

semedy.

Solutions for your
healthcare organization.

CONTENT ENGINEERING



SOLUTIONS

What are the Semedey solutions?

Our knowledge management software is designed for a number of the challenges facing the healthcare system. To better help you understand its wide range of benefits, we have designed a predetermined set of solutions for varying scenarios, or solutions. The solutions are designed for efficiency and scalability that provide significant competitive advantages. Each solution is available through our Clinical Knowledge Management System (CKMS).

Who are the Content Engineering solutions for?

This set of solutions provided through the CKMS software are suitable for knowledge base developers, providers of data and knowledge integration services, and institutions with complex data and content engineering processes.

Where can I see how the solutions work?

Our team at Semedey will be providing live demonstrations of each solution during Virtual HIMSS20. If you are interested in seeing a solution in action, please sign up here:

himss20.semedey.com/solutions

Where can I find more information?

For more information on the Semedey knowledge management software, please visit semedey.com.

For inquiries, please contact himss20@semedey.com

INFORMATION MODELS

Information models are essential for the representation of detailed clinical and life sciences data. Models are typically created to understand and standardize data from different sources, and can also be used to facilitate data exchange and sharing. Smedy's Information Model solution is designed to support data engineering efforts where schemas from multiple data sources have to be represented and harmonized. This solution allows an organization to:

- Represent information models and their components (e.g. data elements, value sets, concepts) as interconnected assets that can be created and managed independently
- Reuse and distribute models and components within and across organizations
- Instantiate information models to generate synthetic data (e.g patient demographics, diagnoses, procedures, lab tests, vitals, cancer staging details, genomic reports, etc.)
- Implement automated testing scripts to validate the integrity of the models after updates to individual components
- Map and reconcile local models with commonly used reference models (e.g. Fast Healthcare Interoperability Resources (FHIR), Observational Medical Outcomes Partnership Common Data Model (OMOP CDM), or Minimal Common Oncology Data Elements (mCODE™))

IMPLEMENTATION

Smedy's Information model solution, implemented using our Clinical Knowledge Management System (CKMS), includes preconfigured and extensible meta-models, extract/transform/load (ETL) pipelines for input and/or export, configurable views, queries, and reports. Previously defined models, data schemas, and data dictionaries can be easily loaded and periodically refreshed using our ETL framework. Commonly used models, ontologies, and terminologies are maintained and distributed by Smedy, along with guidance on how to map and reconcile local models and components to reference standards. With periodic refreshes from reference sources, or schema updates from local sources, CKMS becomes the central repository for curating, mapping, and distributing information models and associated components and metadata.

DEMONSTRATION

Using our CKMS platform, the demonstration will showcase mCODE™, a new set of open source reference models created for the oncology community. We will explain how all 27 mCODE profiles were implemented within CKMS, including property definitions, value sets, and terminology concepts from multiple standard sources. The complete implementation includes over 56,000 interconnected assets that can be searched, queried, and validated using the platform's built-in semantic reasoner. We will also provide examples of synthetic data instances and mappings between mCODE and FHIR components, along with queries to identify obsolete concepts that might be present within value sets.

VALUE SETS

Value sets are used to identify assets that are members of a particular group or collection. The most common use of value sets is to define collections of reference terminology concepts. Within the context of information models, value sets are used to enumerate terminology concepts that can be selected as values for coded data elements. Organizations typically create large quantities of value sets to support activities such as bedside documentation, clinical decision support, data reporting, and patient cohorts or phenotype definitions. Value sets frequently require ongoing maintenance to accommodate new terminology releases and updates, along with periodic refinements guided by domain experts. This solution allows an organization to:

- Catalog available value sets, including assets defined locally and from reference sources - creates a central repository where analysts, developers, researchers, and other stakeholders can search, compare, and validate all value sets
- Create, combine, and manage value sets with different types of members, including terminology value sets that use local dictionary concepts or reference terminology concepts (e.g. SNOMED CT, ICD-10-CM, LOINC, RxNorm)
- Integrate (link) value sets to other asset types (e.g. reports, CDS rules, order sets, documentation templates, information models), and verify if an asset should or not be a member of multiple value sets
- Use and refine value sets obtained from LOINC, NLM's VSAC, SNOMED, or any other source

IMPLEMENTATION

Semedy's Value set solution, implemented using our Clinical Knowledge Management System (CKMS), includes preconfigured models to represent different types of value sets, ETL pipelines for import and/or export, configurable views, queries, and reports. Previously defined value sets can be easily loaded and periodically refreshed using our ETL framework. Commonly used value sets from authoritative sources are maintained and distributed by Semedy, along with guidance on how to refine and reuse to support CDS rules, eMeasures, and patient cohorts. With periodic refreshes from reference sources, value sets are automatically updated, enabling CKMS to become a central repository for curating and distributing value sets and associated metadata.

DEMONSTRATION

Using our CKMS platform, the demonstration will showcase different types of value sets with examples created by Semedy, or obtained from NLM's VSAC and LOINC. We will demonstrate how to search and visualize value sets and their members, and how to verify the source, release date, and other relevant metadata. A new value set for allergic reactions using SNOMED concepts will be created using simple functions that allow search results to be used as a starting point. We will also illustrate the use of configurable queries to identify value sets that contain obsolete assets, as well as assets that are included in multiple value sets.

TERMINOLOGIES

Terminologies and ontologies are essential for encoding and classifying clinical and life sciences data, and to enable semantic data interoperability. Unfortunately, existing terminology vendors only offer solutions for a limited number of domains (e.g. problems, medications, procedures, laboratory tests). The lack of a comprehensive and integrated terminology solution creates important shortcomings for EHR users and those involved with data-centric processes, including researchers and data scientists. Smedy's Terminology solution is designed to support large-scale data engineering efforts where terminologies, ontologies, and code systems from multiple sources are integrated and managed. This solution allows an organization to:

- Use extensible models to represent terminology assets (e.g. concepts, relationships, mappings, terms and synonyms in multiple languages) and their associated metadata
- Create and manage different types of terminology content, including local dictionaries, reference vocabularies, taxonomies, ontologies, and code systems
- Develop configurable methods to group, classify, and cross-reference (map) terminology assets
- Represent and interconnect commonly used reference terminologies (e.g. SNOMED CT, LOINC, ICD-10-CM, NCI Thesaurus, RxNorm, UMLS, CVX, MVX, UCUM, etc.), and obtain periodic updates where items added or modified can be easily identified and analyzed
- Integrate terminologies with other asset types (e.g. orders, problems, procedures, value sets, information models, etc.)
- Proactively manage dependencies on terminology assets to prevent malfunctions and poor data quality

IMPLEMENTATION

Smedy's Terminology solution, implemented using our Clinical Knowledge Management System (CKMS), includes preconfigured models to represent reference terminologies and different types of terminology assets, ETL pipelines for import and/or export, configurable views, queries, and reports. Local and reference terminologies can be easily represented and periodically updated using our ETL framework. Commonly used reference sources are maintained and distributed by Smedy, along with guidance on how to integrate with local CDS rules, eMeasures, patient cohorts, and value sets. Terminology mappings and value sets can also be represented, extended, and systematically maintained within CKMS.

DEMONSTRATION

Using our CKMS platform, the demonstration will showcase how terminologies can be represented, searched, visualized, and cross-referenced using examples created by Smedy and from commonly used reference sources. We will demonstrate how to search and compare similar LOINC concepts, confirm if a concept is a member of existing value sets, and verify if a deprecated concept has been replaced by a newer one. Semantic facets will be used to find LOINC concepts with a specific component, method, and sample type, also illustrating how LOINC parts, answers, and lists are represented. Using UMLS concepts, we will illustrate how mappings and terms in multiple languages can be represented and used. A simple model to represent diagnoses will be used to demonstrate how new models can be created, along with examples of more complex taxonomies to represent therapeutic plans and clinical disorders with detailed cross-references to reference terminologies. We will also illustrate the use of configurable queries to classify concepts and to identify obsolete concepts that might be referenced by other assets.

CONTENT INTEGRATION

Using CKMS within a complex clinical environment, often existing data needs to be loaded. While this can be manually accomplished for smaller data sets, for large data and recurring updates a more automated way is required. That's where the CKMS content integration provides the connection. Various data formats like XML or CSV from a wide range of data sources like web services, application interfaces, databases, or plain files can be extracted, transformed, and loaded into CKMS. Either as a one-time-only import or flexibly scheduled.

IMPLEMENTATION

Content integration within CKMS is based on the Apache open source project Camel. It provides the message-based infrastructure and many available connectors. The CKMS Content Integrator adds an extra layer on top and additional connectors customized for ETL requirements. ETL pipelines, programmed in Java, can be easily deployed, executed, and managed by using the graphical administration area within CKMS.

DEMONSTRATION

The use case in the demonstration shows how the CDC vaccines are integrated. A custom ETL pipeline fetches the immunization data from CDC, transforms and loads the data into CKMS. Beside the execution and management of ETL pipelines the demonstration covers aspects like scheduling and user notification for updated vaccines.

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CONTACT US

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