SNOMED International response to "Discussion paper - Allowance of Extensions to Modify Core Content"

Introduction

A discussion paper from the Content Managers Advisory Group, entitled Discussion Paper - Allowance of Extensions to Modify Core Content has been submitted to SNOMED International management to resolve issues surrounding the interpretation of what national extensions are allowed to modify in the International release of SNOMED CT. The discussion paper outlines a number of proposed clarifications to the interpretation of what is allowed and details the requirements for those changes. This response proposes a series of policy statements that explicitly state what can and cannot be done to content of the International release by national extensions.

While this response is primarily focused on the needs of national extensions, the general policies discussed here will apply to all extensions, regardless if they are directly dependent on the International release or another edition.

Background

The primary concern expressed is the interpretation of Clause 4.1 of the SNOMED CT® AFFILIATE LICENSE AGREEMENT, which states:

"Subject to clause 2.1.4, the Licensee may not modify any part of the SNOMED CT Core distributed as part of the International Release or as part of a Member’s National Release."

Clause 2.1.4 states:

"(The Licensor grants the Licensee, license to) modify the manner of formatting of the copy of the SNOMED CT Core distributed to the Licensee as part of the International Release or as part of a Member’s National Release."

According to the discussion paper, there are two primary issues associated with this clause:

"This restriction on modifications has been interpreted generally in two ways.

A. The RF2 distribution must not be modified, beyond appending additional rows. Overwriting data in the distribution files - such that an extension violates the append only model is not allowed (editor's addition). Additionally, the full history provided by the international release must provided, i.e. extensions may not omit anything;

B. International components must not be modified.

Overriding the international content through either:

○ the addition of new versions for international components within extensions; or
○ the addition of relationships to international concepts and changing their DL definition.

Restrictions covered by B have been shown to be impractical and prohibit proper quality terminology authoring."

Proposed actions allowed for National Extensions

The discussion paper proposes seven actions that national extensions may want to perform in the course of their content development and maintenance:

1. Create new concepts
   - 4.1.1 Proposed policy

2. Fully define concepts they create
   - 4.2.1 Proposed policy

3. Classify terminology extensions
   - 4.3.1 Proposed policy

4. State additional IS A relationships against core (international) concepts
   - 4.4.1 Proposed policy

5. Retire (redundant) IS A relationships (not necessarily stated)
   - 4.5.1 Proposed policy

6. Add additional defining (non-IS A) relationships to primitive international concepts
   - 4.6.1 Proposed policy

7. Retire content considered "inappropriate" - concepts, descriptions or relationships
   - 4.7.1 Proposed policy
Create new concepts.

The current interpretation of Clause 4.1 with regards to creation of new concepts is that new extension concepts would necessarily be subtypes of an international concept, and not be a supertype of an international concept following classification (if the extension does perform classification of its content). This type of content, by its very nature would have no impact on the international content, as it would be distal in the hierarchy to all international content. National extensions have found that, due to gaps in the current International release, it is often necessary to insert intermediate (i.e., non-leaf) concepts into the terminology to meet user requests as well as to provide additional navigational support. These intermediate concepts may be either primitive or fully-defined.

In general, the identification of a need for an intermediate concept in the International release indicates a gap in content coverage. Unless realm specific, requests for addition of the intermediate concept should be forward to SNOMED International for disposition by the editorial staff. It is recognized; however, that there are instances where the addition of an intermediate concept may be required initially in an extension. The primary motivation for the promotion of intermediate extension concepts is to support the needs for cross-border exchange of health data. If intermediate concepts resided solely in national extensions, then countries would need to reconcile multiple extensions in order to get a full representation of the structured data they may receive. Also, there is a potential issue with divergent definitions of similar content if it is solely maintained in an extension.

The creation of intermediate concepts necessarily results in changes to the relationships in the international terminology. These changes can be of almost any type including: assignment of new parent(s), retirement of inferred or stated parents, inheritance of new/additional defining relationships, removal of inferred relationships by the classifier, etc. There are (at least) 2 ways in which an extension concept can become an “intermediate” concept in an edition:

1. The creation of a new fully defined extension concept as a subtype of an international concept. The extension concept's definition may result in it being classified as a supertype of an international concept. In this case, the transitive closure of the international edition stays the same, except for the addition of the new inferred |is a| relationships for the extension concept. The defining attribute relationships of the international subtypes stay the same; however, results in a redundant inferred |is a| relationship in the national edition.
2. A new extension concept (fully defined or primitive) is created and used as the destination of a stated |is a| relationship from an international concept, meaning that the new extension concept is a supertype of an international concept. An example of this might be the creation of an “A or B” concept, where the relationships “A is a ‘A or B’” and “B is a ‘A or B’” are stated. In this case, the extension is changing the stated definition of an existing international concept (the subtypes), which is more likely to lead to significant consequences.

Proposed policy

SNOMED International recognizes that SNOMED CT is not always comprehensive in its terminological coverage in particular domains and that there exist “gaps” in the hierarchies, where concept coverage is not adequate for extensions. It is proposed that intermediate concepts may be added to extensions under the following guidelines:

1. The addition of the concept does not change the transitive closure for the International Release, except to add additional rows that include the new intermediate concept). The transitive closure of the national edition must be a superset of the transitive closure of the international edition. This necessitates the retention of all transitive IS A relationships from the international lease.
2. No stated or inferred defining attribute relationship of international content is inactivated in the extension.
3. |is a| relationships should only be inactivated due to redundancy, but should still represent a valid relationship in the transitive closure. See “Retire (redundant) IS A relationships (not necessarily inferred)”.
4. No stated IS A relationships from an international concept to an extension concept is allowed.
5. Additional inferred defining relationships do not create crossovers (i.e. subtypes with attribute values that are supertypes of the values represented by the same attribute of the parent)
6. Additional inferred IS A relationships of subtypes do not represent a change in meaning as represented by the Fully Specified Name.
7. All extension concepts that are the supertype of an international concept, following classification, must be submitted for promotion to the international release as soon as possible.

Fully define concepts they create

Full definition of intermediate concepts will in many cases result in the reassignment of international relationships due to inferences assigned from the classifier (see next section). Likewise, any subtypes that are inferred under this concept may have their inferred definitions changed (depending on the modeling pattern applied to the extension concept).
Proposed policy

1. The creation of intermediate fully defined concepts within an extension is allowed, contingent on compliance with the proposed policy for creation of new concepts above.

Classify terminology extensions

The ability to classify extensions is an essential part of leveraging the description logics represented in the International Release for the proper maintenance of extension content. However, in some cases the results of classification may change the inferred relationships of existing international content.

Proposed policy

1. In cases where the classification results in an inferred IS A relationship from the core to become transitive (i.e. redundant), this redundant inferred relationship from the core should not be inactivated, but should remain redundant in the release.

N.B. This policy has implications on the 'Expression Constraint Language's "childOf" and "parentOf" operators (which return the direct children/parents based on non-redundant IS A relationships). Rather than relying on the inferred relationships in a release to determine the results of a childOf or parentOf constraint, a pre-processing step would be required to remove the redundant inferred relationships from the release.

State additional IS A relationships against core (international) concepts

Missing stated IS A relationships for international content is usually the result of the existence of intermediate primitive concepts that editors are unaware of. These intermediate primitive concepts are under review, but the volume makes it unlikely that all will be identified and resolved in the very near future. Identification of these missing stated relationships by national extensions provides an opportunity for incremental improvement of the international terminology.

Proposed policy

1. Addition of new stated IS A relationships to international content is not allowed.
2. Where a needed IS A relationship has been identified, a request to SNOMED International for addition of this relationship should be submitted as soon as possible. These will be handled as high priority by the editorial staff.

Retire (redundant) IS A relationships (not necessarily stated)

Redundant IS A relationship exist in SNOMED CT where variations in modeling style have been used and hierarchically related terms have been assigned as stated relationships. These are considered internal quality errors in the and are being incrementally addressed through the SNOMED CT Internal quality improvement program. Many of these are already identified (See: https://dailybuild.ihtsdotools.org/qa Pattern 1) and are being addressed by SNOMED editors as resources allow. Redundant relationships that impact extension structure should be reported to SNOMED International for prioritized disposition.

Proposed policy

1. Inactivation of International release stated IS A relationships is not allowed.
2. Relationships identified as redundant and impacting extension content should be reported to SNOMED Int'l as soon as possible. These will be handled as high priority by the editorial staff.
3. Where retirement of stated relationships are needed, a request should be made to SNOMED International to correct the error.

Add additional defining (non-IS A) relationships to primitive international concepts

The incomplete modeling of international content resulting in a plethora of primitive content is well-recognized. However, correction of these deficiencies within a national extension can lead to a number of unintended consequences including: 1) the impact on the classification process and the potential change in meaning of descendant concepts (e.g. loss of subtypes) 2) eventual remodeling of the primitive concept in the international release could lead to conflicts between the national edition and the International release.

It is recognized that there may be cases where proper structuring of a national extension requires the full definition of currently primitive international content and that the immediate needs of an extension do not coincide with the timing of International releases. The potential dangers of content divergence in national extensions by allowing definition of international primitive content must be recognized by extension managers prior to undertaking such an effort. It must also be recognized that allowing the definition of international concepts to be changed in an extension makes cross-border, cross-organisation exchange/management/querying of health records more difficult than it already is.

Proposed policy

1. When needed to support national extension requirements, the addition of defining (non-IS A) relationships to existing primitive international content is allowed, providing:
   a. the additions are consistent with the current International Machine readable concept model
   b. the additions are submitted to SNOMED International as soon as possible for inclusion in the International release
Retire content considered "inappropriate" - concepts, descriptions or relationships

It is recognized that there are components within the International release that are erroneous. These is a current issue tracker IHTSDO-724 - Retire inappropriate synonyms, that will address the presence of inappropriate synonyms. The existence of other components deemed inappropriate by a national extension are often context or realm dependent. The inactivation of international release components within a national extension can result in substantial deviation from the International release and thus an alternative representation of SNOMED international content. The integrity of SNOMED as an internationally consistent terminology would thus be compromised.

Proposed policy

a. Inactivation of components (concepts, descriptions, stated relationships) originating in the International release, by a national extension, is not allowed.

b. Components in the International release identified as inappropriate for a national extension may be excluded from the national release through refsets. Components in the International release must not be inactivated simply because they are deemed inappropriate for national use.

c. The identification of issues in the international edition that impact a national extension must be added to a Content Request to escalate its priority for resolution by the SNOMED International editorial team.