**Collaborative Terminology Development Tooling**

**Requirements Specification Document**



**Department of Veterans Affairs**

**March 2015**

**Version 0.2**

**Revision History**

Note: The revision history cycle begins once changes or enhancements are requested after the

Requirements Specification Document has been base-lined.

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| --- | --- | --- | --- |
| **Date** | **Version** | **Description** | **Author** |
| February 20,  2015 | 1.0 | Initial document | Engility/Tamra Cox |
| March 18,  2015 | 1.0 | Updated version | Engility/Soni  Mirchandani |

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**1. Introduction**

VA and the Department of Defense (DoD) have failed to meet the goals of interoperability, standardization, and computability as mandated by Congress in the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2014, the Omnibus Spending Bill of 2014, and House of Representatives (HR) 4486 Military Construction and VA Spending Bill.

At this time, VA does not have an approved and resourced terminology plan that can be successful. Interoperability mandates from Congress and the Office of Management and Budget (OMB) can be met with proper planning and investment. As a result, the quality and timeliness of VA Health and Benefits Services can be transformed by up-to-date, computable clinical data, coded with national standards, to and from DoD, Veterans Benefit Administration (VBA), and Veterans Health Administration (VHA) staff at the point of service.

Knowledge Based Systems (KBS) and Standards and Terminology Services (STS) are working to establish a collaborative Enterprise Terminology Service (ETS) that bridges clinical and technical domains in order to address both the Congressional and Executive mandates for interoperability, standardization, computability, and meaningful use. The ETS will consist of two primary components operating in tandem.

First, a robust Clinical Terminology Service (CTS) is necessary to establish and continually improve the VA’s ability to collect and accurately and fully represent healthcare data in the medical record. The CTS will address internal VHA terminology consultation and business ownership needs. These needs have grown tremendously because of the new demands from the Veterans Health Information Systems Technology Architecture (VistA) Evolution, Connected Health, and Compensation and Pension (C&P) and the shift of responsibilities back to VHA from the Interagency Program Office (IPO).

Secondly, a robust Technical Terminology Service (TTS) is necessary to publish standard terminologies and to ensure their complete integration with VA Health Information Technology (HIT) systems and applications. The TTS will address internal Office of Information and Technology (OI&T) technical needs, including terminology publication and distribution, as well as technical consultation for accessing terminology resources, for example, Service Oriented Architecture (SOA) integration.

Collectively, the ETS is foundational to establishing and maintaining robust interoperability with VA partners, such as DoD and VBA, and addressing longstanding Congressional concerns. Specific business objectives that necessitate stating these requirements include:

1. The safety and life-critical nature of the health data VA encodes and processes. Mistakes in the semantic encoding and/or processing of this health data result in morbidity and mortality to the Veterans we serve.

2. Health data must be ubiquitously standardized to deliver the full promises of HIT systems, including the ability to compare the processes, and quality, of care among national and

international health providing organizations. Achieving this ubiquitous standardization requires

participation in collaborative and open-source development efforts. We have a variety of existing relationships, and contemplated relationships, that center around particular open-source projects, such as the International Health Terminology Standards Development Organization (IHTSDO) Open Tooling Framework, and the IHTSDO workbench that is currently utilized by the IHTSDO, Denmark, Sweden, the United States National Library of Medicine, Kaiser Permanente, and some

internal VA projects. In cases where contributions to, or extension of, these shared projects is a business requirement, we will specify requirements for specific development languages, libraries, developer operations automation frameworks, and database technologies. (CTTDM BRD p.1-2)

**1.1. Purpose**

The purpose of this document is to describe the business and informatics architecture needs of a comprehensive Enterprise Terminology Service (identified in the New Service Request [NSR]

#20100904 Collaborative Terminology Developing Tooling). This Requirements Specification Document (RSD) provides insights into the AS-IS and TO-BE of terminology tooling and services in the Department of Veterans Affairs (VA).

This document provides a foundation for establishing baseline and identifies the capabilities and functionalities in support of Collaborative Terminology Developing Tooling.

**1.2. Scope**

The scope of the RSD includes new Collaborative Terminology Developing Tooling functionalities as well as enhancements to existing functionalities.

**1.3. References**

 Department of Veterans Affairs Handbook 6500

 Collaborative Terminology Development Tooling Business Requirements Document

(BRD)

 http://www.gpo.gov/fdsys/pkg/CPRT-113HPRT86280/pdf/CPRT-113HPRT86280.pdf

 Consolidated Appropriations Act, 2014 (http://docs.house.gov/billsthisweek/20140113/CPRT-113-HPRT-RU00-h3547- hamdt2samdt\_xml.pdf)

 http://rules.house.gov/bill/113/hr-4486

 Standard GUI Compliance

 http://www.oracle.com/technetwork/java/javase/overview-137531.html

 http://www.ihtsdo.org/fileadmin/user\_upload/Docs\_01/Publications/SNOMED\_CT\_Diag ramming\_Guideline.pdf

**2. Overall Description**

The following sections will cover specifications for accessibility, business rules, design constraints, disaster recovery, documentation, functionality, user interface, performance, quality attributes, reliability, scope integration, security, system features, and usability.

**2.1. Accessibility Specifications**

The accessibility specifications are to be in compliance with relevant guidelines and regulations set forth by Section 508 of the Rehabilitation Act of 1973. Accessibility testing will be done to included compliance with:

 Americans with Disabilities Act of 1990

 Section 508 Amendment to the Rehabilitation Act of 1973

 Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C)

 http://www.Section508.gov

(CTTDM BRD p.40)

**2.2. Business Rules Specification**

The business rules specifications are identified in section **Error! Reference source not found.**.

**2.3. Design Constraints Specification**

 Must run on UNIX box and be able to run in concert with existing system.

 The default platform for all software development beneath the presentation layer development will be Oracle 64 bit Java 8 SE

 Application is to be built on open-source architecture.

 Must be accessible over the public Internet.

 PRISME will provide a workflow management service that is based on the **Business**

**Process Model and Notation (BPMN) 2.0.**

 The workflow management service engine must be able to run embedded in the default Java 8 Standard Edition (Java 8 SE) application platform.

 The default framework for all web application presentation layer development will be done in HTML5 markup, with JavaScript as the Document Object Model (DOM) scripting language, and with support for high-resolution display devices. Scaled Vector Graphics (SVG) images are the preferred means for scalable image representations to support high-resolution display devices. Alternatively, when SVG imagery is not appropriate, developers may use the image-set () CSS capability (http://dev.w3.org/csswg/css-images-4/) for raster images.

 The default framework for all Java Rich Internet Application (RIA) development will be JavaFX 8.

 REST is the default architectural style for providing web services.

 Apache Jersey 2.6 (https://jersey.java.net) is the default framework for implementing web services.

 The Workflow Management Service shall publish workflow processes as Maven artifacts.

 The Version Control Service shall have storage, configuration, and bandwidth to support version control of large textual data sources, such as a complete history of all SNOMED release files (Systematized Nomenclature of Medicine Clinical Terms

[SNOMED CT] is released biannually, and the data files of the release are ~1.3 GB, compressible to ~200 MB).

 The rich client tools will support scripting using the Oracle Nashorn JavaScript libraries.

 High-performance stand-alone terminology editing environment, deployed as a Java

WebStart rich internet application able to efficiently run on a laptop computer.

 The Stand-alone Terminology Integrated Development Environment must support all the capabilities currently supported by the IHTSDO and ISAAC workbench.

 The system will be able to accept, process, integrate, and version electronic releases from terminology knowledge sharing partners.

**2.4. . Disaster Recovery Specification**

 The disaster recovery plan must have an accurate call list.

 The disaster recovery should be test and retested to ensure accuracy.

 The members who are responsible should be knowledgeable of their defined role.

 The disaster recovery plan should contain easy to follow steps and directions to reach recovery.

 The disaster recovery plan should be kept up-to-date.

 The disaster recovery plan should have a list of vendor contacts and policies.

 The disaster recovery plan should cover all essential and critical infrastructures.

**2.5. Documentation Specifications**

System and user documentation for the Collaborative Terminology Development Tooling released will be provided; documentation should include:

 Standard operating procedures;

 Change Management Process;

 User manual for software;

 Documentation for network setup;

 Maintenance agreements/documentation;

 Implementation Guide.

Updates to user documentation shall be made accordingly Collaborative Terminology

Development Tooling.

**2.6. Functional Specifications**

2.6.1.

**System Function**

**New Requirement # Requirement**

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| **New Requirement #** | **Requirement** |
| **NEW-REQ-1** | The system should be able to check for duplication upon conception. |
| **NEW-REQ-2** | The system should run a daily QA process checking for duplicates. |
| **NEW-REQ-3** | The system should be able to convert terms to any languages based on  configuration. |
| **NEW-REQ-4** | The system should allow a user to be assigned multiple roles. |
| **NEW-REQ-5** | The system shall allow users to be assigned concepts. |
| **NEW-REQ-6** | The system shall allow the workflow status to be edited. |
| **NEW-REQ-7** | The system shall allow the additional workflow status to be added (in  addition to the prototype list). |

2.6.2.

**Alerts**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-121** | The system should have the ability to notify users of various types  about alert conditions and these alert conditions will be triggered by a rule-based system. |
| **ETS-F-122** | Conditions triggering alerts should include rule violations, errors, etc. |

2.6.3.

**Identity and Access Management Service**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-22** | PRISME (**Error! Reference source not found.**) shall provide for a  single-sign-on capability so that users only have to log on once to PRISME and all role-based access control is managed from this single- sign-on. |
| **ETS-F-23** | The Identity and Access Management service (**Error! Reference**  **source not found.**) will support publication of a terminology system that consists of users and their roles, so that terminology development environments can use those concepts to identify editing actions of users, and to determine roles assigned to individual users. |
| **ETS-F-24** | The system will allow stratification of users by level of expertise.  Access to particular user functions and work flows may be granted or denied based on level of expertise. |
| **ETS-F-25** | The system will allow stratification of users by level of domain  knowledge expertise. Access to particular user functions and work |

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| **BRD Requirement #** | **Requirement** |
|  | flows may be granted or denied based on level of domain knowledge  expertise. |
| **ETS-F-26** | The system will allow stratification of user’s assigned role (for  example, modeler, quality assurance, reviewer, and mentor). Access to particular user functions and work flows may be granted or denied based on user role. |

2.6.4.

**Human Consults**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-123** | The workflow system shall allow the modeler to send a request for  modeling assistance to a user or user type. |
| **ETS-F-124** | The system should have configurable workflows capable of directing  model review after model creation. |

2.6.5.

**Context-sensitive help**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-125** | The system should be able to provide context-sensitive info buttons  linked to terminology and modeling guidelines. |
| **ETS-F-126** | The system should build upon available open source info button tools  that VA already has in place or development. |

2.6.6.

**Workflow**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-127** | Appropriate tools will have a workflow inbox from which users can  manage their work. |
| **ETS-F-128** | All tools must have the ability associate workflow processes with edits  and commits to content. |
| **ETS-F-155** | The terminology tooling must incorporate an agreed upon workflow  algorithm that includes adding and allowing authors at increasing levels of authoring permissions (for example, modeler, reviewer, approver). The tooling must provide workflow that supports approval, rejection, approval for publication status, and workflow comments. The system shall display workflow comments and changes. Workflow can be either user-based or role-based, depending on need. |

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-156** | The terminology tooling must also be able to support the workflow  integration of terminology authors external to the KBS team, and potentially external to the VA. |
| **ETS-F-157** | The terminology tooling needs to provide a means of conflict  adjudication/resolution in the event that more than one author models the same concept. |
| **ETS-F-158** | The terminology tooling should also support workflow for exporting  content to VA partners and for submitting content requests to the  United States SNOMED CT Content Request System (USCRS). |
| **ETS-F-174** | The terminology tooling shall be able to display all workflow history  for a concept in a given release period. |
| **ETS-F-175** | The terminology tooling shall provide a means to search workflow to  identify concepts in various stages of workflow using parameters such as: current workflow state (assigned, for review, approved), current editor, etc. |
| **ETS-F-192** | The terminology tooling shall allow the creation of worklists and  assignments to editors. |

2.6.7.

**Terminology Releases from Standards Development**

**Organizations (SDO)**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-147** | The system will be able to accept, process, integrate, and version  electronic releases of terminologies from SDO, the NLM and other authoritative sources. At a minimum, this includes SNOMED CT, LOINC, RxNORM, Code for Vaccine Administered (CVX), and To Be Determined (TBD). |
| **ETS-F-177** | The terminology tooling shall support information models derived from  medical devices – in particular, integration of Model Driven Health  Tools components for UML model viewing. |
| **ETS-F-182** | The terminology tooling shall have the ability to incorporate and  import additional inputs from the following sources:   Veterans Enterprise Terminology System (VETS)   VHA Terminology (VHAT)   VHA Unique Identifiers (VUIDs)   Lexicon |

|  |  |
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| **BRD Requirement #** | **Requirement** |
|  |  Lightweight Expressions of Granular Objects (LEGOs) |
| **ETS-F-208** | The tooling shall import/represent SNOMED CT such that:   SNOMED CT is displayed taxonomically;   Additional extensions are incorporated into the taxonomy  (e.g., the US Extension);   Can be searched using Lucene and have the search limit the results to the SNOMED CT taxonomy;   All descriptions of a SNOMED CT concept are displayed along with appropriate language Refset representation;   All relationships of a SNOMED CT concept are displayed – both in the stated and inferred view, as role groups (where appropriate);   The active/inactive and definition status of the concept is displayed;   All identifiers (concept, description, relationship) identifiers are displayed;   The Refset membership status of a given concept, if appropriate, is displayed. |
| **ETS-F-209** | The tooling shall import/represent RxNorm such that:   RxNorm is represented taxonomically;   Can be searched using Lucene and have the search limit the results to RxNorm taxonomy;   Active Ingredients are represented as defining relationships;   Ingredient Strength is represented on dispensable products using concrete domains;   National Drug Code (NDC) codes are represented as searchable Refsets attached to all dispensable products;   All appropriate identifiers, including RxCUIs and NDCs, associated with an RxNorm concept are displayed;   All RxNorm names for a given concept are displayed;   All RxNorm relationships for a given concept are displayed. |
| **ETS-F-210** | The tooling shall import/represent LOINC such that:   LOINC is represented taxonomically;   Can be searched using Lucene and have the search limit the results to the LOINC taxonomy;   The fully specified name, short name, and long names, as well |

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| **BRD Requirement #** | **Requirement** |
|  | as the LOINC code are all displayed for a given LOINC term;   LOINC parts (Component, Property, Time, System, Scale, and  Method) will be represented as relationships. |
| **ETS-F-212** | The tooling shall import/represent LEGOs such that:   Classified LEGOs are represented taxonomically;   All LEGOs for a particular PNCS are visible as a LEGO list;   All components of the LEGO (discernable, value, qualifier, and timing) are visible and editable;   The LEGO ID and Summary, as well as “pending” SNOMED  CT concepts are visible;   LEGOs are searchable or can be filtered by ID, progress note construction set (PNCS) value, SNOMED CT concept used, component type and component value. |
| **ETS-F-213** | The tooling shall be able to generate a standard module that will digest  the releases of multiple standards (listed below) into a single data resource.   The structure of the data resource must match the IHTSDO Workbench standard (that is, using fully specified names, synonyms/descriptions as appropriate, relationships, and taxonomic representation).   The data resource will be a zip artifact in Workbench format (i.e., Maven Artifact, Maven Artifact stored on Archiva, eConcepts file zipped and stored on Archiva, etc.),   The data resource can be imported into and represented by the Workbench or ISAAC on demand (that is, the data source can be imported when needed).   The data resource will be structured such that when imported into the Workbench, the standards can be utilized for mapping work (keeping the standards separate) or integration work (making them part of the VA extension).   Standards to be incorporated into the data resource: SNOMED CT, LOINC, RxNorm, ICD-9-CM, ICD-10-CM, CVX, CPT, HCPCS, CDC Race and Ethnicity codes, ISO 639-2 alpha-3 language codes, National Uniform Claim Committee (NUCC) taxonomy for provider type codes, Universal Medical Device Nomenclature System (UMDNS). |

2.6.8.

**Terminology Releases from Knowledge Sharing**

**Partners**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-148** | The system will be able to accept, process, integrate, and version  electronic releases from terminology knowledge-sharing partners. At a minimum, this includes SNOMED CT extensions and ref sets. |

2.6.9. **c**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-149** | The system will support searchable, shareable, Extensible Mark-up  Language (XML) structures. Such structures shall be composed of standard terminologies, such as the SNOMED CT and LOINC. The structures will be used to define essential building blocks for medicine, including clinical observations (for example, a notation of “chest pain radiating to the left arm”), order sets (such as, “Give one nitroglycerin tablet sublingually and call M.D.”), and decision support (like, “If chest pain with left arm radiation then do nitroglycerin order set.”). The tools will provide a single consistent way of creating these knowledge artifacts and a seamless flow between documentation, decision support, and ordering at the point of care. |

2.6.10.

**XML Transforms**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-150** | The system must support the automated transform between XML  models of various knowledge artifacts. The transforms should be built on a common model transform methodology available in open source, such as Model Driven Health Tools. |

2.6.11.

**Outputs from System**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-151** | The system will be able to export terminology content and knowledge  artifacts in a variety of formats for internal and external consumption. Exports must support versioning, error checking, tracking, and publish/subscribe paradigms. |
| **ETS-F-152** | Internal consumers will include application builders, terminology |

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| **BRD Requirement #** | **Requirement** |
|  | technical services (STS). |
| **ETS-F-153** | External consumers include SDO, the NLM US realm/NLM,  Healthcare and Health IT partners, and other authoritative sources. |
| **ETS-F-154** | The terminology tooling system must have the ability to export content  requests directly to the United States SNOMED CT Content Request  System (USCRS). |
| **ETS-F-214** | The system shall have a configurable export builder program that will  allow the user to select which fields will be exported for a given content project (for example, all terms and identifiers in a Refset, all terms and identifiers for the source and target terminologies in a mapping, etc.) and in which format (such as, RF 2 release file, text- delimited text file, CSV file, etc.). |

2.6.12.

**Publishing Output Content (VETS)**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-178** | ETS shall support a mechanism for integrating data from the  Terminology Tooling (from both Workbench and ISAAC) with existing (current) VA systems. |
| **ETS-F-179** | The Export Process from the Terminology Tooling will involve the  following components:   Ability to export content from the tooling as IHTSDO Standard Release Format 2 (RF2) SNOMED CT Identifiers (SCT Ids) or Universally Unique Identifiers (UUIDs).   Mapping VHA Unique Identifier (VUIDs) to the components as an individual Reference Set (Refset) in the RF2.   Upon export, any component that doesn’t already contain a VUID will be assigned one from a pool of VUIDs made available by VA and stored in the Workbench.   VUID assignment will be in a dedicated VUID Refset. |
| **ETS-F-180** | The Import Process from the Terminology Tooling will involve the  following components:   A separate program (via Maven possibly) will import  VA/VistA-based content into the Workbench.   Import process will create a Workbench changeset.   Workbench Import Program will retrieve content via Archiva- |

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| **BRD Requirement #** | **Requirement** |
|  | like.  VUID assignment:   If the VistA concept has a SNOMED CT Id, then process  will add that concept’s VUID to a SNOMED CT concept.   If the VistA concept does not have a SNOMED CT Id, then the process will generate a UUID from the VUID in the Workbench, and then add it to the VA extension to SNOMED CT.   At release, all content developed in the Workbench will be assigned a VUID for the VUID collection delivered by the VA. |
| **ETS-F-181** | ETS must support the development, maintenance, and publication of a  VA Extension and its integration with existing VA systems. This includes providing for tooling training and terminology authoring training. |
| **ETS-F-183** | ETS must be able to output VA extension releases or release packages. |
| **ETS-F-184** | ETS must be able to export content requests to NLM US Content  Request System. |

2.6.13.

**Business-Specified Non-Functional**

**Requirements**

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| **BRD** | **Requirement** |
| BRD Page 36 | The system must be **provably** highly usable in a safe, efficient fashion.  The business expects to be involved in iterative cycles of usability planning, evaluation, and improvement. |

2.6.14.

**Document Generation Capabilities**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-87** | Darwin Information Typing Architecture (DITA) documentation may  be associated with all terminology components. |
| **ETS-F-88** | Document generation tooling must be available to extract the  terminology component DITA documentation and generate a DITA  map that can, in turn, be used to generate Portable Document Format |

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| **BRD Requirement #** | **Requirement** |
|  | (PDF) or Hypertext Markup Language (HTML) documentation from  that DITA content. |
| **ETS-F-89** | Document generation tooling must be available to extract the  terminology component DITA documentation and integrate those DITA sources into DocBook 5.1 files, that can, in turn, be used to generate PDF or HTML documentation, or used for other data transformations. |
| **ETS-F-90** | Document generation tooling must be able to embed results from any  query into tables and body text of DITA and DocBook documents. |

2.6.15.

**Mapping Capabilities**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-163** | The system must be able to support mapping between and among terms  and knowledge artifacts. |
| **ETS-F-164** | The system must support users in creating, maintaining, updating, and  versioning mappings between and among terms and knowledge artifacts |
| **ETS-F-165** | The system must support users with mapping decision support  capabilities. This must include the ability to suggest mappings for a target object based on its syntactic, lexical, and sematic properties and utilizing decision support modalities, such as rules, heuristics, and machine learning. Other types of mapping decision support, as described under modeling decision support, may also be required. The mapping decision support system must be able to track if its suggestions were accepted and to continually improve, based on final modeler decisions. |
| **ETS-F-188** | The tooling shall support mapping to multiple standardized  terminologies, including SNOMED CT, LOINC, and RxNorm and the ability to designate mappings as “exact,” “narrower than,” or “broader than.” |
| **ETS-F-189** | The tooling shall have a dedicated terminology mapping interface  allowing users to visualize both the source and the target standardized terminologies (codes and terms) in the same panel. The tooling shall provide drag-and-drop functionality to map the target terminology to the source term. |
| **ETS-F-190** | The tooling shall provide the ability to export the mapping in various  formats (that is, RF2 Refset file, tab-delimited text file) IHTSDO |

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| **BRD Requirement #** | **Requirement** |
|  | workbench eConcept file format, and OWL 2 formats, when  applicable). |
| **ETS-F-191** | The tooling shall support mapping workflow integration, including  assignment of users and roles to mapping tasks, support approval/rejection status or conflict adjudication, the ability of users respond to or add comments, etc. |
| **ETS-F-215** | The tooling shall allow authors to define the metadata for a map  set/value set. Metadata shall include: the map set name; map set identifier; source terminology version; target terminology version; purpose of the map set; map set equivalence identifier; map type that defines if the map is from a standards development organization map, government recognized map, or a proprietary/customized map; map set status; and reason for change. |
| **ETS-F-216** | The tooling shall allow authors to store guidelines or rules (heuristics)  that govern the map and its creation and use. |
| **ETS-F-217** | The tooling shall allow the capability to update the map set when the  source and target are updated from standards development organizations. |

2.6.16.

**Models**

**Browse a Set of Approved, Suggested or Similar**

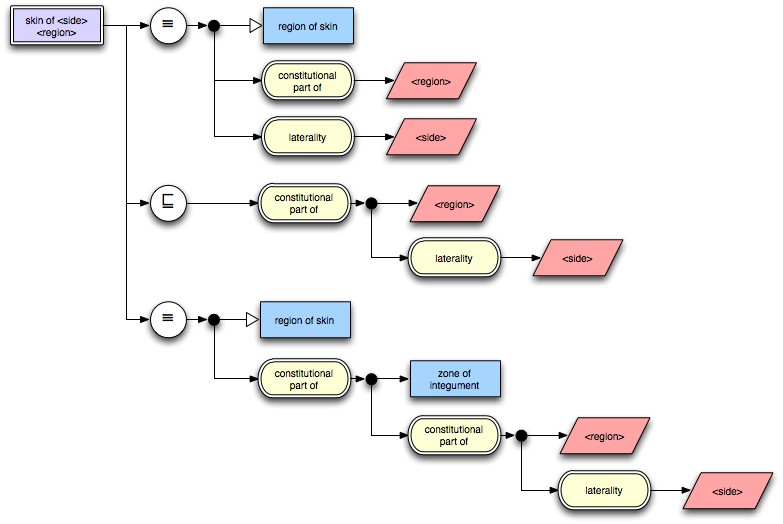
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| **BRD Requirement #** | **Requirement** |
| **ETS-F-97** | System must be able to develop and maintain a library of approved  models and descriptions that can be linked to modeling assignments. |
| **ETS-F-98** | System must be able to suggest exemplar models based on modeling  task, progressive user input, typical user modeling patterns, user  “favorites” and other characteristics. |
| **ETS-F-99** | System must allow exemplar model sets to evolve as modeling task  progresses. |

2.6.17.

**Template Based Modeling**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-100** | The refset values associated with substation templates can be edited  with the concepts definition and in a spreadsheet style format so that entire collections of concepts can be viewed and edited at once. |

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-101** | The refset values associated with substation templates can be edited  with the concepts definition and in a spreadsheet style format so that entire collections of concepts can be viewed and edited at once. |
| **ETS-F-102** | Template-based modeling will support the SNOMED diagramming standard for1 specification of templates. These templates will be stored as versioned annotations on the refset that is used to populate the template. |



**Figure 1: Template Base Modeling**

2.6.18.

**Modify Existing**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-103** | The system must allow the modeler to select an exemplar model and to  use it as a starting point to modify for a new modeling task from their work queue. |

1http://www.ihtsdo.org/fileadmin/user\_upload/Docs\_01/Publications/SNOMED\_CT\_Diagramming\_Guideline.pdf

2.6.19.

**Specialize From Existing**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-104** | The system must allow the modeler to specialize an existing model by  adding to it without changing the base model construction. |

2.6.20.

**Steal Pieces and Re-use in a New Model**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-105** | The system must allow the modeler to select components of an existing  model to be re-used in the creation of a new model. Methods of selection and re-use should be highly useable and easily understood. For example, using graphical elements. |
| **ETS-F-106** | Power Builder: System must have modeling “mail merge” capability;  for example, allow the modeler to select a piece of an exemplar model and designate it as “variable.” The system should allow the modeler to create/maintain a list of elements that would then be merged one at a time into the variable component of the exemplar model, with each merger creating a new draft model for review. |

2.6.21.

**Rules Driven Modeling**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-107** | The System must support the creation of models based on rules-based  system feedback and constraints. Rules will be able to specify terminologies or terminology components, preferred and allowed semantic types, and other modeling style guides. |
| **ETS-F-108** | The system should be able to implement rules that limit the complexity  of modeling by factors including task and/or modeler expertise. For example, no more than one posts coordination or only terms from these trees. Modelers and Quality Assurance (QA) reviewers should be notified when limit boundaries are encountered. |
| **ETS-F-109** | The system must support the creation, versioning, and maintenance of  rules to guide modeling efforts using open-source tools in an  externalized environment that does not create “hard-coded” rules. |
| **ETS-F-110** | The system will allow rules to be created for various use scenario  components, including model domain, modeler domain expertise, and modeler modeling expertise. |
| **ETS-F-111** | The system must support access to modeling rules by various other  functional components specified elsewhere (for example, interview- |

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| **BRD Requirement #** | **Requirement** |
|  | driven modeling). |

2.6.22.

**Interview Driven Modeling**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-112** | The system will step user through a series of questions that guides  model creation that complies with modeling rules. |
| **ETS-F-113** | The questions will be tailored to the initial modeling task and be  refined by each successive answer from the human modeler. |
| **ETS-F-114** | The choices presented to the modeler should have explanations and  context sensitive help as appropriate. |
| **ETS-F-115** | The modeler should be allowed to move backwards to revisit or  reconsider earlier questions and answers as well as to cancel the interview entirely. |
| **ETS-F-116** | Resulting models must conform to modeling rules and styles. |

2.6.23.

**Rules Driven QA**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-117** | The system will be able to execute a rules evaluation batch mode to  when new base terminologies are entered or other conditions that change substrate of lower level components or knowledge objects with dependencies. |

2.6.24.

**Semi-Automated Modeling**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-118** | The system should be able to accept an input string (up to a sentence)  and generate a suggested term modeling the input string. |
| **ETS-F-119** | The system should be able to form post-coordinated expressions of at  least 3 SNOMED terms and relations. |
| **ETS-F-120** | The system should be able to suggest models that correctly represent  negation and uncertainty. |

2.6.25.

**Stratified by Domain**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-144** | The system will support efficient editing and curation of knowledge  artifacts across all knowledge domains, such as pharmacy, lab, and |

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| **BRD Requirement #** | **Requirement** |
|  | ophthalmology in a flexible fashion for all required areas. |
| **ETS-F-145** | The system will utilize rule-bases to provide customized behavior  based on domain and context in the tooling environments. |

2.6.26.

**Stratified by Architectural Level**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-146** | The system will support knowledge types at architectural levels as  specified in the Informatics Architecture (terminology layer, knowledge base layer, clinical context layer, and rules layer). |

2.6.27.

**Workflow Management Service**



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| **BRD Requirement #** | **Requirement** |
| **ETS-F-9** | PRISME (**Error! Reference source not found.**) shall provide a  workflow management service able to create, load, and execute rules, and able to coordinate workflows between ETS client applications. |
| **ETS-F-10** | The workflow management service engine must be able to run  embedded in the default Java 8 Standard Edition (Java 8 SE)  application platform (**Error! Reference source not found.**). |
| **ETS-F-11** | The Workflow Management Service (2.6.27) shall run as a web service  deployed on a Java EE 7/Java 8 SE server ( ). |
| **ETS-F-12** | The Workflow Management Service (2.6.27) shall provide access to  workflow services through a Representational State Transfer (REST) Application Program Interface (API) ( ). |
| **ETS-F-13** | The Workflow Management Service (2.6.27) shall provide Web  Services Human Task (WS-HumanTask) (http://docs.oasis- open.org/bpel4people/ws-humantask-1.1.html) management capabilities that shall include the ability to define the type of task, the priority of the task, the data associated with the task, and the ability to assign a task to an individual or a group. |
| **ETS-F-14** | The Workflow Management Service (2.6.27) shall manage the life-  cycle of human tasks, including task creation, reservation, execution, completion, delegation, revocation, suspension, stopping a task in progress, skipping a task, and managing error states of human tasks. |
| **ETS-F-15** | The Workflow Management Service (2.6.27) shall enable project  managers to view and edit workflow definitions using the BPMN 2.0 standard (http://www.omg.org/spec/BPMN/2.0/). |
| **ETS-F-16** | The Workflow Management Service (2.6.27) shall enable workflow  definitions that can coordinate work across independent projects. For example, when a new concept is created in one project, a workflow |

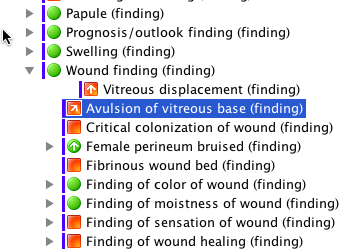
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| **BRD Requirement #** | **Requirement** |
|  | process may be transmitted to a second project to translate that  concept’s description into another language, and another workflow process may be transmitted to a third project to ensure that the new concept is properly mapped to International Classification of Diseases, Tenth Edition, Clinical Modifications (ICD-10-CM). |
| **ETS-F-17** | The Workflow Management Service (2.6.27) shall enable “store and  forward” execution of human tasks by client systems. The client systems would reserve a collection of tasks, which would then be executed offline, with the results transmitted back to the Workflow Management Service when the client comes back online. |
| **ETS-F-18** | The Workflow Management Service (2.6.27) shall provide reporting  capabilities that provide summary statistics regarding process execution, as well as detailed information regarding the status of individual processes. |
| **ETS-F-19** | The Workflow Management Service (2.6.27) shall provide a reliable  audit trail for all workflow task execution. |
| **ETS-F-20** | The Workflow Management Service (2.6.27) shall publish workflow  processes as Maven artifacts (**Error! Reference source not found.**) on the Artifact Repository Service (**Error! Reference source not found.**). |
| **ETS-F-21** | The Workflow Management Service (2.6.27) shall provide support for  guided development of workflow processes by project managers. |

**2.6.28 Taxonomy View**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-69** | Content management environments must have a taxonomy-viewing  component available that can display configurable information (as shown in Figure 2) to meet the needs of a particular application. Minimally, the taxonomy view must support displaying concepts parentage, when more than one parent is present and enabling navigation of the entire parentage and lineage of a concept. Custom shapes and colors may be shown based on different terminology characteristics, and colors may display what path or module a component is part of. |
| **ETS-F-70** | The taxonomy viewer must be configurable to display the preferred or  fully specified name in a specified dialect and language. |
| **ETS-F-71** | The taxonomy viewer must be configurable to display an appropriate  icon based on membership of a concept in a reference set. |
| **ETS-F-72** | The taxonomy viewer must have the ability to show inferred  relationships, stated relationships, and a summation of views. |

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-73** | The taxonomy viewer must have the ability to show concepts that have  non-hierarchical relationships in the viewer. For example, mapping relationships may show SNOMED codes as children of CPT codes, with an icon indicating the nature of the mapping relationship. |
| **ETS-F-74** | The taxonomy viewer must have the ability to navigate a hierarchy that  is represented as refsets, so that navigation can be specified outside of logical subsumption when desired. The taxonomy viewer must also display the definition status of each concept (that is, whether the concept is fully defined or primitive). This can be accomplished through the use of icons. The incorporation of a “focused taxonomy browser” (a view limited to one concept and only its immediate subtypes and super types) would be especially helpful. |

**Figure 2** - Example taxonomy showing colors and shapes to indicate primitive or defined concepts and showing support for showing parentage for concepts that may have more than one parent.



**Figure 2: Taxonomy Viewing**

2.6.29.

**Description Logic**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-92** | The terminology tools will support viewing concept definitions using  the SNOMED diagramming standard. |
| **ETS-F-93** | The terminology tools will support drag and drop editing using the |

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| **BRD Requirement #** | **Requirement** |
|  | SNOMED diagramming standard. |
| **ETS-F-94** | The terminology tools will support type ahead completion of  description logic definitions in any of the Web Ontology Language  (OWL) 2 specified syntaxes. |
| **ETS-F-95** | The terminology tools will support drag and drop editing onto  description logic definitions in any of the OWL 2 specified syntaxes. |
| **ETS-F-96** | The terminology tools will support the complete OWL 2 in addition to  supporting the OWL 2 EL profile. |
| **ETS-F-171** | The terminology tooling shall provide classifier functionality for the  SOLOR Terminologies (SNOMED CT, LOINC, and RxNorm), VA Extension content, post-coordinated expressions, and LEGO content. |
| **ETS-F-172** | The terminology tooling shall display incremental changes that have  occurred with each classification and will allow the user to sort the results by type of relationship change. The tooling shall also display the loss or gain of parent and child concepts when this occurs. |
| **ETS-F-173** | The terminology tooling shall detect and display concepts in  equivalency and cycle errors as well as provide a means for the concepts to be transferred to editing panels for error correction. |

2.6.30.

**Quality Assurance**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-129** | All terminology tooling will utilize rule-based system to perform real-  time quality assurance. The rule-base used by the IHTSDO is a starting point for VHA quality assurance rules. |
| **ETS-F-130** | The tooling will provide capabilities for users to add and edit QA rules,  in a graphical manner, using domain specific languages where appropriate. |
| **ETS-F-176** | The terminology tooling shall provide a means of viewing all QA rules  (in the tool and by export to a document) as well as all concepts in the terminology which violate those rules (i.e., as currently provided by the IHTSDO Workbench QA Case Manager). The tooling shall provide a means for the concepts to be transferred to editing panels for error correction. |

2.6.31.

**Additional Considerations**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-159** | The terminology tooling must allow the modeler to create new  concepts in the SOLOR terminology. New concepts may be created through a semi-automated process (which includes functionality such |

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| **BRD Requirement #** | **Requirement** |
|  | as pre-populating preferred terms and auto-correction of spelling errors  or inadvertent extra spaces). |
| **ETS-F-193** | The terminology tooling must allow the modeler to edit existing  concepts according to specified editorial policy (e.g., addition or retirement of new descriptions, relationships, etc.). The system should be able to auto-correct spelling mistakes, abbreviations, extra spaces, etc. |
| **ETS-F-160** | The terminology tooling must allow the modeler to retire concepts  according to specified editorial policy. Concepts may be retired through a semi-automated process that retires all of the concept components and creates “pointers” to active concepts as substitutions as defined by editorial guidelines. |
| **ETS-F-161** | The terminology tooling must allow the modeler to see a given  concept’s history (all previous versions of the concept) in an easily viewable format. The modeler should be able to revert to a previous version of the concept in the event of a modeling error or conflict between authors. |
| **ETS-F-162** | The terminology tooling must have a means of indicating the origin of  concepts, Refsets, and other content (that is, the capability to distinguish which content is created by the KBS terminology authoring team and which content has been created outside of KBS, and by whom). |
| **ETS-F-194** | The terminology tooling shall allow users to view at least two concepts  simultaneously to support comparison, copying, and cloning via drag- and-drop functionality. |
| **ETS-F-195** | The terminology tooling shall provide graphical user interface  components that enhance and simplify editing processes such as: configurable panels for editing concepts, viewing the taxonomy, refset/mapping development, etc.; a navigable history of concepts visited, the ability to copy/paste identifiers and descriptions (via mouse or keyboard shortcuts); straight-forward, clearly delineated buttons/controls for editing, creating/retiring content, etc. |
| **ETS-F-211** | ETS-F-XXX The terminology tooling must allow the modeler to  import and export LEGOs, create, edit, retire, and classify LEGOs; allow the use of LEGO templates for creating new LEGOs; create, edit, and retire “pending” SNOMED CT concepts; and search existing LEGOs by UUID, by PNCS (progress note construction set) value, and by component. |

2.6.32.

**User Type**

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| **New Requirement #** | **Requirement** |
| **NEW-REQ-8** | **Read Only:** User shall be able to: |

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| **New Requirement #** | **Requirement** |
|  |  Search terminology, refsets, concepts;   View terminology, concepts, refsets;   Run standard reports;   Track the current stage in workflow. |
| **NEW-REQ-9** | **Editor:** User shall be able to:   Edit, add, retire terminology, refsets, concepts;   Send changes to reviewer;   Add comments;   Run standard reports;   Track the current stage in workflow. |
| **NEW-REQ-10** | **Reviewer:** User shall be able to:   Add comments;   Send changes to approver;   Run standard reports;   Track the current stage in workflow. |
| **NEW-REQ-11** | **Approval:** User shall be able to:   Approve new terminology, concepts, refsets that is submitted for approval;   Approve modified terminology, concepts, refsets that is submitted for approval;   Reject new terminology, concepts, refsets;   Reject edited terminology, concepts, refsets;   Add comments to a rejected task;   Update request status;   Publish Approved request;   Run standard reports;   Track the current stage in workflow. |
| **NEW-REQ-12** | **Final Approval:** User should be able to:   Give final approval for new terminology, concepts, refsets;   Give final approval for edited terminology, concepts, refsets;   Reject new terminology, concepts, refsets;   Reject edited terminology, concepts, refsets;   Add comments to a rejected task;   Update Task Status;   Run standard reports;   Track the current stage in workflow. |
| **NEW-REQ-13** | **Administrative:** User should be able to:   Create new users;   Modify user roles;   Assign user roles;   Manage workflow (track and modify the current stage in workflow); |

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| **New Requirement #** | **Requirement** |
|  |  Monitor and run standardized reports;   Review all user inboxes;   Reassign task to other users. |

2.6.33.

**User Functionality**

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| **Requirement #** | **Requirement** |
| **ETS-F-134** | Users can customize screen layout and arrangement of features using an  embedded Java FX 2.0 Scene Builder. |
| **NEW-REQ-14** | User shall be assigned to a concept and a role. |

2.6.34.

**Task/Request**

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| **New Requirement #** | **Requirement** |
| **NEW-REQ-15** | User shall be able to reject or approve task/request. |
| **NEW-REQ-16** | User shall receive email notifications notifying the user a task/request is  available. |
| **NEW-REQ-17** | User shall be able to retrieve task/request. |
| **NEW-REQ-18** | User shall be able to reject or approve task/request. |
| **NEW-REQ-19** | User shall be able to filter task/request by open, closed, due date, etc. |

2.6.35.

**Terminology**

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| **New Requirement #** | **Requirement** |
| **NEW-REQ-20** | User shall have the ability to add new terms, relationships and attributes  to represented terminologies. |
| **NEW-REQ-21** | User shall have the ability to retire terms, relationships, and attributes  from represented terminologies. |
| **NEW-REQ-22** | User shall have the ability to modify terms, relationships, and attributes  in represented terminologies. |
| **NEW-REQ-23** | User should have the ability to browse previous versions of  terminologies. |
| **NEW-REQ-24** | User shall be able to reject or approve task. |
| **NEW-REQ-25** | User shall have the ability to compare the differences between different  versions of terminologies. |
| **NEW-REQ-26** | User shall be able to clone terminology from another terminology. |

2.6.36.

**Concept**

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| **New Requirement #** | **Requirement** |
| **NEW-REQ-27** | User shall have the ability to clone concept – The ability to create a new  concept as a clone of another concept. |
| **NEW-REQ-28** | User shall have the ability to create child concept. The ability to create a  new concept as a child of another. |
| **NEW-REQ-29** | User shall have the ability to move a set of concepts to a new parent  concept. |
| **NEW-REQ-30** | User shall have the ability to retire concept. |
| **NEW-REQ-31** | User shall have the ability to add concepts. |
| **NEW-REQ-32** | User shall have the ability to modify concepts. |

2.6.37.

**Search**

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| **New Requirement #** | **Requirement** |
| **NEW-REQ-33** | User shall be able to perform a basic or advance search. |
| **NEW-REQ-34** | User shall be able to search on complete or partial name. |
| **NEW-REQ-35** | User shall be able to search in a specified portion of the hierarchy, in  reference sets, or relationship type, and destination. |
| **NEW-REQ-36** | User shall be able to save search criteria for individual and public use. |
| **NEW-REQ-37** | User shall be able to search for inactive and active terminology. |
| **NEW-REQ-38** | User shall have a preference option on how the user wants to search in  the taxonomy view. |
| **NEW-REQ-39** | User shall have the ability to compare versions of text. |

2.6.38.

**Workflow Inbox**

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| **New Requirement #** | **Requirement** |
| **NEW-REQ-40** | User shall have access to their personal inbox to work on task/request. |
| **NEW-REQ-41** | User shall be able to search and filter personal inbox. |
| **NEW-REQ-42** | Providing the ability to define a workflow and business process module  that can be modified easily to adapt to changes in VA business requirements. |

2.6.39.

**Query**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-80** | The user shall be able to construct standard queries using a graphical  interface that supports drag and drop of concept into the query specification, as well as type-ahead completion for selecting concepts for use in the query specification. The user shall be able to enter words or fragments in any order to retrieve all appropriate results. |
| **ETS-F-81** | The user shall be able to construct advanced queries using the standard  For, Let, Where, Order, Return (FLWOR) statements defined by XQuery. The FLOWR statement construction shall support drag and drop of concept into the FLOWR statement, and shall also support type- ahead completion for selecting concepts for use in the FLOWR statement. |
| **ETS-F-82** | The user shall be able to save, retrieve, share, browse, and modify  queries. |
| **ETS-F-83** | Content management environments must have access to comprehensive  ad-hoc searching capabilities. These capabilities must include standard Lucene and Regex lexical searches, and must also include semantics searches, such as kind-of, has rel-type, has rel-type with restriction structural searches such as, all components with a version modified by a particular author and temporal searches, such as all components that were members of this refset 1 year ago, but are not members of this refset today. This includes the ability to search by numeric identifiers,  by fully specified name or other description, by active/inactive status, by any of a concept's properties or relationships, and the ability to search using multiple parameters simultaneously, etc. The system should have some heuristic to retrieve and specify the best match returned. |
| **ETS-F-167** | The terminology tooling shall support the following search-related  capabilities:   Save/export search results   Sort search results by various criteria such as alphabetical by FSN or by source (SNOMED CT International Release, US Extension, LOINC, Refset content, etc.)   Provide numerical counts of search results |
| **ETS-F-168** | The terminology tooling shall be able to generate reports based on query  specifications, such as: all new concepts and their identifiers newly created in a release period, all concepts with definition changes in a given period, all concepts in a given Refset, all subtypes/descendants or parent/super-types of a concept, etc. The tooling shall return all the concepts that are connected to the selected concept and the types of relationships that connect them. The reports should be able to be exported in an easily viewed format (e.g., tab-delimited text files). |

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-187** | The terminology tooling shall support metadata queries, such as system  capabilities, terminologies supported, relationship types, search algorithms, and system versions. |

2.6.40.

**Refset Capabilities**

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| **Requirement #** | **Requirement** |
| **ETS-F-84** | The user shall be able to convert the results of any query into an  enumerated Refset. |
| **ETS-F-85** | The user shall be able to convert a query specification into a refset  specification from which the Refset members can be automatically computed. |
| **ETS-F-86** | The Refset specification associated with a refset will be STAMP  versioned and stored as annotations on the concept that identifies the refset. |
| **ETS-F-166** | Authoring includes the ability to create new Refsets and the ability to  have multiple authors of the same Refset. |
| **ETS-F-169** | The terminology tooling shall allow the user to enter Refset member  annotations (e.g., for a Refset member concept, the ability to enter a mapping to a VHAT or standardized terminology code or comment which other users can view). |
| **ETS-F-170** | The terminology tooling shall provide the ability to view, add, and  inactivate Refset members in one editing window. |
| **ETS-F-185** | The terminology tooling shall allow for Refset integration with existing  VA systems, to allow for the import and export of Refsets. |
| **ETS-F-186** | The terminology tooling shall allow for the ability to publish Refsets for  VA national use or be external partners. |
| **NEW-REQ-43** | User shall have the ability to create refsets composed of associations |
| **NEW-REQ-44** | User shall have the ability to create of refsets through definitional  constructs |
| **NEW-REQ-45** | User shall have the ability to update existing refsets |
| **NEW-REQ-46** | User shall have the ability retire terms, relationships, and attributes from  refsets |
| **NEW-REQ-47** | User shall have the ability to view different versions of refsets |
| **NEW-REQ-48** | User shall have the ability to request and submit a request for a new  refset |
| **NEW-REQ-49** | User shall have the ability to request a change or modification to an  existing Refset |

2.6.41.

**The Project Information System and**

**Management Environment (PRISME)**

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| **Requirement #** | **Requirement** |
| **ETS-F-1** | A PRISME will enable developers and managers to comprehend the  complete state of the development environment in the shortest amount of time. PRISME shall make specification and execution of the project build process easy, shall provide a uniform build system, shall provide quality project information, shall provide guidelines for best practices development, and shall allow transparent migration to new features of PRISME |
| **ETS-F-2** | PRISME (ETS-F-1 above) shall provide a dashboard that shows all the  projects known to PRISME, shows summary statistics for those projects, and shall provide links to more detailed project information including detailed build metrics generated by the Continuous Integration Service (ETS-F-54 below), the Tracker for each project (ETS-F-36 below), the artifacts deployed to the Artifact Repository (ETS-F-27 below) for each project, and the version control system (see section  5.1.6 below) for each project’s sources and generated website. |
| **ETS-F-3** | PRISME (ETS-F-1 above) shall use declarative specifications of a  project’s build, deployment, release, reporting, and documentation in a version-controlled Project Object Model (POM) file. This POM file shall contains the Uniform Resource Locator (URL) locations of the version control system that hosts the project’s POM file, as well as any configuration files, data files, and source files and shall also specify the project’s dependencies, the developers involved and the roles they play, the defect tracking system, the continuous integration system, the organizations participating in the project, and the licenses associated with artifacts generated by the project. |
| **ETS-F-4** | PRISME (ETS-F-1 above) shall provide automated change log  documentation created directly from source control. |
| **ETS-F-5** | PRISME (ETS-F-1 above) shall ensure reproducibility, accountability,  and immutability of all aspects of a project’s release by ensuring that the release management process is fully automated, that all sources must be under version control, that all dependencies must be released, that no manual processes can participate in the release process, and that any subsequent modifications to release artifacts can be repudiated. The  only way to change the release process shall be to modify the POM file and project sources, and then to check those changes into the project’s version control system and then to request a project release from PRISME. |
| **ETS-F-6** | PRISME (ETS-F-1 above) shall integrate with issue tracking systems  and will provide automated reports of open issues and resolved issues at any time, and for any release. |
| **ETS-F-7** | PRISME (ETS-F-1 above) shall provide cryptographic (MD4 and  SHA1) checksums for all artifacts to ensure their integrity. |

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| **Requirement #** | **Requirement** |
| **ETS-F-8** | PRISME (ETS-F-1 above) shall be accessible over the public Internet so  that our collaborators (United States National Library of Medicine, DoD, The Centers for Medicare and Medicaid Services [CMS], Office of the National Coordinator, Intermountain Healthcare, Kaiser Permanente, the IHTSDO, and others) may participate in, or subscribe to, PRISME supported projects. |

2.6.42.

**Artifact Repository Service**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-27** | PRISME (ETS-F-1 above) shall provide an Artifact Repository Service  to which project artifacts are published and from which project dependencies are obtained by developers and/or continuous integration servers. |
| **ETS-F-28** | The Artifact Repository Service (ETS-F-27 above) shall be able to  proxy artifact repositories from other organizations, and shall be able to be proxied by artifact repositories hosted by other organizations. |
| **ETS-F-29** | The Artifact Repository Service (ETS-F-27 above) will identify artifacts  by a group identifier, an artifact identifier, and a version. |
| **ETS-F-30** | The Artifact Repository Service (ETS-F-27 above) will classify artifacts  with a classifier that describes the type and format of a project artifact. An example classifier, such as “RF2” would indicate that the artifact contained terminology content represented as Systematized Nomenclature of Medicine (SNOMED) Release Format 2 files. |
| **ETS-F-31** | The Artifact Repository Service (ETS-F-27 above) will enable users to  search the repository via a Graphical User Interface (GUI) for artifacts by checksum, group id, artifact id, classifier, version, license, and by full text search of selected project content, minimally including the project POM file. |
| **ETS-F-32** | The Artifact Repository Service (ETS-F-27 above) will allow clients to  programmatically obtain lists of artifacts filtered by regular expression pattern matching, checksum, group identifier, artifact identifier, classifier, version, license, and by full text search of selected project content, minimally including the project POM file. |
| **ETS-F-33** | The Artifact Repository Service (ETS-F-27 above) shall provide control  over what artifacts are used by PRISME projects. The Artifact Repository Service must enable the organization to standardize on a specific version of a dependency, and to enforce this standardization by only providing access to a specific version of an artifact in a repository manager. |
| **ETS-F-34** | The Artifact Repository Service (ETS-F-27 above) shall provide control  over the licenses of artifacts allowed in the repository, and shall provide reporting of the licenses used by each artifact currently in the repository. |

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-35** | The Artifact Repository Service (ETS-F-27 above) shall allow client  applications, such as the PRISME Project Creation Application (ETS-F-  61 below) to remotely query the artifact repository, and to remotely download selected artifacts. |

2.6.43.

**Tracker Service**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-36** | PRISME (ETS-F-1 above) shall provide a Tracker Service for each  project. |

2.6.44.

**Service Desk**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-37** | PRISME (ETS-F-1 above) shall provide a Service Desk Portal to allow  users to log service requests that relate to PRISME Services and  Terminology Tooling. |
| **ETS-F-38** | The Service Desk (ETS-F-37 above) shall support Service Level  Agreements that are automatically associated with user requests, and will enable real-time generation of performance metrics. |

2.6.45.

**Version Control Service**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-39** | PRISME (ETS-F-1 above) shall provide a Version Control Service. |
| **ETS-F-40** | The Version Control Service (ETS-F-39 above) shall be available on the  Public Internet. |
| **ETS-F-41** | The Version Control Service (ETS-F-39 above) shall allow single-sign-  on and role-based access control via the Identity and Access  Management Service (ETS-F-22 above). |
| **ETS-F-42** | The Version Control Service (ETS-F-39 above) shall be available on the  Public Internet. |
| **ETS-F-43** | The Version Control Service (ETS-F-39 above) shall be available on the  Public Internet so that developers and collaborators with no access to the VA intranet can access the service. |
| **ETS-F-44** | The Version Control Service (ETS-F-39 above) shall have the necessary  storage, configuration, and bandwidth to support version control of large textual data sources, such as a complete history of all SNOMED release files (Systematized Nomenclature of Medicine Clinical Terms [SNOMED CT] is released biannually, and the data files of the release are ~1.3 GB, compressible to ~200 MB). |

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-45** | The Version Control Service (ETS-F-39 above) shall have one master  repository for each terminology system or independent module of a terminology system that is used in the VA, or are of collaborative importance. Today these terminology systems include, but are not limited to: SNOMED CT International Edition, SNOMED CT US Extension, SNOMED CT Spanish Edition, Logical Observation Identifiers, Names, and Codes (LOINC), International Classification of Diseases, Ninth Edition, Clinical Modification (ICD-9-CM), ICD-10- CM, RxNorm, National Drug File (NDF), National Drug File-Reference Terminology (NDF-RT), Current Procedural Terminology (CPT), Healthcare Common Procedure Coding System (HCPCS), Diagnosis Related Group (DRG), and VHA Terminology (VHAT). |
| **ETS-F-46** | The Version Control Service (ETS-F-39 above) shall support hosting of  project websites generated by the continuous integration service (ETS-  F-54 below) and will thereby provide for historical records of all project metrics published via the website. |

2.6.46.

**Quality Management Platform**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-47** | PRISME (ETS-F-1 above) shall provide a quality management platform  that will enable tracking of quality metrics for each project over time. |
| **ETS-F-48** | The Quality Management Platform (ETS-F-47 above) shall provide  trend analysis tools to monitor quality evolution and milestones. |
| **ETS-F-49** | The Quality Management Platform (ETS-F-47 above) shall provide  detailed reporting of complexity, compliance, and coverage metrics. |
| **ETS-F-50** | The Quality Management Platform (ETS-F-47 above) shall be  extensible by writing plugins that can support terminology specific metrics. |
| **ETS-F-51** | The Quality Management Platform (ETS-F-47 above) shall provide  individual-level, team-level and project-level monitoring of metrics. |
| **ETS-F-52** | The Quality Management Platform (ETS-F-47 above) shall support  rule-based defect detection, and shall support white listing of rule violations, that are identified as allowed exemptions to the rule after a manual review of the rule violations. |
| **ETS-F-53** | The Quality Management Platform (ETS-F-47 above) shall support  rule-based defect detection and shall support a comprehensive audit trail of all white listing activities. |

2.6.47.

**Continuous Integration Service**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-54** | PRISME (ETS-F-1 above) shall provide a continuous integration  service that is able to build and test projects as defined by the project’s  POM. |
| **ETS-F-55** | The Continuous Integration Service (ETS-F-54 above) shall support  feature branching or a branch-per-issue workflow by automatically detecting new project branches in the Version Control Service (ETS-F-  39 above) project repository, and then to automatically apply the main line's continuous integration scheme to the new branches, so that branch metrics are automatically generated and available from the Dashboard. |
| **ETS-F-56** | The Continuous Integration Service (ETS-F-54 above) shall be  configurable to listen to commit triggers from the Continuous Integration Service (ETS-F-54 above), and to enable those triggers to initiate a project build on the continuous integration server. |
| **ETS-F-57** | The Continuous Integration Service (ETS-F-54 above) shall ensure the  integrity of all dependent artifacts used in a project build by verifying  the cryptographic checksums of all artifacts. If checksums do not match, the Continuous Integration service must force the build to fail. |

2.6.48.

**Project Creation Application**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-58** | PRISME (ETS-F-1 above) shall provide a Project Creation Application,  that will enable a PRISME project administrator to create and deploy new projects. |
| **ETS-F-59** | The Project Creation Application (ETS-F-59) shall automate the  creation and initialization of the Version Control Service (ETS-F-39 above) repository for a project, and check in initial project sources into the Version Control Service. |
| **ETS-F-60** | The Project Creation Application (ETS-F-59 above) shall automatically  configure the Continuous Integration Service (ETS-F-54 above) to check out the project from the Version Control Service (ETS-F-39 above), build the project, and then deploy the project to the Artifact Repository Service (ETS-F-27 above). |
| **ETS-F-61** | The Project Creation Application (ETS-F-59 above) shall allow a  project administrator to select filtered project dependencies (such as a version of SNOMED or LOINC) from a list of dependencies of the proper classification (java library, terminology content, etc.) obtained from searching the PRISME Artifact Repository Service (ETS-F-32 above) in real time. |

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-62** | The Project Creation Application (ETS-F-59 above) shall allow a  project administrator to create an archetype from a configured project and to configure all necessary services to version control, test, and release the archetype. |
| **ETS-F-63** | The Project Creation Application (ETS-F-59 above) shall allow a  project administrator to update an existing archetype and to commit that update to version control and to release the updated archetype. |
| **ETS-F-64** | The Project Creation Application (ETS-F-59 above) shall allow a  project administrator to create projects from selectable list of available archetypes. |
| **ETS-F-65** | The Project Creation Application (ETS-F-59 above) shall allow a  project administrator to select workflow processes that will be available in a project. |

2.6.49.

**Component Request Service**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-75** | PRISME (ETS-F-1 above) shall provide a Component Request Service. |
| **ETS-F-76** | The Component Request Service (ETS-F-75 above) will allow users to  enter component requests independent of a particular project. |
| **ETS-F-77** | The Component Request Service (ETS-F-75 above) will allow project  administrators to assign component requests to a specific project’s tracker service (ETS-F-36 above) and to initiate workflow processes related to that request as defined by the workflow management service (ETS-F-9 above). |
| **ETS-F-78** | The Component Request Service (ETS-F-75 above) will support custom  forms for each type of component request. These custom forms will enable dynamic form population and may utilize all the knowledge base and quality assurance capabilities of the stand-alone editing environments to help requestors potentially completely model their requests, leaving only a central quality assurance function. |
| **ETS-F-79** | The Component Request Service (ETS-F-75 above) will provide the  entering user with an immediate Universal Unique Identifier (UUID), as well as a skeletal definition that they can import into their system and immediately use, while the component is being quality-assured  centrally. |

2.6.50.

**Terminology Web Application Environment**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-142** | Web Application Environment will be configurable to provide selected  content management capabilities. |

2.6.51.

**New Concept Request Application**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-143** | Any tools that support new concept requests shall integrate with request  submission systems such as the National Library of Medicine (NLM)  request submission system via the workflow service. |

2.6.52.

**Scripting Capabilities**

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| **BRD Requirement #** | **Requirement** |
| **ETS-F-91** | The rich client tools will support scripting using the Oracle Nashorn  JavaScript libraries. |

**2.7. Graphical User Interface (GUI) Specifications**

2.7.1.

**General GUI Compliance**

The terminology tooling shall provide general graphical user interface compliance. Some general

GUI compliance including the following specifications:

 A well-defined on-screen indication of the current focus will be provided.

 The on-screen indication moves among interactive interface elements as the input focus changes.

 The focus will be programmatically exposed so that assistive technology can track focus and focus changes.

 The identity, operation, and state of the user interface element, will be available to support assistive technology.

 When an image represents a program element, the information conveyed by the image must also be available in text.

 Textual information will be provided through operating system functions for displaying text.

 The minimum information that will be made available is text content, text input caret location, and text attributes.

 Applications will not override user-selected contrast and color selections and other individual display attributes.

 When electronic forms are used, the form will allow people using assistive technology, to access the information, field elements, and functionality required, for completion and submission of the form, including all directions and cues.2

6 Standard GUI Compliance pp. 4-7

2.7.2.

**GUI Compliance Specific to Terminology Tooling**

The terminology tooling shall provide graphical user interface compliance specific to

Terminology Tooling. This specific compliance includes the following specifications:

 For Project Information System and Management Environment (PRISME), the Artifact Repository Service will enable users to search the repository via a Graphical User Interface (GUI) for artifacts by checksum, group id, artifact id, classifier, version, license, and by full text search of selected project content, minimally including the project POM file.

 For content management capabilities re. query capabilities, the user shall be able to construct standard queries using a graphical interface that supports drag and drop of concept into the query specification, as well as type-ahead completion for selecting concepts for use in the query specification. The user shall be able to enter words or fragments in any order to retrieve all appropriate results.

 For content management capabilities re. re-useability, that is, the re-use of existing components, the system will allow the modeler to select components of an existing model to be re-used in the creation of a new model. Methods of selection and re-use should be highly useable and easily understood, for example, using graphical elements.

 For content management capabilities re. quality assurance (QA), the terminology tooling will provide capabilities for users to add and edit QA rules, in a graphical manner, using domain specific languages where appropriate.

 For content management capabilities re. additional considerations, the terminology tooling shall provide graphical user interface components that enhance and simplify editing processes, such as:

o Configurable panels for editing concepts.

o Viewing the taxonomy, refset/mapping development, etc.

o A navigable history of codes/concepts visited.

o The ability to copy/paste identifiers and descriptions, via mouse or keyboard shortcuts.

o Straight-forward, clearly delineated buttons/controls for editing, creating/retiring content etc.

**2.8. Multi-divisional Specifications**

A robust Technical Terminology Service (TTS) is necessary to publish standard terminologies and to ensure their complete integration with VA Health Information Technology (HIT) systems and applications. Service will utilize a J2EE Platform running on a non-Windows dependent OS.

 The TTS will address internal Office of Information and Technology (OI&T) technical needs, including terminology publication and distribution as well as technical consultation for accessing terminology resources, e.g., Service Oriented Architecture (SOA) integration.

 Establishing and maintaining robust interoperability with VA partners, such as DoD and

VBA.

 Health data must be ubiquitously standardized, including the ability to compare the processes, and quality of care among national and international health providing organizations.

 Must be able to share data with organizations such as the International Health Terminology Standards Development Organization (IHTSDO) Open Tooling Framework, and the IHTSDO workbench that is currently utilized by the IHTSDO, Denmark, Sweden, the United States National Library of Medicine, Kaiser Permanente, and some internal VA projects.

 The rich client tools will support scripting using the Oracle Nashorn JavaScript libraries.

 The terminology tooling shall provide classifier functionality for the SOLOR Terminologies (SNOMED CT, LOINC, and RxNorm), VA Extension content, post- coordinated expressions, and LEGO content.

 The terminology tooling must also be able to support the workflow integration of terminology authors external to the KBS team, and potentially external to the VA.

 The terminology tooling should also support workflow for exporting content to VA partners and for submitting content requests to the United States SNOMED CT Content Request System (USCRS).

**2.9. Performance Specifications**

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| **If this is a system modification, how many users does the current system support?** |
| The current system supports 8-10 users (STS and KBS staff). |
| **How many users will the new system (or system modification) support?** |
| The web application components of the system are expected to support 5,000 registered users, and 600 concurrent users. This includes STS staff, KBS staff, contractors, field staff, etc. |
| **What is the predicted annual growth in the number of system users?** |
| Annual growth is expected to average 10-15%. Initially, growth may be as high as 20% (specifically related to VistA Evolution and Connected Health initiatives). However, it is expected to plateau. |
|  The system shall remain responsive at all times, with no more than 2-second lags between user action and system response to action.   Editing environments that support classification must be able to classify the entire terminology in 30 seconds or less, and to incrementally classify additive changes to the terminology in 500 milliseconds or less.   Refset environments must support Refset computation of a 150,000 member set, and computation of parent Refsets in less than 10 seconds. |

(CTTDM BRD p.42)

**2.10. Quality Attributes Specification**

The following types of testing will be done to ensure the quality of the CTTDM application:

 Graphical user interface testing

 Usability testing

 Software performance testing

 Compatibility testing

 Exception handling

 Load testing

 Volume testing

 Stress testing

 Security testing

 Scalability testing

 Sanity testing

 Smoke testing

 Exploratory testing

 Ad hoc testing

 Regression testing

 Installation testing

 Maintenance testing

 Recovery testing and failover testing.

 Accessibility testing, including compliance with:

 Americans with Disabilities Act of 1990

 Section 508 Amendment to the Rehabilitation Act of 1973

 Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C) (CTTDM BRD p.40)

**2.11. Reliability Specifications**

 The system shall be 99.9% available Monday-Friday, 6:00 AM ET to 3:00 AM ET. The system shall be 98% available on an annual basis.

 Build (system implementation) shall be scheduled during off-peak hours or in conjunction with relevant maintenance schedules.

 Maintenance, including maintenance of externally developed software incorporated into the application, shall be scheduled during off-peak hours or in conjunction with relevant maintenance schedules. The business owner should provide specific requirements for establishing system maintenance windows when planned service disruptions can occur in support of periodic maintenance.

(CTTDM BRD p.43)

**2.12. Scope Integration**

The following sections provide CTTDM known interfaces and related projects or work efforts.

2.12.1 **Known Interfaces**

Known interfaces included, but are not limited to:

 VHA Enterprise Terminology Services (VETS) (includes New Term Rapid Turnaround

(NTRT)

 Connected Health/Mobile Applications

 Corporate Data Warehouse (CDW)

 Registries

(CTTDM BRD p.44)

2.12.2 **Related Projects or Work Efforts**

The following are related projects or work efforts:

 **PRISME** will enable developers and managers to comprehend the complete state of the development environment in the shortest amount of time. PRISME shall make specification and execution of the projects build process easy, shall provide a uniform build system, shall provide quality project information, shall provide guidelines for best practices development, and shall allow transparent migration to new features of PRISME.

 **NSR #20120905 Mobile Applications**

The Mobile Development project is focused on the development of simple and complex applications and treats these applications as functions being released to the App Store. This project manages the development of mobile applications and plans for cyclic release of applications over the course of 4, 6 month increments.

 **NSR #20130905 VistA Evolution (VE)**

The VistA-4 Project will be the first project in the VistA Evolution Program. VistA-4 will focus on syntactic, semantic, and process interoperability, care coordination, the integration of ancillary services, and meaningful use. VistA-4 will rely upon infrastructure components, data models, and services that support an open, modular, extensible EHR platform allowing VA to provide high-quality solutions at increased speed and decreased cost. The resulting system will be flexible and agile –

accommodating new technology advances and achieving optimal results more efficiently.

 **NSR #20140509 VA/DoD Data Standardization**

VA is collaborating with the DoD and the IPO to improve the interoperability of data contained in the VA and DoD health care systems. Data standardization is the key. As

part of the improvement process, this request will provide the framework for expectations related to sharing standardized clinical data between VA and its health care deliver partners (namely DoD).

 **NSR #20080407 Standard Computable Data in Documents**

This request seeks to standardize objects in documents so that they are computable and available for all document types.

 **NSR #20110408 Certification of VistA for Meaningful Use**

This NSR seeks to bring VistA into compliance with the Stage 1 Meaningful Use of EHR Technology certification criteria, enabling VA to meet its commitment to the Meaningful Use objectives. The Health Information Technology for Economic and Clinical Health (HITECH) Act, enacted as part of the American Recovery and Reinvestment Act

(ARRA) of 2009, was signed into law on February 17, 2009, to promote the adoption and meaningful use of certified health information technology. In July of 2010, CMS announced a final rule to implement provisions of ARRA that include criteria for achieving meaningful use of health information technology. This final rule defined meaningful use adoption criteria in stages of adoption. In an effort to further codify the relationship between the aforementioned legislation, OMB issued a memorandum on September 17, 2010, requiring that selected federal agencies, including VA, achieve five HIT Principle Processes by the end of FY12.

(CTTDM BRD p.44-45)

**2.13. Security Specifications**

The VA requires that any enhancement to the CTTDM application should address standards, procedures, and technical aspects of the solution required to achieve Certification and Accreditation of the system. These should address controls listed in the FIPS PUB 200 Minimum Security Requirements for Federal Information and Information Systems. Additional security specifications include compliance with:

 Standards and regulatory requirements published in VA Handbook and Directive 6500: Veterans Affairs Directives > VA Handbook and Directive 6500

 FIPS PUB 140-2, Security Requirements for Cryptographic Modules, and for all voice and data traffic encryption: Computer Security Division > Publications > Federal Information Processing Standards > FIPS PUB 140-2.

In consideration of patient safety considerations, data protection measures such as backup intervals and/or redundancy shall be consistent with systems categorized as critical.

All VA security requirements will be adhered to. Based on Federal Information Processing Standard (FIPS) 199 and National Institute of Standards and Technology (NIST) SP 800-60, recommended Security Categorization is HIGH.

The Security Categorization will drive the initial set of minimal security controls required for the information system. Minimum security control requirements are addressed in NIST SP 800-53 and VA Handbook 6500. (CTTDM BRD3)

**2.14. System Features**

3 CTTDM BRD p.47

**2.14.1. System Features**

|  |  |
| --- | --- |
| **Requirement #** | **Requirement** |
| **NEW-REQ-50** | The system should be able to check for duplication upon conception. |
| **NEW-REQ-51** | The system should run a daily QA process checking for duplicates. |
| **NEW-REQ-52** | The system should be able to convert terms to any languages based on  configuration. |
| **NEW-REQ-53** | The system should allow a user to be assigned multiple roles. |

|  |  |
| --- | --- |
| **NEW-REQ-54** | The system shall allow users to be assigned concepts. |
| **NEW-REQ-55** | The system shall allow the workflow status to be edited. |
| **NEW-REQ-56** | The system shall allow the additional workflow status to be added (in addition  to the prototype list). |

For additional system details, refer to the CTTDM System Design Document (SDD).

**2.15. Usability Specifications**

User acceptance testing and training tools shall include user guide and manuals. The training and technical curriculum shall be delivered to all levels of staff users.

A technical training curriculum shall be developed and delivered to all levels of staff users.

The training curriculum shall state the expected task completion time for primary and secondary users.

**3. Applicable Standards**

The following is a list of applicable standards for the functionality:

 Compliance with standards and regulatory requirements published in VA Handbook and

Directive 6500

 Compliance with standards and regulatory requirements published in VA Handbook and

Directive 6513

 Compliance and certification of Section 508 IT accessibility standards governed under 29

U.S.C 794d

 Federal Information Processing Standards Publications (FIPS PUBS) 140-2, Security

Requirements for Cryptographic Modules, May 2001

 Federal Information Processing Standards Publications (FIPS PUBS) 200, Minimum

Security Requirements for Federal Information and Information Systems, March 2006

 Federal Information Processing Standards Publications (FIPS PUBS) 199, Standards for

Security Categorization of Federal Information and Information Systems, February 2004

 National Institute of Standards and Technology (NIST) Special Publication (SP) 800-30

Rev. 1, Guide for Conducting Risk Assessments, September 2012

 National Institute of Standards and Technology (NIST) Special Publication (SP) 800-37

Rev. 1, Guide for Applying the Risk Management Framework to Federal Information

Systems: A Security Life Cycle Approach, February 2010

 National Institute of Standards and Technology (NIST) Special Publication (SP) 800-53

A , Guide for Assessing the Security Controls in Federal Information Systems, July 2008

 National Institute of Standards and Technology (NIST) Special Publication (SP) 800-53

Rev. 3, Recommended Security Controls for Federal Information Systems and

Organizations, August 2009

 National Institute of Standards and Technology (NIST) Special Publication (SP) 800-60

Rev. 1, Guide for Mapping Types of Information and Information Systems to Security

Categories, August 2008

 National Institute of Standards and Technology (NIST) Special Publication (SP) 800-111, Guide to Storage Encryption Technologies for End User Devices, November 2007

**4. Interfaces**

Known ES interfaces are found in section 2.12.1 of this document.

**4.1 Communications Interfaces**

Communications interface information will be provided when available.

**4.2 Hardware Interfaces**

Hardware interface information will be provided when available.

**4.3 Software Interfaces**

Software interface information will be provided when available.

**4.4 User Interfaces**

User interface information will be provided when available.

**5 Legal, Copyright, and Other Notices**

System will comply with 508 requirements, as noted in section 2.1 of this document. There are no other legal or copyright notices for this specification

**6 Purchased Components**

No purchased components at this time.

**6.1 Defect Source (TOP 5)**

Not applicable.

**7 User Class Characteristics**

The user’s community consists of the following two user groups:

 Primary Users: Standards and Terminology Services (STS) and Knowledge Based

Systems (KBS) Staff

 Secondary Users: Mobile Health and Others (Clinical Information System/Anesthesia

Record Keeper/Nursing, etc.)

To the extent that new functionality or changes that affect the usability of the tooling application are introduced, STS, KBS, Mobile Health, and Other Staff users will require training to ensure that each understands the steps needed to successfully execute their responsibilities.

**8 Estimation**

The estimation information is not available at this time.

**Project Software Functional Size and Size-Based Effort and Duration**

**Estimate**

**Application**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Item** | **A** | **B** | **C** | **D** | **E** | **Total** |
| **Counted Function**  **Points** |  |  |  |  |  |  |
| **Estimated Scope**  **Growth** |  |  |  |  |  |  |
| **Estimated Size at**  **Release** |  |  |  |  |  |  |

|  |  |  |
| --- | --- | --- |
| **Size-Based Effort Estimates** | **Labor Hours** | **Probability** |
| **Low-Effort Estimate – With indicated probability, project will consume no more than:** |  |  |
| **High-Effort Estimate – With indicated probability, project will consume no more than:** |  |  |

|  |  |  |
| --- | --- | --- |
| **Size-Based Duration Estimates** | **Work Days** | **Probability** |
| **Low-Duration Estimate – With indicated probability, project will consume no more than:** |  |  |
| **High-Duration Estimate -- With indicated probability, project will consume no more than:** |  |  |

**Figure 3: Cumulative Probability (“S-curve”) Chart**

*[Insert Cumulative Probability (“S-curve”) Charts here]*

**9 Approval Signatures**

REVIEW DATE: *<date>*

SCRIBE: *<name>*

Signed:

Integrated Project Team (IPT) Chair – Alan Arnold Date:

Project Manager – Alan Arnold

Program Manager – Roger Sigley Date:

Business Sponsor – Steven Brown, M.D. Date:

**Appendix A Use Case Specification**

**Concept Workflow**

**A. Create a Request for a Change to Concept(s)**

**User Type: Editor**

1. The need to create a new concept or a change an existing concept

2. An editor creates a request for the new concept to be created or for the existing concept to be modified.

3. The request is submitted for review.

4. The request is routed to the appropriate reviewer Queue.

5. The request is marked as “Assigned.”

6. The request resides in the assigned reviewer Queue.

**B. Review and Reject/Approve the Concept(s)**

**User Type: Reviewer**

1. The workflow state associated with this request is marked as “Ready for Review” in the reviewer workflow inbox.

2. The request resides in the appropriate Reviewer’s Queue.

3. The Reviewer reviews the request that is marked “Ready for Review,”

4. The reviewer rejects the modification to one or more concepts made by the editor a. The reviewer marks the rejected concepts as “Rejected” with comment.

b. The reviewer sends back the request to the original editor.

5. The Concept Reviewer approves the modification

a. The reviewer marks the approved concepts as “Approved.”

b. The reviewer sends the request to the approval.

c. The approved request is marked “Ready for Approve” in the assigned approval workflow

inbox queue.

**C. Approve the Request**

**User Type: Approval**

1. The workflow state associated with this request is marked as “Ready to Approve.”

2. The request resides in the approver’s Queue.

3. The approver reviews the request and the concept(s) marked “Ready to Approve.”

4. The approver approves the modification to all concepts made by the original editor.

5. The approver marks all concepts as “Approved.”

6. Requests are marked as “Completed.”

7. All concepts are marked as “Approved.”

8. The requests are removed from the approver’s Queue.

9. The approved changes are published and system updated accordingly.

**D. Reject the Request**

**User Type: Approver**

1. The workflow state associated with this request is marked as “Ready to Approve.”

2. The request resides in the approver’s Queue.

3. The approver reviews the request and the concept(s) marked “Ready to Approve.”

4. The approver rejects the modification to one or more concepts.

5. The approver marks the rejected concepts as “Rejected.”

6. The approver adds comments on why the request was rejected.

7. The approver sends back the request to the editor.

8. The request is removed from the approver’s Queue.

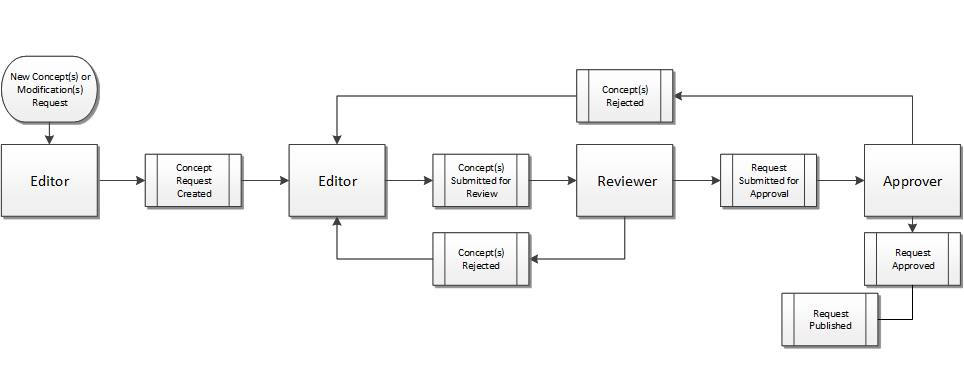


Figure 4: **Terminology Workflow**

**E. Create a Request for a Change to Terminology(s)**

**User Type: Editor**

7. The need to create a new terminology or a change an existing terminology

8. An editor creates a request for the new terminology to be created or for the existing terminology to be modified.

9. The request is submitted for review.

10. The request is routed to the appropriate reviewer Queue.

11. The request is marked as “Assigned.”

12. The request resides in the assigned reviewer Queue.

**F. Review and Reject/Approve the Terminology(s)**

**User Type: Reviewer**

6. The workflow state associated with this request is marked as “Ready for Review” in the

reviewer workflow inbox.

7. The request resides in the appropriate Reviewer’s Queue.

8. The Reviewer reviews the request that is marked “Ready for Review.”

9. The reviewer rejects the modification to one or more terminologies made by the editor c. The reviewer marks the rejected terminology as “Rejected” with comment.

d. The reviewer sends back the request to the original editor.

10. The Terminology Reviewer approves the modification

d. The reviewer marks the approved terminology as “Approved.”

e. The reviewer sends the request to the approval.

f. The approved request is marked “Ready for Approve” in the assigned approval workflow

inbox queue.

**G. Approve the Request**

**User Type: Approval**

10. The workflow state associated with this request is marked as “Ready to Approve.”

11. The request resides in the approver’s Queue.

12. The approver reviews the request and the terminology(s) marked “Ready to Approve.”

13. The approver approves the modification to all terminology made by the original editor.

14. The approver marks all terminology as “Approved.”

15. Requests are marked as “Completed.”

16. All terminology is marked as “Approved.”

17. The requests are removed from the approver’s Queue.

18. The approved changes are published and system updated accordingly.

**H. Reject the Request**

**User Type: Approval**

9. The workflow state associated with this request is marked as “Ready to Approve.”

10. The request resides in the approver’s Queue.

11. The approver reviews the request and the terminology(s) marked “Ready to Approve.”

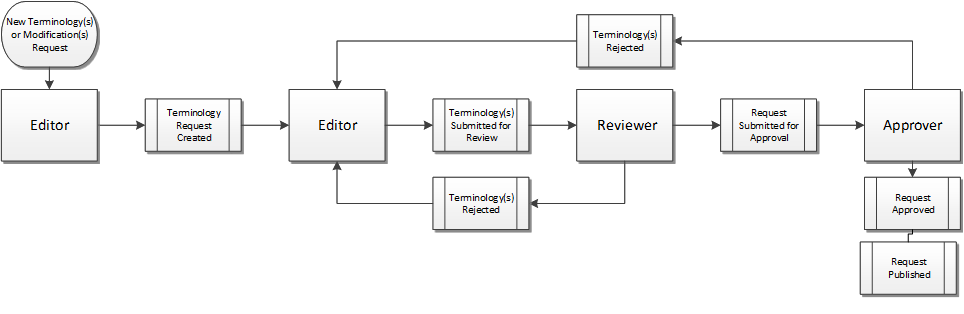
12. The approver rejects the modification to one or more terminology.

13. The approver marks the rejected terminology as “Rejected.”

14. The approver adds comments on why the request was rejected.

15. The approver sends back the request to the editor.

16. The request is removed from the approver’s Queue.



**Figure 5**: **Terminology Workflow**

**Read-Only Workflow**

**To-Be**

**I. Create a Request for a Change to Terminology(s)**

**User Type: Read-Only User**

13. The need to create a new terminology or a change an existing terminology

14. A read-only user creates a request for the new terminology to be created or for the existing terminology to be modified (this is done in a tracking system i.e. Jira)

15. The request is submitted for review.

16. The request is routed to the appropriate reviewer Queue.

17. The request is marked as “Assigned”.

18. The request resides in the assigned reviewer Queue.

**J. Review and Reject/Approve the Terminology(s)**

**User Type: Reviewer**

11. The workflow state associated with this request is marked as “Ready for Review” in the

reviewer workflow inbox.

12. The request resides in the appropriate Reviewer’s Queue.

13. The Reviewer reviews the request that is marked “Ready for Review.”

14. The reviewer rejects the modification to one or more terminologies made by the read only

user.

e. The reviewer marks the rejected terminology as “Rejected” with comment.

f. The rejected request is sent back to the read only user (via tracking system)

g. The read only user receives an email notification of the status update (via tracking system)

15. The Terminology Reviewer approves the modification

g. The reviewer marks the approved terminology as “Approved.”

h. The reviewer sends the request to the approval.

i. The approved request is marked “Ready for Approve” in the assigned approval workflow

inbox queue.

**K. Approve the Request**

**User Type: Approval**

19. The workflow state associated with this request is marked as “Ready to Approve.”

20. The request resides in the approver’s Queue.

21. The approver reviews the request and the terminology(s) marked “Ready to Approve.”

22. The approver approves the modification to all terminology made by the original editor.

23. The approver marks all terminology as “Approved.”

24. Requests are marked as “Completed.”

25. Terminology is marked as “Approved.”

26. The requests are removed from the approver’s Queue.

27. The approved changes are published and system updated accordingly.

28. The status is updated in the tracking system to notify user of the approved request.

**L. Reject the Request**

**User Type: Approval**

17. The workflow state associated with this request is marked as “Ready to Approve.”

18. The request resides in the approver’s Queue.

19. The approver reviews the request and the terminology(s) marked “Ready to Approve.”

20. The approver rejects the modification to one or more terminology.

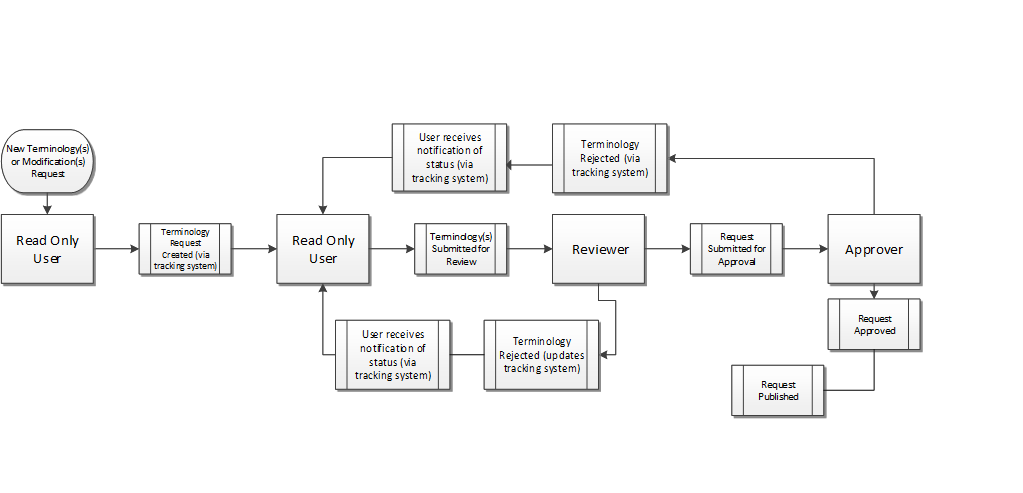
21. The approver marks the rejected terminology as “Rejected.”

22. The approver adds comments on why the request was rejected.

23. The rejected request is sent back to the read only user (via tracking system).

24. The read only user receives an email notification of the status update (via tracking system).

25. The request is removed from the approver’s Queue.



**Figure 6: To Be Read Only User Workflow**

**Appendix B Acronyms and Abbreviations**

|  |  |
| --- | --- |
| **Term** | **Definition** |
| ADR | Administrative Data Repository |
| ADT | Admission, Discharge, and Transfer |
| AIM | Applied Informatics Management |
| AITC | Austin Information Technology Center |
| API | Application Program Interface |
| ARRA | American Recovery and Reinvestment Act |
| BPMN | Business Process Model and Notation |
| BRD | Business Requirements Document |
| C&P | Compensation and Pension |
| CDS | Clinical Decision Support |
| CDW | Corporate Data Warehouse |
| CHDR | Clinical/Health Data Repository |
| CMS | Centers for Medicare & Medicaid Services |
| COTS | Commercial-Off-The-Shelf |
| CPT | Current Procedural Terminology |
| CSIRO | Commonwealth Scientific Research Organization (from Australia) |
| CTS | Clinical Terminology Service |
| CVX | Code for Vaccine Administered |
| DITA | Darwin Information Typing Architecture |
| DoD | Department of Defense |
| DOM | Document Object Model |
| DRG | Diagnosis Related Group |
| EHR | Electronic Health Record |
| ESM | Enterprise Systems Manager |
| ETS | Enterprise Terminology Service |
| FIPS | Federal Information Processing Standard |
| FLWOR | For, Let, Where, Order, Return |
| FY | Fiscal Year |
| GEM | General Equivalency Mapping |

|  |  |
| --- | --- |
| **Term** | **Definition** |
| GUI | Graphical User Interface |
| H.R. | House of Representatives |
| HCPCS | Healthcare Common Procedure Coding System |
| HDR | Health Data Repository |
| HDS | Health Data Systems |
| HIT | Health Information Technology |
| HITECH | Health Information Technology for Economic and Clinical Health |
| HSI | Health Systems Informatics |
| HTML | Hypertext Markup Language |
| ICD | International Classification of Diseases |
| ICD-9-CM | International Classification of Diseases, Ninth Edition, Clinical Modification |
| ICD-10-CM | International Classification of Diseases, Tenth Edition, Clinical Modification |
| IEC | International Electrochemical Commission |
| IHTSDO | International Health Terminology Standards Development Organization |
| IOM | Institute of Medicine |
| IPO | Interagency Program Office |
| ISAAC | Informatics Architecture Acceleration |
| ISO | International Organization for Standardization |
| IT | Information Technology |
| Java 8 SE | Java 8, Standard Edition |
| jBPM | Java Business Process Model |
| JDK 8 | Java Development Kit, Version 8 |
| JIRA | Commercial Software name |
| JPA | Java Persistence API |
| JVM | Java Virtual Machine |
| KBS | Knowledge Based Systems |
| LEGO | Lightweight Expression of Granular Objects |
| LOINC | Logical Observation Identifiers, Names, and Codes |
| MFS | Master File Server |
| NDAA | National Defense Authorization Act |

|  |  |
| --- | --- |
| **Term** | **Definition** |
| NDF | National Drug File |
| NDF-RT | National Drug File-Reference Terminology |
| NIST | National Institute of Standards and Technology |
| NISTIR | National Institute of Standards and Technology Interagency Report |
| NLM | National Library of Medicine |
| NSR | New Service Request |
| NTRT | New Term Rapid Turnaround |
| OHI | Office of Health and Informatics |
| OI&T | Office of Information and Technology |
| OIA | Office of Informatics and Analytics |
| OMB | Office of Management and Budget |
| ONC | Office of the National Coordinator |
| OSEHRA | Open Source Electronic Health Record Alliance |
| OTF | Open Tooling Framework (From the IHTSDO) |
| OWL | Web Ontology Language |
| PD | Product Development |
| PDF | Portable Document Format |
| PL | Public Law |
| POM | Project Object Model |
| PRISME | Project Information System and Management Environment |
| QA | Quality Assurance |
| RDM | Requirements Development and Management |
| REST | Representational State Transfer |
| RF2 | Release Format 2 |
| RIA | Rich Internet Application |
| Rx | Prescription |
| SCS | Standard Code Systems (terminologies developed by Standards Development  Organizations such as SNOMED CT, ICD-10, and LOINC) |
| SDO | Standards Development Organizations |
| SIM | Strategic Investment Management |

|  |  |
| --- | --- |
| **Term** | **Definition** |
| SME | Subject Matter Expert |
| SNOMED | Systematized Nomenclature of Medicine |
| SNOMED CT | Systematized Nomenclature of Medicine Clinical Terms |
| SOA | Service Oriented Architecture |
| SOLOR | SNOMED LOINC and RxNorm |
| STAMP | Status Time Author Module Plan |
| STS | Standards and Terminology Services |
| SVG | Scaled Vector Graphics |
| TDS | Terminology Deployment Server |
| TED | Terminology Editor |
| TIDE | Terminology Integrated Development Environment |
| TTS | Technical Terminology Service |
| UCD | User Centered Design |
| URL | Uniform Resource Locator |
| UUID | Universal Unique Identifiers |
| VA | Department of Veterans Affairs |
| VBA | Veterans Benefit Administration |
| VE | VistA Evolution |
| VETS | VHA Enterprise Terminology Services |
| VHA | Veterans Health Administration |
| VHAT | VHA Terminology |
| VHIEx | Veterans Health Interoperability and Exchange |
| VistA | Veterans Health Information Systems and Technology Architecture |
| VUID | VHA Unique Identifier |
| W3C | World Wide Web Consortium |
| WAI | Web Accessibility Initiative |
| WS-Human Task | Web Services Human Task |
| XML | Extensible Mark-up Language |