HL7 Tooling Challenge 2012
"Produce a UML Profile for MIF Static Models"

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Files are located at : http://gforge.hl7.org/svn/toolchlge_001

Intro

- Challenge: *"Produce a UML Profile for MIF Static Models - This is a task so that other modeling tools have a chance to be configured to understand MIF."*
- Sidenote: UML "friendly" Profile for HL7 MIF Static Models
- My focus: **Functionally Equivalence**
- Previous work by: AMS, Dave Carlson, Graham's notes in the MIF XML Schemas, http://wiki.hl7.org/index.php?title=Requirements-Static_Model
- Keep in mind the ongoing OMG AML work

Method

- Used MIFs 2.1.6 from NE2013
  - Main difference with MIF 2.2.0.0 is in the vocab part
  - Could not get the xslt 2.1.6 > 2.2.0 to run
- EA MIF Profile (shapes for Choice, EntryPoint, Refs)
- Created import using XSLT and MAX XML
- Toolchain: MIF -> XSLT (Eclipse) -> MAX -> EA (with MIF Profile)-> MAX *(-> XSLT -> MIF)*

Deliverables

Files are located at : http://gforge.hl7.org/svn/toolchlge_001

- MIF2.eap with the MIF2 UML Profile, Manual Examples and the MAX versions imported
- HL7-MIF2 Profile.xml
- MIF216toMAX.xslt for transforming MIF's to MAX format with the UML Profile applied.
- *.max.xml MAX versions of RIM, R_AssignedPerson informational, E_Organisation Informational
- MAX_EA_Extension <dd>.setup.msi for importing the MAX files into EA

Additional Objectives

From: http://wiki.hl7.org/index.php?title=HL7_Tooling_Challenge#Additional_objectives

- Produce a MIF to XMI XML transform consistent with the updated UML Profile.
  - **MZ: Created a MIF to MAX transform that imports in EA (UML)**
- Produce a viewer that can browse MIF schemas (Meta level)- this task makes it easier to understand the relationship among the MIF files and their elements.
  - **MZ: Used Eclipse XML Schema Browser**
- Produce a viewer that can browse MIF based models (model level)- this task makes it easier to understand the serialized models expressed in MIF XML.
  - **MZ: Using the MIF to MAX and then import in EA to do browsing**
- Produce a viewer that can browse instances from MIF based models (instance level) - this task makes it easier to evaluate instances based on serialized MIF models.(there is some work that already exists)
  - **MZ: Not done**

Results

In the following sheets you will find:

- Used as is: Classes, Attributes, Constraints, Associations
- Mapping MIF to UML
- Handling derivedFrom and attribute order with sortKey
- Issues identified
- TODO
- Resulting UML Profile
- Manual Example and Imported through MAX MIF Example
- Special EA features used

Mapped MIF on UML (1/2)

N.B. Detailed mapping is in the XSLT

	UML	Stereotype	MIF
•	Package	StaticModel	staticModel
		StaticModelRef	derivedFrom/targetStaticModel
		StaticModelRef	importedDatatypeModelPackage
		StaticModelRef	importedVocabularyModelPackage
		StaticModelRef	importedCommonModelElementPackage
•	Interface	EntryPoint	entryPoint
		CommonModelElementRef	containedClass/commonModelElementRef
•	Class	Choice	containedClass/class[not(attribute)]
		-	containedClass/class[attribute]

Mapped MIF on UML (2/2)

N.B. Detailed mapping is in the XSLT

UML	Stereotype	MIF
• Association		association
• Directed Association		entryPoint
• Generalization		containedClass/class[parentClass]
• Dependency	DerivedFrom	staticModel/derivedFrom
• Dependency	Import	importedDatatypeModelPackage
	Import	importedVocabularyModelPackage
	Import	importedCommonModelElementPackage

Handling derivedFrom

- MIF Import:
  - In the MIF only the derivedFrom stuff is there that is used, without the full referenced models can only do a partial reconstruction in the <derivedFrom> <StaticModelRef>
- MIF Export:
  - DerivedFrom derivable from the UML Model Inheritance

Handling Attribute sortKey

- MIF Import:
  - EA keeps attribute order (using Tpos) and MAX assumes order is significant
- MAX Export:
  - In EA order can be changed. In the export sortKey is set to Tpos

Issues (1/2)

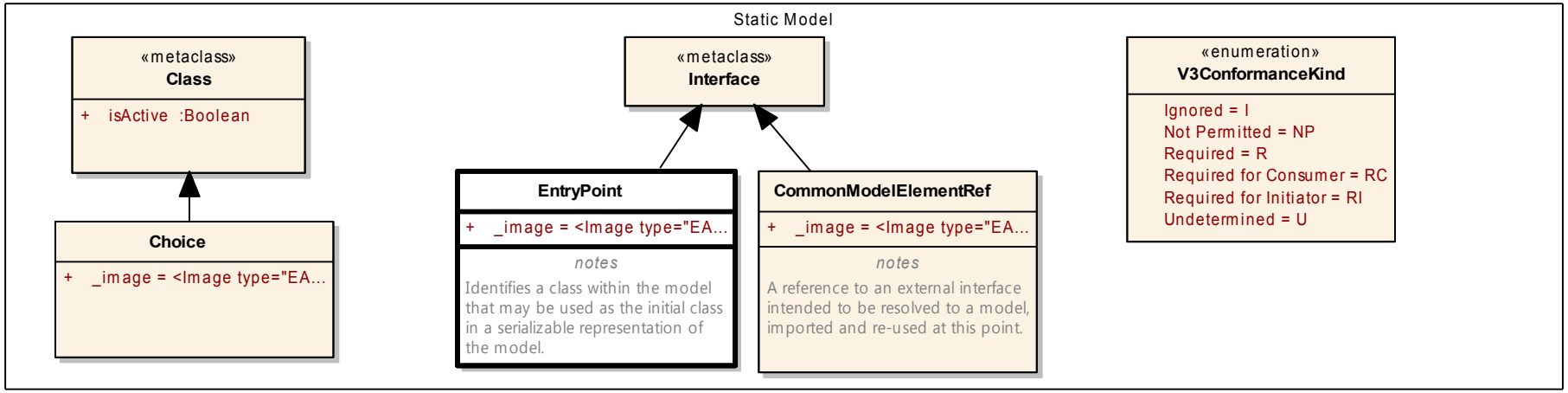
- Missing Information in the MIF but in the Visio Diagram
  - Constraints
  - Alias of CMET's used, e.g. COCT_MT150007UV, it is now referenced by name E_OrganizationInformational
- There is no explicit Choice definitions in the MIF, now assume if a class has no attributes that it is a Choice
- Mandatory?
- Why is EntryPoint a Class? Class can be derived from Class that EntryPoint points to.

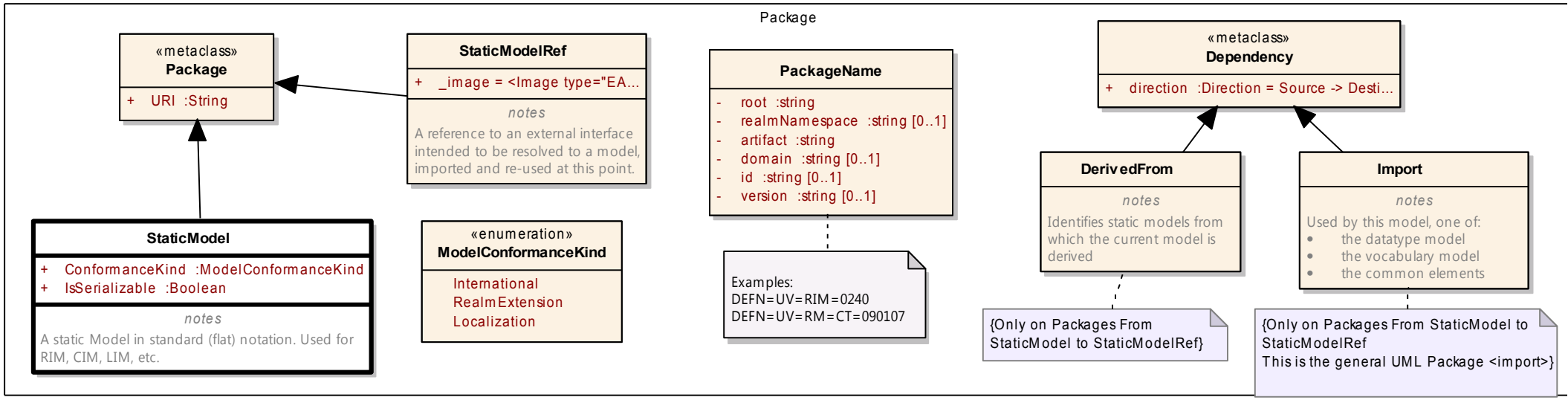
Issues (2/2)

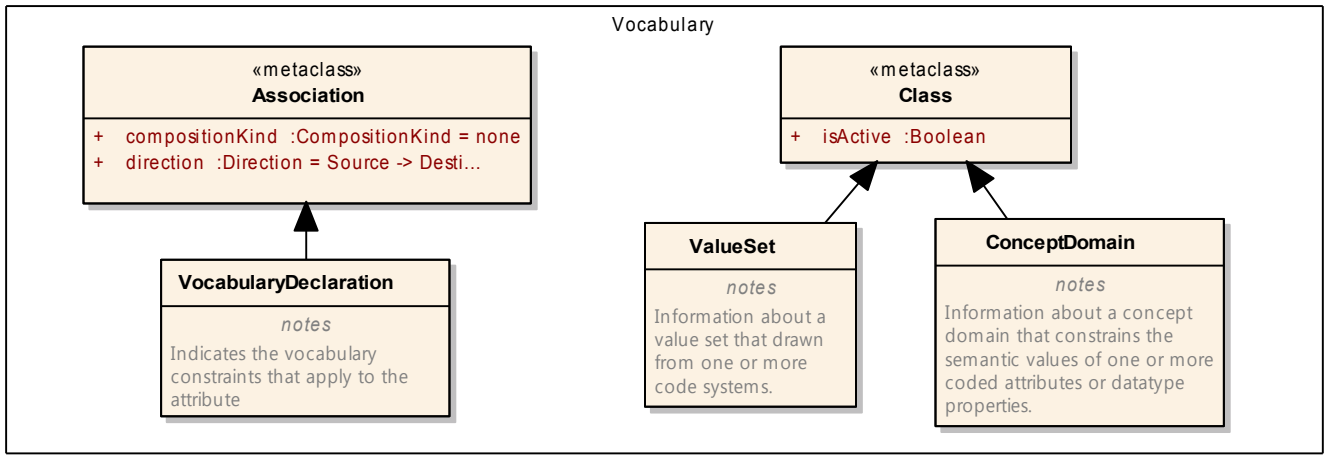
- Conformance
  - Looked at a couple of MIF's and they only have conformance="R" attributes. Is this used?
  - Possible solution: use UML Attribute qualifiers for this?
- ChildClass
  - In UML the parent of a class is with that class and not in its parent.
- Shadow Classes
  - Ignored for now. Just make reference to actual class. This is only a diagramming thing.

TODO

- XSLT from MAX back to MIF (basis is there)
  - MAX2MIF220.xslt
- Vocabulary part in import. Now have manual example
- Reconstruct the partial derivedFrom classes in their associated packages or reference the actual imported package/StaticModel (RIM, DMIM, RMIM, CMET)







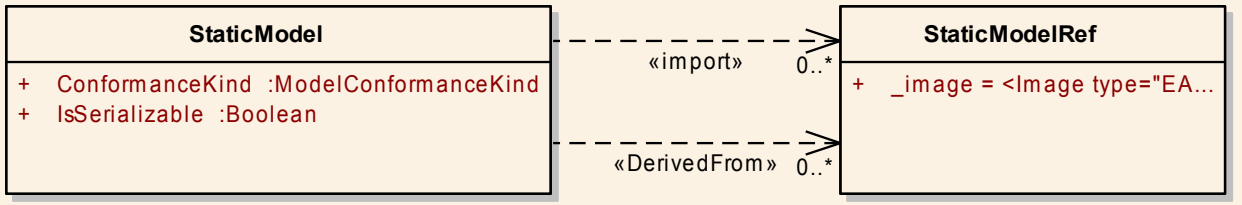
MIF2 UML Profile

Name: MIF2
Author: ZelM
Version: 1.0
Created: 23-6-2013 19:49:19
Updated: 1-7-2013 22:20:16

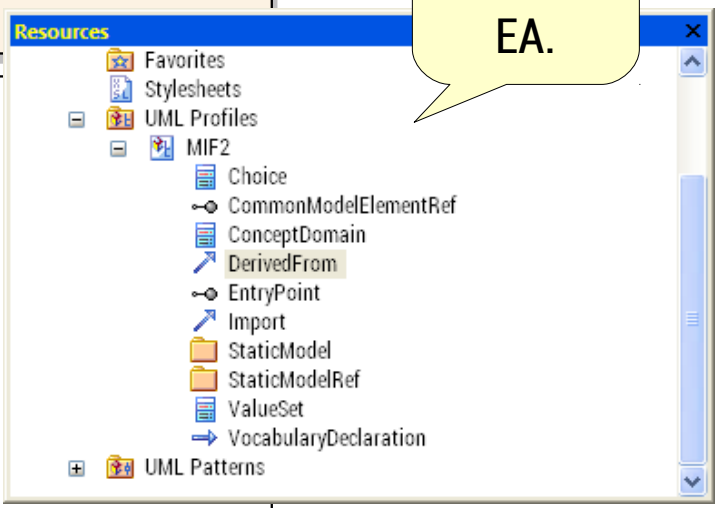
MIF2 UML Profile Usage

Root Package

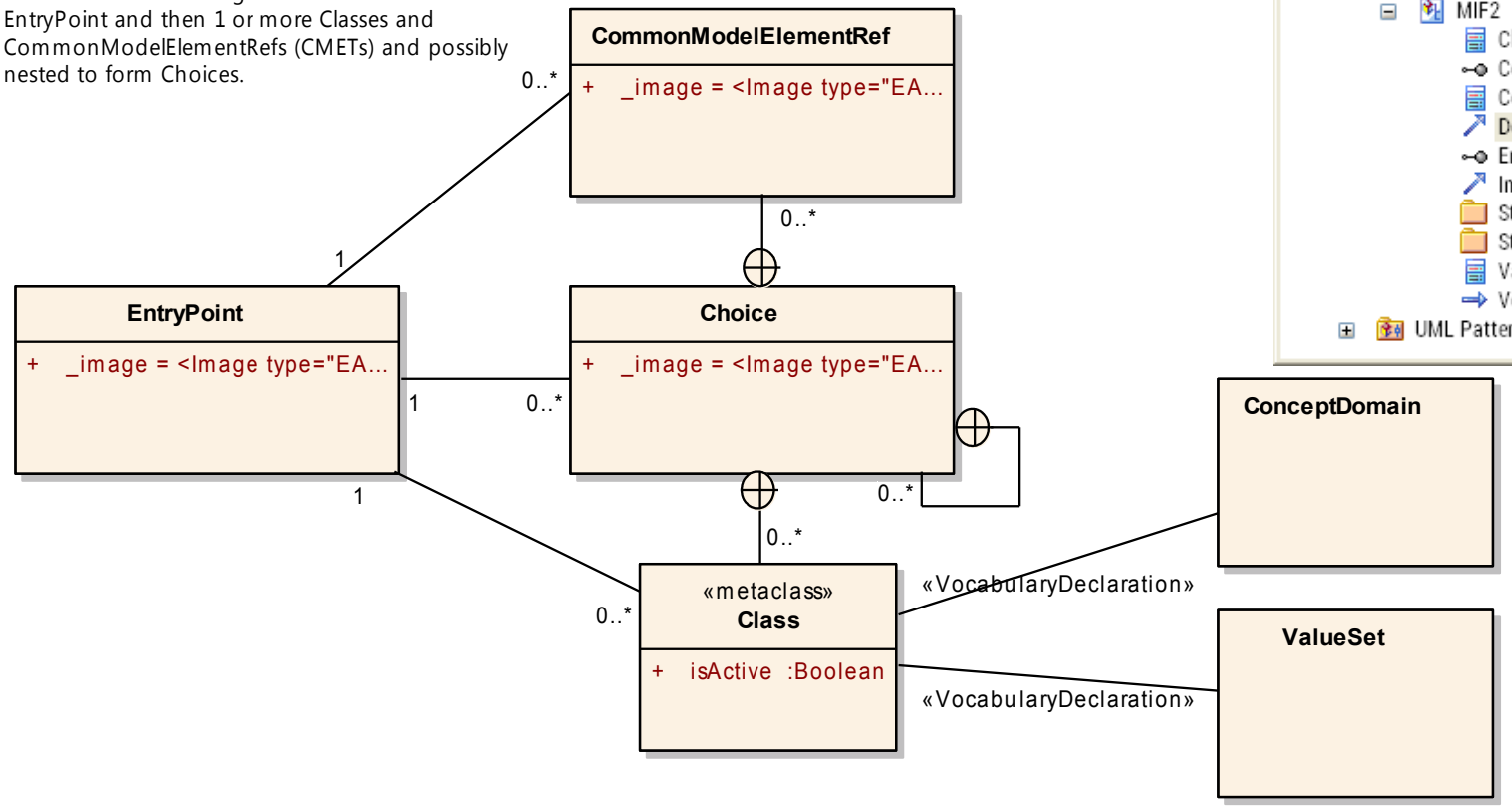
There is 1 StaticModel Package and multiple StaticModelRef Packages.
The 1 StaticModel is the Model.



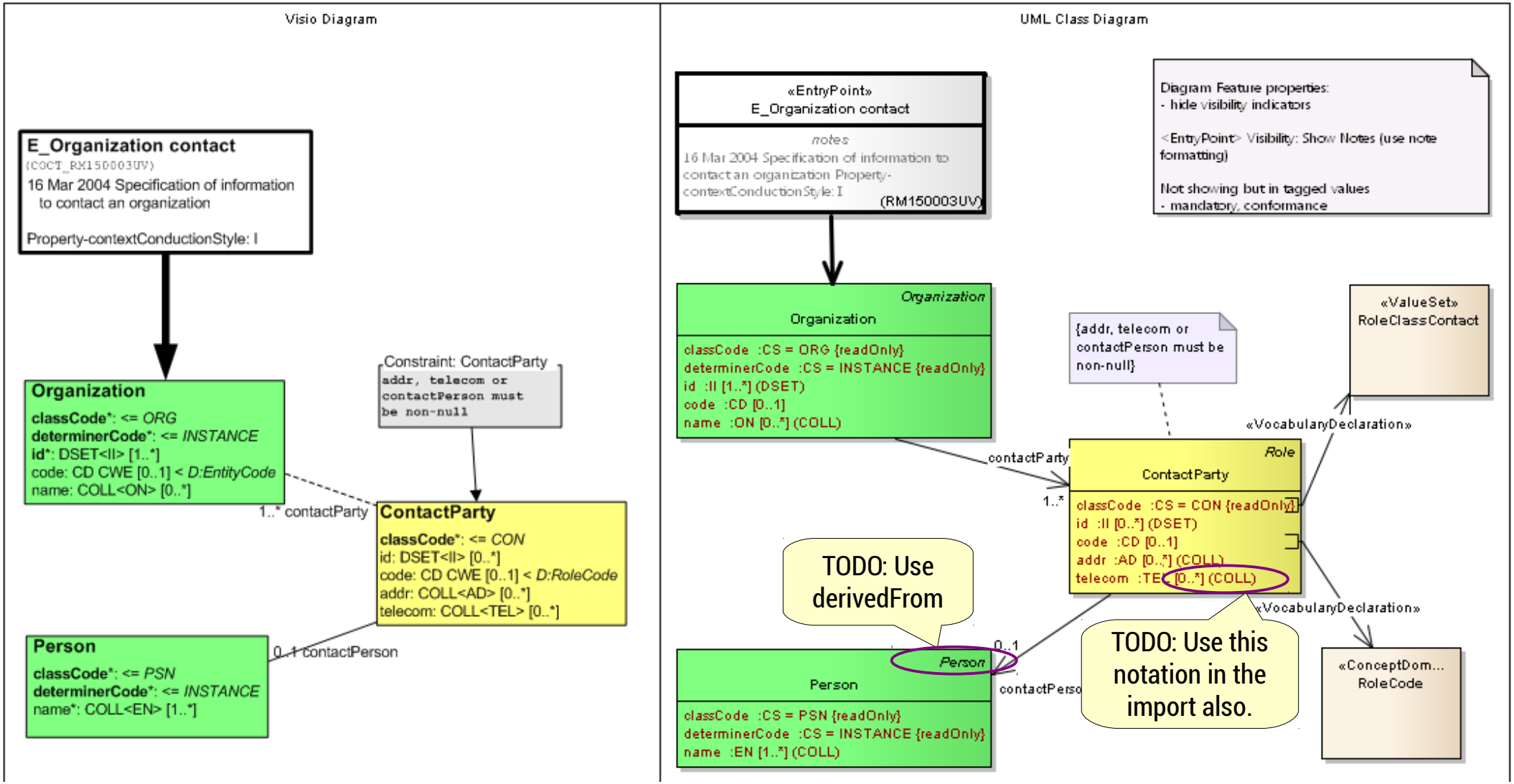
As it will show in EA.



The StaticModel Package consists of at least 1 EntryPoint and then 1 or more Classes and CommonModelElementRefs (CMETs) and possibly nested to form Choices.

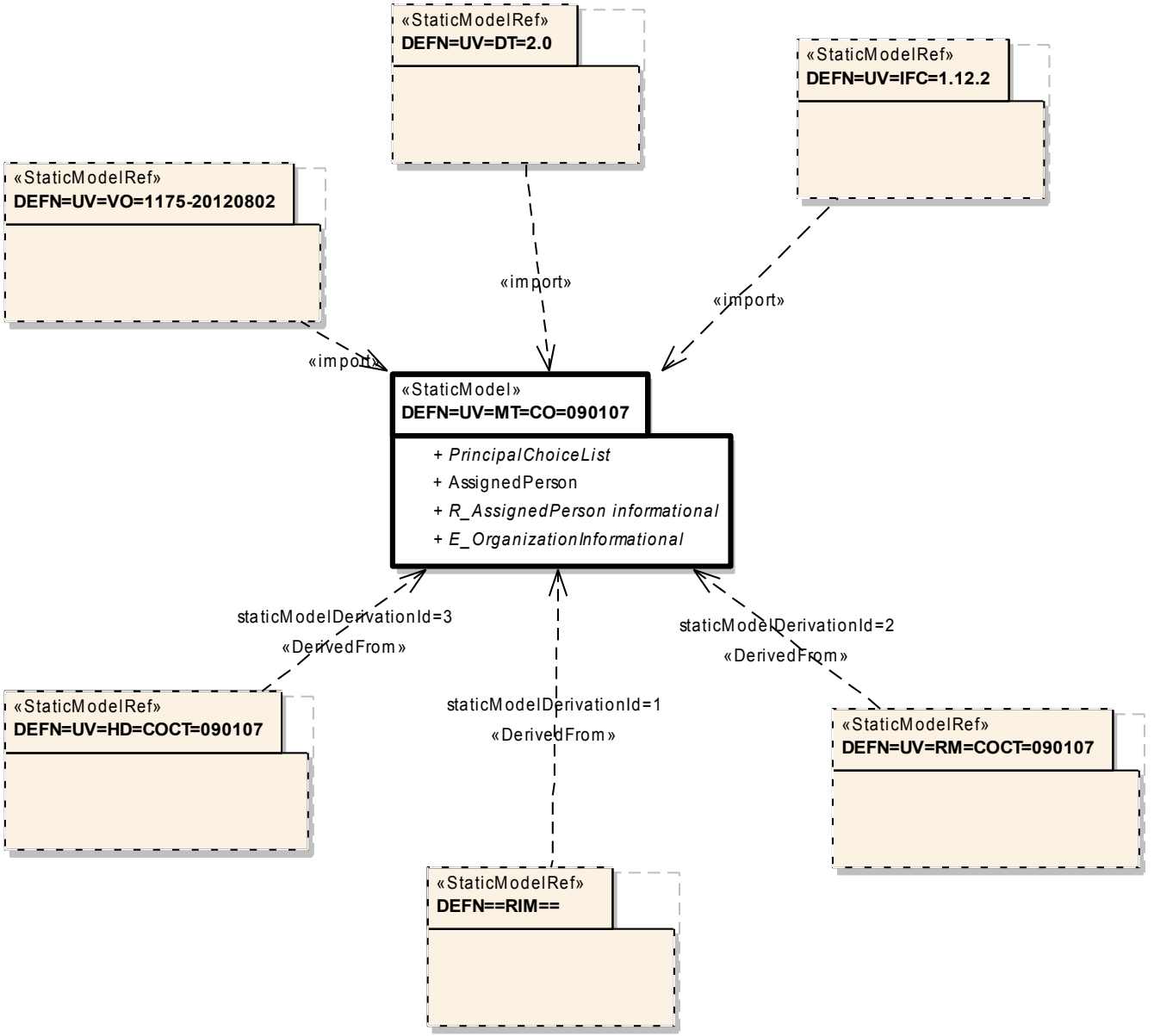


Manual Example

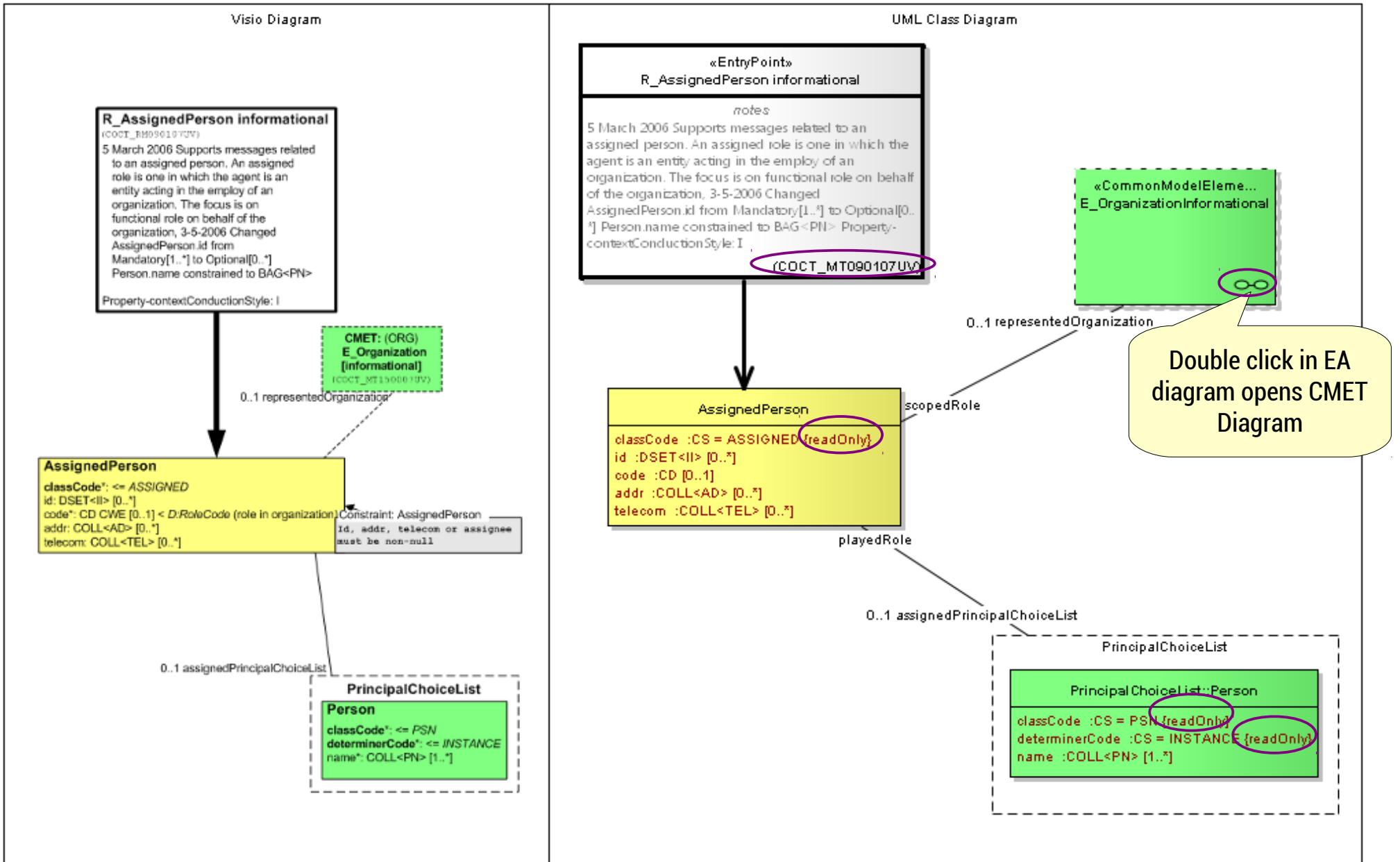


R_AssignedPerson informational

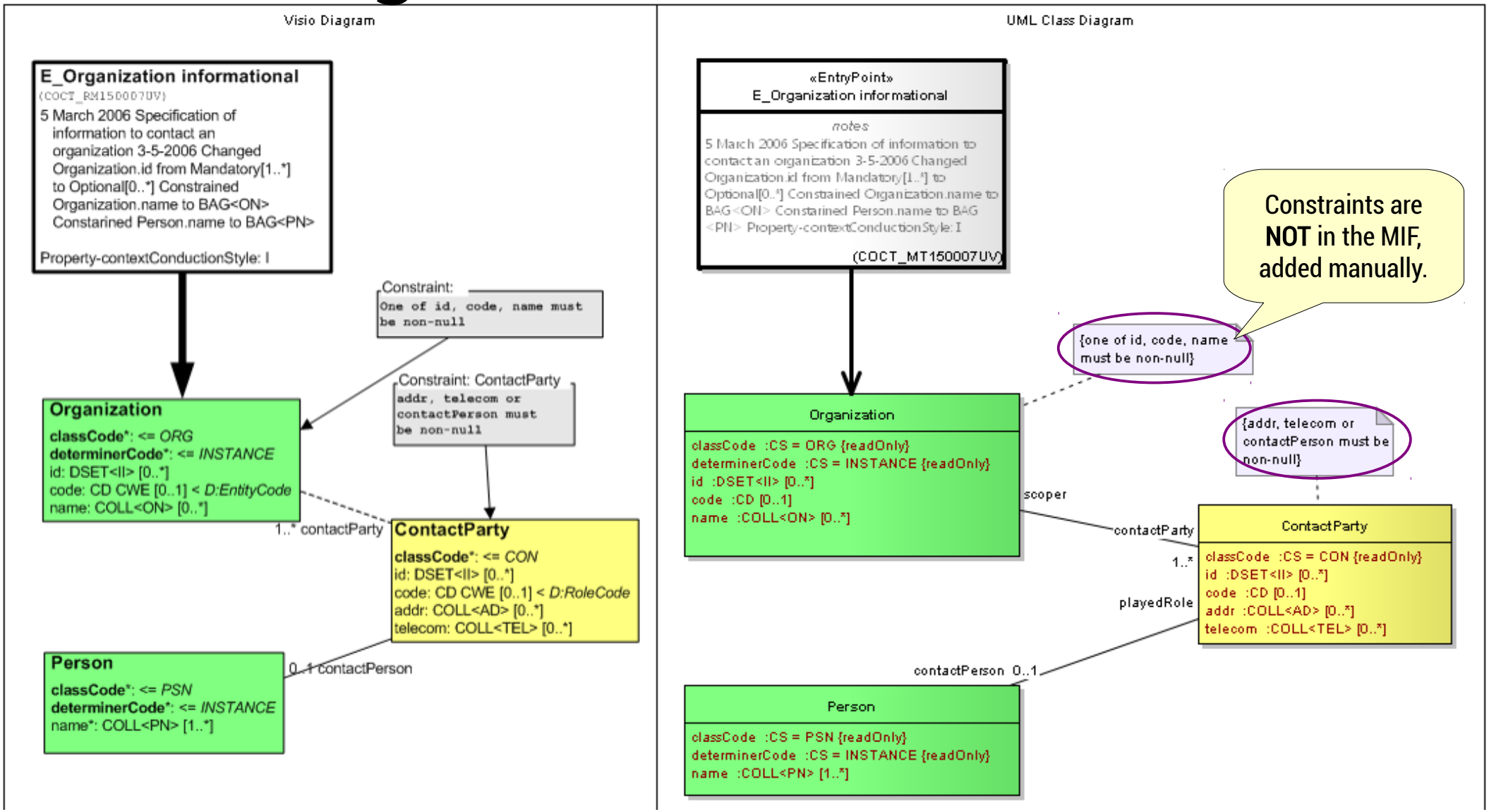
(Package Diagram from Import)



Compare (imported) R_AssignedPerson informational



Compare (imported) E_Organization informational



Special EA Features

- (Profile) Shape Scripts for Stereotypes:
  - EntryPoint – whitefill,border=3, +alias, +notes
  - *Xxx*Ref – extra dashed rectangle
  - Choice – dashed line, +composite diagram for children
- (Diagram) Composite Diagram
  - For children in Choice
  - For double click jump to subdiagram of e.g. CMET's

EA Extra (1/2)

- Diagrams are now manual, layout, RIM colors, composite diagrams for referenced CMET's
- Extend MAX with <diagram> section to also support the mif:graphicRepresentation import
- Create MIF Extension to EA with functions:
  - Apply RIM colors. For this the inheritance (derivedFrom) needs to be walked and all the RIM classes have an associated color.
  - Find package/StaticModel based on the XxxRef. Jump to package/StaticModel containing actual definition.

EA Extra (2/2)

- Validation of Models – UML allows more than MIF Static Models, e.g. dependency association or aggregation. This is to check the model against the rules of MIF Static Models, restricting types of associations in the MIF UML Static Models.
  - use EA's validation Extension
  - or validate through MAX Schematron (as demonstrated in the EHR-S FM Profile Tool Phase 1)