Concept Group Design For An Effective Medical Vocabulary Utilization

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The aim of the present work is to design a model pattern for controlled vocabularies subset representation (see its UML representation below). Vocabularies utilization in informatics system faces some obstacles: their model representation heterogeneity; their size and organization. The pattern we present intends to address this last problem by including artifacts for subset representation in an existing unified model for vocabularies description. This subset, composed by vocabulary concepts (also called 'concept group'), stems from and complies with actual standards and projects for vocabulary description.

There are many situations requiring limitation of the readily available concepts into sets, among them: 1) constraining the concepts to information system forms; 2) defining a navigational taxonomy for improving information retrieval; and 3) hiding some of the complexity by defining a list of concepts relevant for a special use.

Some modeling problems for vocabularies representation have already been addressed by various projects and standards but none of them suits for complex group notions such as the examples described above. Our approach does not claim to define an ex nihilo revolutionary model but intends to be a best practice paradigm for vocabulary concept group representation. Thus we widely reuse and extend efficient and effective ways of accomplishing knowledge representation which stem from standards, projects and have been applied over time to several research and industrial applications: InterSTIS, Eurovoc.

We define a specific entity, named *ConceptGroup*, which may represent a whole vocabulary (e.g. SNOMED CT concept group has all concepts of type 'Concept SNOMED CT' as member) as well as a vocabulary subset (e.g. SNOMED CT Subset).

Then we characterize two ways to express group membership:

- by intention - every concept in its query answer set is implicitly member of this group. Note that no explicit relation *isMemberOf* is stated; and
- by extension - all concepts referring a group. Concepts are explicitly linked to a concept group by the mean of *isMemberOf* relation. If a new concept is added to the vocabulary without specifying its group membership, it will not be member of this group.

By the mean of *groupNavigationRelation*, we allow navigational relation representation in order to display a tree view of a concept group such as the whole SNOMED CT tree.

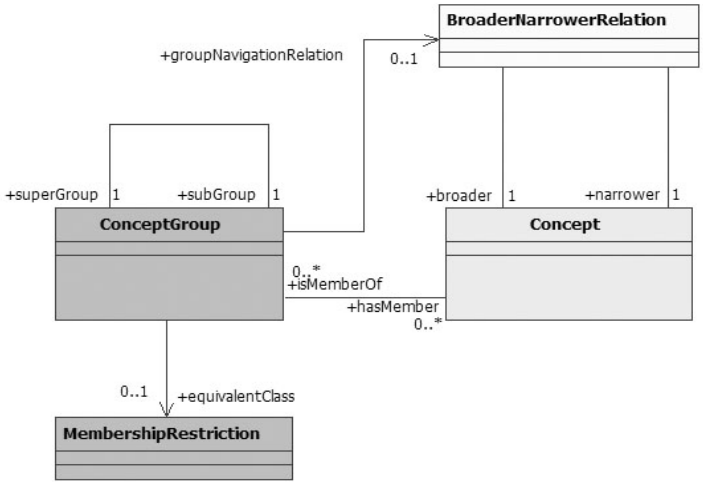

Figure 1-Medical vocabulary utilization model