

# UML Modeling in the Open Health Tools (OHT)

Dave Carlson  
XMLmodeling.com



## VISION OF OPEN HEALTH TOOLS

### Vision:

To enable a ubiquitous ecosystem where members of the Health and IT professions can collaborate to build open, standards-based interoperable systems that enable patients and their care providers to have access to vital and reliable medical information at the time and place it is needed.

## Enhancements for HL7 Message Design

Extend the UML2 Tools model editors to enable design of clinical models that support and enforce HL7 methodology:

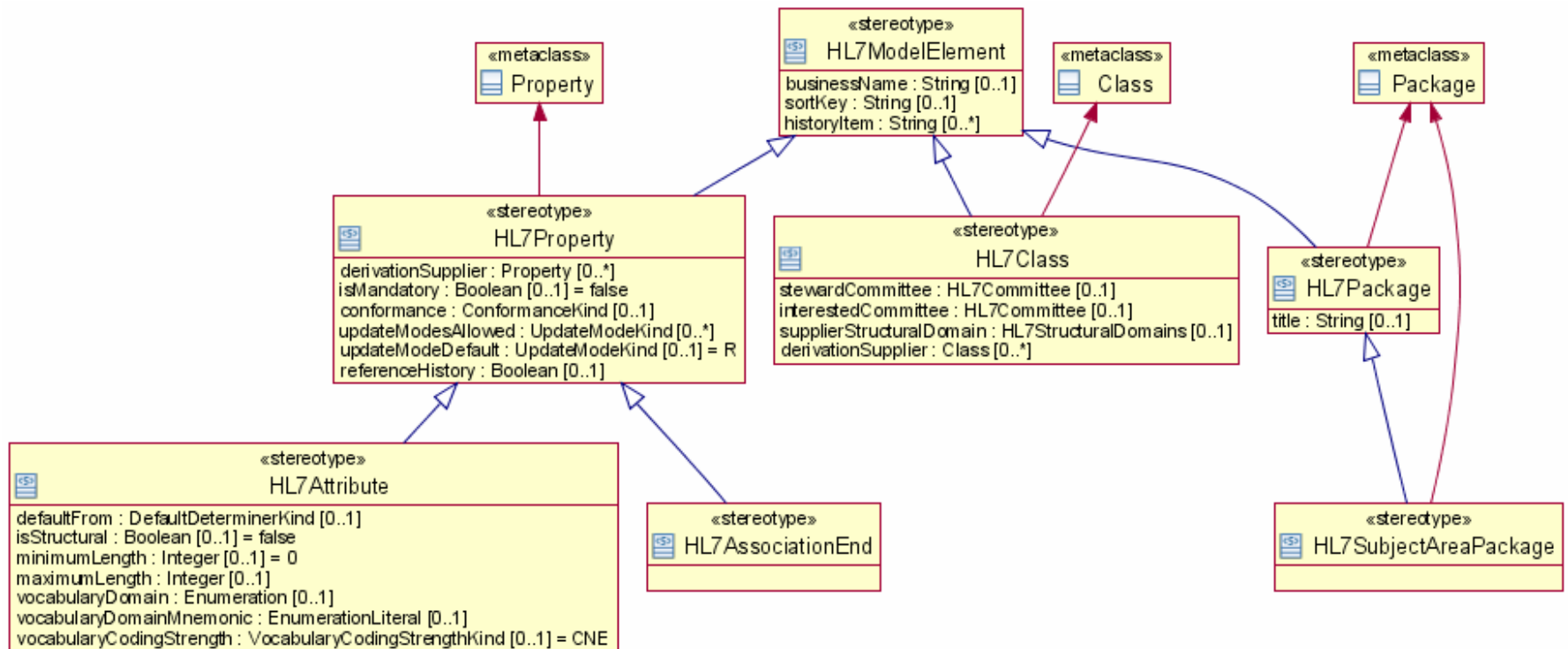
- UML Profile for HL7 modeling extensions
- HL7 Properties view tab for editing stereotype values
- Import HL7 Model Interchange Format (MIF)
  - ◆ Using a custom Ant task
- Colorize class diagrams
  - ◆ Based on stereotype assignments
- HL7 Reference Information Model (RIM)
  - ◆ All HL7 domain classes must be restrictions of RIM classes
- Validate UML models with HL7 Constraints
  - ◆ Using EMF Validation Framework

## Enhancements to UML2 Tools

Several enhancements are required before UML2 Tools editors are usable by modelers. I have made these changes:

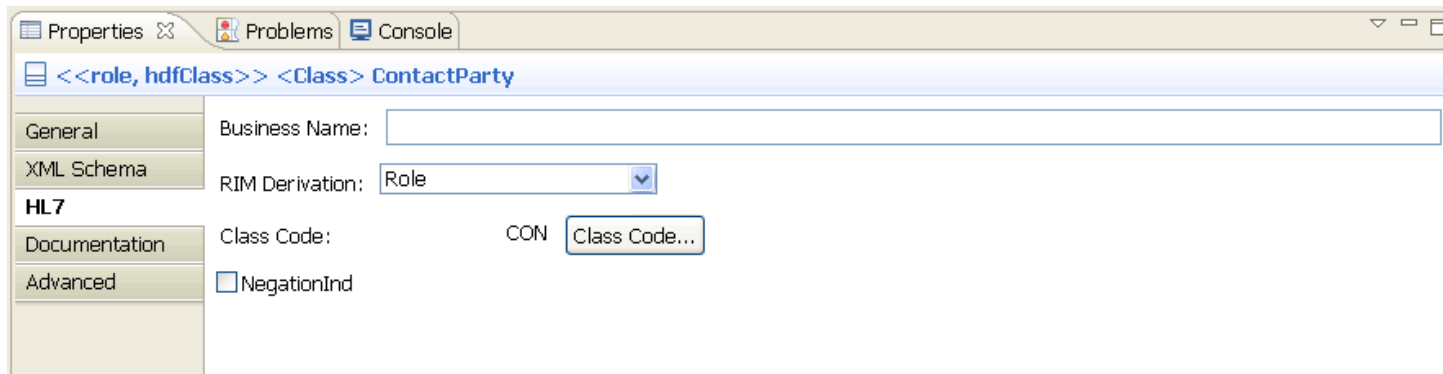
- Project Explorer
  - ◆ Filter model content; extends SaveablesProvider; enable undo/redo; use EMF transactions; improved context menus; add label decorator for validation problems
  - ◆ [https://bugs.eclipse.org/bugs/show\\_bug.cgi?id=139767](https://bugs.eclipse.org/bugs/show_bug.cgi?id=139767)
- Explorer and all diagrams use a shared EditingDomain
  - ◆ Is this a fundamental limitation of GMF?
  - ◆ [https://bugs.eclipse.org/bugs/show\\_bug.cgi?id=189974](https://bugs.eclipse.org/bugs/show_bug.cgi?id=189974)
- Properties View Tabs for editing model

# UML Profile for HL7



# HL7 Properties View Tab

HL7 tab allows domain expert users to assign stereotypes and values, without requiring knowledge that they are using UML stereotypes.



Properties Problems Console

<<role, hdfClass>> <Class> ContactParty

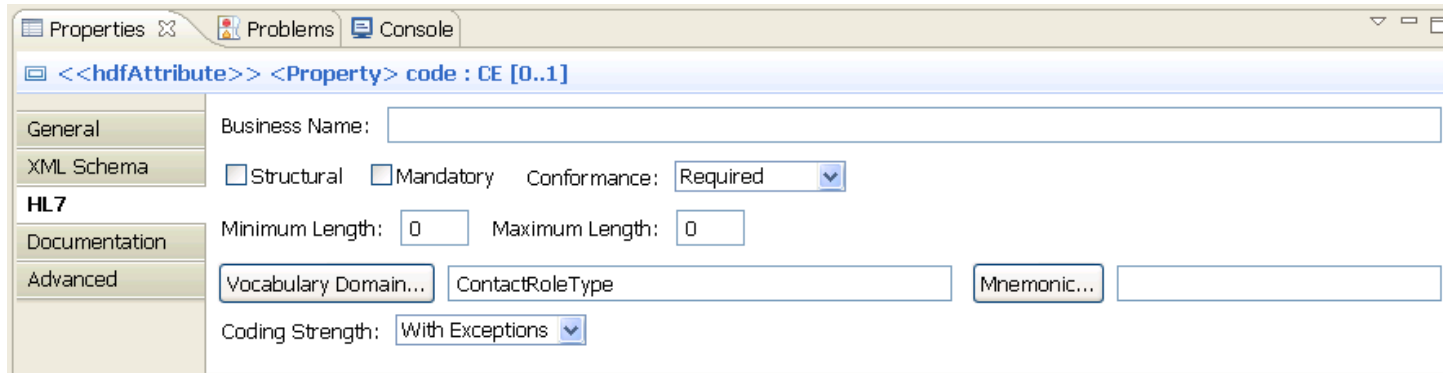
General Business Name:

XML Schema RIM Derivation: Role

**HL7**

Documentation Class Code: CON

Advanced  NegationInd



Properties Problems Console

<<hdfAttribute>> <Property> code : CE [0..1]

General Business Name:

XML Schema  Structural  Mandatory Conformance: Required

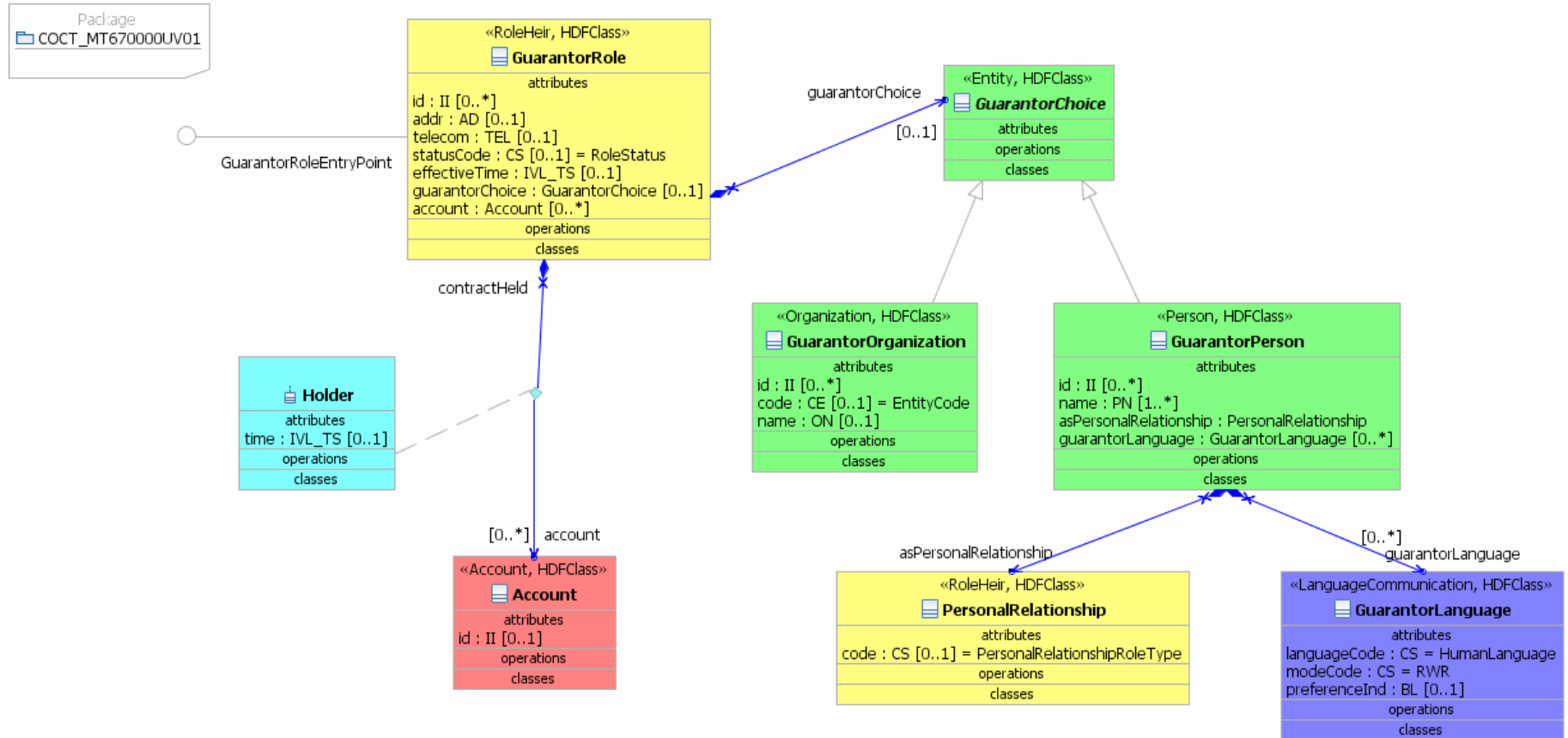
**HL7**

Documentation Minimum Length:  Maximum Length:

Advanced Vocabulary Domain...

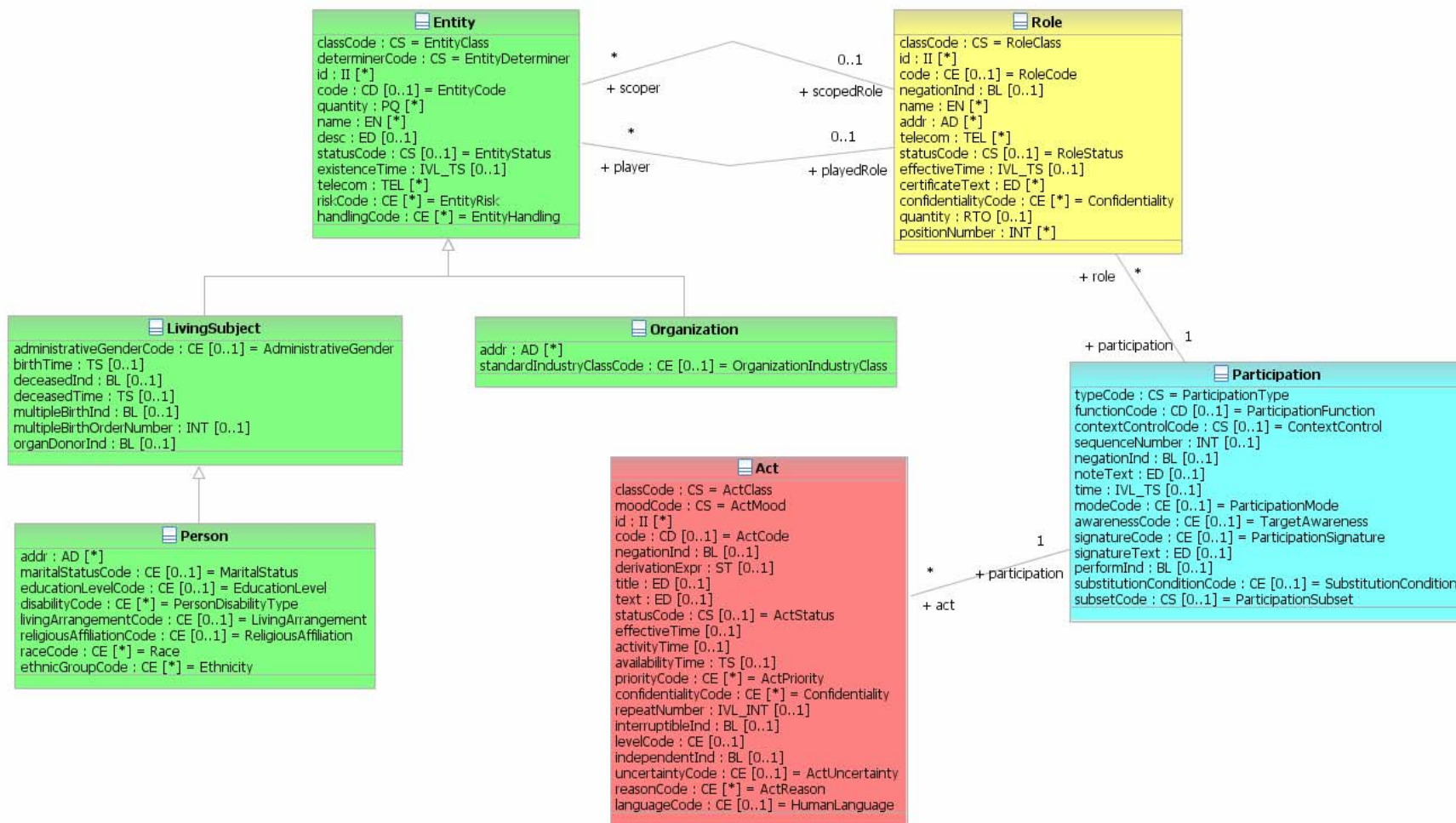
Coding Strength:

# Colorize Class Diagrams based on Stereotypes



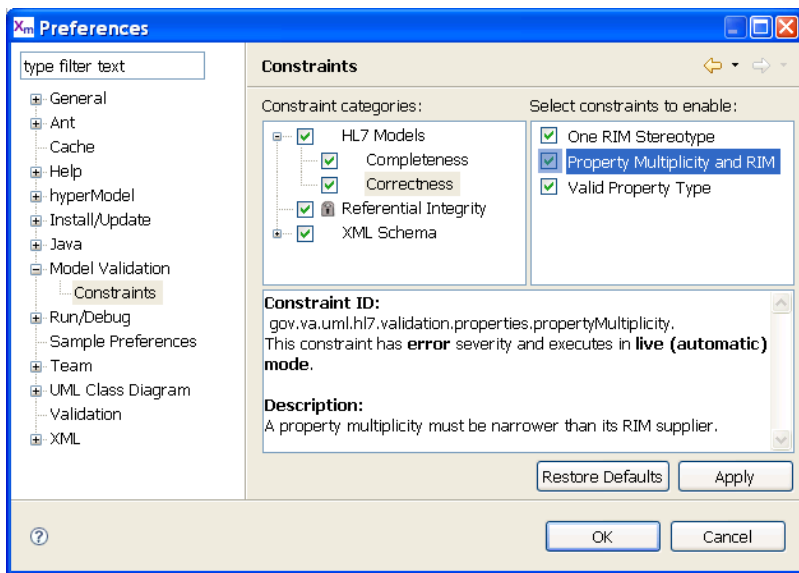


# HL7 Reference Information Model (RIM) subset





# Validating UML models with HL7 Constraints



The screenshot shows the Eclipse Problems view with 5 error items. The first error is highlighted with a red box and a mouse cursor. The error message is: 'Property multiplicity "guarantorLanguage [0..\*]" must be narrower than its RIM supplier "languageCommunication [1..1]".' The other errors are: 'Property type "code : CS" is not compatible with its RIM supplier', 'Property type "contractHeld : GuarantorRole" is not compatible with its RIM supplier', 'Property type "languageCode : CS" is not compatible with its RIM supplier', and 'Property type "modeCode : CS" is not compatible with its RIM supplier'. The table below summarizes the error items.

Description	Resource	Path	Location	Type
Property multiplicity "guarantorLanguage [0..*]" must be narrower than its RIM supplier "languageCommunication [1..1]".				EMF Problem
Property type "code : CS" is not compatible with its RIM supplier	PatientAdmi...	Build	PatientAdministration::COCT_MT670...	EMF Problem
Property type "contractHeld : GuarantorRole" is not compatible with its RIM supplier	PatientAdmi...	Build	PatientAdministration::COCT_MT670...	EMF Problem
Property type "languageCode : CS" is not compatible with its RIM supplier	PatientAdmi...	Build	PatientAdministration::COCT_MT670...	EMF Problem
Property type "modeCode : CS" is not compatible with its RIM supplier	PatientAdmi...	Build	PatientAdministration::COCT_MT670...	EMF Problem