

Mapping: FAQs

Mapping to a Reference Terminology

Purpose:

The purpose of this document is to provide general information about creating maps from a Point of Service Terminology to a Reference Terminology.

Audience and Objectives:

This document is intended to provide new and experienced Business Analysts with introductory level information about terminology maps and is not intended to provide detailed information specific to mapping, why they are needed and how they might be created. Business Analysts who are preparing their Point of Service Terminology files in a healthcare information system will find this document of particular interest.

Frequently Asked Questions:

1. What is a Map?

A map provides a link from one terminology to another. Mapping involves "matching" between a source term and a target concept that represents the same meaning, such as between two databases that contain the data elements that are meant to be similar but are called by different names. In most cases, the relationship is between the local point of service or vendor specific terms (the "source") and the respective term from a Reference Terminology such as SNOMED CT® or LOINC® (the "target"). A mapping process simply matches the terms or words from a local system to the appropriate concept that represents the same meanings from a Reference Terminology.

2. Why do I need a Map?

Maps enable software and systems to meaningfully exchange patient information. Many Point of Service (POS) systems in a health care environment use a "local" terminology designed to support that particular POS system. These specific terminologies, although meaningful to the specific system they support, may lose their meaning when shared with other similar electronic systems (lab to lab, EMR to EMR, lab to EMR etc.). To overcome this disparity, Reference Terminologies are used to bridge the gap between these distinct "local" terminologies.

3. How should I use a POS map to a Reference Terminology?

A map is intended to be used in electronic systems and is not exposed to the user at the point of service. The terminology used in the local system usually does not have to change. The target Reference Terminology is what is used to communicate with other systems. This facilitates interoperability between systems using their own local terminology. It also facilitates research and gathering information for statistical analyses.

4. What type of stakeholders need a map?

Stakeholders that are sharing their data electronically with other electronic systems will need a map if they wish to retain their local or vendor specific descriptions but still share data electronically. Mapping their "local" terminology to a Reference Terminology allows the stakeholder to retain their existing and familiar coded concepts at the user interface and retain a link to previously collected data. Stakeholders who are not sharing their data electronically will need to have a specific business requirement other than sharing data electronically to justify mapping their local terminology.

5. What types of mapping relationships are there?

There are two types of mapping relationships that can be used in a map. A map can use one or more types of relationships as needed.

1. One to one relationship - each local term is mapped to one concept that represents the same meaning in the Reference Terminology. This requires that each term in the local system be unique.
2. Many to one relationship - many similar local terms may be mapped to one concept that represents the same meaning in the Reference Terminology. Some examples of this type of map from a lab system are:
 - Labs may have two tests for Potassium, one using serum and the other using plasma, although the labs need to differentiate, both tests will map to the same LOINC code;
 - Labs may create a new test when they change the units of measure (mg/L to g/L), both tests will map to the same LOINC code; and
 - Clinical systems may have different terms such as 'fever', 'pyrexia' and 'febrile' which are required to describe different clinical symptoms, but all will map to the same SNOMED CT Concept.

6. What types of maps are there?

There are two types of maps, bi-directional and unidirectional.

Unidirectional mapping goes from the source to the target. Bidirectional maps translate in both directions. Not all maps can be bidirectional; for instance, when multiple and differing terms in the source map to a single concept that represents the same meaning in the target. This map is represented in Figure 1.

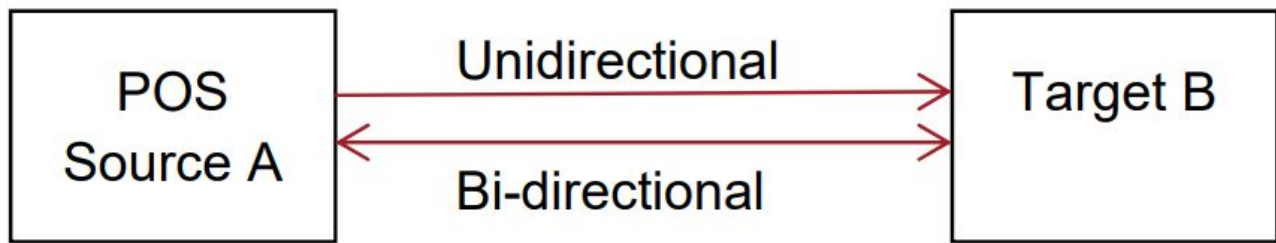


Figure 1

In some maps, a database can act as a translation key from one source to the next, providing perhaps agreed upon user friendly descriptions that are mapped to the target. This map is represented in Figure 2.

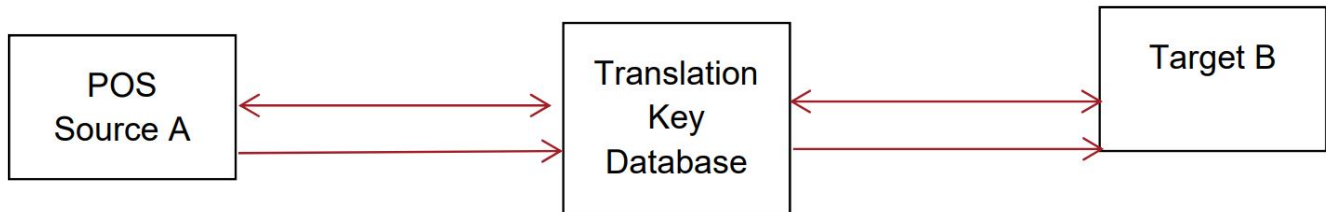


Figure 2

In this map, local terms can be mapped to a specifically developed Terminology which acts as the buffer between the source terms and the target Reference Terminology. The specifically developed Terminology can be a common terminology that will be used by implementers (rather than using the source terminology or the Reference Target terminology) and is identified in the diagram as the "Translation Key Database". This model involves more management and maintenance but provides implementations with the flexibility they may need to meet multiple requirements. It also provides an Interface Terminology, which provides common language for the users of the system that is not identical to the local terminology or the Reference Terminology, but something agreed on by the stakeholders.

7. Are there different approaches to mapping?

There are two basic approaches to mapping. The preferred approach is a centralized approach but there are times when a decentralized approach is preferred.

a) Centralized Model – In this model, all the mapping is done for all organizations at a central source. All the files and the mapping are managed by the same group of people and are centrally located. Using the same people provides benefits:

- It is easier to perform the maps quickly;
- The mapping is done consistently;
- Mappers are able to leverage mappings across multiple organizations;
- It requires education and training for a small group of people; and
- The ongoing maintenance is less labor intensive.

There are some pitfalls of the centralized approach:

- This method sometimes leads to a lack of ownership for maintenance changes at the POS, mostly because staff are not involved (out of sight, out of mind); and
- It is more challenging to resolve difficult mapping issues because of the lack of specific subject matter experts for the source data.

b) Decentralized Model – In this model, each organization performs their own mapping. Some benefits are:

- Each organization takes ownership and responsibility for any changes to the mapping that results from maintenance; and
- It is less challenging to gain access to local subject matter experts to assist with difficult mappings.

Some of the pitfalls of this approach include:

- Less consistency between organizations because everyone approaches decision making slightly differently. This inconsistency is greatest when there are no documented mapping rules;
- It requires extensive support and increased education/training (each person will require the same training);
- Ongoing maintenance must occur within each organization, so is more labor intensive; and
- Each person mapping will be unable to leverage other organizational maps if the mapping is occurring simultaneously.

8. What kind of resources do I need to complete the map?

There are several different kinds of resources required to do the mapping.

1. Resources to do the mapping – these resources need to have a good knowledge of both the source and the Reference Terminologies;
2. Resources to validate the mapping – these resources need to have knowledge of both the source and the Reference Terminologies;

3. POS system administrators – these resources need to have access to the databases of the systems that have the source terms in order to export them; and
4. POS Domain Subject Matter Experts – these resources need to have a good knowledge of the business application of the source terms to help clarify use of the terms.

9. What technical resources do I need?

Technical resources may be required to support any mapping tool that is used. These resources will be responsible for loading software, providing software access and/or removing network restrictions. They may also:

1. Install and support the mapping tool or enable a browser for a web based tool;
2. Import and export data to the mapping tool;
3. Manage version upgrades for software and Reference Terminologies; and
4. Provide backup and restore functionality.

10. Is a tool required to do mapping?

Tools are required to map source terms to a concept that represents the same meaning in a Reference Terminology, and there are a variety available:

1. Tools can be as simple as a pen and paper; this would work for very small scale projects;
2. Excel spread sheets or access data bases can be used for small scale projects where pen and paper are not sufficient;
3. Commercial off the shelf (COTS) products available but should be evaluated against the requirements of the project first;
4. If resources are available, a customized tool may be developed; and
5. Some freeware is available from some of the Reference Terminology SDO's, but these would likely need to be used in combination with pen and paper or excel/access.

11. What type of knowledge do I need?

Anyone responsible for mapping should be specifically trained on the Reference Terminology that will be used. If there is sufficient access to the subject matter experts to support the business functionality, then a minimal knowledge of the source terms is required. If the access to the subject matter experts is limited, then a resource will require sound knowledge of the source terms and their use.

12. Are there other resources that can help me?

The Regenstrief website offers helpful information on using LOINC. (<https://loinc.org/learn/>)

SNOMED CT provides mapping material in its eLearning server. (<https://elearning.ihtsdotools.org/>)

Get Involved:

[Join](#) a collaboration group to solve interoperability challenges.

The [Health Terminologies Community](#) is a open forum for sharing and communicating on topics of terminologies and classifications and their use in Canada. We welcome all participants.