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SNOMED CT
Example EMR / EHR Requirements Guide

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The SNOMED CT Example EMR/EHR Requirements Guide is a practical and useful starting point from which any jurisdiction can begin contemplating including requirements for SNOMED CT into their procurement documents. These examples only provide a high-level outline of each requirement. More detail is likely to be required within a formal procurement document for a specific system. The SNOMED CT Document Library (http://snomed.org/doc) provides a range of SNOMED CT guides that may be used to source more detailed requirements. For example, the 'Search and Data Entry Guide' and the 'Data Analytics with SNOMED CT' guide could be used to source more detailed requirements related to searching, entering and querying SNOMED CT codes in health records.

SNOMED CT Document Library: http://snomed.org/doc

1. Introduction

This document presents a set of high-level examples of categories and requirements that could be considered when procuring a SNOMED CT enabled EMR or EHR system. These requirements remain relatively generic in order to be broadly applicable across Member countries and territories.

Goals and Objectives

The intent of this document is to spark thinking within each Member's National Release Center (NRC) in terms of the categories and types of requirements they may want to consider (and build on) in their local procurements. This document will also provide vendors with example SNOMED CT requirements that might be requested of products being procured.

Disclaimer:

- Please note that the exact SNOMED CT requirements that should be included in an EMR or EHR procurement depend upon the specific use case.

Target Audience

The target audience for this Example Guide includes:

- People from various disciplines who may be involved at any point in the procurement of an EMR/EHR system that includes SNOMED CT – from initial planning, analysis and clinical content definition and implementation through to use of the resulting clinical information. This spans people involved with planning and deciding to proceed and resource a SNOMED CT implementation, people involved in reference set development, terminology management, clinical subject matter experts, technical implementation and all aspects of deployment and use. It also includes people involved in clinical information retrieval, analyses, decision support and other aspects of knowledge representation.
- Vendors that may be interested in responding to procurement opportunities that include requirements for EMR/EHR systems containing SNOMED CT. The intent is to provide vendors with an understanding of generic or baseline requirements for provisioning a SNOMED CT – enabled system.

Topics

The topics covered in this SNOMED CT Example EMR/EHR Requirements Guide include:

- Edition, Language and Content
- User Interface
- Analytics and Reporting
- Maintenance
- Storage
- Interoperability
- Additional Resources

2. Edition, Language and Content

It is important that vendors work with valid editions, versions and derivatives of SNOMED CT that are relevant in the context of the country. This is also pertinent when considering the native language of local healthcare systems, if this is relevant and the native language is available.

1. The vendor shall incorporate SNOMED CT as the primary, clinical terminology in the EHR, including the international edition, national edition, and any relevant local extensions.
2. The vendor shall be responsible to update SNOMED CT within 12 months of a new version of the deployed SNOMED CT edition being published (e.g. international, national or local edition). This process should include updating all SNOMED CT components that have been added or changed, and other derivative artifacts that refer to SNOMED CT components.
3. The vendor shall implement SNOMED CT in the native language of implementing country/organization.
4. The vendor shall create or source all SNOMED CT subsets and maps required by the customer. All such subsets and maps shall undergo an approved quality assurance process required by the customers to support user interface value lists, CDS trigger rules, queries, reports and messages.
5. The vendor shall provide a strategy for feedback mechanism to submit new content and/or add content locally e.g. vendors shall engage with the NRC if additional content is required.

3. User Interface

The success of an implementation of SNOMED CT is often driven by the quality and approach that has been employed in the development of the user interface. This is where end users will interact and use SNOMED CT and a poor implementation will have a considerable impact on the quality of data entered. These points provide some guidance on what should be expected from vendors in systems using SNOMED CT.

1. Use SNOMED CT for searching, display, storage, communication, knowledge linkage, querying and analytics in the following clinical domains (or specific data elements)
    - Problems, Diagnosis and Clinical Findings
    - Reason for Admission
    - Procedures (e.g. Planned Procedures, Performed Procedures)
    - Allergies
2. Support searching for SNOMED CT concepts using any term that is preferred or acceptable in the national language reference set.
3. The vendor shall include one of the following options for each SNOMED CT coded data element (depending on user preferences and local requirements for standardization of interface terms):
    - Upon selection of a concept, use the term entered by the user to display the selected concept; OR
    - Upon selection of a concept, use the preferred term from the national language reference set) to display the selected concept; OR
    - Upon selection of a concept, use the preferred term from the regional or institution specific language reference set to display the selected concept.
4. The vendor shall allow searching and selection of only those concepts from the SNOMED CT subset that has been specifically bound to that data element.
5. The vendor shall display the most frequently selected concepts at the top of the list, for elements bound to a subset containing more than 20 concepts.
6. As the user types each character into a SNOMED CT coded data element, limit the selection of concepts to those with a preferred or acceptable term that matches the characters types (using a ‘word prefix any order’ algorithm), and use auto-complete when only one option is available for selection.
7. When displaying the list of possible matches, display the concept with the shortest matching term first.
8. For each free text data element that records clinical information (e.g. Past history, Clinical notes) use SNOMED CT-enabled techniques (e.g. Natural Language Processing) to suggest possible SNOMED CT encoding (including appropriate contextual information), for selection and confirmation by the user.
9. Support the capture of SNOMED CT post-coordinated expressions using predefined expression templates and automatically-generated interface terms – for laterality, allergies and family history.
10. Use SNOMED CT concept identifiers stored in the EHR to suggest patient-specific clinical knowledge to the clinician, and to test clinical decision support rules.
11. Use SNOMED CT codes stored in the EHR, together with SNOMED CT and other map-enabled coding systems (e.g. SNOMED to ICD-10) to suggest appropriate codes for the clinician to select (if required).
12. The system shall be sufficiently performant to return the first (X) results in a given time period (e.g. less than 1s).

4. Analytics and Reporting

One of the main drivers for deploying SNOMED CT is to structure data and benefit from the ontology to gain clinical insights into patient data that may otherwise be unavailable in unstructured data. The use of maps of data already coded using local systems to SNOMED CT will help to move towards the rich analysis that SNOMED CT enables, as well as using maps to provide the step from SNOMED CT to national & international classifications for statistical reporting.

1. Use maps from local code systems to SNOMED CT to enable ad hoc querying, reporting and analysis of legacy clinical data or for national or local reporting.
2. Use maps to national and international classifications to enable analysis and reporting of data, including legacy and current data.
3. Applications supporting data reporting, extraction and/or clinical decision support rules shall (where appropriate) use SNOMED CT's defining relationships in the determination of the correct results or outcomes.

5. Maintenance

The ability to incorporate changes from International and National editions of SNOMED CT is key to a successful, long-term implementation. SNOMED International provides release twice a year and national release centers may provide the same or more. These updates contain important changes that may be due to changes in medical knowledge or patches on feedback from the community, and it is important that vendors are able to process these updates.

1. Ensure that the version of the given SNOMED CT edition being used within the solution is no more than 2 versions (n-2) behind the most current version. Components that may change between versions may include:
    - Concepts: new concepts added, concepts made inactive.
    - Descriptions (with terms): new terms added, terms made inactive, terms changed (minor typing mistakes may have been corrected).
    - Relationships: new relationships, relationships made inactive, additional inferred relationships from classifying the terminology.
    - Refsets: new refsets, new members to a refset, members made inactive within a refset, a refset made inactive.
2. Ensure all subsets and maps used in user interfaces, reports, queries, etc. are maintained with each new version of SNOMED CT to ensure continued clinical validity.
3. If the vendor is required to create a SNOMED CT extension, they must follow the general principles of SNOMED CT, including allocating globally unique identifiers, concept permanence (i.e. never reusing the same concept id for a different concept), and maintaining a robust audit trail for all inactivation's (including when the code was inactivated and what codes have replaced it).

6. Storage

How SNOMED CT is used and stored against patient records is another factor that can drive a successful implementation or not. The use of the SNOMED CT concept identifier is a mandatory requirement and for all the points in this section, it is important that implementations are quality assured and prove that these requirements are met.

1. Must store SNOMED CT concept identifiers in the health records
2. Store the SNOMED CT concept identifier (or SNOMED CT expression) together with the term selected by the user in the EHR for SNOMED CT coded data element.
3. Ensure that the context of each SNOMED CT concept identifier or expression is clearly represented in either the information structure or the terminology (but not both).
4. Ensure that all inactivated concepts, descriptions and relationships remain available to support querying over historical clinical data.

7. Interoperability

The final important aspect of SNOMED CT implementations is how interoperability is implemented. SNOMED CT is a very powerful tool to ensure the safe, unambiguous transfer of patient data between organizations and the use of SNOMED CT concept identifiers is at the foundation of this.

1. Use SNOMED CT concept identifiers and/or SNOMED CT expressions to populate SNOMED CT coded data elements for all relevant message exchanges.
2. Use SNOMED CT to share data, based on national/local data standards.
3. The system shall have the capacity to take in mappings to other terminologies/classifications where available such as ICD-10, ICPC2, LOINC, Orphanet codes, and make the mappings available in the relevant contexts. This may include on-screen display and inclusion in generated documents, reports and data extracts.

8. Additional Resources

Contact info@snomed.org for additional resources or questions pertaining to the SNOMED CT Example EMR/EHR Requirements Guide.

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