

Value Sets and ISO 11179



ISO 11179 Metadata Registries

- Owning group is ISO/IEC JTC1 SC32 (Data Management and Interchange)
- Working Group 2 MetaData
- 11179 is a six part standard
 - 1) Framework
 - **2)** Classification
 - 3) Registry Metamodel and basic attributes
 - 4) Formulation of data definition
 - 5) Naming and identification principles
 - 6) Registration



11179-3 Edition 3

- Metadata
- First edition published 1994
- Second edition 2004
- Edition 3 is (or soon will be) FDIS
- One goal of this edition is to fill out "the upper left hand corner" and get ontology/terminology fully integrated.



Describing Data





Describing Data





Describing Data





Describing Data Example 1





Describing Data Example 2



















March 11, 2011

© 2011 Mayo Clinic

12



Information and Meaning





Information and Meaning



March 11, 2011

MAYO CLINIC package Data_Description[🛒]] Diagram name Consolidated Data Description metamodel region Modification date 1/26/10 7:51 AM Object_Class Characteristic +object_class 0..1 0..1 +characteristic data_element_concept_object_class data_element_concept_characteristic +data_element_concept 0..* 0..* +data_element_concept Conceptual_Domain Data_Element_Concept 0..* 0..* +dimensionality: Dimensionality [0..1] +usage +domain data_element_concept_domain +m eaning +m eaning 1 1 {complete, overlapping } Described_Conceptual_Domain Enumerated_Conceptual_Domain +conceptual_domain_description : Text [1] +containing_domain [1..* +m eaning 1 value_meaning_set +member 1..* Value_Meaning +value_meaning_begin_date : Date [1] +value_meaning_end_date : Date [0..1] 1 +m eaning described_value_domain_meaning value_domain_meaning permissible_value_meaning data_element_meaning 0..* +representation Permissible_Value Derivation Rule +permitted value : Value [1] Data_Element_Example +pemnissible_value_begin_date : Date [1] +derivation_rule_specification : Text [1] +example_item : Text [1. +permissible_value_end_date : Date [0..1] +derivation_rule_notation : Notation [1] 1..* +member 0..^ +example +rule 1 derivation_rule_application permissible_value_set exemplification +representation 0..* +application 0..* 0..* Å +containing domain Described_Value_Domain Enumerated_Value_Domain Data_Element_Derivation +value_domain_description : Text [1] 0..* +inputter +derivation 0..1 value_domain_subset derivation_input derivation_output +representation 0.* 0..* +subdomain 0..* Value_Domain +representation +superdomain +value_domain_datatype : Datatype [1] 0..* 1..* +exhibitor 1..* +input +output 1..* +value_domain_maximum_character_quantity : Integer [0..1] Data_Element +domain+value_domain_format : String [0..1] +usage +value_domain_unit_of_measure : Unit_of_Measure [0..1] +data_element_precision : Integer [0..1] data_element_domain 0..*

| | 1 | | |
|---|--|--|---|
| package Data_Description] |)J | Diagram name | Consolidated Data Description metamodel region |
| 0 +ok | bject_Class Characteristic | Modification date | 1/26/10 7:51 AM |
| data_element_concep +data_el Data_E | Model o | f Mear | ning |
| 1 +m eaning | | +domain ∟ concept_domain | +m eaning 1 |
| | | (complete, o | verlapping } |
| | Descr +conceptu | ibed_Conceptual_Domain al_domain_description : Text [1] | Enumerated_Conceptual_Domain |
| | | +m eaning 1 | +containing_domain [®] 1* value mieaning set |
| | | | +member 1* |
| | | + | Value_Meaning /alue meaning begin date:Date[1] |
| | -;- | + | /alue_meaning_end_date : Date [01] |
| | described_va | alue_domain_meaning permissible | value_meaning value_domain_meaning |
| data_element_meaning | | | 0t +representation |
| | Derivation Rule | | Permissible_Value |
| Data_Element_ +example_tem | Example +derivation_rule_specification : T (Text [1?] +derivation_rule_notation : Notation | ext [1] +perm pn [1] +perm | issible_value_begin_date : Date [1] issible_value_end_date : Date [01] |
| 0* +exam | ple +rule 1 | | 1* +member |
| | | | |
| | Model of | Inform | ation |
| | 0* +inputer +derivation 01 | | |
| | derivation_input derivation_output | value_domain_subset | +representation 0* |
| • (| | 0* | Value_Domain |
| +representation | | +superdomain/workin_domain | |
| +representation | tor 1* +input +output 1* | +superdomain+value_domain_dai +value_domain_ma | aximum character_quantity : Integer [01] |







THE MEANING OF "VALUE SET"





















The Challenge

We are presented with multiple approaches to representing "value sets"

- Rector's "Representing Specified Values in OWL: "value partitions" and "value sets" (<u>http://www.w3.org/TR/2004/WD-swbp-specified-values-20040803/</u>)
 - Pattern 1: Values as subclasses partitioning a quality
 - Pattern 2: Values as individuals whose enumeration is equivalent to the quality (Expanded upon in "Binding Ontologies & Coding systems to Electronic Health Records and Messages" (Rector – KRMed 2006)



The Challenge (continued)

- HL7 Concept Domain, Value Set and Concept Domain Binding
- CTS2 Value Set, Value Set Definition, Value Set Resolution, Concept Domain and Concept Domain Binding



The Challenge (continued)

- The method of representing value sets being proposed to the NCI by Lynch et. al.
- SPARQL definitions and queries as proposed
- CDC PHIN Vads
- (others)



The Challenge

- The good news is that there is less conflict and overlap than originally expected...
- ... each approach turns out to focus on just a few of the various definitions described above.
- The *challenge*, however, is to determine where there is overlap and collision and...

... where there are gaps that need to be filled in to make a complete model



Goals

- Arrive at a consistent model of "value sets" (all 6+ definitions)
- Identify a consistent, interoperable suite of representations, each of which fulfills a particular purpose (e.g. description, definition, interchange, reasoning, mapping, etc.)
- Specify the *identity* of various model components and how they are used