# 3. Requirements

## Overview

In this section, we present the key requirements of the SNOMED CT MRCM. These requirements are grouped into 'constraint requirements' and 'design requirements'.

## Constraint Requirements

The constraint requirements for the SNOMED CT MRCM include:

**Requirement C.1**: *Attribute domains*

The MRCM must be able to specify the set of concepts to which a given attribute may be applied.

**Requirement C.2**: *Attribute ranges*

The MRCM must be able to specify the set of concepts which may be used as the value for a given attribute.

**Requirement C.3**: *Attribute cardinality*

The MRCM must be able to specify the minimum and maximum number of times that a given attribute may appear in a concept definition. Additionally, it must be able to specify the minimum and maximum number of times that a given attribute may appear in each relationship group in a concept definition.

**Requirement C.4**: *Grouping*

The MRCM must be able to specify whether an attribute may or may not belong to a relationship group.

**Requirement C.5**: *Rule strength*

The MRCM should indicate the strength with which each rule should be applied – for example, whether a rule is mandatory (resulting in an error), or optional (resulting in a warning).

**Requirement C.6**: *Rule scope*

There should be a clear specification of which concept model rules apply to a given SNOMED CT module.

## Design Requirements

The design requirements for the SNOMED CT MRCM include:

**Requirement D.1**: *Machine Computable*

In order to facilitate easy adoption, the MRCM must represent the concept model rules in a form that is machine computable.

**Requirement D.2**: *Human readable*

The MRCM must be computationally transformable into a representation that is human readable, to support human review, validation, education and understanding of the rules. Additional text explaining the rules should be able to be added to further aid its understanding.

**Requirement D.3**: *Unambiguous*

The MRCM must provide an unambiguous representation of the SNOMED CT concept model rules.

**Requirement D.4**: *Support specified use cases*

The MRCM must be useful in supporting the use cases described in Chapter 2, including the authoring and validation of SNOMED CT concepts, expressions, constraints and queries, natural language processing (NLP) and terminology binding.

**Requirement D.5**: *Version history*

The SNOMED CT concept model rules must be able to be changed between releases to fix identified issues and enhance future releases (in conjunction with clear editorial guidelines). As such, the MRCM must be versioned to retain a history of changes, and to enable the concept model to evolve gracefully over time.

**Requirement D.6**: *Extensible*

The international MRCM rules defined by the IHTSDO must be able to be extended and adapted by organizations developing SNOMED CT extensions, to support the concept model requirements of their extension content. This may include the addition of new attributes, the addition of new rules, and the customization of existing rules. Principles need to be defined as to how MRCM rules may be extended and adapted, to ensure consistency and data integrity between SNOMED CT editions.

**Requirement D.7**: *Consistency with existing SNOMED CT formats and languages*

The design of the MRCM should be consistent with existing SNOMED CT formats and languages, including the SNOMED CT Release Format 2 (RF2) and the SNOMED CT Expression Constraint Language. The goals of appropriate use of existing formats and languages include:

- Leverage the work that has already been performed to support common requirements, such as versioning and intensional constraint definition,
- Make it easier for the SNOMED CT community to understand the design and correctly interpret the meaning of the MRCM rules,
- Facilitate the easier adoption of the MRCM rules by existing SNOMED CT implementers, and
- Allow common terminology services to be reused to support the implementation of the MRCM.