

3M Response to Vocabulary Task Force Questions

Vocabulary Task Force September 1 and 2, 2010

8:00 a.m. to 2:30 p.m./Eastern Time
Washington, DC.

3M thanks the HIT Standards Committee Clinical Operations Workgroups – Task Force on Vocabulary for the invitation to participate and for requesting 3M’s responses to questions about achieving a one-stop shopping for obtaining value sets, subsets and convenience subsets. 3M’s responses follow.

Overall questions

1. **What are the requirements for a centralized infrastructure to implement “one-stop shopping” for obtaining value sets, subsets, and vocabularies for meaningful use?**
 - a. A mechanism for consumers of terminologies to register for update notifications. This functionality is already provided by HL7 Common Terminology Services version 2 (CTS2) standard.
 - b. A standard for a terminology/subset/value set distribution service (already provided by HL7 CTS2 standard)
 - c. A standard file format for vocabulary distribution (such as SKOS)
 - d. A terminology repository to hold various versions of vocabularies, value sets and convenience subsets, and which complies with the above standards.
 - e. Support by the government to get appropriate licenses and permission for distribution from the creators of these terminologies.

2. **Which requirements or functionalities are urgent, i.e., absolutely required to support “meaningful use”? Which would be most useful immediately? What would be a staged approach over time to get to the desired end state?**

A standard distribution file format for terminologies/subsets/value sets, and terminology repositories that support the necessary functions are immediately required, in addition to the HL7 messaging standards which are already defined.

We recommend that the distribution file format standard must be created first. Various terminology service implementations are available from commercial vendors and the academic community. In the later stages, a mechanism to register for update notifications, and a service standard for automated distribution (both standardized by HL7 CTS2) shall be adopted.

Detailed Questions

3. Where are you using value sets and subsets? For what domains? How many value sets and subsets?

We currently use convenience subsets for various domains such as lab tests, lab results, pharmacy products, pharmaceutical substances, allergens, problem lists, diagnoses, procedures, anatomical structures (body parts), various units of measure, race, ethnicity, religion, gender, and so on. The 3M Healthcare Data Dictionary (3M HDD) has more than 2.5 million concepts in more than 1,100 domains, and hence a complete list of domains is not included in this response.

4. In your experience with creating, disseminating, updating and/or using value sets, subsets, and entire vocabularies, what works and what does not work?

A collaborative process between experts with various areas of expertise is required for successful implementation. All the new content that an expert creates undergoes a second review by another expert to maintain high data integrity. A good mix of tools, techniques and people are required for a successful deployment.

5. What human resources does it take to implement and manage value sets, subsets, and entire vocabularies? Informaticists? Clinicians? IT people? How are you organized?

Medical Informaticists with vocabulary expertise define the structure of the various vocabularies, value sets and subsets, and often define the upper level ontologies. Subject matter experts such as clinicians, pharmacists, lab technicians, radiology technicians and so on define the content within the various domains. Computer professionals such as programmers and database administrators help with database design, optimization, and creating the various authoring tools and services required.

Other people who play an important role include quality analysts, project managers, educators, clinician champions and so on, who play a role in managing the vocabulary content, and play an important role in a successful deployment at a client site.

The 3M HDD group is a cross-disciplinary team whose members have expertise in multiple areas. Based on formal training, the group comprises of medical informaticists, physicians, nurses, radiology technicians, pharmacy technicians, lab technicians, computer programmers, and database analysts.

6. What national resources and services could be leveraged to reduce the level of effort required for local implementations? What is the irreducible minimum of local work at an implementation site, or within an organization or system?

The Government can reduce the local level of effort by the following:

- Build a repository for terminology standards and tools that follow these standards
- Publish a database of standard value sets and convenience subsets on this repository
- Define standards for terminology services as well as the distribution file formats
 - o Work closely with the HL7 Vocabulary working group, especially the HL7 CTS2 group, to define the distribution mechanisms.
- Work closely with terminology standards development organizations (SDOs) and encourage them to adopt standard terminology distribution file formats and distribution service mechanisms. This will reduce the amount of work required at the local level to integrate various terminologies in various formats into a single terminology repository.
 - o Test and validate whether UMLS satisfies the requirements of various SDOs and local users.

The irreducible amount of local work required at an organization includes the following:

- Semantically correct integration (mapping) of local (legacy) terminologies with the standard terminologies, value sets and subsets
- Maintaining and updating the terminology content in the terminology repository
 - o Mapping various vocabularies, value sets and subsets so that they can be efficiently used by the electronic medical record systems, decision support applications and messaging engines
 - o Integrating the updates to these various terminologies, subsets and value sets with the organization's existing terminologies.
 - o Reconciling conflicts between various terminologies, subsets and value sets.
 - o Inactivating and superseding old obsolete concepts with newer valid concepts, and supporting them in various clinical applications.
- Integrating the various applications that use terminologies with the terminology service.

Detailed Questions, continued

7. What is your maintenance process? How do you manage updates?

We make changes to the master copy of the 3M HDD. While making changes contributed by a specific organization, we clarify any questions we may have about the vocabulary content through a streamlined question and answer process with our customer. We then publish daily updates for different customers. Each customer can then download the update file intended for them, and apply these changes to their

copy of the 3M HDD using a user-friendly tool. The tool will resolve dependencies and perform consistency checking so that local terminology modifications performed by the customer do not cause conflicts with terminology changes made by us.

8. What metadata do you maintain and how do you maintain versioning?

We maintain a list of terminologies and versions that are integrated and included in our master terminology repository. We regularly update our master terminology repository so that they are current with the latest versions of various standard terminologies. We maintain a list of terminologies and their versions that each customer has licensed. When we publish update files to our customers, we provide them a change log by email and a customer support website. The customer can then apply these updates to receive the latest versions of the standard terminologies.

9. Is there a difference between versioning for clinical documentation vs. versioning for reported measures, i.e., when do you go live with a change in the EHR vs. when do you use the new version for measures?

The terminology service used by any healthcare organization needs to be backward compatible so that data captured using old versions of a terminology can still be interpreted, while any new data will be captured using new versions of a terminology.

The 3M HDD uses a graceful evolution process where old concepts are inactivated and superseded with new concepts as applicable. Hence, our customers are able to use the latest version of our terminology service for both clinical documentation as well as reporting. Our terminology change management process ensures that the changes made to our terminology content are always backward compatible, and do not necessitate our customers to use different versions of the terminology for clinical documentation and measures reporting.

10. How do you manage versioning in clinical decision support vs. changes in value sets?

Not applicable to 3M.

11. How does an application know which value set is for which purpose? How is the specific context for a value set maintained at the message data element level of specificity? How is the English language intent of the value set context documented and maintained?

The medical information models can provide binding between specific types of clinical data elements and the corresponding terminology content. For instance, the information model for a drug prescription will specify that the name of the drug is chosen from the value set that contains orderable drugs, and the route of administration information model will specify that the route of administration is populated from those specified in a corresponding value set. In some cases, this

binding may be specified at an application level instead of at the information model level.

12. What are lessons learned about web links vs. storage of the vocabulary or other artifact in a physical repository?

Not applicable to 3M.

13. How do you manage distribution of updates to multiple sites?

We generate update files for each customer on a daily basis. The update file generated for a customer contains updates to only the content licensed by that customer. The files are automatically posted into the FTP directory for that customer on our FTP server. The customers are provided with a graphical update utility that downloads their update file from the FTP server and applies the updates to their vocabulary server.

14. Where is local customization appropriate and how much customization is acceptable?

The customers are allowed to do local modifications to the terminology content. Customers have full control over local domains such as the list of providers, hospital locations, hospital beds and so on. Customers can also make changes to clinical domains of content. When the customer applies updates provided by us, the update utility applies only those updates that are consistent with local modifications, and skips the updates that will render the data dictionary in an inconsistent state due to conflicts between our updates and the customer's local modifications.

15. How do you manage distribution of updates with local variations and optionality? Unique subsets? Local mappings?

The master copy of the 3M HDD supports unique subsets, local mappings and other types of content that are intended for specific customer(s). As mentioned in response to question 13, the update files are generated on a per-customer basis, which contain updates intended for that customer.

16. What has to be local in an EHR implementation vs. what can be external in a vocabulary repository?

Information on vocabulary binding between various user-interface artifacts such as pick lists and the corresponding 3M HDD domains are maintained locally in an EHR implementation or in the information models. The clinical information models are external to the 3M HDD, and are not kept within the EHR as well. The medical information models are kept in a separate repository which are accessible to the EHR system as well as the vocabulary repository.

17. What functions are required that users have not yet appreciated?

Many users have not appreciated the need for a well-structured semantically correct terminology service that integrates multiple vocabularies and their periodic updates in a consistent manner. Some users have also not appreciated the challenges with mapping multiple terminologies in a semantically correct and consistent manner.

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