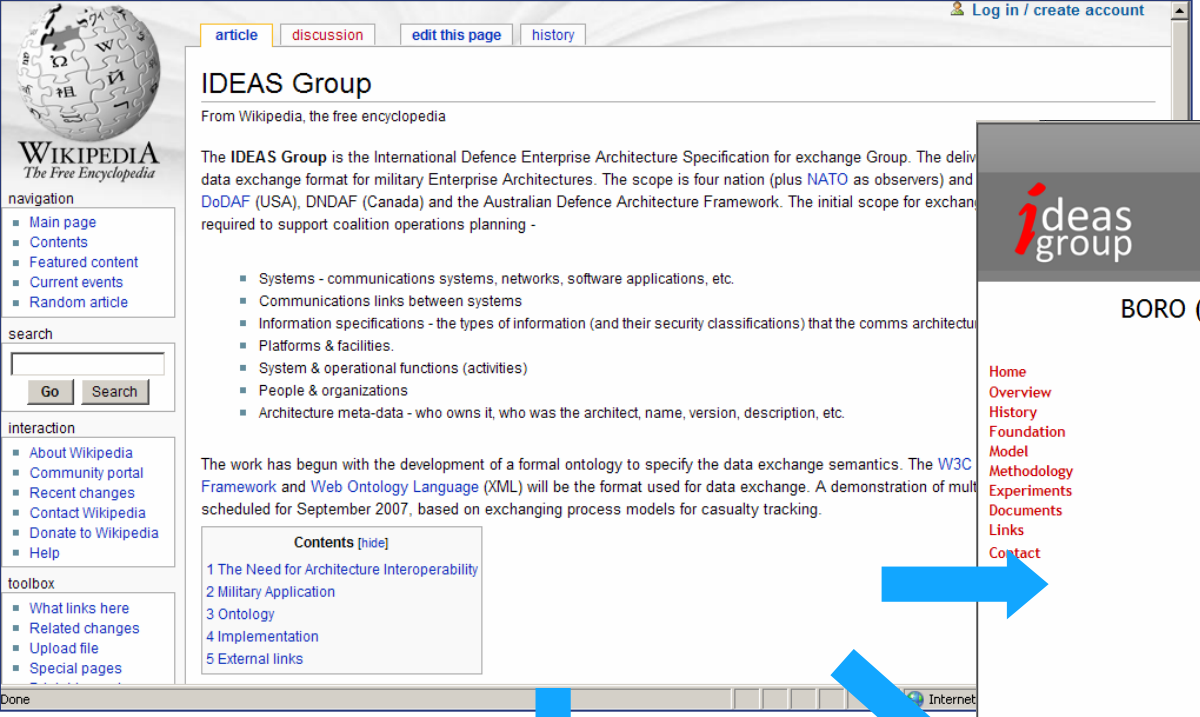
-- *Leveraged Ongoing IDEAS Foundation* --



Examples:

- System A1 (part) wholePart System A (whole)
- Activity A (before) beforeAfter Activity B (after)
- Capability Increment temporalWholePart of Capability
- Organization typeInstance Organization Type
- Location A overlap Location B
- System (subtype) superSubType System (supertype)

- IDEAS is more than OWL:
  - Based on mathematics
    - set & 4D meronymy theory
  - Deals with issues of states, powertypes, measures, space -- what is truly knowable vs. what is assumed
- Domain concepts are extensions to the formal foundation
  - Everything in the EA Domain inherits from the foundation
  - Rigorously worked-out common patterns are reused
  - Saved a lot of repetitive work – ***"ontologic free lunch"***
  - Result is higher quality and consistency throughout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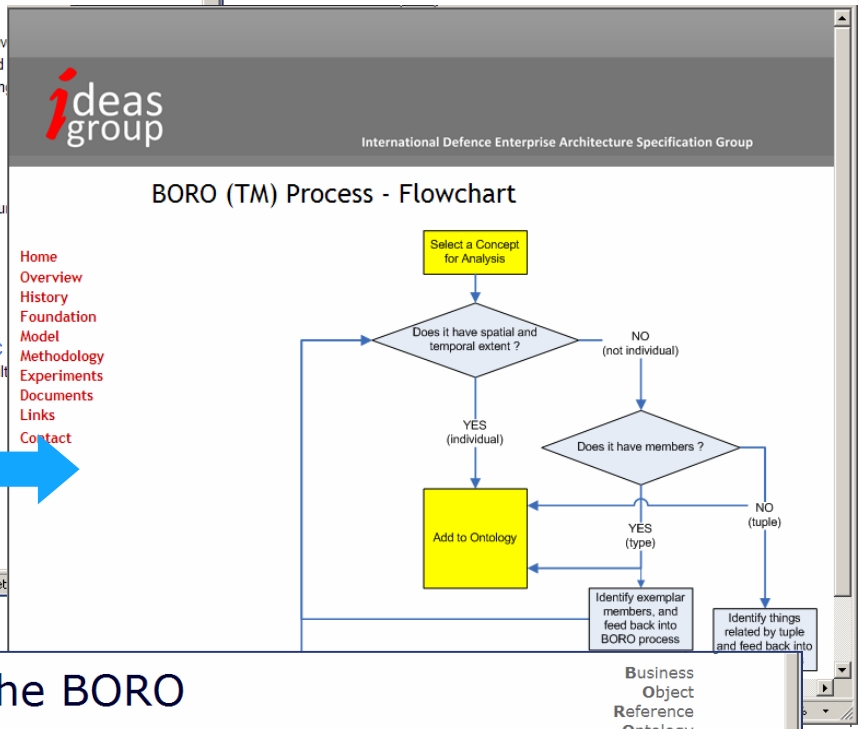
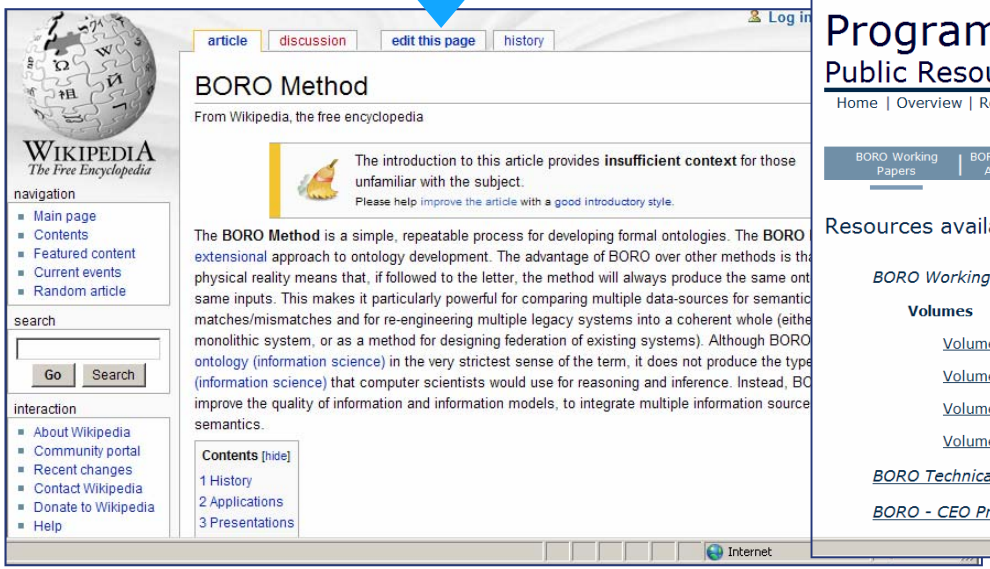
history
IDEAS Group
From Wikipedia, the free encyclopedia
The IDEAS Group is the International Defence Enterprise Architecture Specification for exchange Group. The deliv
data exchange format for military Enterprise Architectures. The scope is four nation (plus NATO as observers) and
DoDAF (USA), DNDAF (Canada) and the Australian Defence Architecture Framework. The initial scope for exchan
required to support coalition operations planning -
Systems - communications systems, networks, software applications, etc.
Communications links between systems
Information specifications - the types of information (and their security classifications) that the comms architectu
Platforms & facilities.
System & operational functions (activities)
People & organizations
Architecture meta-data - who owns it, who was the architect, name, version, description, etc.
The work has begun with the development of a formal ontology to specify the data exchange semantics. The W3C
Framework and Web Ontology Language (XML) will be the format used for data exchange. A demonstration of mult
scheduled for September 2007, based on exchanging process models for casualty tracking.
Contents [hide]
1 The Need for Architecture Interoperability
2 Military Application
3 Ontology
4 Implementation
5 External links
navigation
Main page
Contents
Featured content
Current events
Random article
search
Go
Search
interaction
About Wikipedia
Community portal
Recent changes
Contact Wikipedia
Donate to Wikipedia
Help
toolbox
What links here
Related changes
Upload file
Special pages
Done
Internet


ideas group
International Defence Enterprise Architecture Specification Group
BORO (TM) Process - Flowchart
Home
Overview
History
Foundation
Model
Methodology
Experiments
Documents
Links
Contact
Select a Concept for Analysis
Does it have spatial and temporal extent ?
NO (not individual)
YES (individual)
Does it have members ?
NO (tuple)
YES (type)
Add to Ontology
Identify exemplar members, and feed back into BORO process
Identify things related by tuple and feed back into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article
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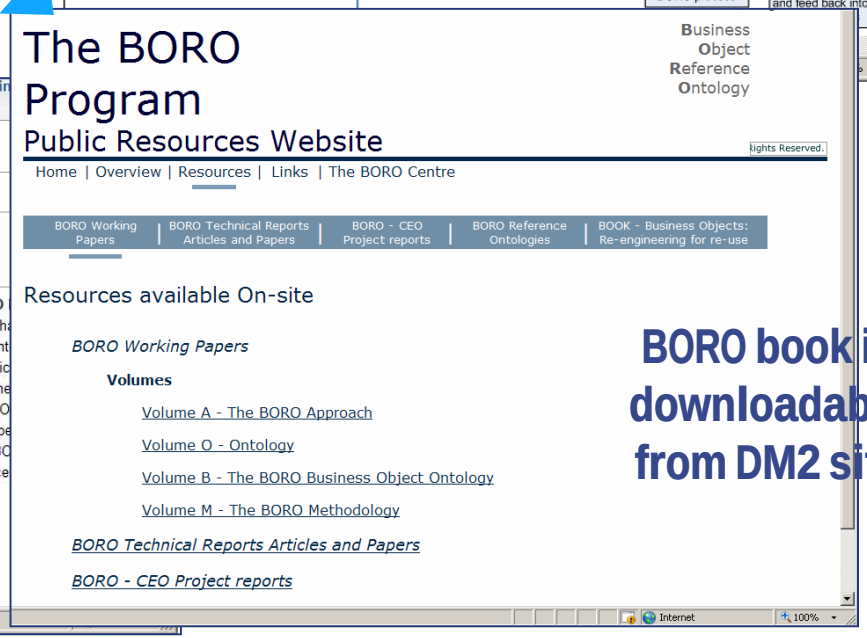
BORO Method
From Wikipedia, the free encyclopedia
The introduction to this article provides insufficient context for those unfamiliar with the subject.
Please help improve the article with a good introductory style.
The BORO Method is a simple, repeatable process for developing formal ontologies. The BORO
extensional approach to ontology development. The advantage of BORO over other methods is th
physical reality means that, if followed to the letter, the method will always produce the same ont
same inputs. This makes it particularly powerful for comparing multiple data-sources for semantic
matches/mismatches and for re-engineering multiple legacy systems into a coherent whole (eithe
monolithic system, or as a method for designing federation of existing systems). Although BORO
ontology (information science) in the very strictest sense of the term, it does not produce the type
(information science) that computer scientists would use for reasoning and inference. Instead, BO
improve the quality of information and information models, to integrate multiple information source
semantics.
Contents [hide]
1 History
2 Applications
3 Presentations
navigation
Main page
Contents
Featured content
Current events
Random article
search
Go
Search
interaction
About Wikipedia
Community portal
Recent changes
Contact Wikipedia
Donate to Wikipedia
Help
Internet


The BORO Program
Public Resources Website
Business Object Reference Ontology
Home | Overview | Resources | Links | The BORO Centre
BORO Working Papers
BORO Technical Reports Articles and Papers
BORO - CEO Project reports
BORO Reference Ontologies
BOOK - Business Objects: Re-engineering for re-use
Resources available On-site
BORO Working Papers
Volumes
Volume A - The BORO Approach
Volume O - Ontology
Volume B - The BORO Business Object Ontology
Volume M - The BORO Methodology
BORO Technical Reports Articles and Papers
BORO - CEO Project reports
BORO book is downloadable from DM2 site
Internet
100%

Why Formal Ontology?

- Corresponds to the real world being modeled:
  - Physical objects that have parts, can be aggregated into larger wholes – both spatially and temporally
    - The parts don't have to be contiguous, e.g., parts of a squadron
    - The objects have a lifetime (temporal extent) that can be broken into temporal states
    - Only one object can occupy the same spatio-temporal extent
    - Examples: $A \text{ part-of } B \wedge B \text{ part-of } C \Rightarrow A \text{ part-of } C$

      $A \text{ before } B \wedge B \text{ before } C \Rightarrow A \text{ before } C$
  - Things are categorized
    - Multiply
    - Categorization should follow the rules to set theory, e.g.,

      $A \subset B \wedge B \subset C \Rightarrow A \subset C$

      $a \in A \wedge A \subset B \Rightarrow a \in B$

      $\text{if } \{A_i\} \text{ forms a partition of A then } a \in A_j \Rightarrow a \notin A_k \forall j \neq k$

Why Formal Ontology (cont'd)

- Why is this better? "is-a" example:
  - Not mathematically rigorous:

    Vladimir Putin is-a human is-a mammal is-a species $\Rightarrow$ Putin is-a species
  - More precise: $\text{Putin} \in \text{human} \subset \text{mammal} \in \text{species}$

    $\Rightarrow \text{Putin} \in \text{mammal};\ ¿\ \text{Putin} \in \text{species}$
- "Has" – the basis of fields and attributes is flawed too
- More precise: Define the powerset of A as the set of all subsets of A:

  $$\mathbf{P}(A) = \{\{\ \}, \{a_1\}, \{a_2\}, ..., \{a_n\}, \{a_1, a_2\}, \{a_1, a_3\}, ..., \{a_1, a_n\}, ..., \{a_1, a_2, a_3\}, ...\}$$

  Then:

  $B \subset A \Rightarrow B \in \mathbf{P}(A)$

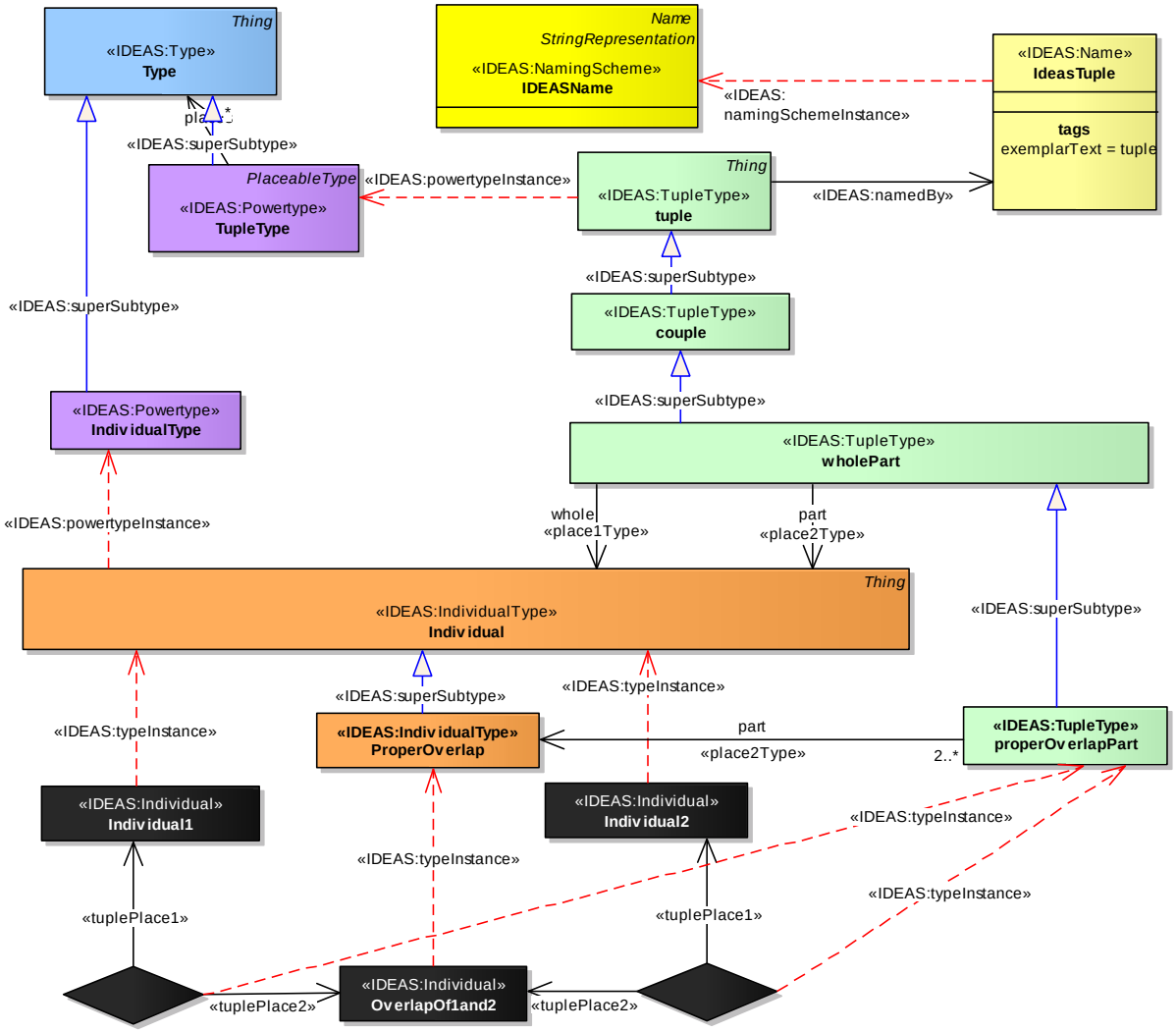
  if $A \subset \mathbf{P}(A)\ \ni\ \forall a_m \in A \exists A_i \in A\ \ni\ a_m \in A$

  then A is called a "property-of" A or A "has" A

  If $A \equiv \{A_i\}, A_i \subset A\ \ni\ A$ is a partition over A

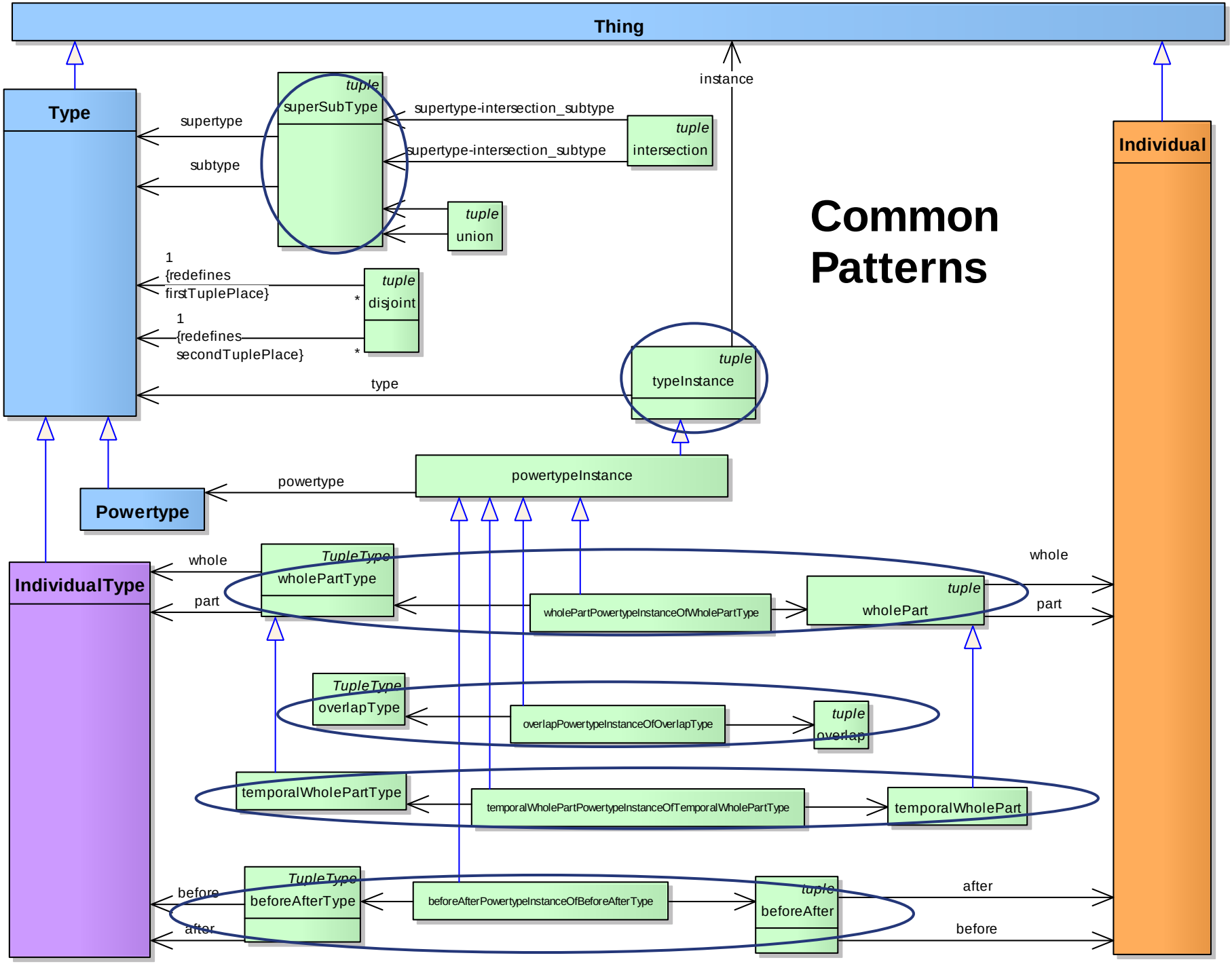
  then A is called a "unique property-of" A
- Does this really matter – all the time – fouls queries, analysis algorithms, and interoperability
- Why did this happen? Database design had in origins in form automation, not mathematical analysis – good for storing stuff to be processed by humans – terrible for automated processing as in data fusion

Diagram Conventions and Use of UML



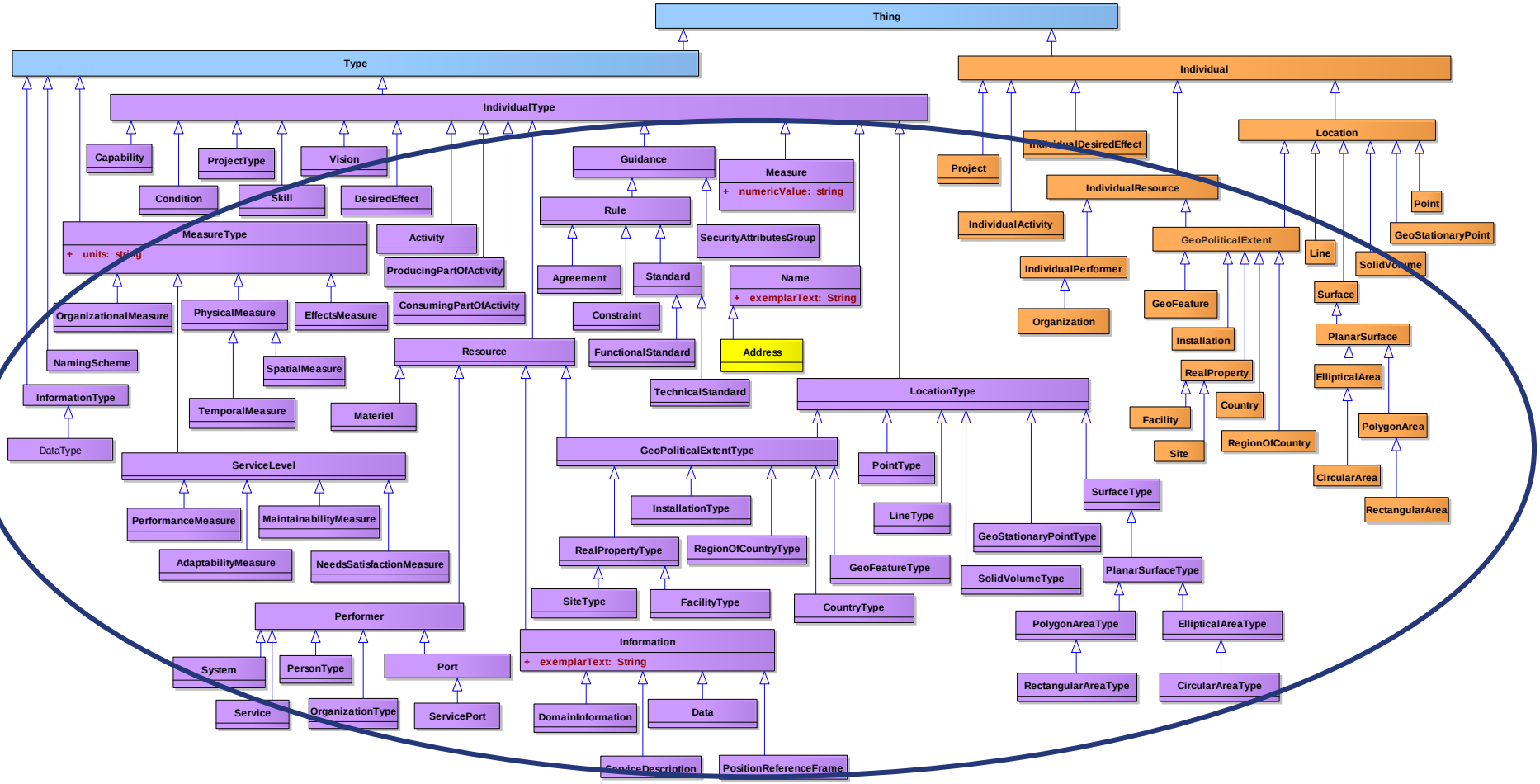
- <<Individual>> An instance of an Individual - something with spatio-temporal extent [Grey(80%) R40G40B40]
- <<Type>> The specification of a Type [Pale Blue R153 G204 B255]
- <<IndividualType>> The specification of a Type whose members are Individuals [Light Orange R255 G173 B91]
- <<TupleType>> The specification of a Type whose members are tuples [Light Green R204 G255 B204]
- <<Powertype>> The specification of a Type that is the set of all subsets of a given Type [Lavender R204 G153 B255]
- <<Name>> The specification of a name, with the examplar text provided as a tagged value [Tan R255 G254 B153]
- <<NamingScheme>> The specification of a Type whose members are names [Yellow R255 G255 B0]

(see handout or briefing notes for complete set of stereotypes)


Thing
instance
Type
tuple
superSubType
supertype
subtype
supertype-intersection_subtype
supertype-intersection_subtype
tuple
intersection
tuple
union
Individual
Common
Patterns
1
{redefines
firstTuplePlace}
*
tuple
disjoint
1
{redefines
secondTuplePlace}
*
tuple
typeInstance
type
powertypeInstance
powertype
Powertype
IndividualType
whole
part
TupleType
wholePartType
wholePartPowertypeInstanceOfWholePartType
tuple
wholePart
whole
part
TupleType
overlapType
overlapPowertypeInstanceOfOverlapType
tuple
overlap
temporalWholePartType
temporalWholePartPowertypeInstanceOfTemporalWholePartType
temporalWholePart
before
after
TupleType
beforeAfterType
beforeAfterPowertypeInstanceOfBeforeAfterType
tuple
beforeAfter
after
before

DoDAF Domain Concepts are Specializations

Domain Class Hierarchy

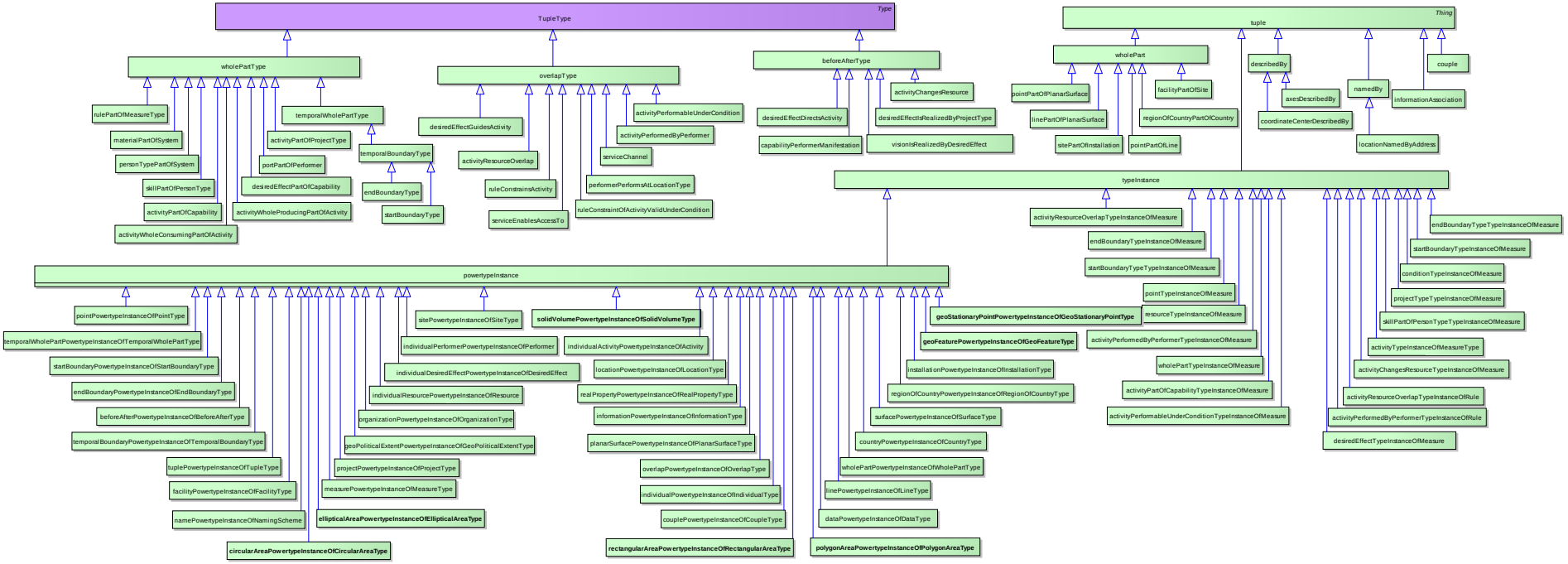


- So they inherit associations (can occupy association place positions)

(zoom-in or see wall chart to read)

All Associations are Typed

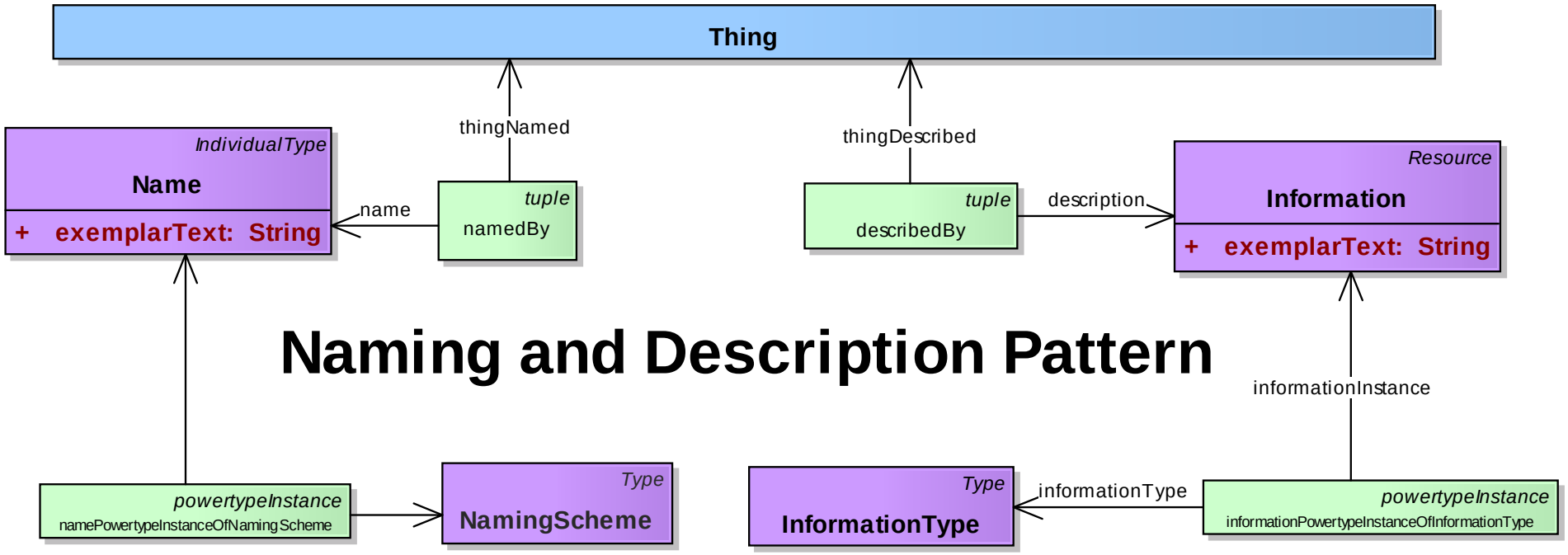
Foundation For Associations



- So their mathematical meaning is formally modeled – a first in DoDAF meta models

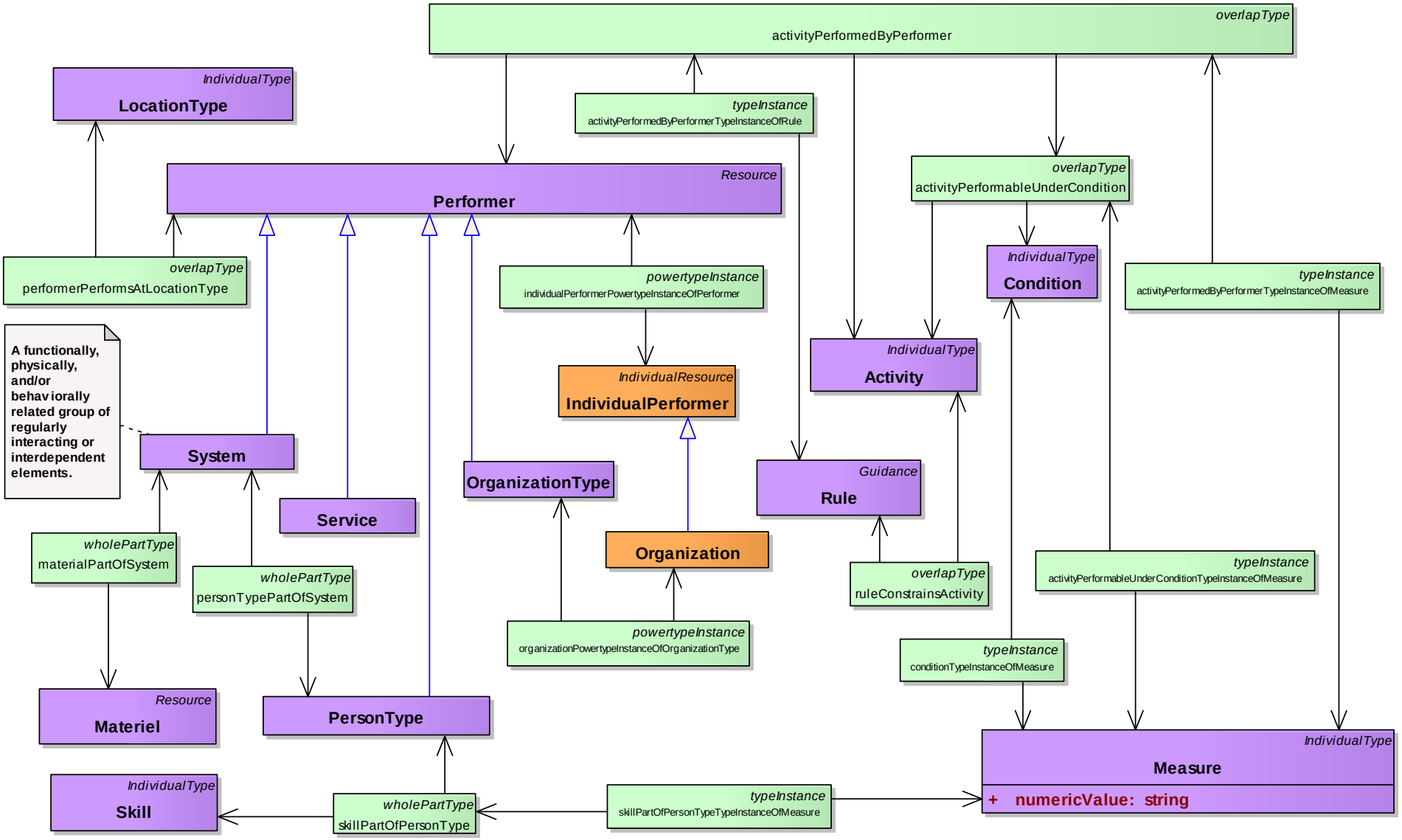
(zoom-in or see wall chart to read)

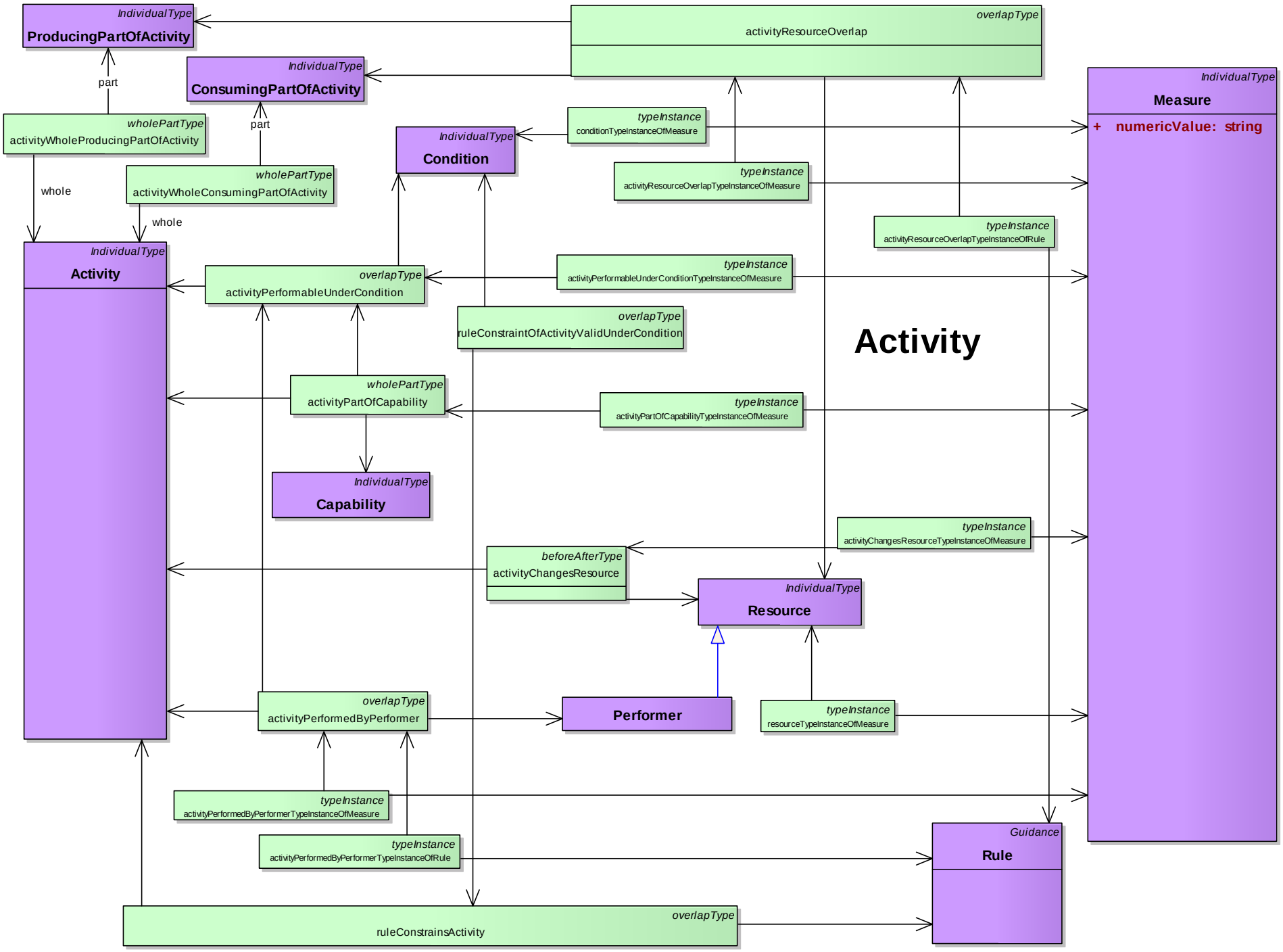
Naming and Description Pattern



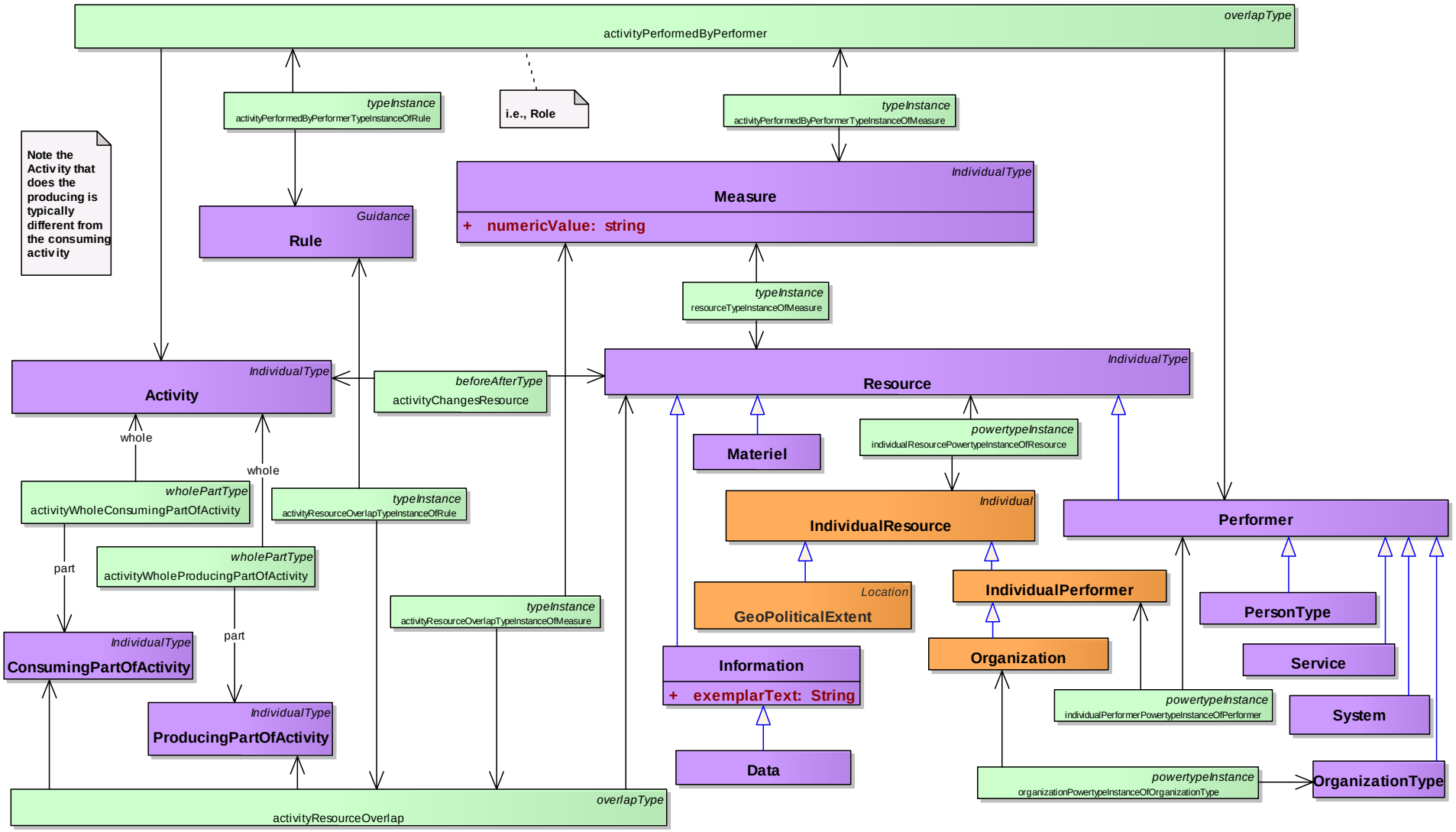
- Multiple names for same thing (aliases) – must tell Naming Scheme
- Information (formerly Information Element) linked to the Things it describes

Performer

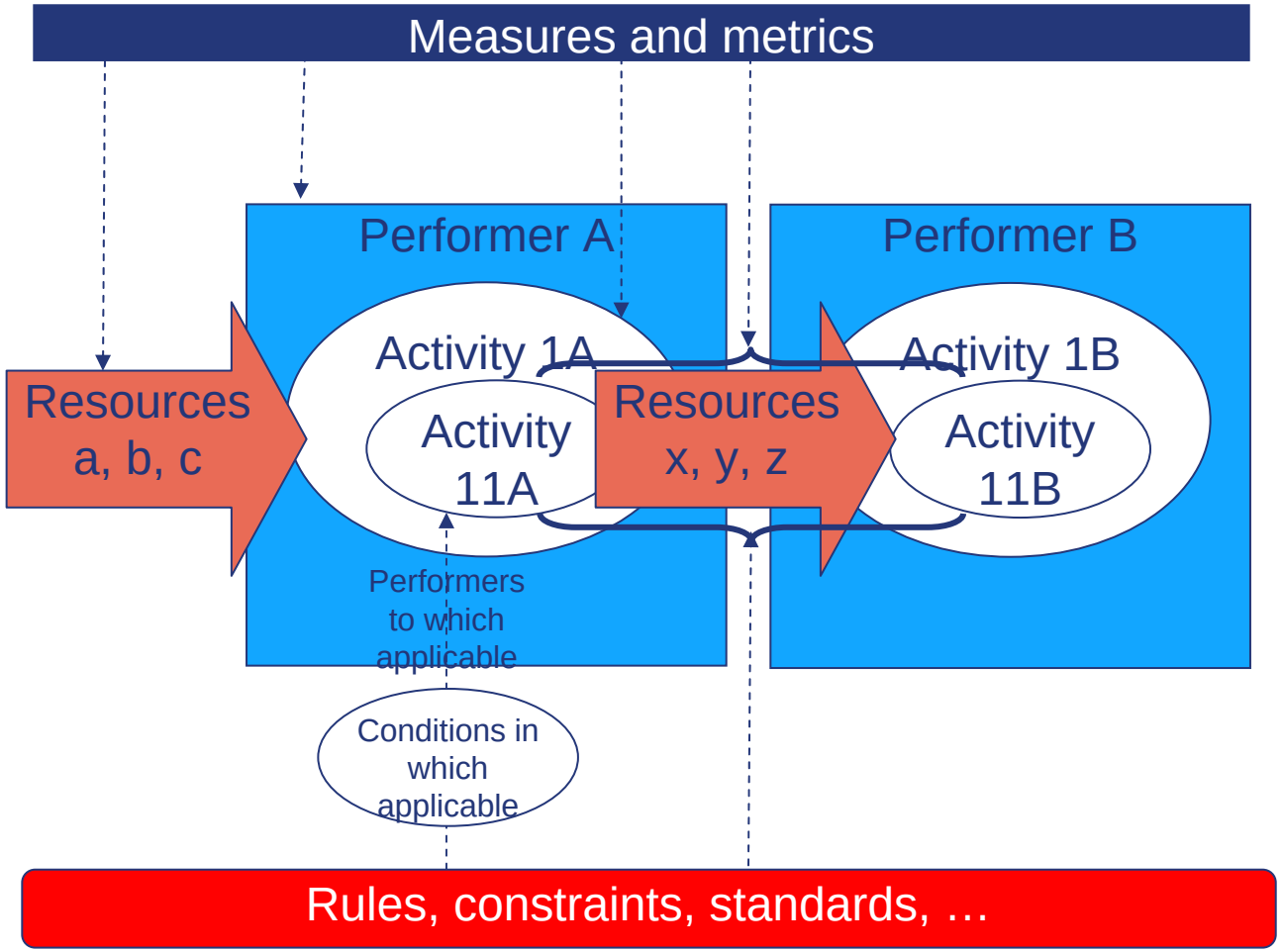

overlapType
activityPerformedByPerformer
IndividualType
LocationType
typeInstance
activityPerformedByPerformerTypeInstanceOfRule
overlapType
activityPerformableUnderCondition
Resource
Performer
IndividualType
Condition
typeInstance
activityPerformedByPerformerTypeInstanceOfMeasure
overlapType
performerPerformsAtLocationType
powertypeInstance
individualPerformerPowertypeInstanceOfPerformer
IndividualType
Activity
A functionally, physically, and/or behaviorally related group of regularly interacting or interdependent elements.
IndividualResource
IndividualPerformer
System
OrganizationType
Guidance
Rule
Service
wholePartType
materialPartOfSystem
Organization
wholePartType
personTypePartOfSystem
overlapType
ruleConstrainsActivity
typeInstance
activityPerformableUnderConditionTypeInstanceOfMeasure
powertypeInstance
organizationPowertypeInstanceOfOrganizationType
typeInstance
conditionTypeInstanceOfMeasure
Resource
Materiel
PersonType
IndividualType
Measure
+ numericValue: string
IndividualType
Skill
wholePartType
skillPartOfPersonType
typeInstance
skillPartOfPersonTypeTypeInstanceOfMeasure


IndividualType
ProducingPartOfActivity
overlapType
activityResourceOverlap
IndividualType
ConsumingPartOfActivity
IndividualType
Measure
+ numericValue: string
part
part
wholePartType
activityWholeProducingPartOfActivity
wholePartType
activityWholeConsumingPartOfActivity
whole
whole
IndividualType
Condition
typeInstance
conditionTypeInstanceOfMeasure
typeInstance
activityResourceOverlapTypeInstanceOfMeasure
typeInstance
activityResourceOverlapTypeInstanceOfRule
IndividualType
Activity
overlapType
activityPerformableUnderCondition
typeInstance
activityPerformableUnderConditionTypeInstanceOfMeasure
overlapType
ruleConstraintOfActivityValidUnderCondition
Activity
wholePartType
activityPartOfCapability
typeInstance
activityPartOfCapabilityTypeInstanceOfMeasure
IndividualType
Capability
typeInstance
activityChangesResourceTypeInstanceOfMeasure
beforeAfterType
activityChangesResource
IndividualType
Resource
overlapType
activityPerformedByPerformer
Performer
typeInstance
resourceTypeInstanceOfMeasure
typeInstance
activityPerformedByPerformerTypeInstanceOfMeasure
typeInstance
activityPerformedByPerformerTypeInstanceOfRule
Guidance
Rule
overlapType
ruleConstrainsActivity

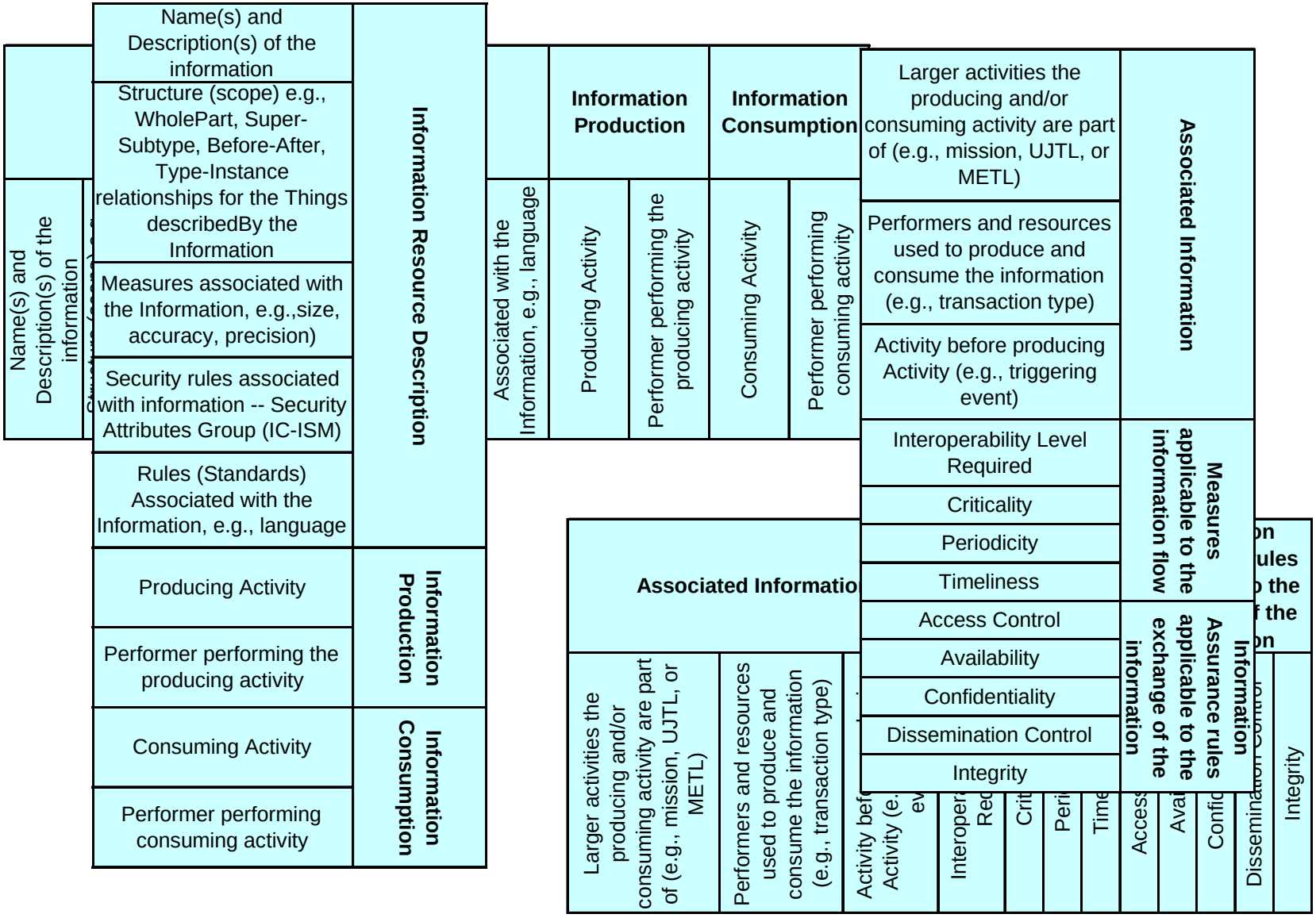
Resource Flow



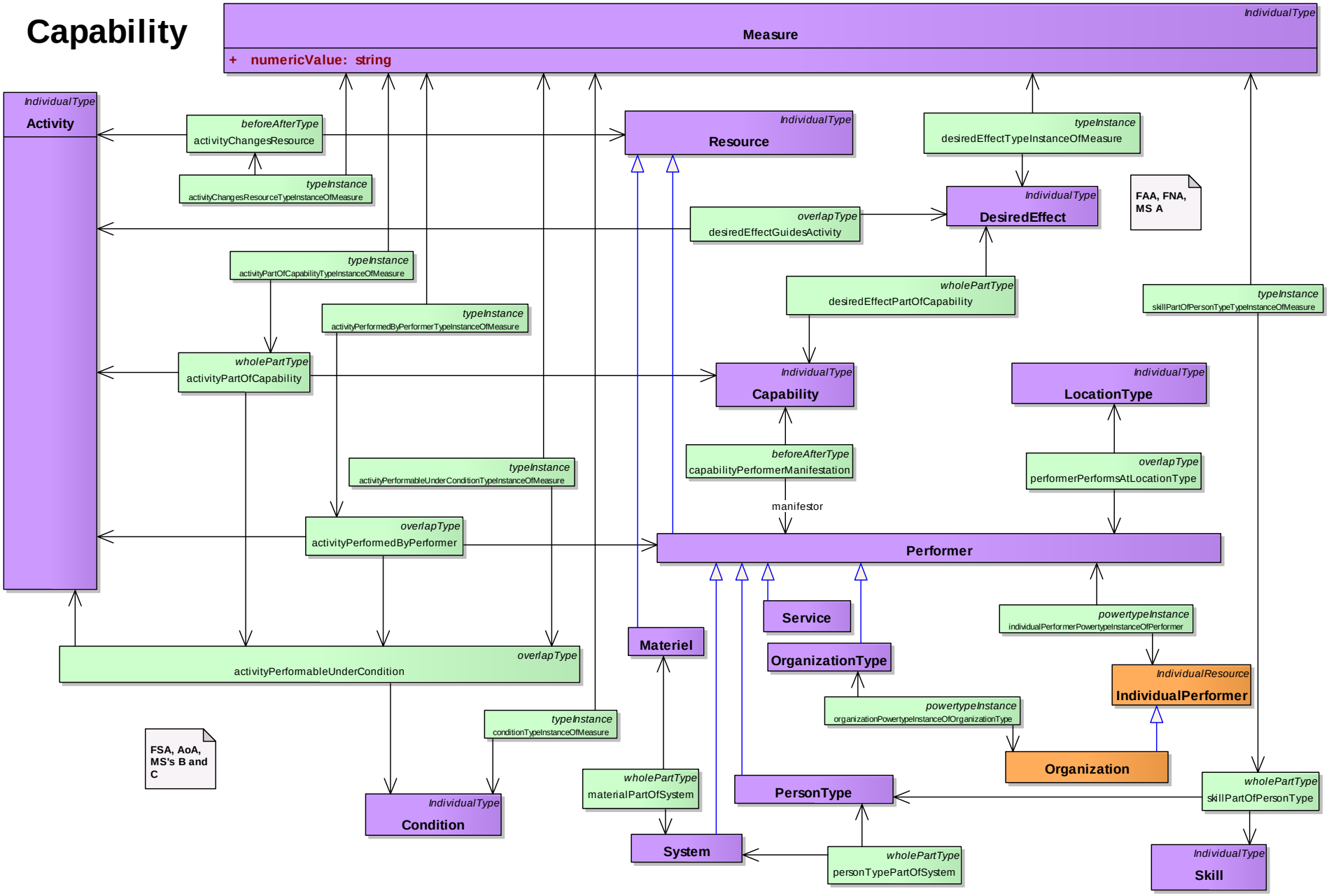
Activity Model in this Terminology



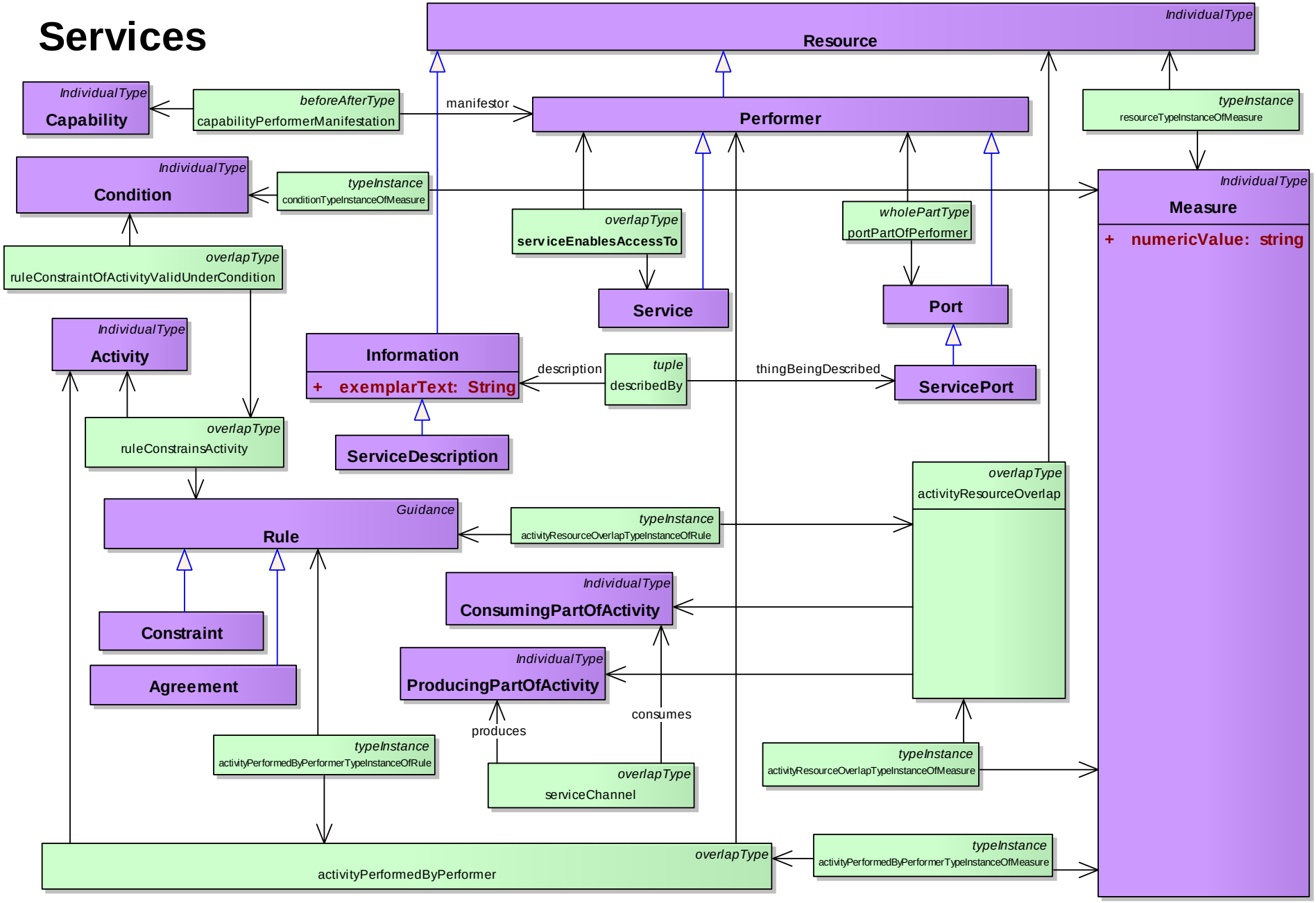
IER "Matrix" in this Terminology

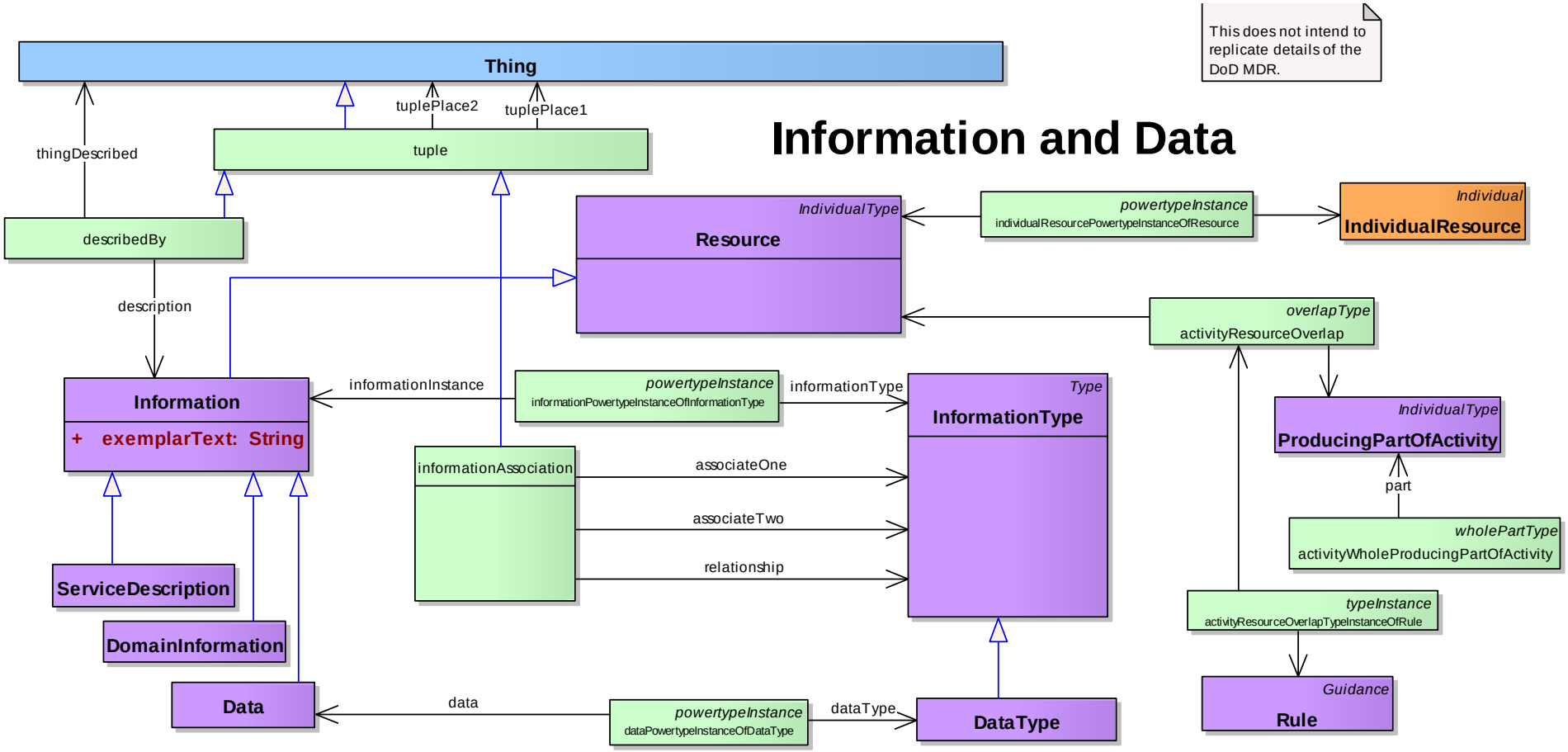


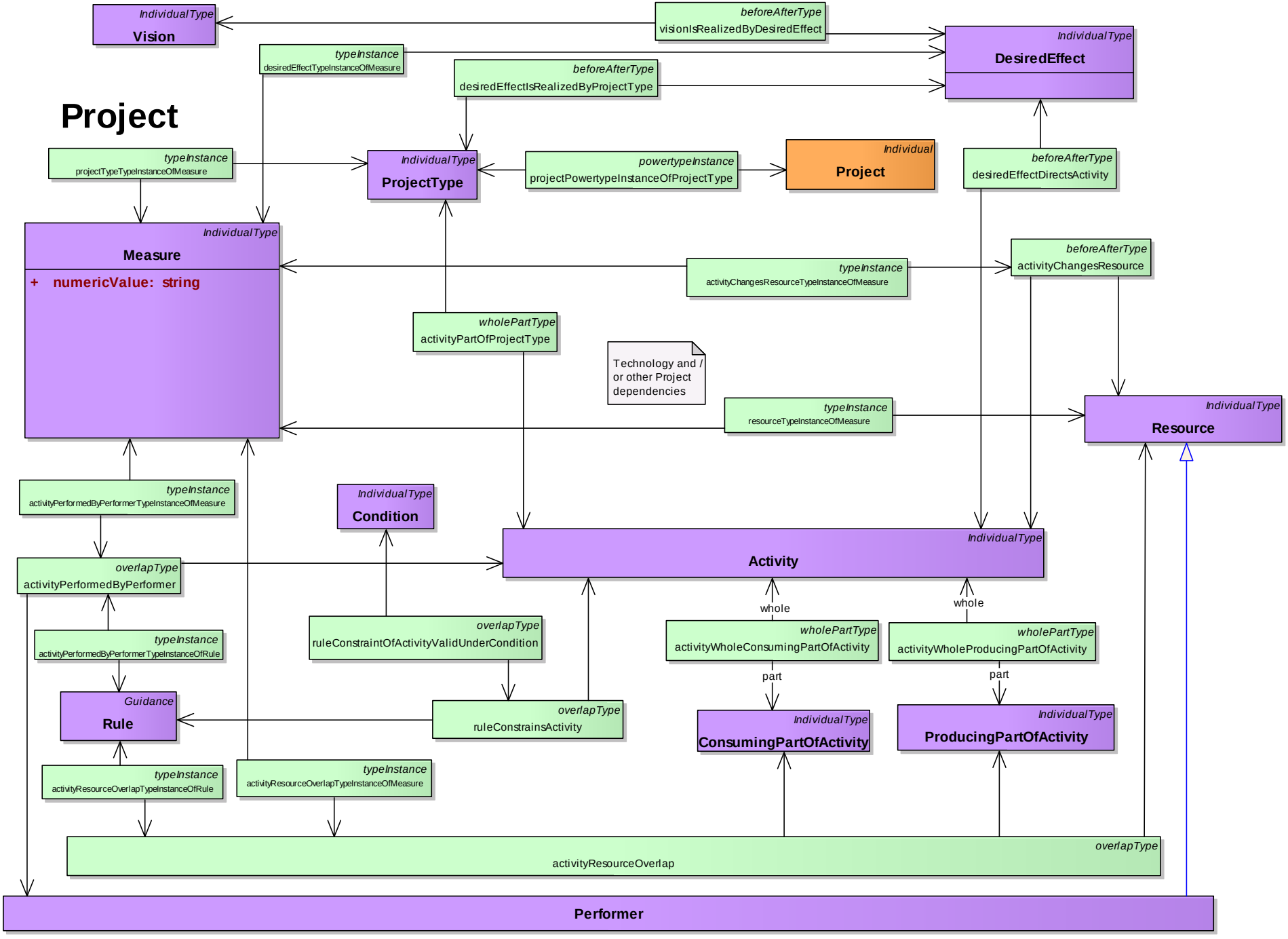
Capability

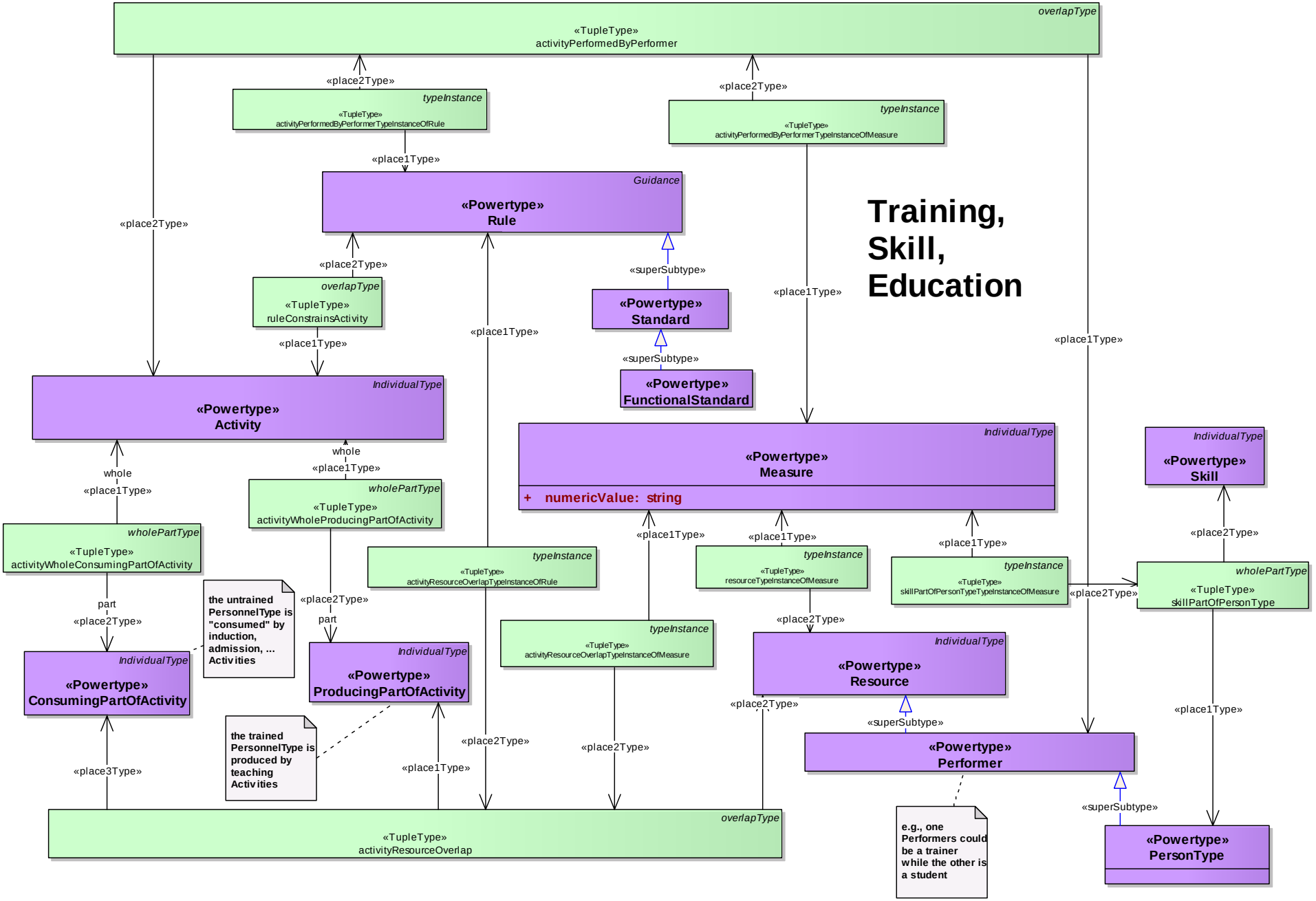

IndividualType
Measure
+ numericValue: string
IndividualType
Activity
beforeAfterType
activityChangesResource
typeInstance
activityChangesResourceTypeInstanceOfMeasure
IndividualType
Resource
typeInstance
desiredEffectTypeInstanceOfMeasure
IndividualType
DesiredEffect
FAA, FNA, MS A
overlapType
desiredEffectGuidesActivity
typeInstance
activityPartOfCapabilityTypeInstanceOfMeasure
typeInstance
activityPerformedByPerformerTypeInstanceOfMeasure
wholePartType
desiredEffectPartOfCapability
typeInstance
skillPartOfPersonTypeTypeInstanceOfMeasure
wholePartType
activityPartOfCapability
IndividualType
Capability
IndividualType
LocationType
typeInstance
activityPerformableUnderConditionTypeInstanceOfMeasure
beforeAfterType
capabilityPerformerManifestation
overlapType
performerPerformsAtLocationType
manifestor
overlapType
activityPerformedByPerformer
Performer
Service
powertypeInstance
individualPerformerPowertypeInstanceOfPerformer
Materiel
OrganizationType
overlapType
activityPerformableUnderCondition
IndividualResource
IndividualPerformer
powertypeInstance
organizationPowertypeInstanceOfOrganizationType
typeInstance
conditionTypeInstanceOfMeasure
FSA, AoA, MS's B and C
Organization
wholePartType
materialPartOfSystem
PersonType
wholePartType
skillPartOfPersonType
IndividualType
Condition
System
wholePartType
personTypePartOfSystem
IndividualType
Skill

Services

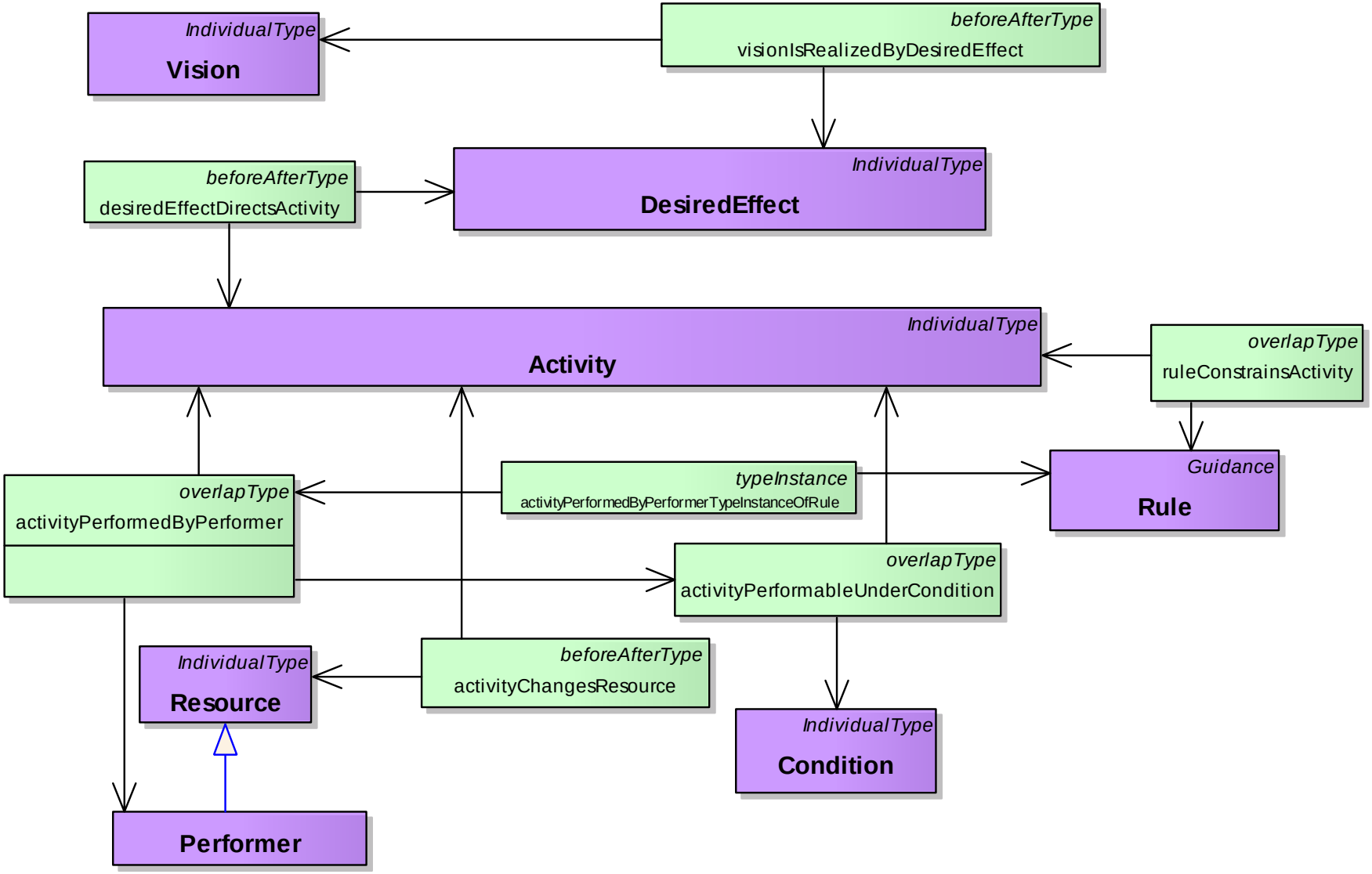

IndividualType
Resource
IndividualType
Capability
beforeAfterType
capabilityPerformerManifestation
manifestor
Performer
typeInstance
resourceTypeInstanceOfMeasure
IndividualType
Condition
typeInstance
conditionTypeInstanceOfMeasure
IndividualType
Measure
+ numericValue: string
overlapType
serviceEnablesAccessTo
wholePartType
portPartOfPerformer
overlapType
ruleConstraintOfActivityValidUnderCondition
Service
Port
IndividualType
Activity
Information
+ exemplarText: String
description
tuple
describedBy
thingBeingDescribed
ServicePort
overlapType
ruleConstrainsActivity
ServiceDescription
overlapType
activityResourceOverlap
Guidance
Rule
typeInstance
activityResourceOverlapTypeInstanceOfRule
IndividualType
ConsumingPartOfActivity
Constraint
IndividualType
ProducingPartOfActivity
Agreement
produces
consumes
typeInstance
activityPerformedByPerformerTypeInstanceOfRule
typeInstance
activityResourceOverlapTypeInstanceOfMeasure
overlapType
serviceChannel
typeInstance
activityPerformedByPerformerTypeInstanceOfMeasure
overlapType
activityPerformedByPerformer


This does not intend to replicate details of the DoD MDR.
Information and Data
Thing
tuplePlace2
tuplePlace1
thingDescribed
tuple
describedBy
description
IndividualType
Resource
powertypeInstance
individualResourcePowertypeInstanceOfResource
Individual
IndividualResource
overlapType
activityResourceOverlap
Information
+ exemplarText: String
informationInstance
powertypeInstance
informationPowertypeInstanceOfInformationType
informationType
Type
InformationType
IndividualType
ProducingPartOfActivity
part
wholePartType
activityWholeProducingPartOfActivity
informationAssociation
associateOne
associateTwo
relationship
ServiceDescription
DomainInformation
typeInstance
activityResourceOverlapTypeInstanceOfRule
Guidance
Rule
Data
data
powertypeInstance
dataPowertypeInstanceOfDataType
dataType
DataType

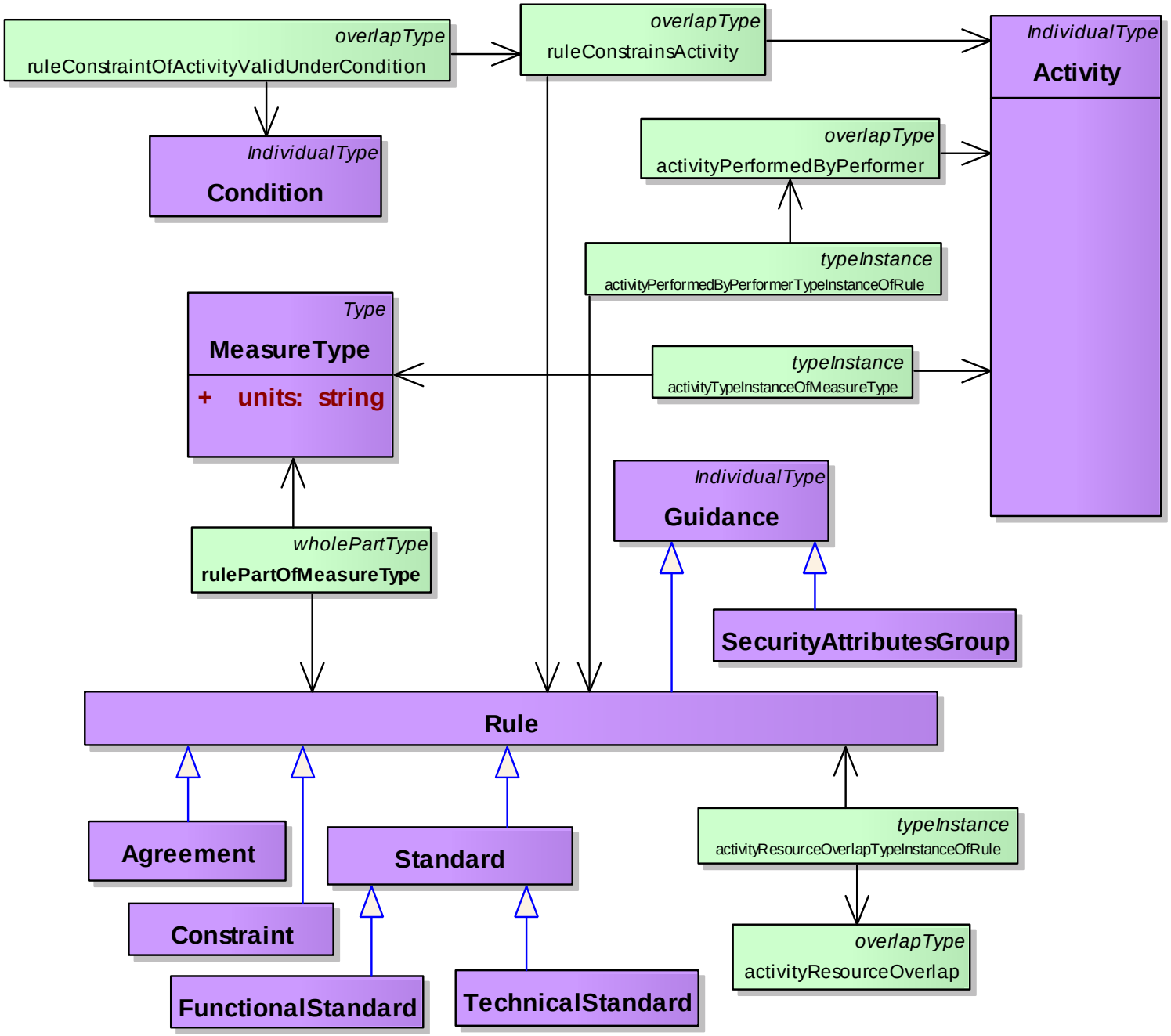

Project
IndividualType
Vision
beforeAfterType
visionIsRealizedByDesiredEffect
IndividualType
DesiredEffect
typeInstance
desiredEffectTypeInstanceOfMeasure
beforeAfterType
desiredEffectIsRealizedByProjectType
typeInstance
projectTypeTypeInstanceOfMeasure
IndividualType
ProjectType
powertypeInstance
projectPowertypeInstanceOfProjectType
Individual
Project
beforeAfterType
desiredEffectDirectsActivity
IndividualType
Measure
+ numericValue: string
typeInstance
activityChangesResourceTypeInstanceOfMeasure
beforeAfterType
activityChangesResource
wholePartType
activityPartOfProjectType
Technology and / or other Project dependencies
typeInstance
resourceTypeInstanceOfMeasure
IndividualType
Resource
typeInstance
activityPerformedByPerformerTypeInstanceOfMeasure
IndividualType
Condition
IndividualType
Activity
overlapType
activityPerformedByPerformer
whole
whole
typeInstance
activityPerformedByPerformerTypeInstanceOfRule
overlapType
ruleConstraintOfActivityValidUnderCondition
wholePartType
activityWholeConsumingPartOfActivity
wholePartType
activityWholeProducingPartOfActivity
part
part
Guidance
Rule
overlapType
ruleConstrainsActivity
IndividualType
ConsumingPartOfActivity
IndividualType
ProducingPartOfActivity
typeInstance
activityResourceOverlapTypeInstanceOfRule
typeInstance
activityResourceOverlapTypeInstanceOfMeasure
overlapType
activityResourceOverlap
Performer


overlapType
«TupleType»
activityPerformedByPerformer
«place2Type»
typeInstance
«TupleType»
activityPerformedByPerformerTypeInstanceOfRule
«place2Type»
typeInstance
«TupleType»
activityPerformedByPerformerTypeInstanceOfMeasure
«place1Type»
Guidance
«Powertype»
Rule
Training,
Skill,
Education
«place2Type»
«place2Type»
overlapType
«TupleType»
ruleConstrainsActivity
«superSubtype»
«Powertype»
Standard
«place1Type»
«place1Type»
«place1Type»
«superSubtype»
«Powertype»
FunctionalStandard
IndividualType
«Powertype»
Activity
IndividualType
«Powertype»
Measure
+ numericValue: string
IndividualType
«Powertype»
Skill
whole
«place1Type»
whole
«place1Type»
wholePartType
«TupleType»
activityWholeProducingPartOfActivity
«place1Type»
«place1Type»
«place1Type»
«place2Type»
wholePartType
«TupleType»
activityWholeConsumingPartOfActivity
typeInstance
«TupleType»
activityResourceOverlapTypeInstanceOfRule
typeInstance
«TupleType»
resourceTypeInstanceOfMeasure
typeInstance
«TupleType»
skillPartOfPersonTypeTypeInstanceOfMeasure
«place2Type»
wholePartType
«TupleType»
skillPartOfPersonType
part
«place2Type»
the untrained PersonnelType is "consumed" by induction, admission, ... Activities
«place2Type»
part
typeInstance
«TupleType»
activityResourceOverlapTypeInstanceOfMeasure
«place2Type»
IndividualType
«Powertype»
Resource
IndividualType
«Powertype»
ConsumingPartOfActivity
IndividualType
«Powertype»
ProducingPartOfActivity
«place2Type»
«place1Type»
«superSubtype»
«Powertype»
Performer
«place3Type»
the trained PersonnelType is produced by teaching Activities
«place2Type»
«place2Type»
«place1Type»
«superSubtype»
e.g., one Performers could be a trainer while the other is a student
«Powertype»
PersonType
overlapType
«TupleType»
activityResourceOverlap

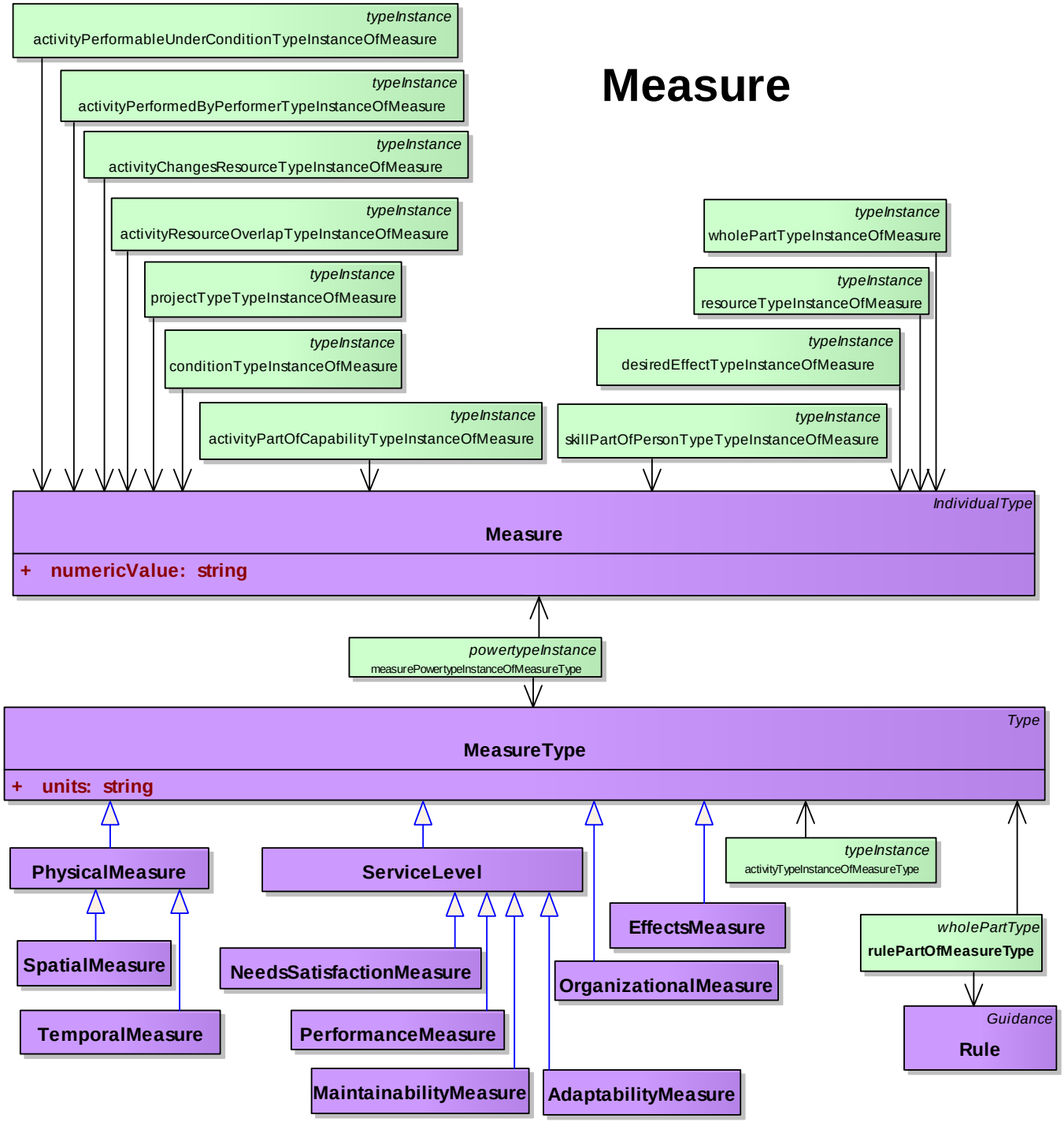
Goals

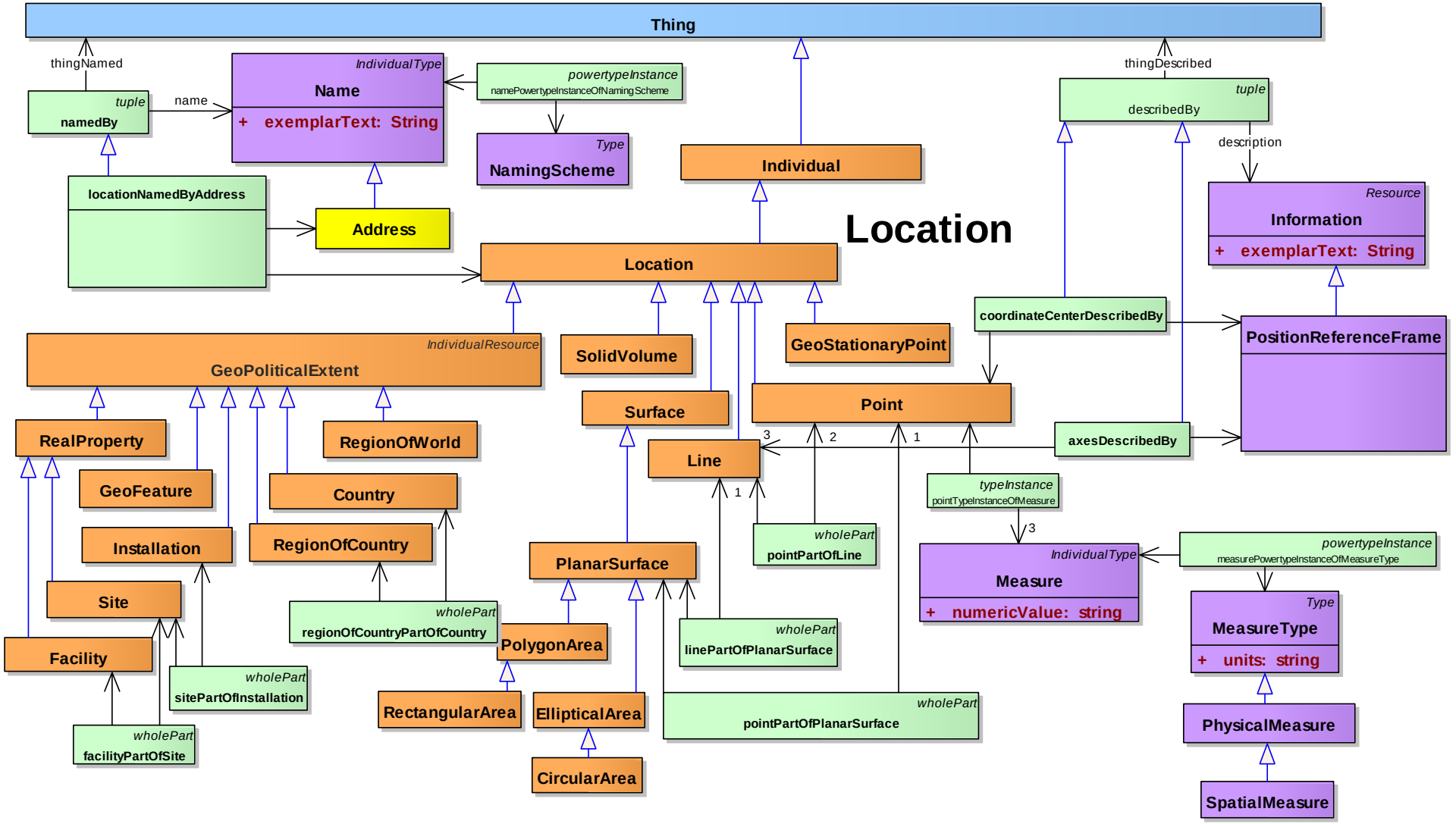

IndividualType
Vision
beforeAfterType
visionIsRealizedByDesiredEffect
beforeAfterType
desiredEffectDirectsActivity
IndividualType
DesiredEffect
IndividualType
Activity
overlapType
ruleConstrainsActivity
Guidance
Rule
typeInstance
activityPerformedByPerformerTypeInstanceOfRule
overlapType
activityPerformedByPerformer
overlapType
activityPerformableUnderCondition
IndividualType
Resource
beforeAfterType
activityChangesResource
IndividualType
Condition
Performer

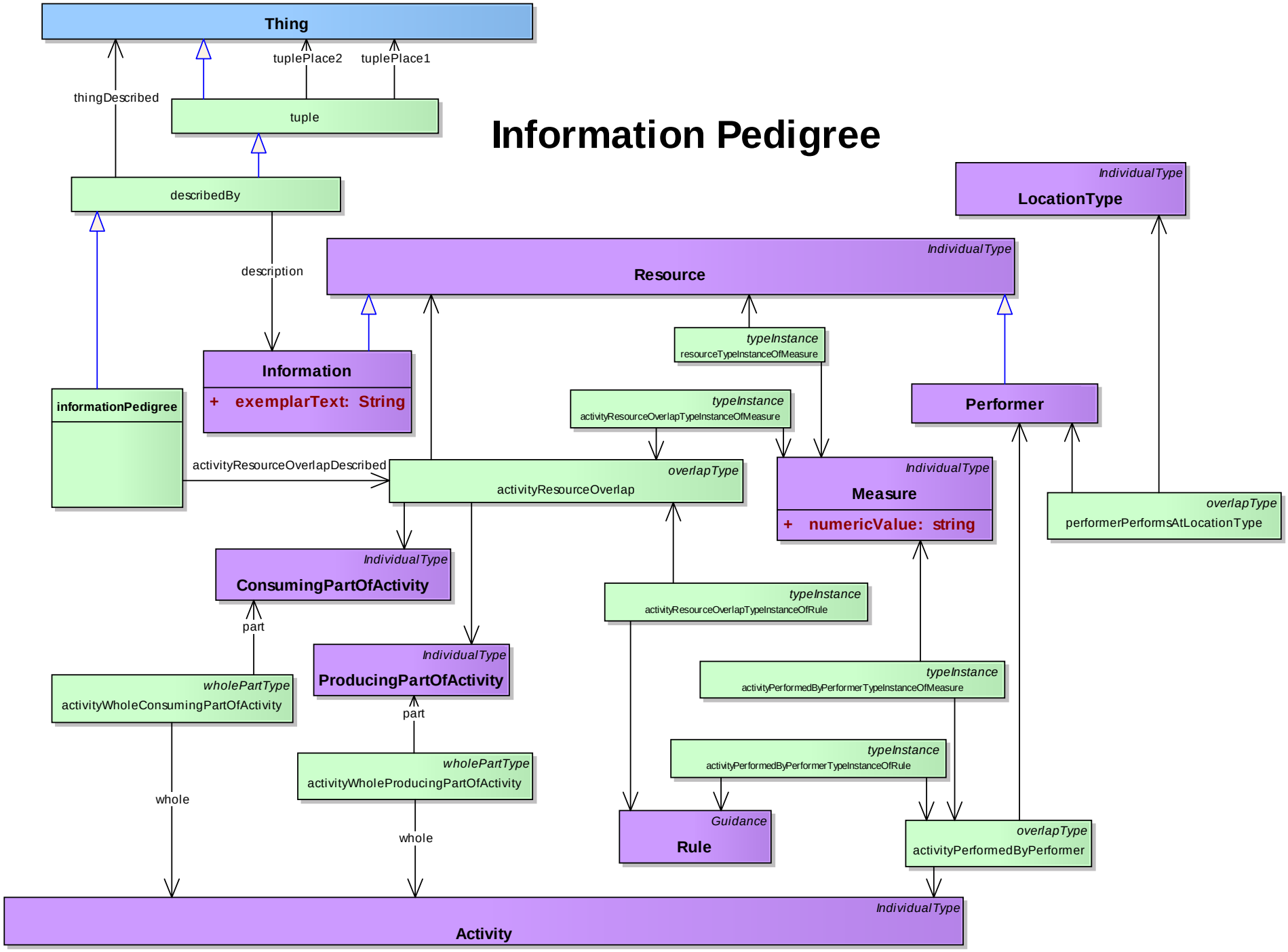
Rules


overlapType
ruleConstraintOfActivityValidUnderCondition
overlapType
ruleConstrainsActivity
IndividualType
Activity
IndividualType
Condition
overlapType
activityPerformedByPerformer
typeInstance
activityPerformedByPerformerTypeInstanceOfRule
Type
MeasureType
+ units: string
typeInstance
activityTypeInstanceOfMeasureType
IndividualType
Guidance
wholePartType
rulePartOfMeasureType
SecurityAttributesGroup
Rule
Agreement
Constraint
Standard
FunctionalStandard
TechnicalStandard
typeInstance
activityResourceOverlapTypeInstanceOfRule
overlapType
activityResourceOverlap

Measure

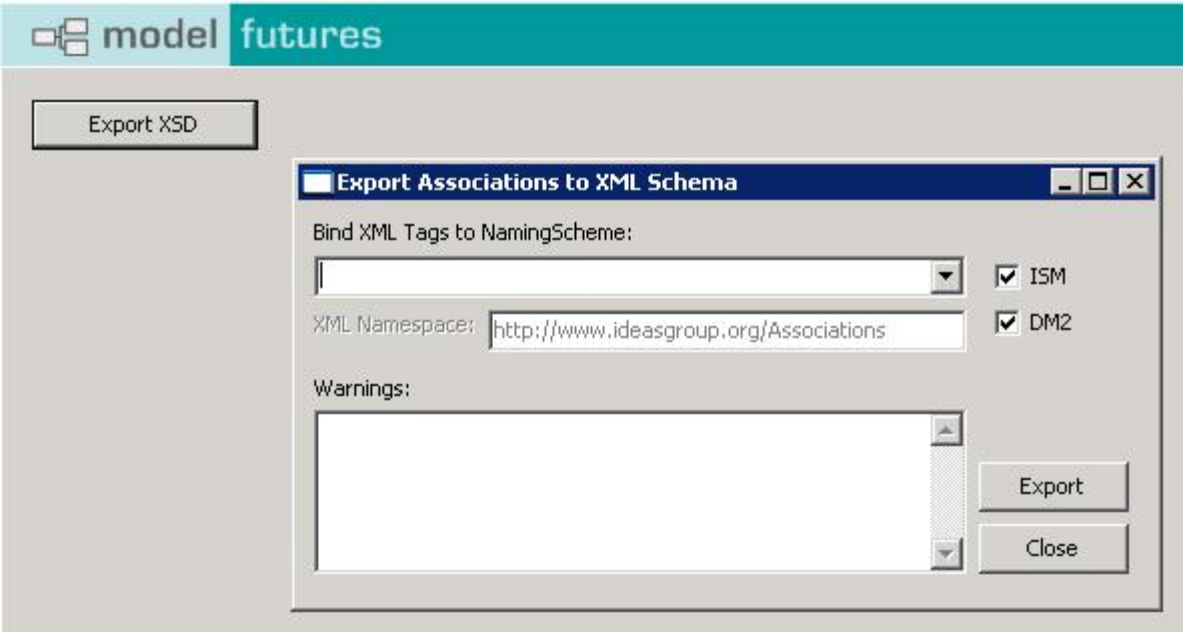

typeInstance
activityPerformableUnderConditionTypeInstanceOfMeasure
typeInstance
activityPerformedByPerformerTypeInstanceOfMeasure
typeInstance
activityChangesResourceTypeInstanceOfMeasure
typeInstance
activityResourceOverlapTypeInstanceOfMeasure
typeInstance
projectTypeTypeInstanceOfMeasure
typeInstance
conditionTypeInstanceOfMeasure
typeInstance
activityPartOfCapabilityTypeInstanceOfMeasure
typeInstance
wholePartTypeInstanceOfMeasure
typeInstance
resourceTypeInstanceOfMeasure
typeInstance
desiredEffectTypeInstanceOfMeasure
typeInstance
skillPartOfPersonTypeTypeInstanceOfMeasure
IndividualType
Measure
+ numericValue: string
powertypeInstance
measurePowertypeInstanceOfMeasureType
Type
MeasureType
+ units: string
typeInstance
activityTypeInstanceOfMeasureType
wholePartType
rulePartOfMeasureType
Guidance
Rule
PhysicalMeasure
SpatialMeasure
TemporalMeasure
ServiceLevel
NeedsSatisfactionMeasure
PerformanceMeasure
MaintainabilityMeasure
AdaptabilityMeasure
EffectsMeasure
OrganizationalMeasure


Thing
thingNamed
tuple
namedBy
name
IndividualType
Name
+ exemplarText: String
powertypeInstance
namePowertypeInstanceOfNamingScheme
Type
NamingScheme
Individual
thingDescribed
tuple
describedBy
description
Resource
Information
+ exemplarText: String
locationNamedByAddress
Address
Location
Location
coordinateCenterDescribedBy
PositionReferenceFrame
IndividualResource
GeoPoliticalExtent
SolidVolume
GeoStationaryPoint
Surface
Point
RealProperty
RegionOfWorld
Line
axesDescribedBy
GeoFeature
Country
typeInstance
pointTypeInstanceOfMeasure
Installation
RegionOfCountry
wholePart
pointPartOfLine
PlanarSurface
IndividualType
Measure
+ numericValue: string
powertypeInstance
measurePowertypeInstanceOfMeasureType
Site
wholePart
regionOfCountryPartOfCountry
Type
MeasureType
+ units: string
Facility
PolygonArea
wholePart
linePartOfPlanarSurface
wholePart
sitePartOfInstallation
RectangularArea
EllipticalArea
wholePart
pointPartOfPlanarSurface
PhysicalMeasure
wholePart
facilityPartOfSite
CircularArea
SpatialMeasure


Information Pedigree
Thing
tuplePlace2
tuplePlace1
thingDescribed
tuple
describedBy
description
IndividualType
LocationType
IndividualType
Resource
typeInstance
resourceTypeInstanceOfMeasure
Information
+ exemplarText: String
informationPedigree
typeInstance
activityResourceOverlapTypeInstanceOfMeasure
Performer
activityResourceOverlapDescribed
overlapType
activityResourceOverlap
IndividualType
Measure
+ numericValue: string
overlapType
performerPerformsAtLocationType
IndividualType
ConsumingPartOfActivity
typeInstance
activityResourceOverlapTypeInstanceOfRule
part
IndividualType
ProducingPartOfActivity
wholePartType
activityWholeConsumingPartOfActivity
typeInstance
activityPerformedByPerformerTypeInstanceOfMeasure
part
typeInstance
activityPerformedByPerformerTypeInstanceOfRule
wholePartType
activityWholeProducingPartOfActivity
whole
Guidance
Rule
overlapType
activityPerformedByPerformer
whole
IndividualType
Activity

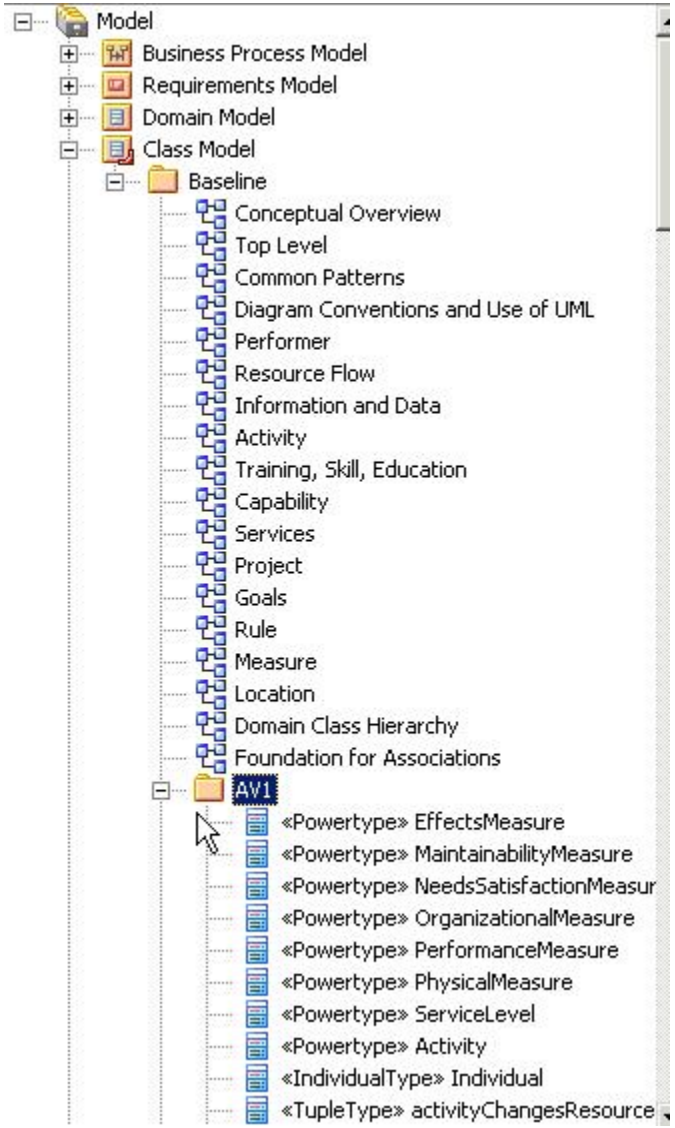
Physical Exchange Specification

Exporter


model futures
Export XSD
Export Associations to XML Schema
Bind XML Tags to NamingScheme:
ISM
XML Namespace:
http://www.ideasgroup.org/Associations
DM2
Warnings:
Export
Close


IDEAS Plug-In for Sparx EA
developed by:
model futures
www.modelfutures.com
Development sponsored by UK MOD
(under sub-contract to Serco Consulting)
ideas group
This Plug-In uses the Model Futures Desktop
Ontology Engine (Demonstration License)


Enterprise Architect
Version 7.1
© 1998 - 2008 Sparx Systems. All rights reserved.
SPARX SYSTEMS


Model
Business Process Model
Requirements Model
Domain Model
Class Model
Baseline
Conceptual Overview
Top Level
Common Patterns
Diagram Conventions and Use of UML
Performer
Resource Flow
Information and Data
Activity
Training, Skill, Education
Capability
Services
Project
Goals
Rule
Measure
Location
Domain Class Hierarchy
Foundation for Associations
AV1
«Powertype» EffectsMeasure
«Powertype» MaintainabilityMeasure
«Powertype» NeedsSatisfactionMeasur
«Powertype» OrganizationalMeasure
«Powertype» PerformanceMeasure
«Powertype» PhysicalMeasure
«Powertype» ServiceLevel
«Powertype» Activity
«IndividualType» Individual
«TupleType» activityChangesResource

Mapping of Models Basis for XSDs

Technical Term	AV-1	AV-2	OV-1	OV-2	OV-3	OV-4	OV-5a	OV-5b	OV-6a	OV-6b	OV-6c	SV-1	SV-2	SV-3	SV-4	SV-5a	SV-5b	SV-6	SV-7	SV-8	SV-9	SV-10a	SV-10b	SV-10c	SvcV-1	SvcV-2	SvcV-3a	SvcV-3b	SvcV-4	SvcV-5	SvcV-6
Activity	n	o		n	n		n	n	o	n	n	n	n	n	n	n	o	n	o	o	o	o	n	n	n	n	n	n	n	o	n
activityChangesResource	o								o	o	o											o	o	o							
activityChangesResourceTypeInstanceOfMeasure	o								o	o	o											o	o	o							
activityPartOfCapability																	o												o		
activityPartOfCapabilityTypeInstanceOfMeasure																	o														
activityPartOfProjectType																															
activityPerformableUnderCondition								o	o	o	o				o		o					o	o	o							
activityPerformableUnderConditionTypeInstanceOfMeasure								o	o	o	o				o		o					o	o	o							
activityPerformedByPerformer	o			o	o			o	o	o	o				o	o	o	o	o	o	o	o	o	o					o		o
activityPerformedByPerformerTypeInstanceOfMeasure	o				o			o	o	o	o				o		o		o	o	o	o	o	o					o		
activityPerformedByPerformerTypeInstanceOfRule								o	o	o	o				o			o				o	o	o				o			o
activityResourceOverlap				n	n			n	o	n	n	n	n	n	n			n				o	n	n	n	n	n	n			n
activityResourceOverlapTypeInstanceOfMeasure					o			o	o	o	o	o	o	o	o			o				o	o	o	o	o	o	o			o
activityResourceOverlapTypeInstanceOfRule					o			o	o	o	o	o	o	o	o			o				o	o	o	o	o	o	o			o
activityTypeInstanceOfMeasureType	o				o			o	o	o	o	o	o	o	o			n	n	o	o	o	o	o	o	o					n
activityWholeConsumingPartOfActivity				n	n		o	n	o	n	n	n	n	n	n											n	n	n			n
activityWholeProducingPartOfActivity				n	n		o	n	o	n	n	n	n	n	n											n	n	n			n
AdaptabilityMeasure		o			o			o	o	o	o	o	o	o	o			o	o	o	o	o	o	o	o	o	o	o			o
Address	o											o	o					o				o	o		o	o					o
Agreement	o	o						o	o	o	o																				
axesDescribedBy									o			o	o									o			o	o					
beforeAfter	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f
beforeAfterPowertypeInstanceOfBeforeAfterType	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f
beforeAfterType	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f	f
Capability		o															o														

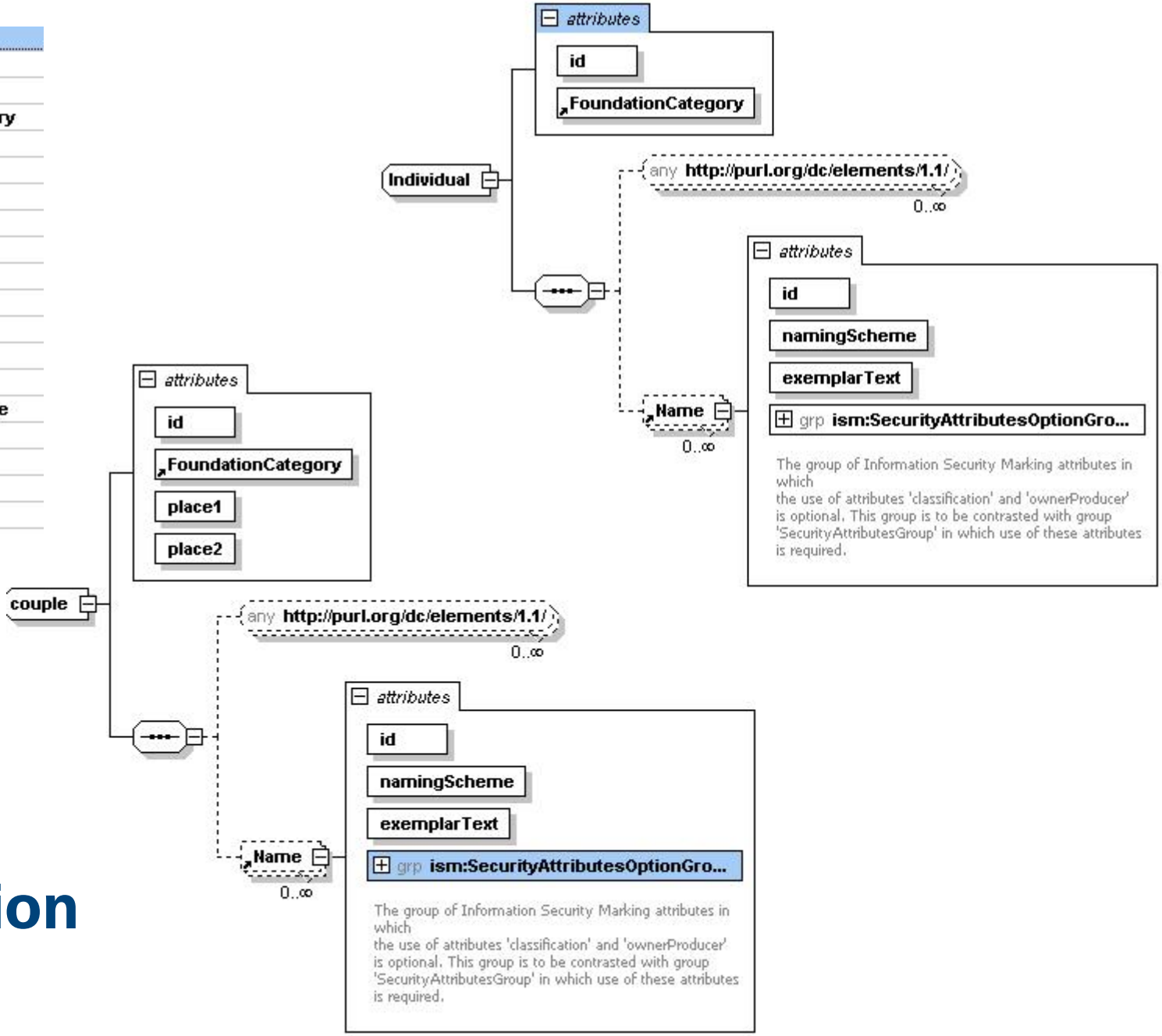
In DoDAF Vol II

(see wall chart to read entire matrix)

Components

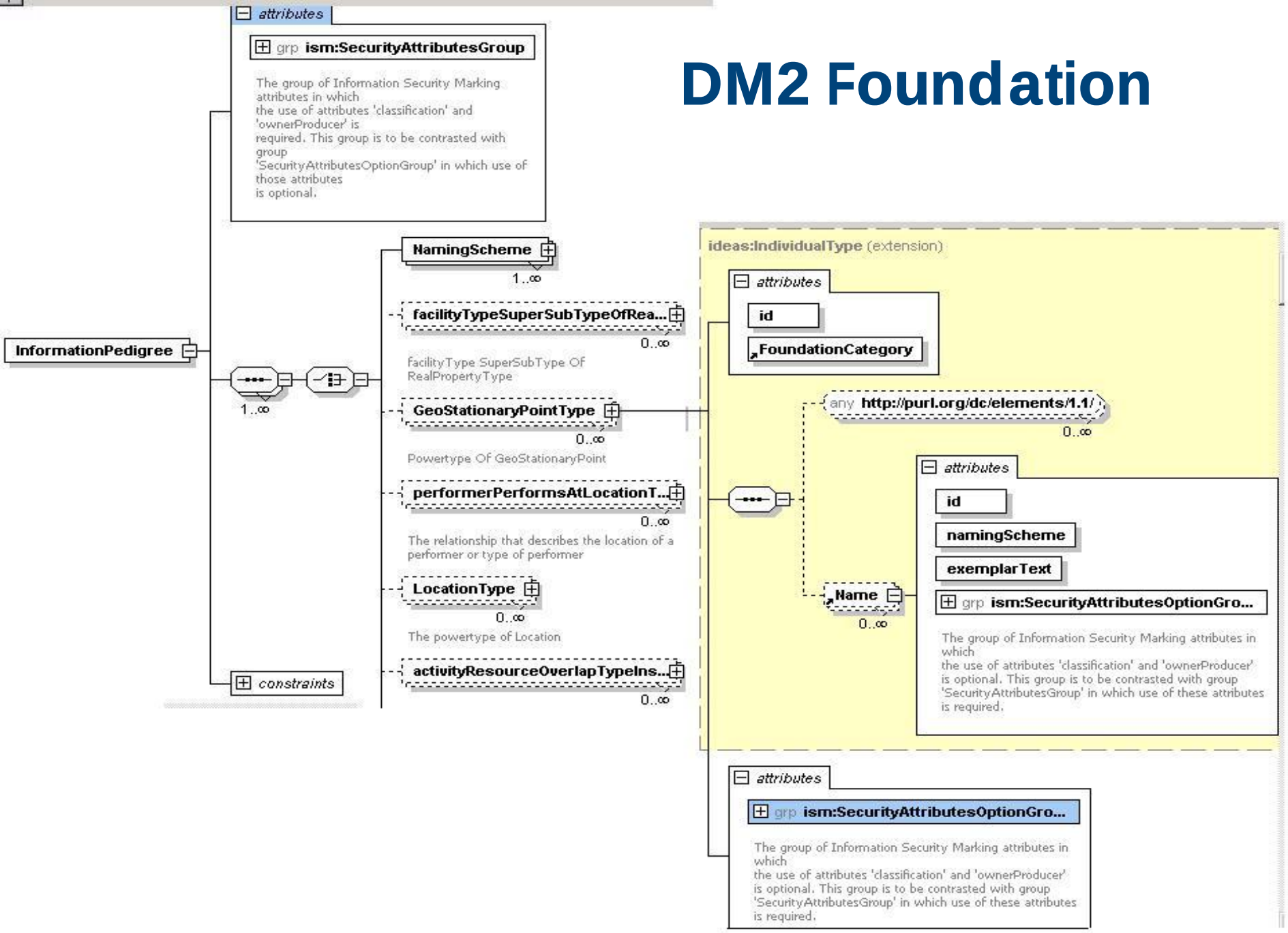
- One per DoDAF model (52) with necessary and optional parts
- 1 comprehensive with all optional for “fit for purpose” models
- 3 references – IDEAS Foundation, Security marking (IC-ISM), and Pedigree
  - Everything is tied to the IDEAS Foundation
  - Everything has a classification marking – a “portion mark”
  - Everything has a pedigree – who, how,… it came into being

import	loc:IC-ISM-v2.1.xsd
simpleType	**refList**
simpleType	**nameList**
attribute	**FoundationCategory**
element	**Name**
complexType	**Thing**
complexType	**Individual**
complexType	**Type**
complexType	**Powertype**
complexType	**IndividualType**
complexType	**NamingScheme**
complexType	**tuple**
complexType	**couple**
complexType	**typeInstance**
complexType	**powertypeInstance**
complexType	**wholePart**
complexType	**superSubtype**
complexType	**triple**
complexType	**quadruple**



IDEAS Foundation

DM2 Foundation



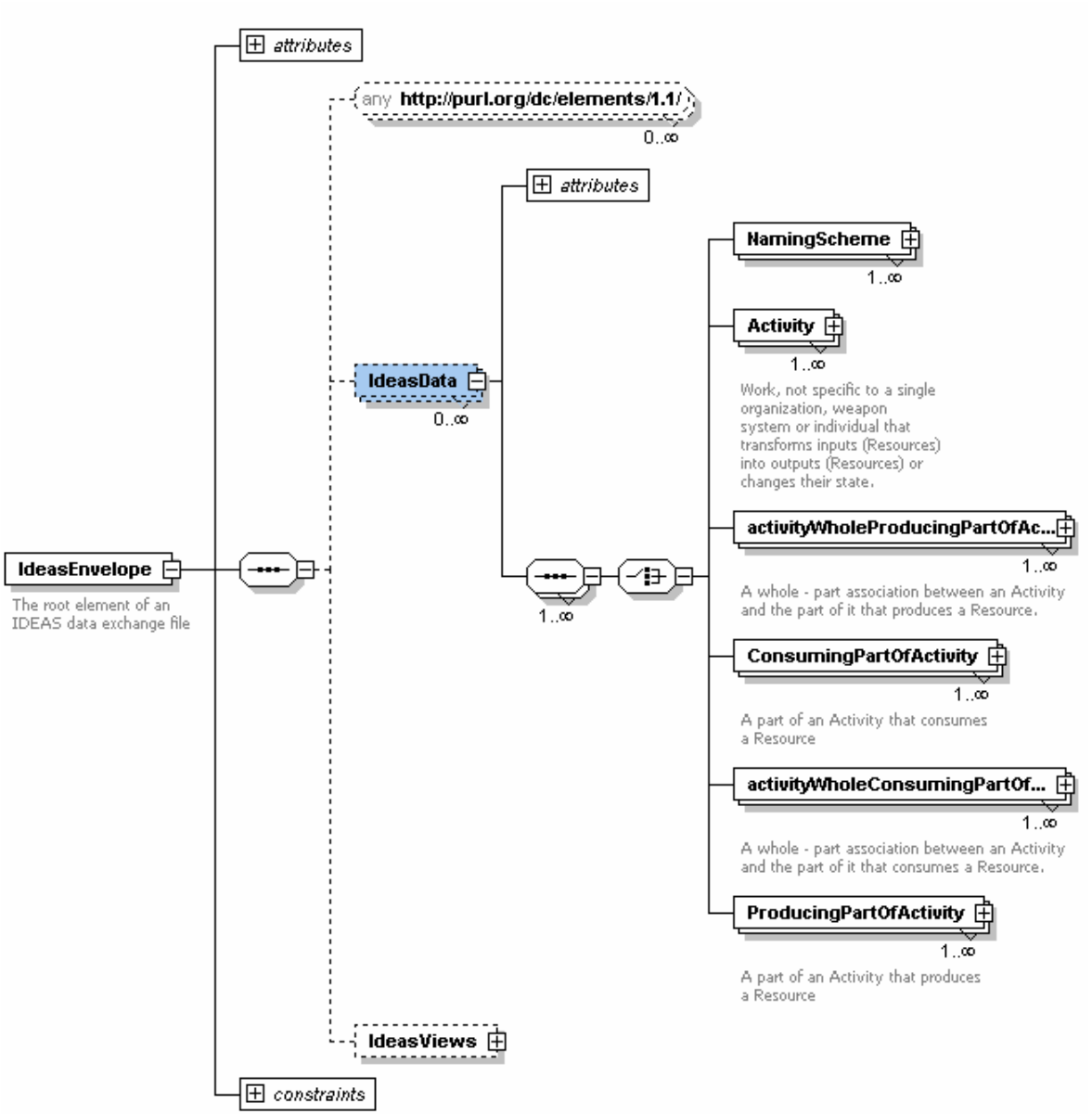
Structure

- Wrapper, describing that the document is
- Independent entities with naming and aliases
- Associations
- Constraints

OV-5a Elements

- Activity
- activityWholeConsumingPartOfActivity
- activityWholeProducingPartOfActivity
- ConsumingPartOfActivity
- ProducingPartOfActivity

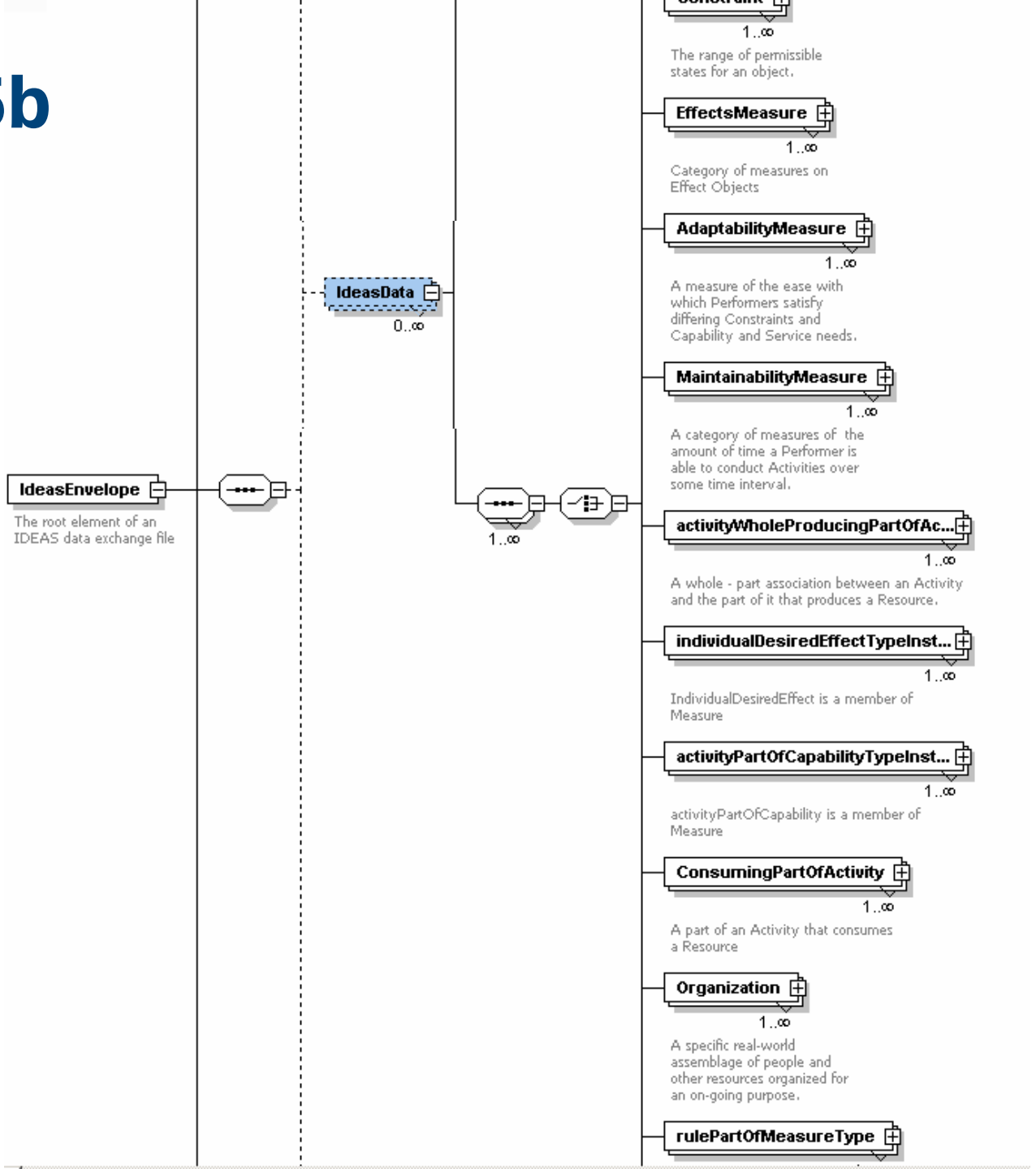
OV-5a XSD Root



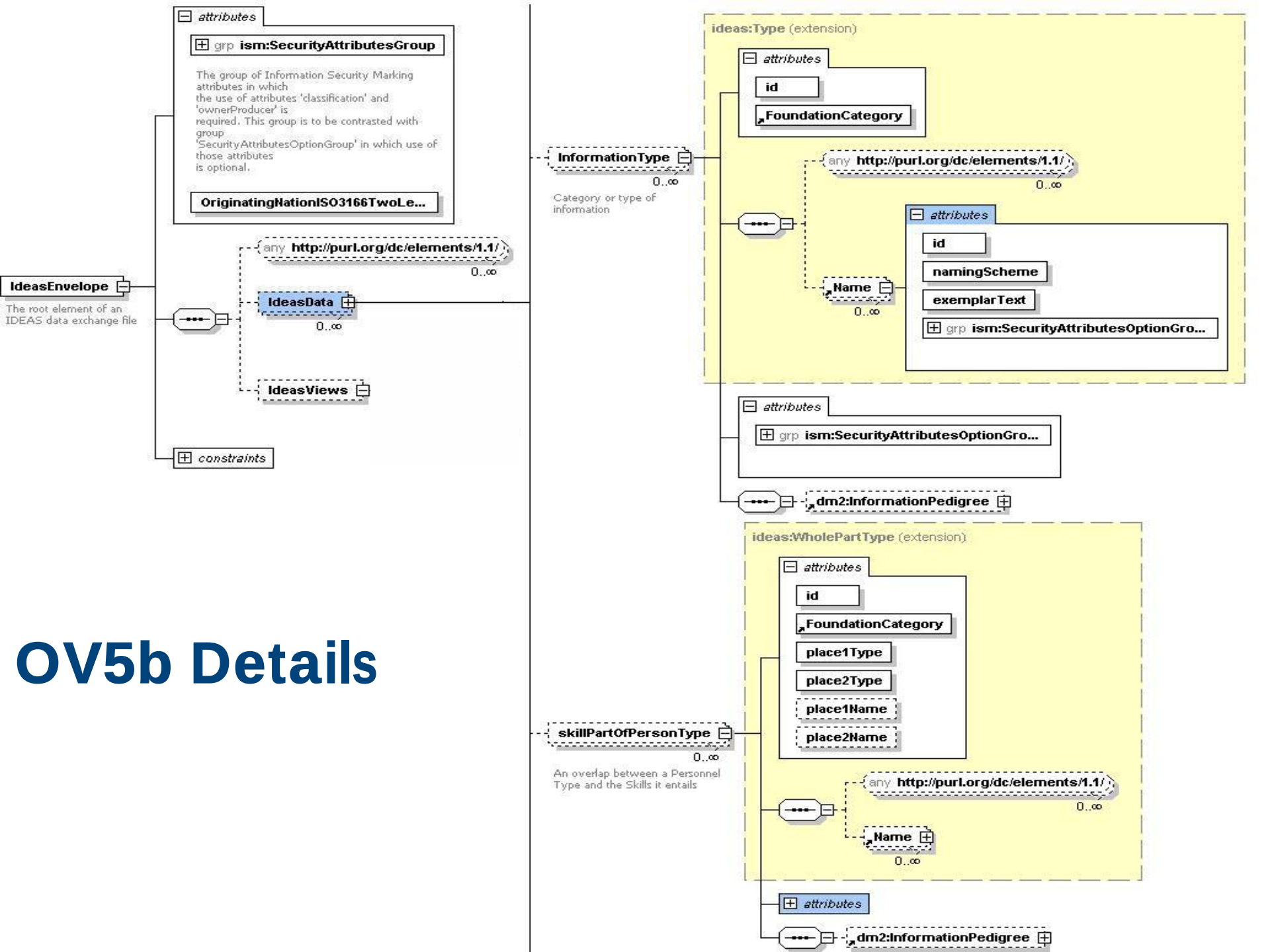
OV-5b Elements

- Activity
- activityPartOfCapabilityTypeInstanceOfMeasure
- activityPerformableUnderCondition
- activityPerformableUnderConditionTypeInstanceOfMeasure
- activityPerformedByPerformer
- activityPerformedByPerformerTypeInstanceOfMeasure
- activityPerformedByPerformerTypeInstanceOfRule
- activityResourceOverlap
- activityResourceOverlapTypeInstanceOfMeasure
- activityResourceOverlapTypeInstanceOfRule
- activityTypeInstanceOfMeasureType
- activityWholeConsumingPartOfActivity
- activityWholeProducingPartOfActivity
- AdaptabilityMeasure
- Condition
- conditionTypeInstanceOfMeasure
- Constraint
- ConsumingPartOfActivity
- Country
- desiredEffectTypeTypeInstanceOfMeasure
- DomainInformation
- EffectsMeasure
- FunctionalStandard
- individualDesiredEffectTypeInstanceOfMeasure
- InformationType
- MaintainabilityMeasure
- Measure
- measurePowertypeInstanceOfMeasureType
- MeasureType
- NeedsSatisfactionMeasure
- Organization
- OrganizationalMeasure
- OrganizationType
- PerformanceMeasure
- Performer
- PhysicalMeasure
- ProducingPartOfActivity
- Resource
- ResourceType
- resourceTypeInstanceOfMeasure
- Rule
- ruleConstrainsActivity
- rulePartOfMeasureType
- ServiceLevel
- skillPartOfPersonTypeTypeInstanceOfMeasure
- SpatialMeasure
- TemporalMeasure
- wholePartTypeInstanceOfMeasure

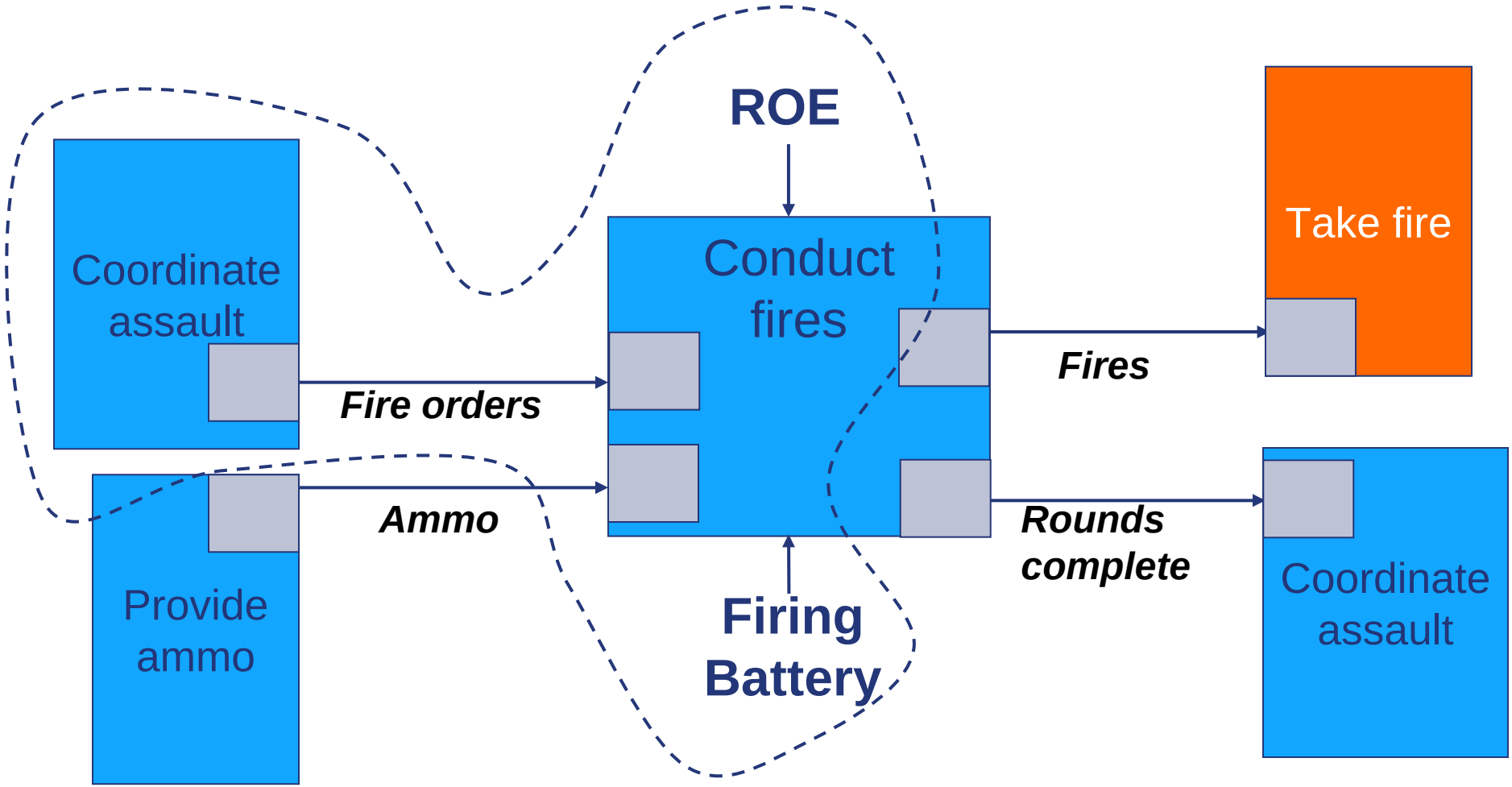
OV-5b Root


1..∞
The range of permissible states for an object.
EffectsMeasure
1..∞
Category of measures on Effect Objects
AdaptabilityMeasure
1..∞
A measure of the ease with which Performers satisfy differing Constraints and Capability and Service needs.
IdeasData
0..∞
MaintainabilityMeasure
1..∞
A category of measures of the amount of time a Performer is able to conduct Activities over some time interval.
IdeasEnvelope
The root element of an IDEAS data exchange file
1..∞
activityWholeProducingPartOfAc...
1..∞
A whole - part association between an Activity and the part of it that produces a Resource.
individualDesiredEffectTypeInst...
1..∞
IndividualDesiredEffect is a member of Measure
activityPartOfCapabilityTypeInst...
1..∞
activityPartOfCapability is a member of Measure
ConsumingPartOfActivity
1..∞
A part of an Activity that consumes a Resource
Organization
1..∞
A specific real-world assemblage of people and other resources organized for an on-going purpose.
rulePartOfMeasureType

OV5b Details

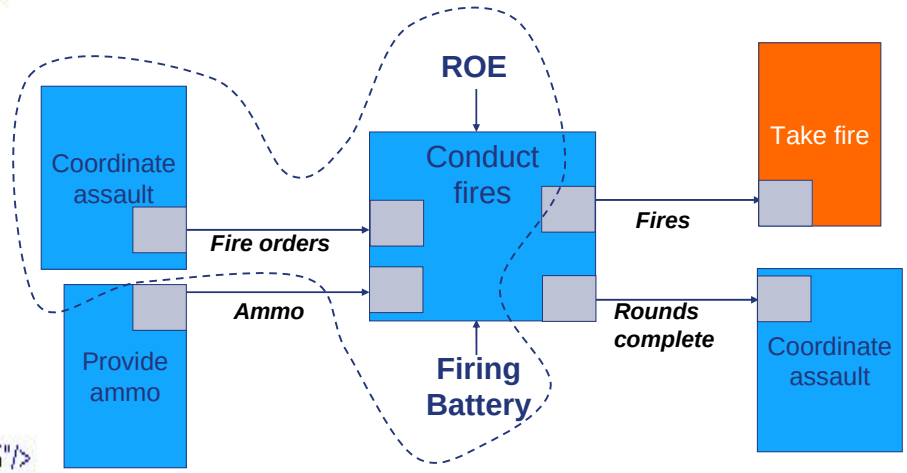


Example Use Case

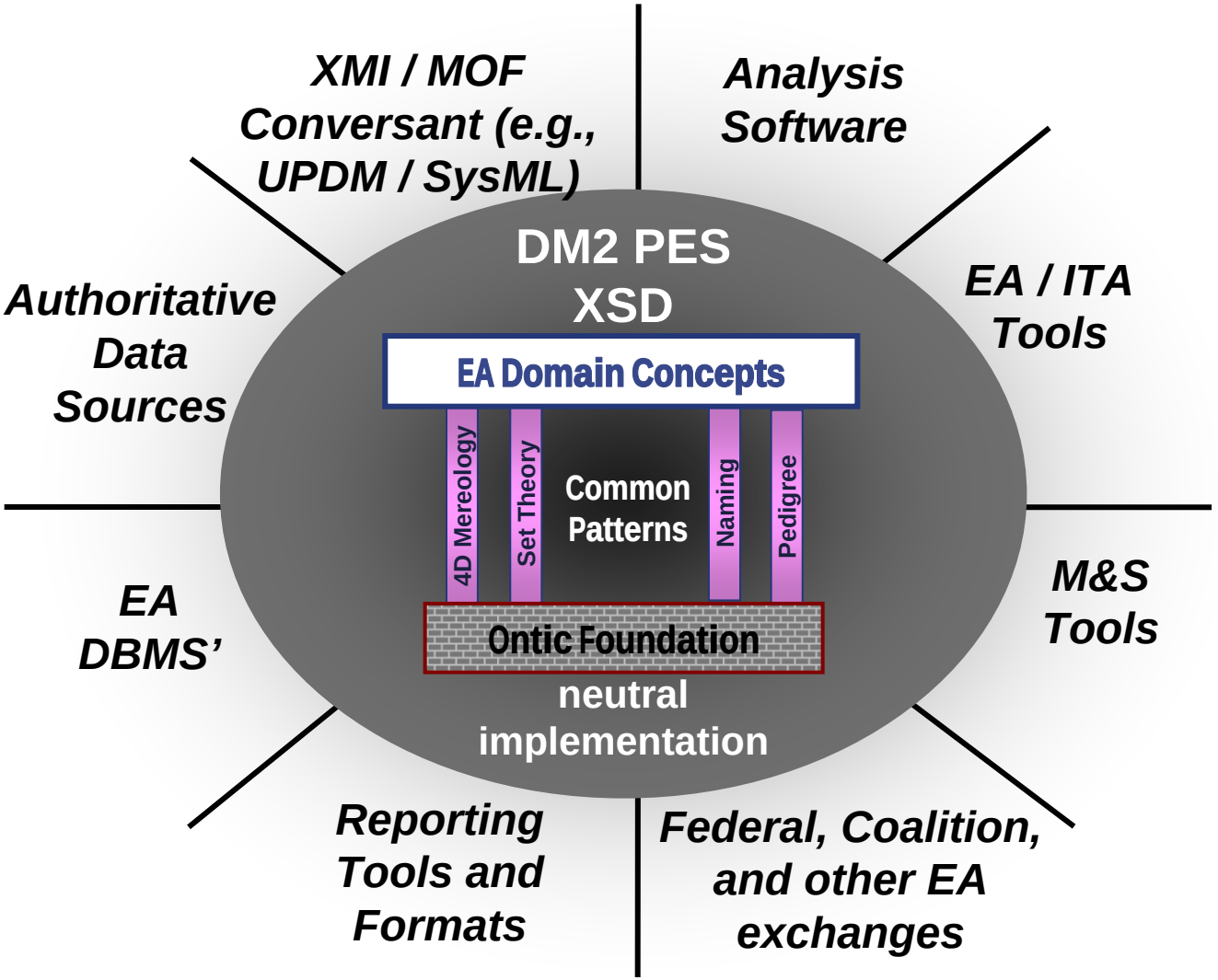


- Activity 1=Conduct fires
- Activity 2=Coordinate assault
- Resource=Fire orders
- Performer=Firing Battery
- Rules=ROE

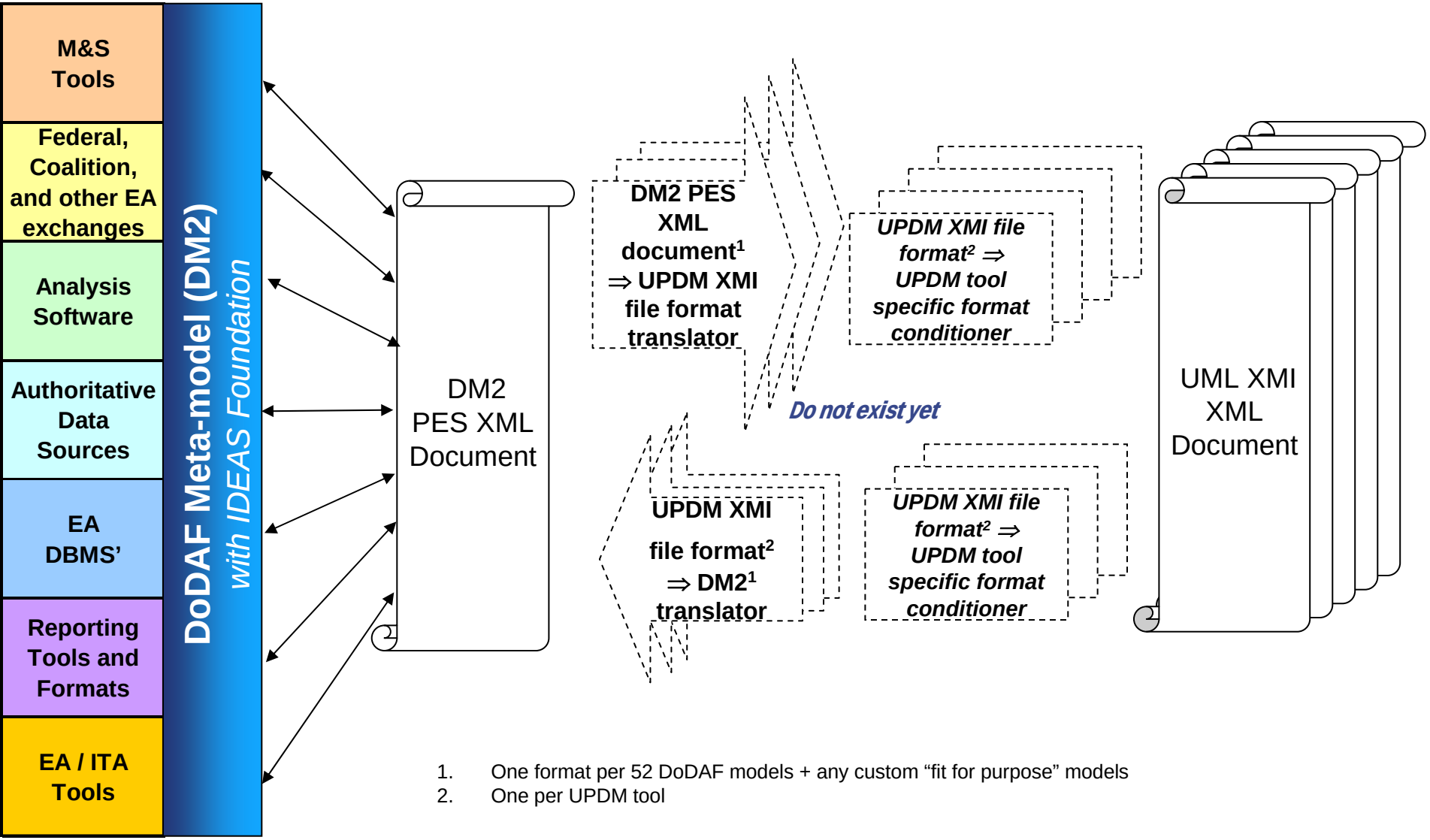
```
<?xml version="1.0" encoding="UTF-8"?>
<IdeasEnvelope OriginatingNationISO3166TwoLetterCode="US" ism:ownerProducer="NMTOKEN" ism:classification="U" xsi:noNamespaceSchemaLocation="OV5b.XSD" xmlns:ideas="
http://www.ideasgroup.org/xsd" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:ism="urn:us:gov:ic:ism:v2">
  <IdeasData XMLTagsBoundToNamingScheme="DM2Names" Model="String">
    <NamingScheme ideas:FoundationCategory="NamingScheme" id="NS1"/>

    <Activity ideas:FoundationCategory="IndividualType" id="A1">
      <ideas:Name namingScheme="NS1" exemplarText="Conduct fires" id="N1"/>
    </Activity>
    <Activity ideas:FoundationCategory="IndividualType" id="A2">
      <ideas:Name namingScheme="NS1" exemplarText="Coordinate assault" id="N2"/>
    </Activity>

    <Resource ideas:FoundationCategory="IndividualType" id="Re1">
      <ideas:Name namingScheme="NS1" exemplarText="Fire orders" id="N3"/>
    </Resource>

    <Performer ideas:FoundationCategory="IndividualType" id="P1">
      <ideas:Name namingScheme="NS1" exemplarText="Firing Battery" id="N4"/>
    </Performer>

    <Rule ideas:FoundationCategory="IndividualType" id="Ru1">
      <ideas:Name namingScheme="NS1" exemplarText="Rules Of Engagement" id="N5"/>
    </Rule>

    <ConsumingPartOfActivity ideas:FoundationCategory="IndividualType" id="CA1"/>
    <ProducingPartOfActivity ideas:FoundationCategory="IndividualType" id="PA1"/>

    <activityWholeConsumingPartOfActivity ideas:FoundationCategory="WholePartType"  id="WP1" place1Type="A1" place2Type="CA1" />
    <activityWholeProducingPartOfActivity ideas:FoundationCategory="WholePartType"  id="WP2" place1Type="A2" place2Type="PA1"/>

    <activityResourceOverlap ideas:FoundationCategory="TripleType"  id="O3" place1Type="PA1" place2Type="Re1" place3Type="CA1"/>

    <activityPerformedByPerformer ideas:FoundationCategory="TripleType" id="O1" place1Type="P1"  place2Type="A1" />

    <ruleConstrainsActivity ideas:FoundationCategory="CoupleType"  id="O2" place1Type="A1" place2Type="Ru1"/>
  </IdeasData></IdeasEnvelope>
```



DM2 Provides a Neutral Exchange Specification for Many Kinds of Architecture Data



DM2 (including PES), IDEAS Foundation V1.0, and UPDM 2.0 Vision



1. One format per 52 DoDAF models + any custom "fit for purpose" models
2. One per UPDM tool

Sample XMI

- Neutral format for UML file
- Should allow for use of a UML model by any other UML tool
- Oriented toward full re-creation of the native model:
  - Graphics
  - Layout
  - All UML features
- NOT a neutral format for non-UML tools

```
ackagedElement xmi:type="uml:Class"
xmi:id="EAID_1ACDB2AD_F9B8_4027_82A1_C4958A996A15" name="Activity"
visibility="public">
eneralization xmi:type="uml:Generalization"
xmi:id="EAID_93CE829E_4313_40a1_A61A_AA877F0EB69A"
general="EAID_A95155D1_CA8D_4a1c_9F13_E4C7EE9AFC78" />
</packagedElement>
ackagedElement xmi:type="uml:Association"
xmi:id="EAID_02FE471B_FA52_4d05_B1A0_FC652F38B709" visibility="public">
emberEnd xmi:idref="EAID_dstFE471B_FA52_4d05_B1A0_FC652F38B709" />
emberEnd xmi:idref="EAID_srcFE471B_FA52_4d05_B1A0_FC652F38B709" />
wnedEnd xmi:type="uml:Property"
xmi:id="EAID_srcFE471B_FA52_4d05_B1A0_FC652F38B709" visibility="public"
association="EAID_02FE471B_FA52_4d05_B1A0_FC652F38B709" isOrdered="false"
isDerived="false" isDerivedUnion="false" aggregation="none">
ype xmi:idref="EAID_DC3813C5_2553_4504_B656_C36FD00FB61F" />
</ownedEnd>
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xmi:id="EAID_1D1D3B5D_B5E8_4cd3_91B8_B2A0071D3F85" visibility="public">
emberEnd xmi:idref="EAID_dst1D3B5D_B5E8_4cd3_91B8_B2A0071D3F85" />
emberEnd xmi:idref="EAID_src1D3B5D_B5E8_4cd3_91B8_B2A0071D3F85" />
wnedEnd xmi:type="uml:Property"
xmi:id="EAID_src1D3B5D_B5E8_4cd3_91B8_B2A0071D3F85" visibility="public"
association="EAID_1D1D3B5D_B5E8_4cd3_91B8_B2A0071D3F85" isOrdered="false"
isDerived="false" isDerivedUnion="false" aggregation="none">
ype xmi:idref="EAID_4B93D321_BE44_4b47_B23E_CD9C85AEF992" />
</ownedEnd>
</packagedElement>
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emberEnd xmi:idref="EAID_dst099A29_2F56_46e3_87EE_7D95F1FC8D37" />
emberEnd xmi:idref="EAID_src099A29_2F56_46e3_87EE_7D95F1FC8D37" />
wnedEnd xmi:type="uml:Property"
xmi:id="EAID_src099A29_2F56_46e3_87EE_7D95F1FC8D37" visibility="public"
association="EAID_25099A29_2F56_46e3_87EE_7D95F1FC8D37" isOrdered="false"
isDerived="false" isDerivedUnion="false" aggregation="none">
ype xmi:idref="EAID_ACA7CDB7_DE09_4807_BCAB_C6EDE104F60F" />
</ownedEnd>
</packagedElement>
```
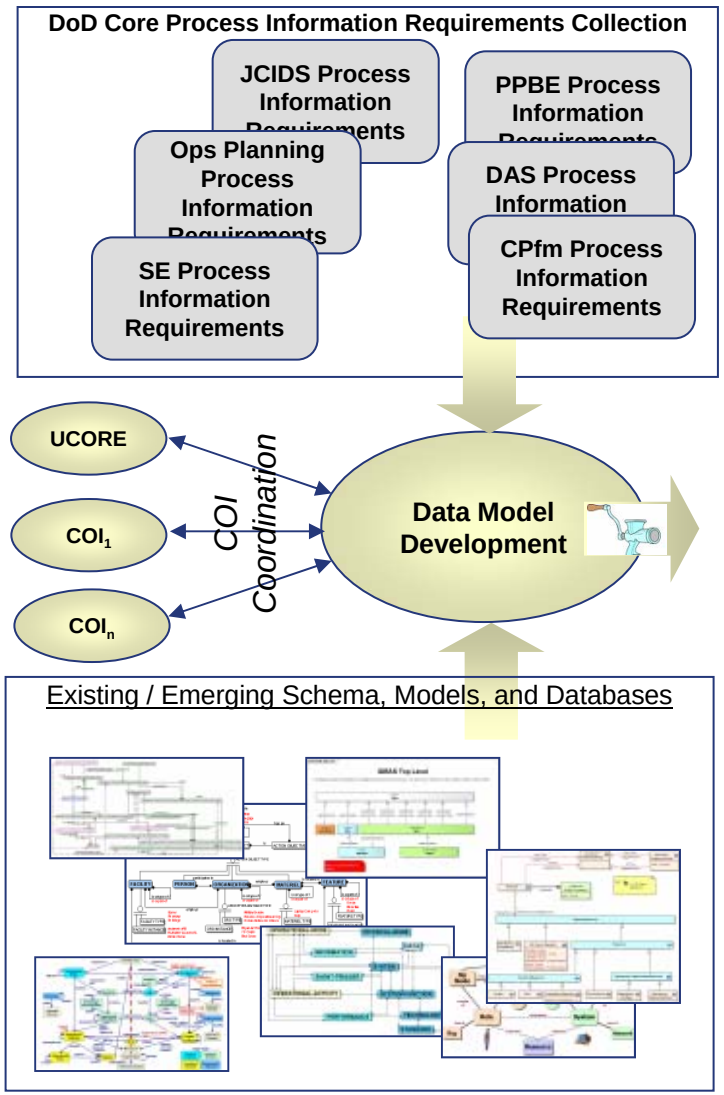

Where to learn more and participate in DM2 evolution

- Join the Data TWG
  - Access to Share site
  - Weekly email message with invitation to participate in DCO telecon
  - Stay in touch with ongoing evolution, pilots, and Configuration Management activities

Questions?

Top-Down / Bottom-Up Development



DoDAF 2.0:

- Conceptual Data Model (Vol I)
- Logical Data Model (Vol II)
- Physical Exchange Model (Vol III)