FSS Teicneolaíocht agus Claochlú
HSE Technology and Transformation

SNOMED CT Vendor Specification Procurement document

Part 1

SNOMED CT Implementation Support Guide

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Author	Theresa Barry
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Contents

Introduction

The SNOMED CT Vendor Specification Procurement document provides valuable insights, illustrations, and templates aimed at facilitating the effective implementation of SNOMED CT. It caters for all stakeholders involved in care organisations procuring Digital Health Solutions, and the internal teams or IT system suppliers tasked with designing and deploying these systems. This guide will help you successfully implement SNOMED CT within your system and ensure compliance with SNOMED CT Requirements.

This document encompasses a comprehensive guide for formulating your specific SNOMED CT system requirements and provides general guidance on ensuring compliance with SNOMED CT requirements.

This document supports vendor companies who are involved in the procurement process to gain an understanding of what the requirements are to enable SNOMED CT to deliver in their Digital Health Solution.

Structure and purpose

This document will lead you through the process of outlining the functionalities required for your SNOMED CT compliant implementation. For each requirement, it outlines the recommended assurance activities and, where relevant, provides examples of useful test data. These can serve as a foundation for developing your own comprehensive assurance plans. It comprises of four main sections:

- **The High-Level SNOMED CT Requirements:** offer an overview of the fundamental principles governing the integration of SNOMED CT within a system, along with the functionalities it should facilitate.
- **The Core Requirements Baseline;** furnishes a collection of requirement statements suitable for inclusion in the functional specification of various SNOMED CT-enabled systems. Each statement is then elaborated upon to elucidate the rationale behind it and assurance factors to take into consideration.
- **Compliance with SNOMED CT.**
- **Building on Core Requirements;** serves as a guide for formulating additional requirements specific to your organisation. This is achieved by dissecting the system into key areas reliant on SNOMED, with guidance derived from the core requirements.

Certain aspects of validating SNOMED system changes, particularly those related to reporting or clinical decision support, are highly complex. While this document aims to be a basic guide and an accessible starting guide, please reach out to our team via our email, snomed@hse.ie for a more detailed discussion on SNOMED CT functional assurance.

Important Note

The aim of this document is to assist you in evaluating and outlining system requirements pertaining to SNOMED CT. They have been included based on their frequent appearance in specifications we've encountered or as elements commonly discussed with HSE SNOMED CT implementers.
This is intended to be used as a baseline for all procurements where clinical terminology is a requirement.

Process Flow in this Document
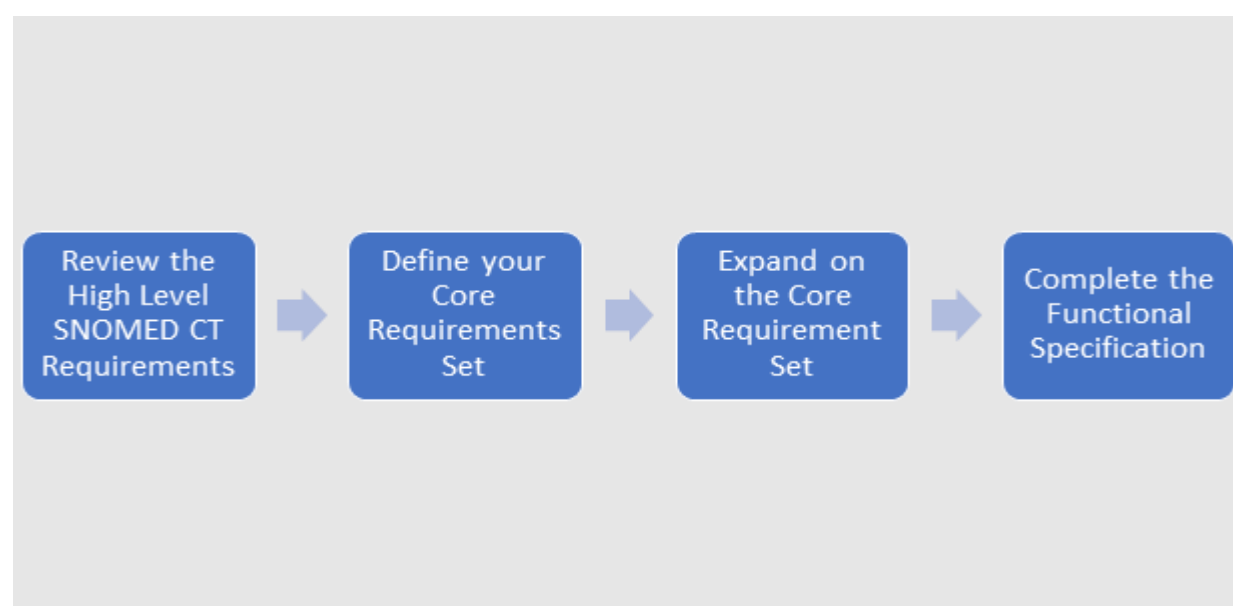
High Level SNOMED CT Requirements

High-level requirements might not typically appear in a detailed functional specification, but they establish the principles upon which more detailed requirements are based. Therefore, they are valuable to reference when planning and developing these detailed requirements. These should be reviewed at the start of your assurance planning and again after completing your assurance design to help ensure you begin with a clear understanding of the task with full comprehension.

These high-level requirements are recommended by the "*Digital for Care: A* Digital Health Framework for Ireland 2024-2030[1]"as published by HIQA and endorsed by the Department of Health.

The five High-Level Requirements for SNOMED CT, which should apply to all functions across all systems, are:

• **Data Entry:** Allow users to use SNOMED CT for data entry across all system areas where clinical terms are provided for selection. Ensure that any configuration tools, such as data entry templates, must be configurable using SNOMED CT.

• **Reporting:** Enable and ensure users can use SNOMED CT in search specifications where clinical concepts define the patient records to be retrieved.

• **Business Rules:** Ensure that all system functionalities based on clinical terms use the SNOMED CT terminology and its hierarchies to determine functional outcomes.

• **Interoperability:** Ensure that national data extractions, interactions, and messages provide and accept data in SNOMED CT to facilitate interoperability and national processing.

• **Content Scope:** The system must use SNOMED CT to record all structured clinical data that needs to be computable (i.e., clinical data that the system needs to understand and process algorithmically). This generally includes a minimum of symptoms, medications, allergies, diagnoses, clinical findings, observables, and procedures. It may also extend to family history, assessment scales, test requests, test results, and problem orientation.

For each functional requirement, consider which of the high-level requirements it pertains to and whether the planned assurance covers those aspects adequately.

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[1] gov - Digital for Care: A Digital Health Framework for Ireland 2024-2030 (www.gov.ie)

Core Requirements Baseline

The following table presents a set of 40 core requirements that could be included in any functional specification for a system using SNOMED CT. Establishing a core requirement set is beneficial as it provides a common baseline upon which further requirements can be built.

Each of these 30 requirements will be described and their use, to highlight key elements to consider when designing assurance for each requirement.

The core requirements are categorised into eight fundamental areas:

1. **Versioning:** Support and ongoing maintenance of a specific edition of SNOMED.

2. **Available Content:** Curation and management of available concepts.

3. **Data Display:** Presentation of human-readable terms.

4. **Search and Select:** Tools to assist users in finding the necessary terms.

5. **Reporting:** Querying data in Digital Health solutions using SNOMED.

6. **Post-Coordination:** Management of expressions composed of multiple SNOMED CT concepts.

7. **Interoperability:** Ensuring data exchange and comprehension between systems.

8. **Historical Data Management:** Converting data from legacy coding schemes into SNOMED CT.

These categories will also be used later to help identify additional requirements that will complete your full requirements set.

Core Requirement Table

Reference	Requirement Text	Area
SCT-001	The system must use the Irish Edition of SNOMED CT i.e. SNOMED International plus the Irish Extension of SNOMED CT as the primary clinical terminology for recording clinical data in the Digital Health Solution from the Irish NRC.	Versioning
SCT-002	A single release version of the Irish Edition of SNOMED CT will be available across the entire system, or suite if the system consists of multiple products or modules.	Versioning
SCT-003	The release of the Irish Edition of SNOMED CT will always be within 18 months of the latest available Irish Edition of SNOMED CT release.	Versioning
SCT-004	The system will not permit users to choose the version of the clinical terminology or select terminologies other than SNOMED CT.	Versioning
SCT-005	The system will provide tools to assist users in editing, updating, or re-authoring artifacts affected by a new Irish Edition of SNOMED CT release, (such as fields where a value set now contains inactive concepts).	Versioning
SCT-006	The system will exclude inappropriate clinical content when entering data into the Digital Health Solution. When using the Irish Edition of SNOMED CT, the solution will not allow the entry of the following concepts or their descendants into the Patient Record: - 410663007 | Concept history attribute (attribute) | - 408739003 | Unapproved attribute (attribute) | - 900000000000441003 | SNOMED CT Model Component (metadata) |	Available Content
SCT-007	At a minimum, the system will support the entry of SNOMED CT for all instances of diagnoses, procedures, laterality, symptoms, family history, assessment tools, observables, clinical findings, allergies, and medications in the Digital Health Solutions	Available Content

SCT-008	When appropriate, the system will display only terms that are relevant to the context of the Digital Health Solution area. (e.g. only children of 71388002 | Procedure (procedure) | will be allowed when recording procedures)	Available Content
SCT-009	The system will prevent the selection of inactivated concepts or descriptions for data entry.	Available Content
SCT-010	During data entry, only terms deemed acceptable by the Irish SNOMED extension will be displayed. Previously acceptable terms will remain visible for historical data.	Available Content
SCT-011	The system will support the full and un-truncated display of the Irish Edition of SNOMED CT terms up to 255 characters wherever human-readable terms are shown.	Data Display
SCT-012	Concept IDs and Description IDs will be visible in Digital Health Solutions data and can be toggled on or off by users with a single button always available in the interface when viewing patient records.	Data Display
SCT-013	The system will require a minimum search string of three characters, and the search will only be triggered once the user has entered a three-character term, excluding whitespaces or blank characters.	Search and Select
SCT-014	The system will perform searches independent of the order of search tokens (e.g., "Skin Cancer" and "Cancer Skin" will return the same results).	Search and Select
SCT-015	The system will default to partial matching in search results and will not require the entry of wildcard characters.	Search and Select
SCT-016	The system will default to returning search results in ascending order of term length.	Search and Select
SCT-017	The system will enable searches using Concept ID and Description ID.	Search and Select
SCT-018	The system will permit users to paste strings into the search box of the term browser.	Search and Select
SCT-019	The system will facilitate real-time progressive matching of term results.	Search and Select

SCT-020	Following the return of search results, the system will permit users to browse through IS A relationships.	Search and Select
SCT-021	The system will use the Irish Edition of SNOMED CT for all hierarchical searching, reporting, and analysis of clinical data stored in the Digital Health Solution.	Reporting
SCT-022	The system will guarantee that inactivated concepts are accessible for reporting, graphing, grouping, and analytics by implementing the Irish Edition of SNOMED CT Query Table.	Reporting
SCT-023	All reporting, graphing, grouping, and analytical functions will automatically operate at the Concept ID level by default.	Reporting
SCT-024	If a SNOMED CT post-coordinated expression is recorded and supported, all attribute value relationships must be stored alongside the focus concept in the Digital Health Solution	Post-coordination
SCT-025	Before being committed to the digital health solution post-coordination will undergo validation against the SNOMED CT Concept Model.	Post-coordination
SCT-026	The system will facilitate the transmission and reception of clinical data using SNOMED CT for various data exchanges, including record transfer, electronic discharge, data migration, data warehousing, and national data returns.	Interoperability
SCT-027	The system will prohibit concepts from local or proprietary SNOMED CT extensions from being used in any interoperability beyond the local system or suite of systems.	Interoperability
SCT-028	The system will facilitate the reception, filing, and onward propagation of all incoming valid Irish Edition of SNOMED CT codes, including those beyond the locally selectable range, without any loss of quality.	Interoperability
SCT-029	The system will facilitate the mapping of historical data from legacy terminologies to SNOMED CT, which will encompass data previously entered using local code systems.	Historical Data Management

SCT-030	The system will facilitate fully automated mapping of data from legacy terminologies using national mapping tables provided by the Irish Edition of SNOMED CT Release Centre.	Historical Data Management
SCT-031	The system will automatically update value sets referenced in user-defined artefacts according to SNOMED CT hierarchical statements.	Versioning
SCT-032	The system will replace all inactive codes with new ones based on the history substitution table, which identifies valid replacements for inactive concepts and provides metadata about each substitution. When a single inactive concept is replaced by multiple codes, all replacement concepts will be added to the value set.	Versioning
SCT-033	The system will generate a report for super-users and system administrators, detailing the changes caused by the new SNOMED CT release. This report will include: - All user artifacts affected by the update. - The nature of the changes (e.g. increased value set options, reduced value set options, changes due to concept inactivation). The report will also provide links to the definition module entry for each item, facilitating easy access for manual review and editing. The SNOMED NRC will assist in these reporting measures of details of inactivation's and replacement concepts.	Versioning
SCT-034	The system will alert super-users and system administrators to any value sets that are empty or have had their member numbers increased by more than 20%, requiring manual review of these items before they can be used.	Versioning
SCT-035	In an app, if a SNOMED CT term exceeds 45 characters, a yellow ellipsis icon will be displayed next to the text box. Pressing this icon will trigger auto-scrolling for the term. Alternatively, users can enable autoscrolling by default in their settings, eliminating the need to press the icon.	Data Display

SCT-036	When code display is activated, the relevant codes will be shown in parentheses to the right of the term text, following the format (ConceptID / Description ID).	Data Display
SCT-037	When hovering over any SNOMED CT term in the Digital Health Solutions the status bar at the bottom of the screen will display: - The Fully Specified Name of the concept - The Preferred term (if the term in the Digital Health Solution is not the preferred term) - The Concept ID - The Description ID	Data Display
SCT-038	Users will be able to input SNOMED CT Expression Constraint Language syntax directly into the reporting module, either by typing or pasting.	Reporting
SCT-039	All SNOMED CT data will incorporate a Human Readable string corresponding to the term displayed to users in the sending system, used for handling degradation in the event that the primary code is not recognised by the receiving system and for the receiving system to design manual or secondary checks if needed.	Interoperability
SCT-040	All systems will verify their SNOMED CT version against the Central Terminology Service, (CTS). In case of any disparity, they will request new SNOMED database rows following the guidelines outlined in the Terminology Server API Documentation.	Interoperability

Compliance with SNOMED CT

A Note on SNOMED

SNOMED CT represents a distinct iteration of SNOMED. While earlier versions remain present within the HSE, it's crucial to exclusively employ the latest iteration, of SNOMED CT. Henceforth in this document, whenever "SNOMED" is mentioned, it refers to SNOMED CT.

Fundamental Standards vs System Compliance

The adoption of SNOMED within the HSE serves as a foundational standard, encompassing all functions related to the input, retrieval, or exchange of clinical data concerning patient care and management. The comprehensive scope of this standard is recommended in the '*Digital for Care: A Digital Health Framework for Ireland 2024-2030*'.

Asserting that all HSE systems must adhere to SNOMED is like mandating that a product designed for storing and presenting measurements must consistently employ the metric system. It's evident that a product displaying lengths in centimetres but weights in ounces does not fully conform to the metric system's fundamental standard. While it may comply with length measurements, it falls short in terms of weight measurements. Similarly, a product still using inches for data input and display but capable of converting data to centimetres, when necessary, offers access to the metric system through a specific function, yet does not adopt metric as its foundational standard. The principles for evaluating compliance with SNOMED in clinical systems mirror this analogy.
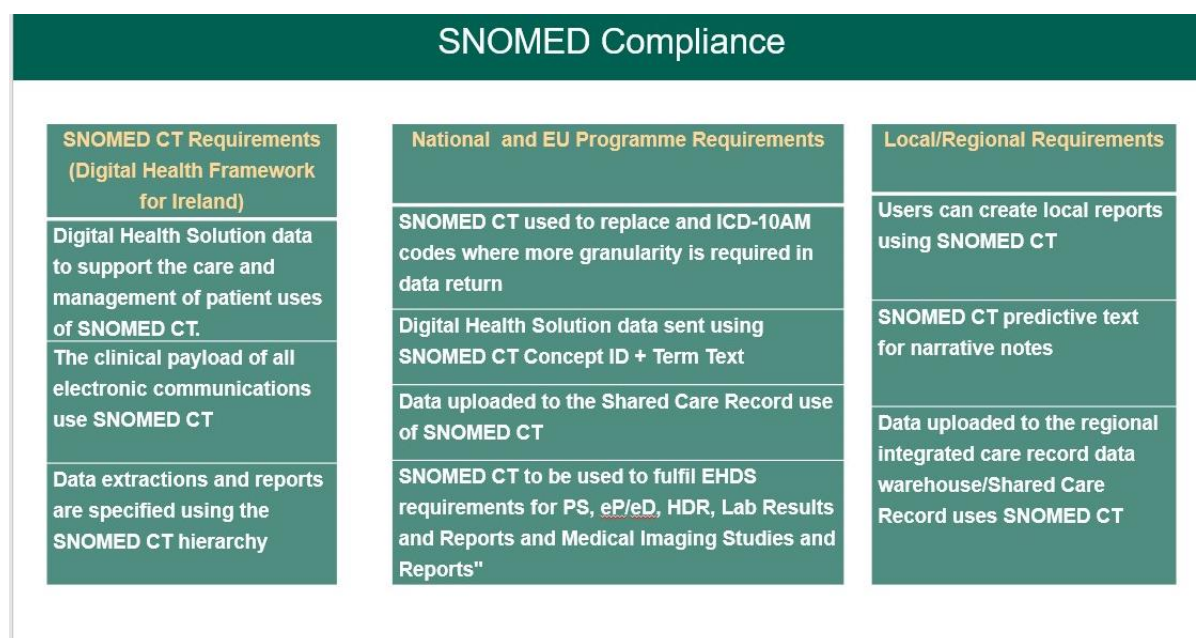
The SNOMED fundamental standard encompasses a diverse array of system functions, with the specific set of functions to consider varying based on individual requirements regarding clinical data input, processing functions, and communication of clinical data.

It is presumed that any system proclaiming itself as "SNOMED compliant" without further clarification fully satisfies every aspect of its architecture and functionality governed by SNOMED's fundamental standard, ranging from data input at the point of care to interoperability with other systems.

Systems exhibiting partial compliance with SNOMED, such as a Digital Health Solution system capturing data using SNOMED while still relying on local codes or string matching for reporting, should refrain from labelling themselves as "SNOMED compliant." However, they may indicate that only those specific functions within their product adhere to the SNOMED fundamental standard.

Three Sources of SNOMED CT Requirements

Attempting to conceptualise what "full compliance" with the SNOMED CT standard entails, a potential model seen in diagram provided below. *The Digital for Care: A Digital Health Framework for Ireland (2024-2030)"*, outlines certain crucial requirements within its specification, inclusive of SNOMED CT, serving as the primary source and laying the groundwork upon which all other requirements must be constructed. Additionally, other HSE-wide standards such as messaging, or data extraction may constitute the secondary source. Lastly, the local requirements of care organisations, established during system commissioning, form the third source. All these components would need to adhere to the fundamental standard of SNOMED CT before claiming "full compliance."

SNOMED Compliance

SNOMED CT Requirements (Digital Health Framework for Ireland)	National and EU Programme Requirements	Local/Regional Requirements
Digital Health Solution data to support the care and management of patient uses of SNOMED CT.	SNOMED CT used to replace and ICD-10AM codes where more granularity is required in data return	Users can create local reports using SNOMED CT
The clinical payload of all electronic communications use SNOMED CT	Digital Health Solution data sent using SNOMED CT Concept ID + Term Text	SNOMED CT predictive text for narrative notes
Data extractions and reports are specified using the SNOMED CT hierarchy	Data uploaded to the Shared Care Record use of SNOMED CT	Data uploaded to the regional integrated care record data warehouse/Shared Care Record uses SNOMED CT
	SNOMED CT to be used to fulfil EHDS requirements for PS, eP/eD, HDR, Lab Results and Reports and Medical Imaging Studies and Reports"	

A system that employs SNOMED terms for data input but fails to populate Digital Health Solutions do not meet the requirement of the" Digital *for Care: A Digital Health Framework for Ireland, (2024-2030)"*, rendering it SNOMED compliant at that data input level only. It would need to align with the expectations which assumes SNOMED is the fundamental standard within the system.

Another crucial aspect demonstrated in this diagram involves local or regional requirements. Different care organisations may have varied needs concerning SNOMED CT, even if they deliver similar types of patient care. The same clinical terminology is required across local and regional systems to ensure interoperability.

SNOMED CT is the recommended EU standard for digital health solutions to help fulfil European Health Data Space, (EHDS), requirements for Patient Summary/ePrescriptions and eDispensations/Hospital Discharge Reports/Lab results and Reports & Medical Imaging Studies and Reports.

Conclusion

This document, along with the "SNOMED CT Compliance document Part 2" and the accompanying training resources available on our website, SNOMED CT Irish Edition Release - eHealth Ireland as dynamic documents that will undergo regular review and updating. We highly value feedback from HSE/Health Service SNOMED CT implementers regarding areas for improvement, modifications, and expansions, ranging from individual document content to entirely new topics related to SNOMED CT implementation. If you wish to share your insights and experiences with us, please contact snomed@hse.ie.

Glossary

ADD	Additional
API	Application Programming Interface
Concept ID	Concept identification number
CTS	Central Terminology Server/Service
Description ID	Description identification number
Digital Health Solutions	Digital health solutions use computing platforms, connectivity, software, sensors for healthcare and related issues
DoH	Department of Health
e.g	Example
EHDS	European Health Dataspace
eP	Electronic Prescribing
EPR	Electronic Patient Record
FAQ's	Frequently asked questions
FSN	Fully specified name
HDR	Health Data Repository
HSE	Health Service Executive
ICD-10AM	The International Statistical Classification of Diseases and Related Health Problems 10th edition, Australian Modification
IE	Irish Edition
LOINC	Logic Observation Identifiers Names and Codes
LSD	Lysergic acid diethylamide
NRC	National Release Centre
PS	Patient Summary
Refset	Reference Set
RF2	Release Format 2
SCT-001	SNOMED CT reference numbers
SCTID	SNOMED CT identification code
SNOMED CT	Systemised Nomenclature of Medicine Clinical Terminology
UK	United Kingdom
US	United States of America