

Standard Medical Terminologies

*Adoption, Localization and Deployment
in Your Organization and Around the World*

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Apelon

Agenda

- Introduction
 - Apelon
 - Medical terminologies
 - Terminology software
- Terminology management
 - Distribution
 - Adoption
 - Customization
 - Feedback
- Case studies
- Conclusion

Apelon

- Largest provider of terminology products and services
- Unique expertise



Representative Engagements

- **Department of Veterans Affairs**
Enterprise reference terminology and software; extensive consulting
- **SNOMED International**
Authoring software and custom enhancements for SNOMED CT
- **National Cancer Institute**
Authoring and deployment software; extensive consulting
- **Department of Defense**
Enterprise medication mediation server
- **Food and Drug Administration**
Data element standardization of Structured Product Label
- **Department of Health and Human Services**
Data element standardization
- **Kaiser Permanente**
Authoring software for the Convergent Medical Terminology (CMT)
- **Care Science / Quovadx**
Terminology server; consulting
- **National Library of Medicine**
Since 1988, primary extramural contractor for UMLS Metathesaurus, the world's largest health thesaurus
- **National e-Health Transition Authority (Australia)**
Comprehensive terminology software suite, e.g., for Australian Medicine Terminology (AMT)



Global Knowledge, Local Delivery



Apelon

Medical Terminology In Practice

Mission

- We help our customers
 - create,
 - maintain, and
 - leveragestandard and enterprise terminologies
- It's about *speaking the same language*
 - Across applications
 - Across organizations
- From a multilingual perspective, it's about *referring to the same concepts*

Facts

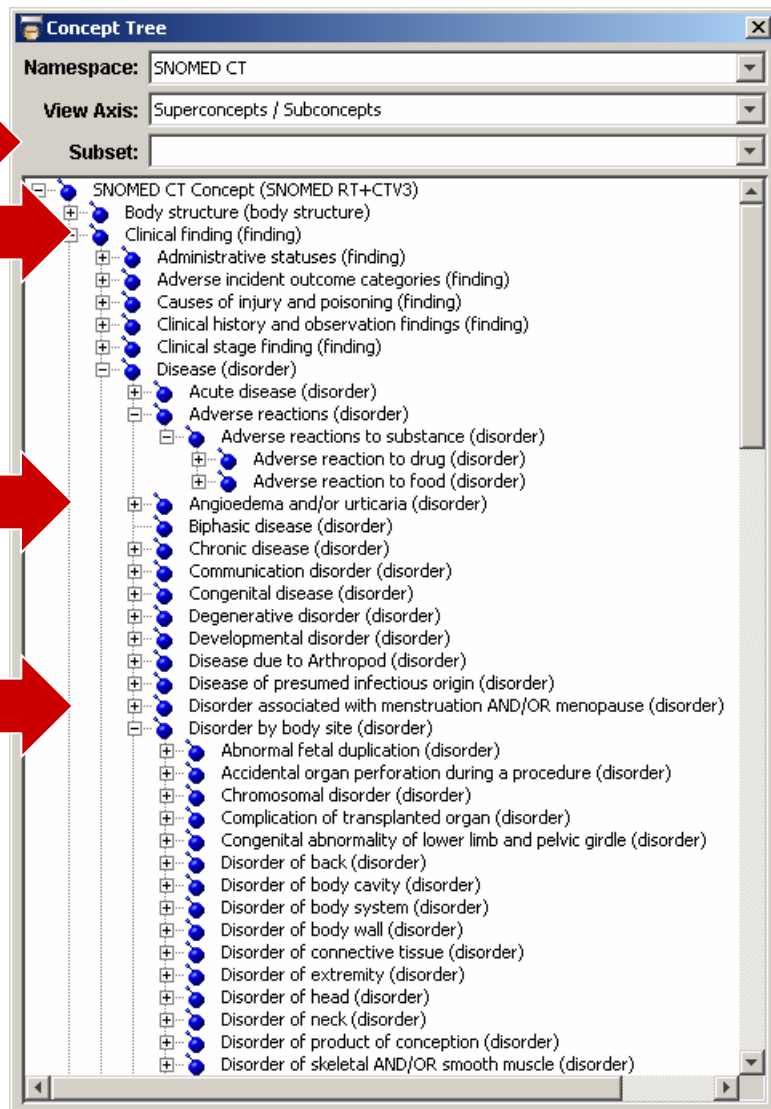
Most of the world's standard healthcare terminology resources have been built and/or are maintained with Apelon tools, including

- SNOMED
- CPT
- ICD-9-CM
- NDF-RT
- UMLS

Bethesda Office



What is a Structured Formal Terminology?

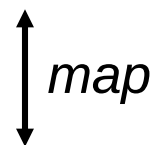


- A structured terminology is composed of *concepts* along with *synonymous terms*, *properties* and various relationships, especially a *taxonomy*
- A formal terminology (or ontology) uses principles of formal logic which allow computers to reason about the content

What is a Mapping?

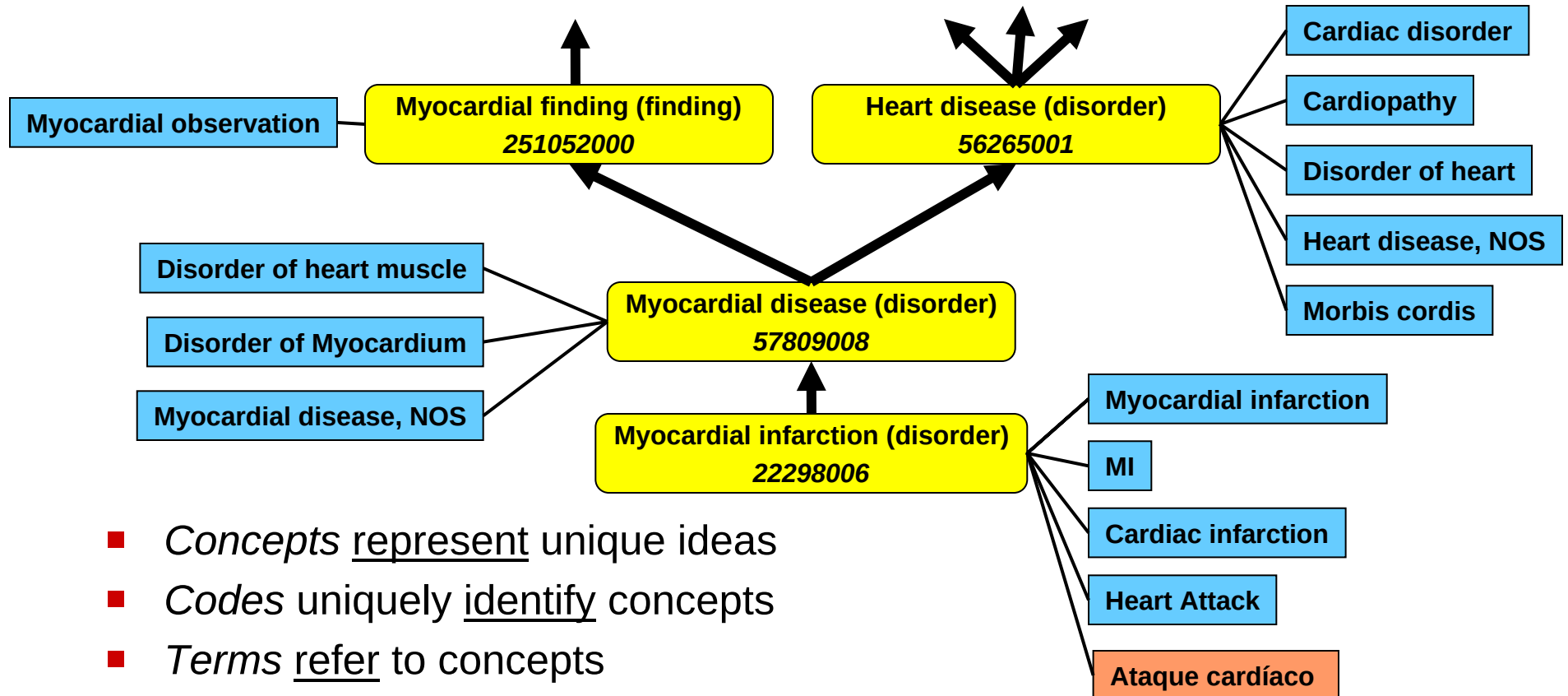
Mapping is the process of developing relationships (maps) between elements in two different terminologies to facilitate exchange of information by meaning

Podunk Medical Center: AN9876 Diabetes



SNOMED CT: 73211009 Diabetes Mellitus (disorder)

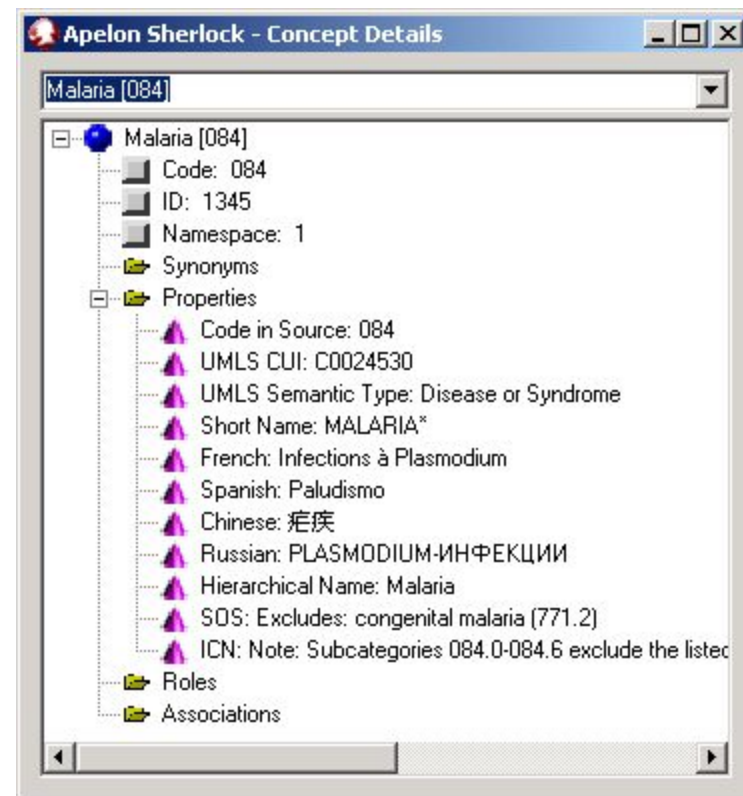
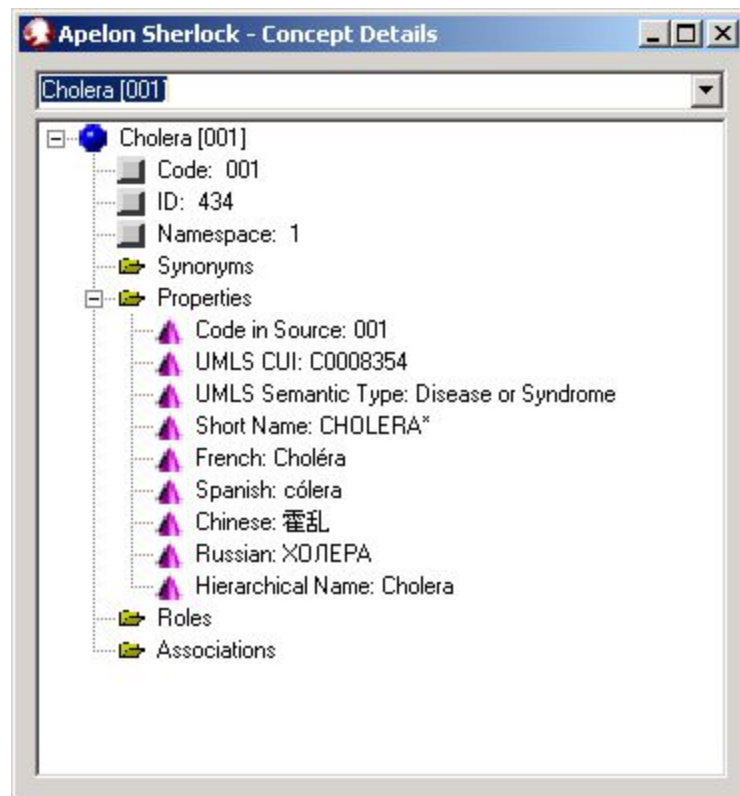
Terminology Elements



- Concepts represent unique ideas
- Codes uniquely identify concepts
- Terms refer to concepts
- Typically
 - Humans communicate concepts using terms
 - Computers communicate concepts using codes
- Concepts are language independent; concepts are dependent

Language Translation

- Render terminology in other human language(s)



Interplay among Terminology Elements

- Humans and computers
 - select, apply and transform
 - concepts, codes and terms
 - Across human languages
 - Across contexts (geographic, medical specialty, etc.)
 - Across applications
- Example scenario
 1. English *term* entered by clinician
 2. *Term* is encoded in SNOMED
 3. *Code* is recorded in Electronic Health *Record*
 4. *Record* is retrieved
 5. *Record* is transmitted to another application in another institution
 6. *Code* is extracted
 7. *Term* is requested e.g.,
 - ◆ Spanish term
 - ◆ Consumer term
 - ◆ Spanish consumer term
- Terminology servers facilitate such actions

Why Standard Terminology?

- Provide *consistent meaning*
- Promote *shared understanding*
- Facilitate *communication* with humans
- Enable *comparison* and *integration* of data
- Essential for *interoperation* among systems, applications and institutions
- Crucial for Electronic Health Record (EHR) *sharing* and *portability*
 - Organization with disparate systems
 - Regional Health Information Organization (RHIO)
 - National Health Information Network (NHIN)

Terminology for EHRs

“The two groups urged the President to increase support and efforts to formally adopt EHR standards for use in the healthcare industry that ensure a complete, legal, and uniform health record and to accelerate efforts to upgrade and ensure the coordination of health information data standards including classifications, terminologies, and vocabularies.”

- American Health Information Management Association (AHIMA)
- American Medical Informatics Association (AMIA)

(February 2, 2006)



Example: National Health Information Network

- Architecture prototypes
- Consortia funded by ONCHIT (HHS)
- Accenture, Apelon, et al.
 - Providers and RHIOs in Tennessee, Virginia, Kentucky and West Virginia
 - Emphasis on data standardization
 - Medications, labs, diagnoses, demographics
- Apelon role
 - Mappings of local terms to standard terminologies
 - ◆ Developed with Apelon TermWorks
 - ◆ Maintained with Apelon Distributed Terminology System (DTS)
 - ◆ Deployed with Oracle Health Transaction Base (HTB)
 - Enable system interactions

Example: Medication Terminologies

First DataBank NDDF+

- HYDROCODONE BIT/ACETAMINOPHEN 5-500MG TABLET
GCN_SEQNO: 004204

MediSpan MDDDB

- Acetaminophen w/ Hydrocodone Tab 500-5 MG
GPI: 03679

Micromedex RED BOOK

- ACETAMINOPHEN/HYDROCODONE BITARTRATE 500 MG-5 MG Oral (systemic) tablet
GFC: 101828

Multum MMSL

- acetaminophen-hydrocodone 500 mg-5 mg oral tablet
MMDC: 452

SNOMED-CT

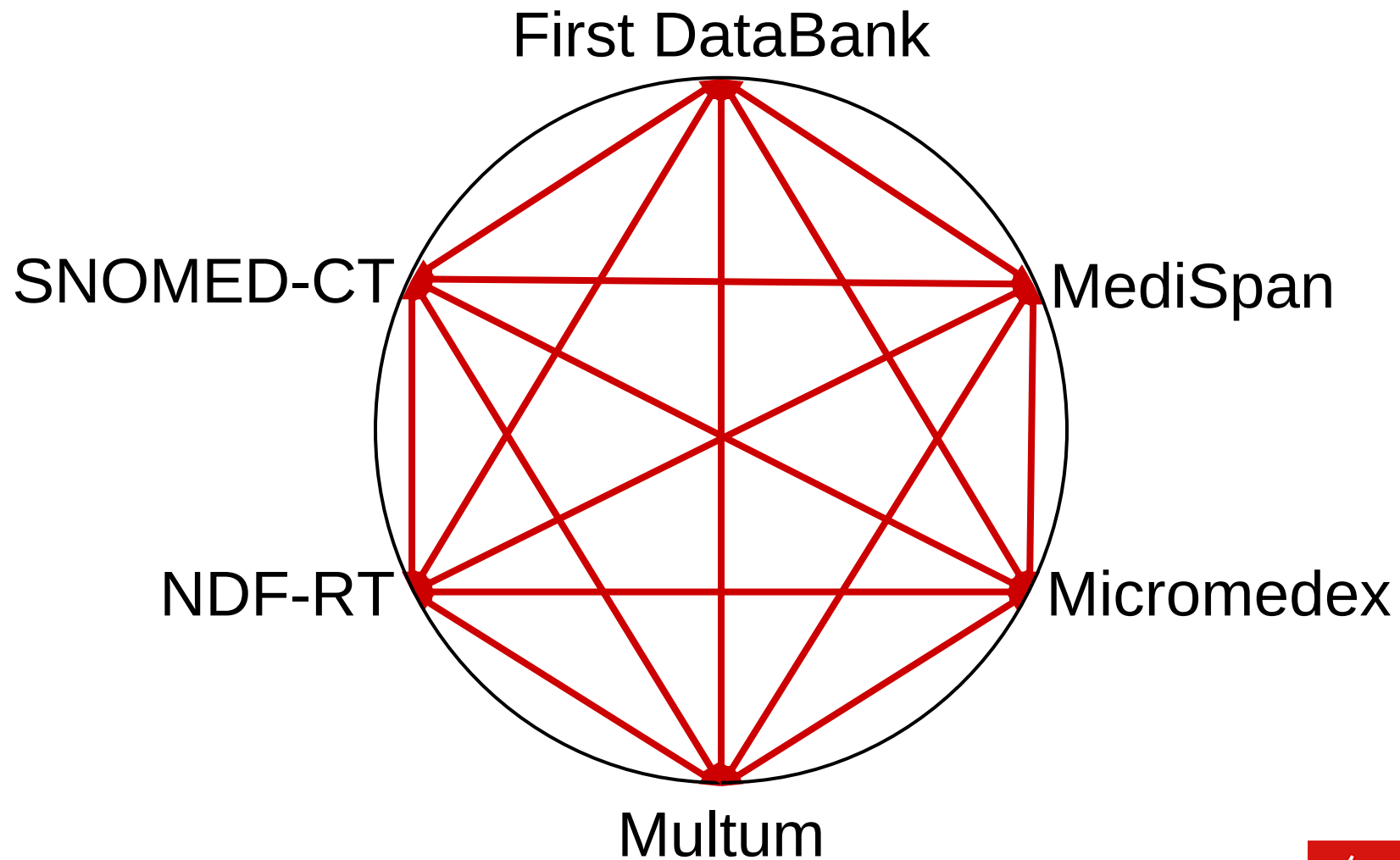
- Acetaminophen+hydrocodone bitartrate 500mg/5mg tablet
SCID: 377300000

VA NDF or NDF-RT

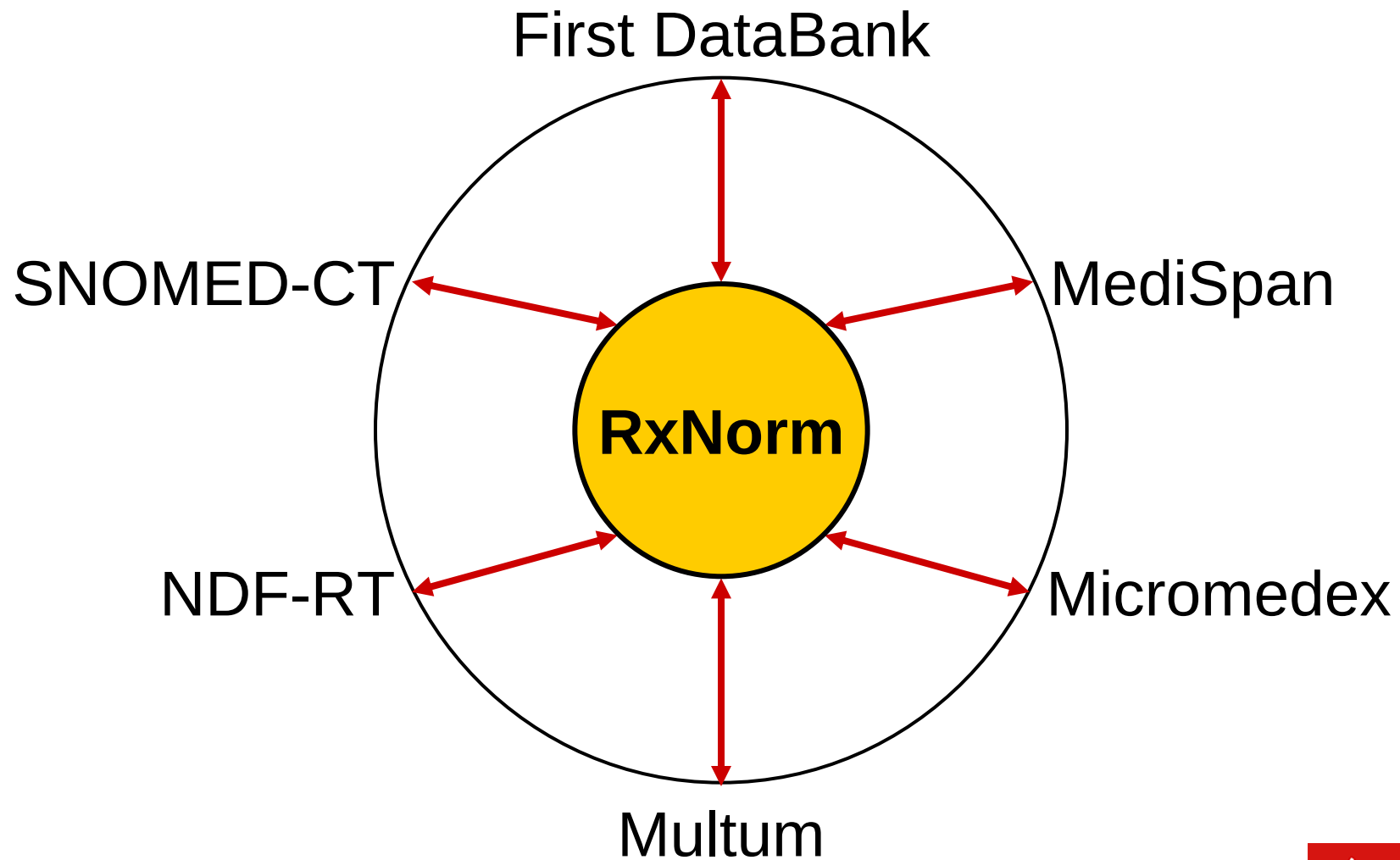
- HYDROCODONE 5MG/ACETAMINOPHEN 500MG TAB
NDC: 00029136530



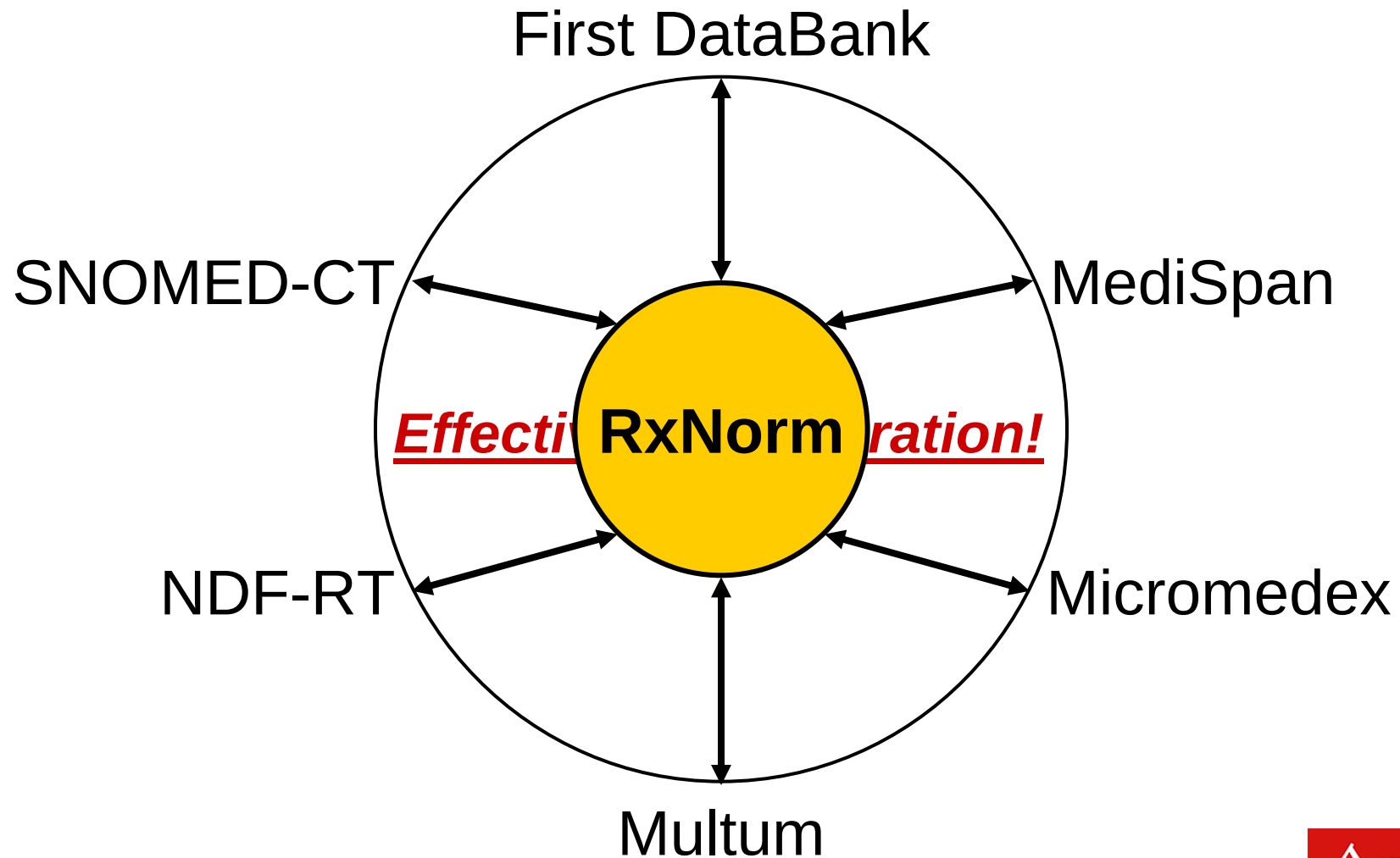
Interoperation



Interlingua



Interlingua



Case Study: MTMS

- Medication Terminology Mediation Server
- U.S. Department of Defense (DoD) engaged Apelon to pursue interoperability among diverse medication terminologies for its EHR system and ancillary systems
- Apelon implemented and deployed a successful prototype MTMS by extending our Distributed Terminology System (DTS)



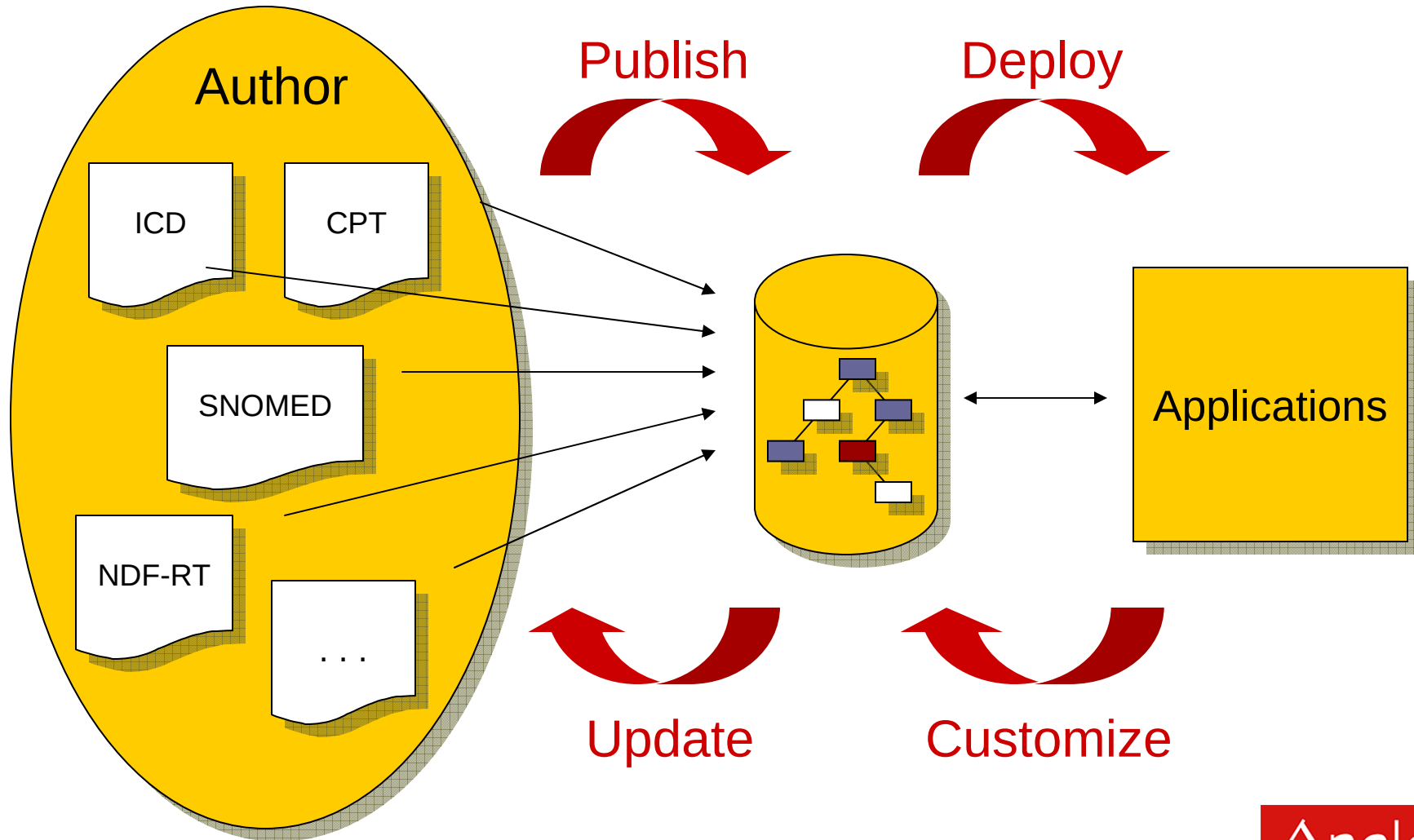
Apelon



Further Significance ...

- Structured terminologies are needed in healthcare for
 - Reimbursement
 - Data integration
 - Decision support
 - Clinical guidelines
 - Medical error reduction
 - Clinical trials
 - Public health surveillance
- Medical terminology is fundamental to Healthcare IT just as words are to human communication

Terminology Life-Cycle

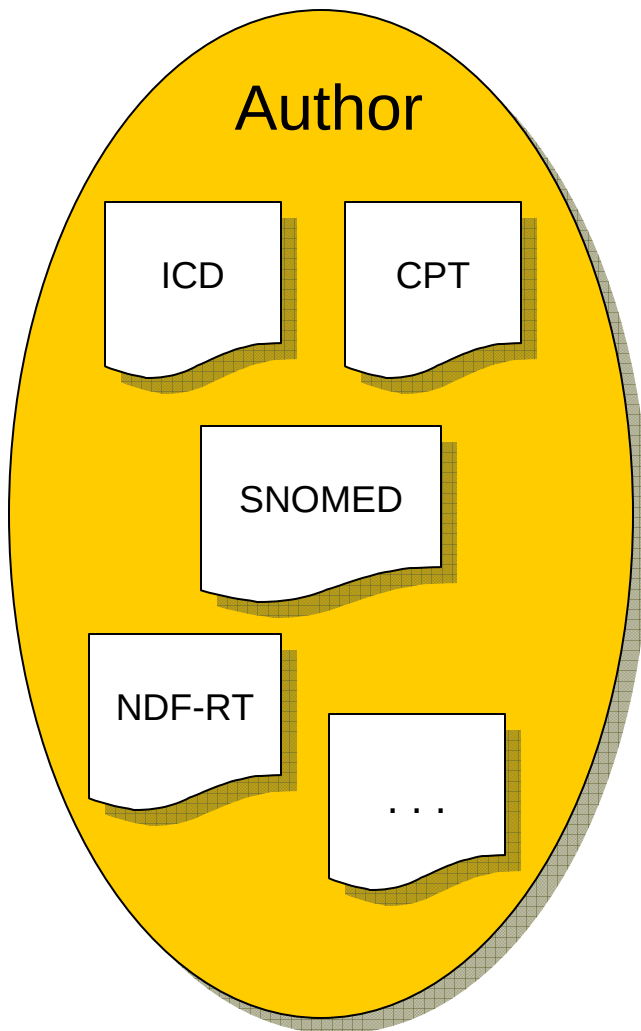


Terminology Software

1. Terminology authoring
2. Terminology mapping
3. Terminology deployment



1 – Terminology Authoring



- Example: *Apelon Terminology Development Environment (TDE)*
- Tools to effectively create and maintain structured terminologies
 - Commercial product – *CPT*
 - Internal infrastructure – *Kaiser Permanente CMT*
 - Public benefit – *SNOMED CT, NDF-RT, NCI Thesaurus, AMT*

Apelon Ontology Editor

File View Search Tools Options Help

Hierarchy Tree :: Defined View (classic)

- SNOMED CT Concept (SNOMED RT+CTV3)
 - Attribute (attribute)
 - Body structure (body structure)
 - Context-dependent categories (context-dependent categories)
 - Disease (disorder)
 - Acute disease (disorder)
 - Acute copper poisoning (disorder)
 - Acute digestive system disorder (disorder)
 - Acute disease of cardiovascular system (disorder)
 - Acute disease of hematopoietic system (disorder)
 - Acute disease of lymphatic vessel (disorder)
 - Acute disease of musculoskeletal system (disorder)
 - Acute disease of orbit (disorder)
 - Acute disorder of ear (disorder)
 - Acute drug overdose (disorder)
 - Acute genitourinary disorder (disorder)
 - Acute infectious disease (disorder)
 - Acute inflammatory disease (disorder)
 - Acute metabolic disorder (disorder)
 - Acute nervous system disorder (disorder)
 - Acute adenoviral encephalitis (disorder)
 - Acute ascending myelitis (disorder)
 - Acute necrotizing myelitis (disorder)
 - Acute transverse myelitis (disorder)
 - Acute viral transverse myelitis (disorder)
 - Acute cerebellar ataxia due to varicella (disorder)
 - Acute cerebrovascular insufficiency (disorder)
 - Acute confusional migraine (disorder)
 - Acute disseminated encephalomyelitis (disorder)
 - Acute infection of spinal cord (disorder)

Tree Editor

Acute ascending myelitis (disorder)

- Defined
 - Kind: SNOMED_kind
 - Code: DA-10151
 - Id: 8528005
 - Acute inflammatory disease (disorder)
 - Acute nervous system disorder (disorder)
 - Myelitis (disorder)
 - some Course (attribute): Acute (qualifier value)
 - Role Group 1
 - SNOMED_CODE: DA-10151
 - SNOMED_DESCRIPTION: 15066015|Acute ascending myelitis|1|0
 - SNOMED_DESCRIPTION: 827301010|Acute ascending myelitis (disorder)|3|0
 - SNOMED_DESCRIPTION_ID: 15066015
 - SNOMED_DESCRIPTION_ID: 827301010
 - SNOMED_PREFERRED_TERM: Acute ascending myelitis
 - SNOMED_TERM: Acute ascending myelitis
 - SNOMED_TERM: Acute ascending myelitis (disorder)

Tree Editor Wells

- Super Concept
- Access (attribute)
- Approach (attribute)
- Associated etiologic finding (attribute)
- SNOMED_CODE
- SNOMED_DESCRIPTION
- SNOMED_ICD9_MAP
- SNOMED_ICD9_MAP_CATEGORIZED
- SNOMED_ICD10_MAP

Save Undo New Delete

Concept Versions

	Jan 8, 2003 4:57:54 PM
Name	Acute ascending myelitis (disorder)
Type	Defined
Kind	SNOMED_kind
Code	DA-10151
ID	8528005
Super Concept	Acute inflammatory disease (disorder)
Super Concept	Acute nervous system disorder (disorder)
Super Concept	Myelitis (disorder)
Associated morphology (attribute)	Inflammation (morphologic abnormality) some
Course (attribute)	Acute (qualifier value) some
Finding site (attribute)	Spinal cord structure (body structure) some
SNOMED_CODE	DA-10151
SNOMED_DESCRIPTION	15066015 Acute ascending myelitis 1 0
SNOMED_DESCRIPTION	827301010 Acute ascending myelitis (disorder) 3 0
SNOMED_DESCRIPTION_ID	15066015
SNOMED_DESCRIPTION_ID	827301010
SNOMED_PREFERRED_TERM	Acute ascending myelitis
SNOMED_TERM	Acute ascending myelitis
SNOMED_TERM	Acute ascending myelitis (disorder)

Concept Walker

- Acute inflammatory disease (disorder)
- Acute nervous system disorder (disorder)
- Myelitis (disorder)

Acute ascending myelitis (disorder)

- Acute necrotizing myelitis (disorder)
- Acute transverse myelitis (disorder)
- Acute viral transverse myelitis (disorder)

Search

Search For: [] S... C...

Maximum Results: 50 Filter Properties

Search By: ☒ Role ☒ Property ☒ Name

Access (attribute) SNOMED_PREFERRED_TERM

Approach (attribute) SNOMED_TERM

Associated etiologic finding (attribute)

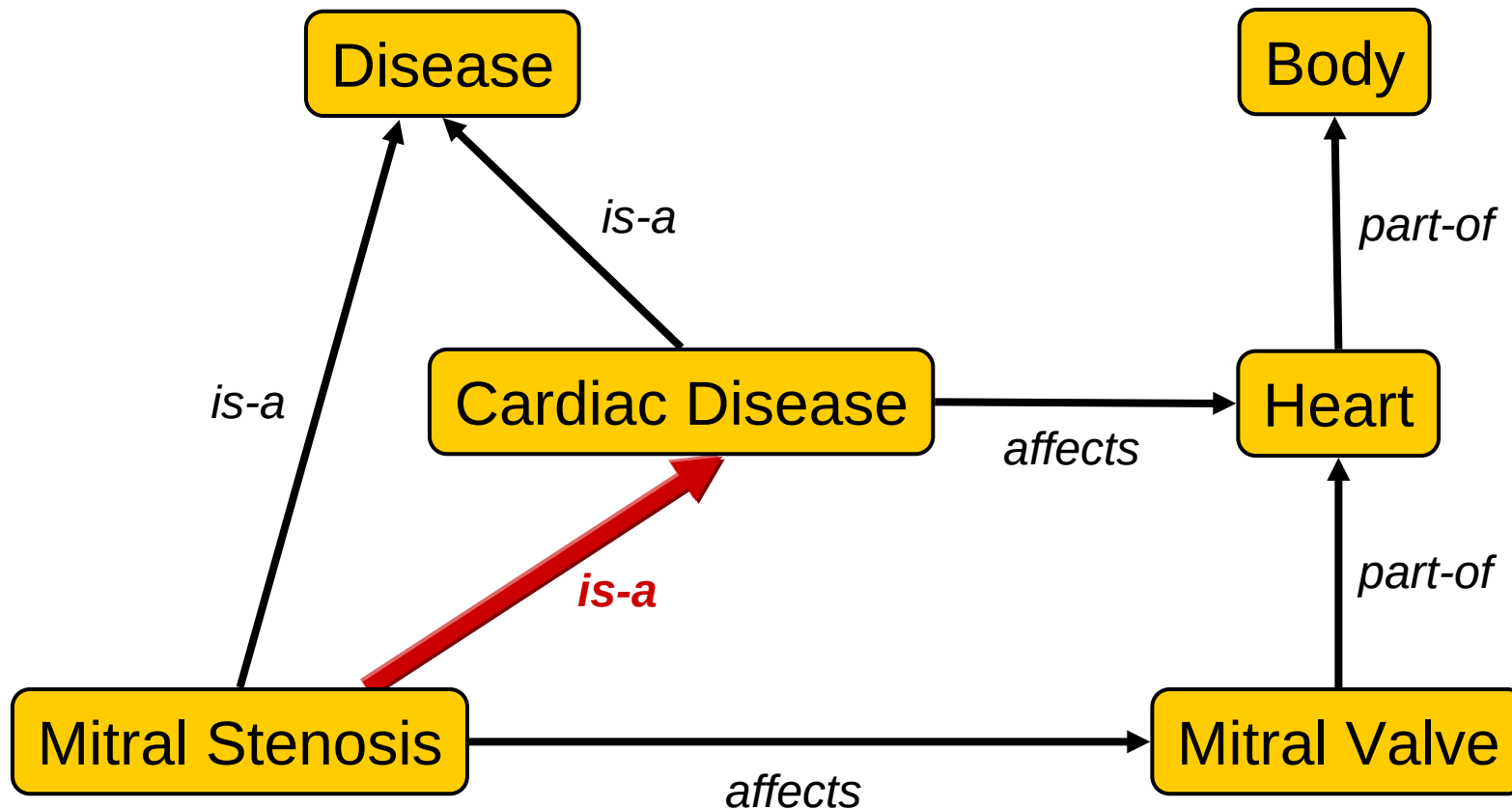
Associated finding (attribute)

Search Results Matches found: 0

Unchanged New Changed Deleted

Connected. User: snomedct Host: millimeter

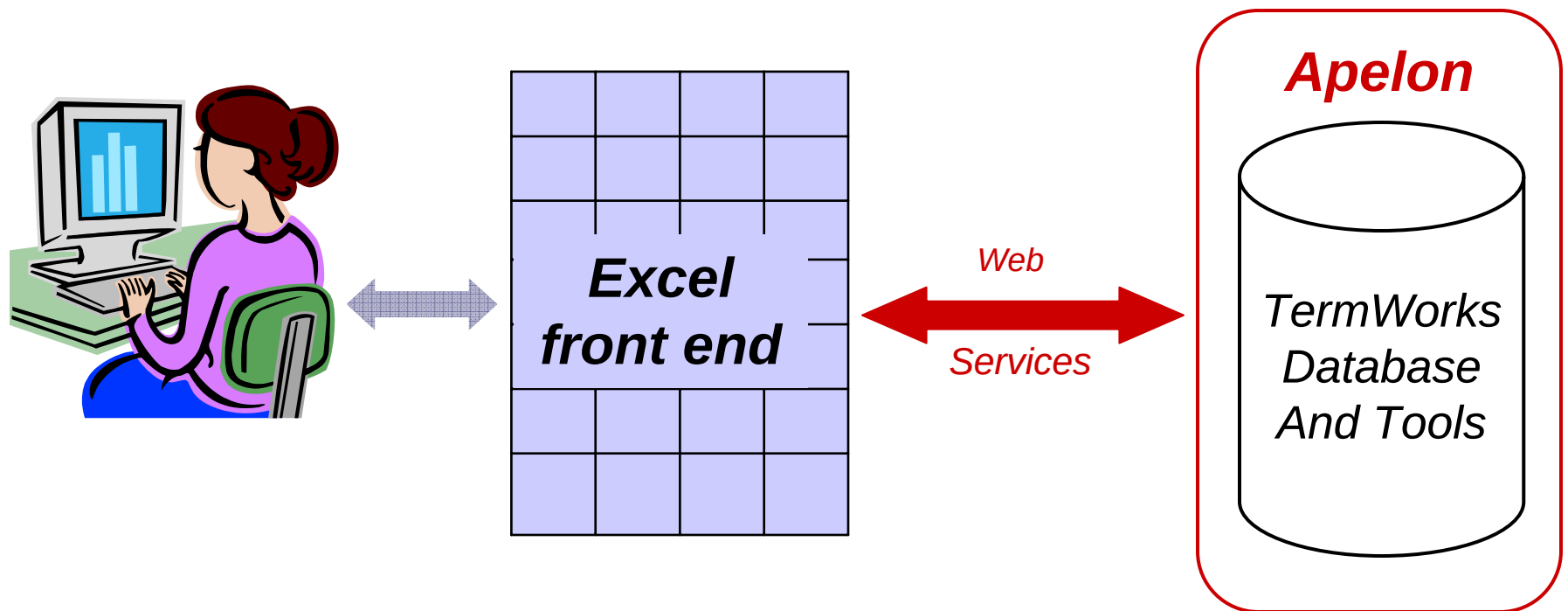
1 – Automatic Classification

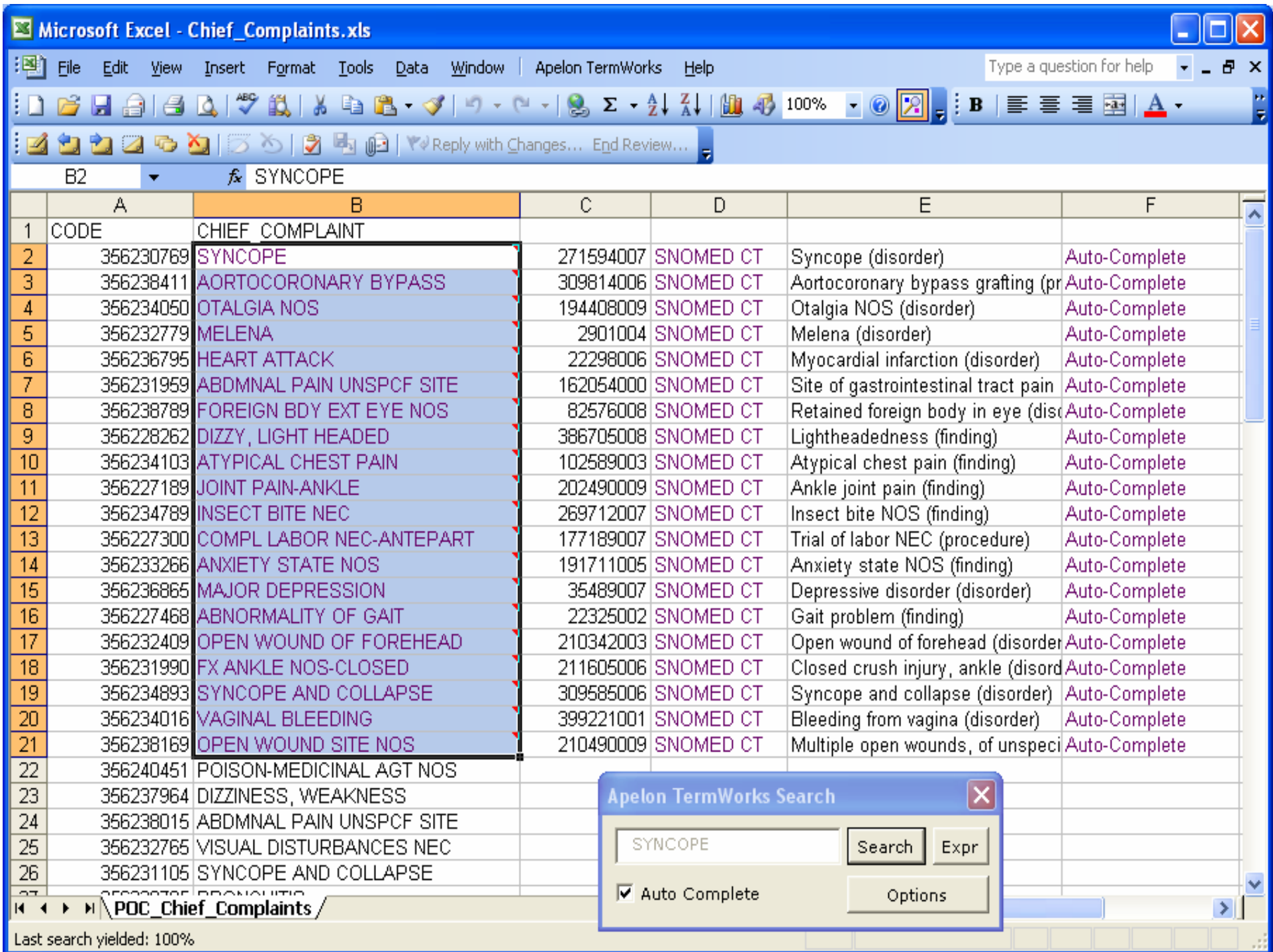


2 – Terminology Mapping

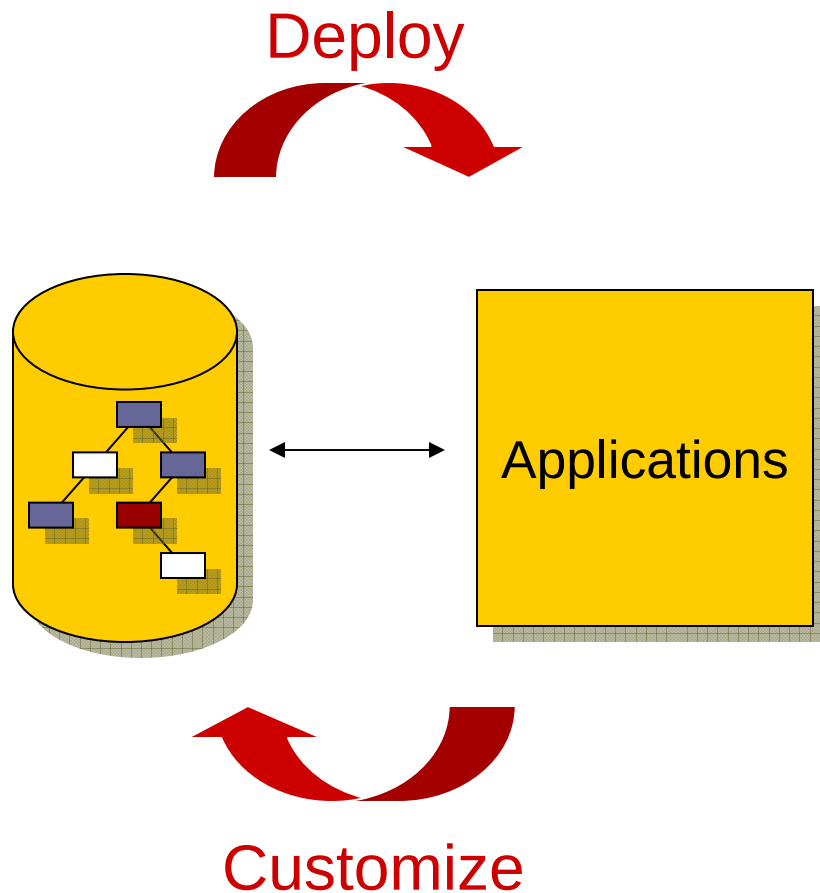
- Crucial for data standardization and interoperation
- Example: *Apelon TermWorks*
 - Terminology web service
 - Easy, low cost, rapid mapping solution
 - Web services standards (SOAP / WSDL)
 - Powerful matching capabilities
 - Comprehensive set of terminologies
 - Deployment via MS Office applications
 - ◆ Charge master management
 - ◆ Laboratory data integration
 - ◆ Legacy data mapping

2 - Easy to Use Excel Plug-in





3 – Terminology Deployment



- Terminology servers reduce costs of terminology acquisition, integration and management
- Applications
 - EMRs and CDRs
 - ◆ NextGen, VA
 - Knowledge repositories
 - ◆ CDC, NCI
 - Healthcare information portals
 - ◆ HKHA

3 – What is a Terminology Server?

A terminology server is
a networked software component
that centralizes terminology content and reasoning
to provide (complete, consistent and effective)
terminology services for other network applications

3 – How is a Terminology Server Used?

- By informaticists
to create, maintain, localize and map terminologies
- By clinical applications and their users
to select and record standardized data
- By integration engines
to map data elements between applications

3 - Examples of Terminology Services

- Term/name normalization:

What is the SNOMED CT name for *heart attack*? ***Myocardial Infarction***

- Code translation:

What is the ICD-9 code for Myocardial Infarction? ***410.9***

- Grouping and aggregation:

Is Myocardial Infarction a Cardiac Disease? ***Yes***

- Clinical knowledge:

What drug treats Myocardial Infarction? ***Streptokinase***

- Local information:

Add L227 as the local code for Serum Calcium. ***OK***

3 – Terminology Services

- Example: *Apelon Distributed Terminology System (DTS)*
- Integrated repository for all terminologies
 - Varying release cycles ➡ regular releases
 - Inconsistent data models ➡ common object model
 - Independent views ➡ integrated view with mappings
 - Current snapshot ➡ version management
- Extensible with local terminology and maps
- Subsets
- Easy subscription updates (with exception reports)
- Desktop editor and webtop browser
- Workflow support
- Flexible import, export and integration
- Innovative perpetual source license

3 – Knowledge Base (KB)

- Clinical (SNOMED CT)
- Reimbursement (ICD, CPT, HCPCS, DRG)
- Pharmaceuticals (Multum, NDF-RT)
- Labs (LOINC)
- Nursing (ICNP, NIC, NOC, and NANDA)
- Adverse events (MedDRA, COSTART, WHOART)
- Extensive crosswalks
- Mappings to MeSH and UMLS CUIs
- *Local additions*

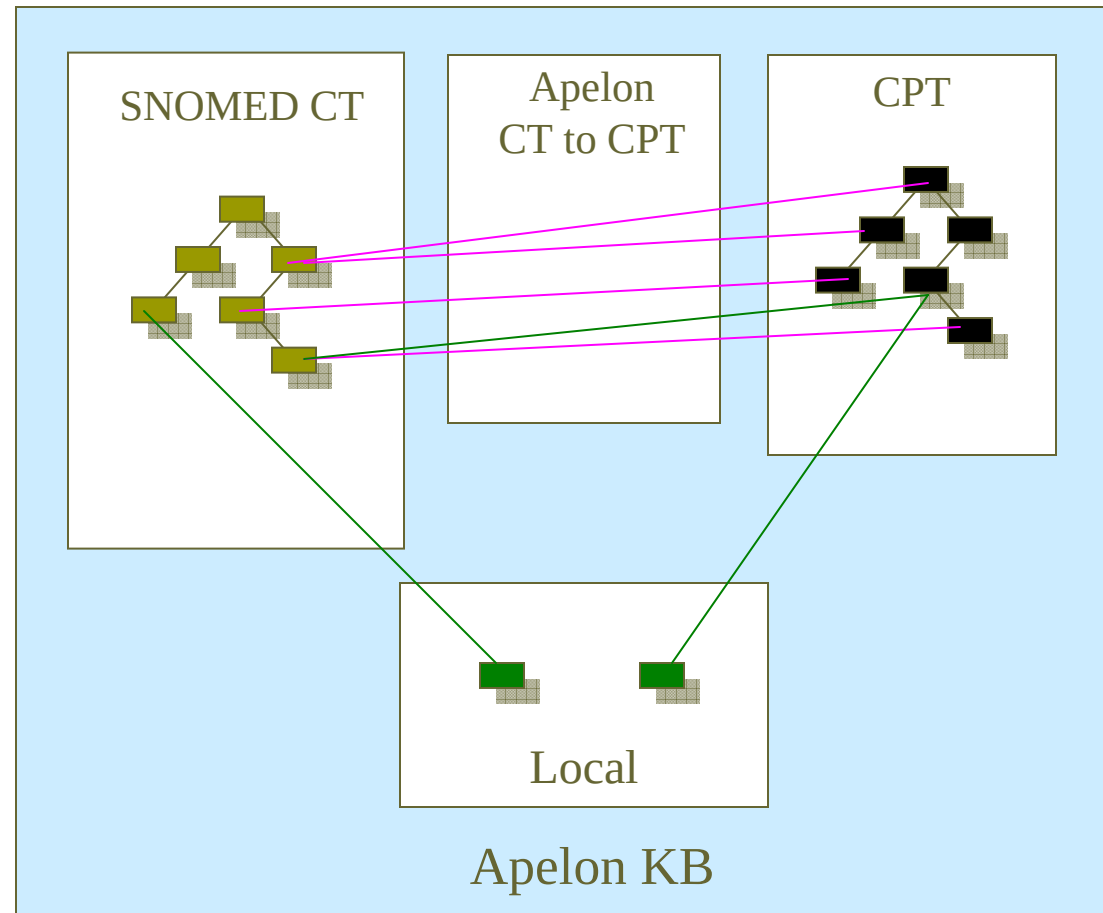
3 - KB Architecture

Subscription Namespaces

- Derived from industry sources
- Provided by Apelon
- “Read only” in DTS

Local Namespaces

- Customer-specific
 - Concepts and terms
 - Properties
 - Associations (e.g., mappings)
- Protected during updates



Terminology Management

■ Complex

- Numerous, large, diverse, richly structured terminologies
- Auxiliary information
- Cross mappings

■ Multidimensional challenges

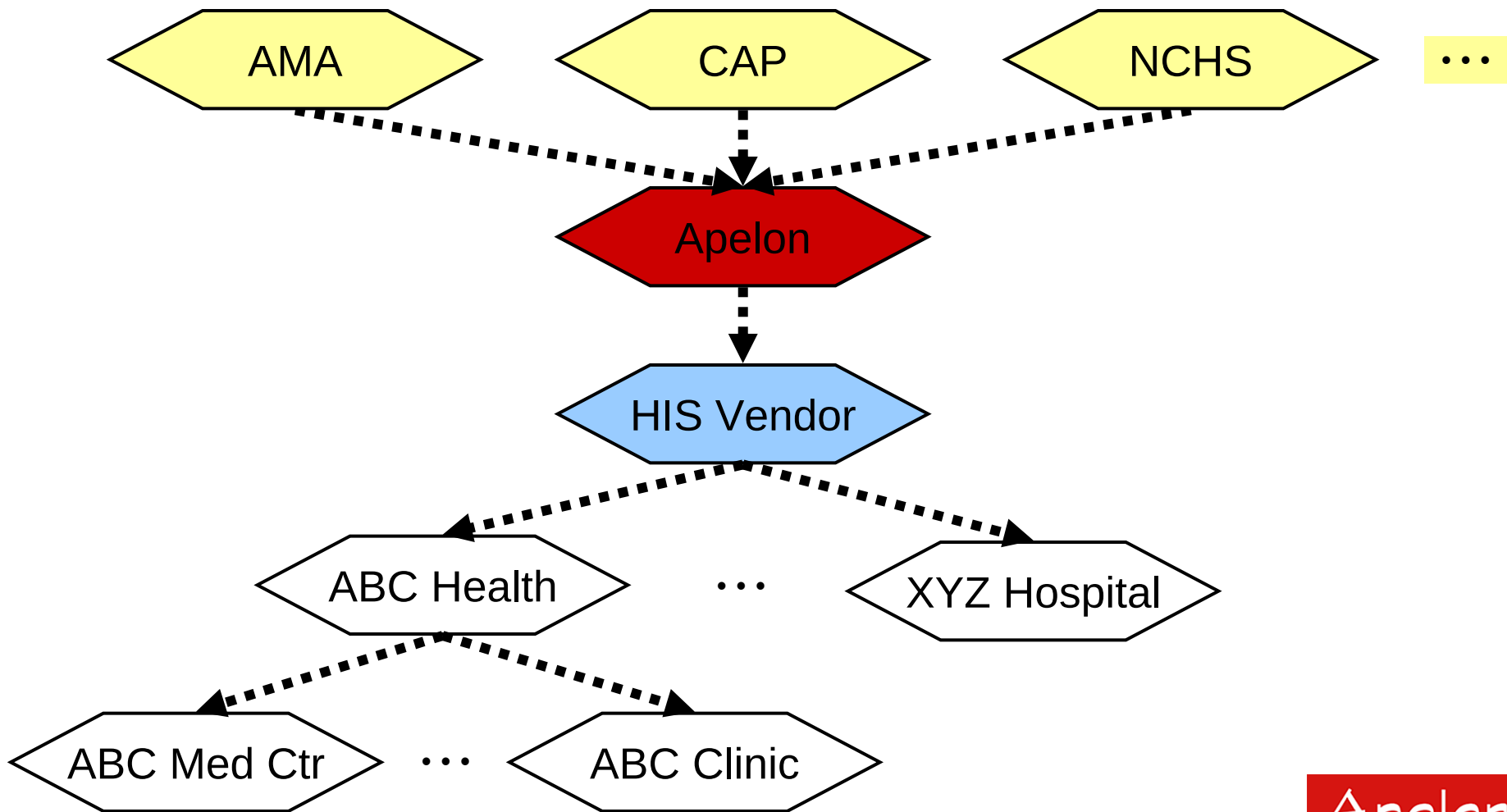
Terminology Supply Chain

SNOMED CT example:

- | | |
|----------------------|----------------------------|
| • CAP | Manufacturer |
| • Apelon | Consolidator / Distributor |
| • HIS Vendor | Value-added Integrator |
| • ABC Health System | Customer |
| • ABC Medical Center | Customer site |

... really a supply *network*!

Supply Network Example



Terminology Management Activities

- **Plan**
- **Build**
 - Author
 - Import
 - Subscribe
 - Customize
 - ◆ Subset
 - ◆ Enhance
 - ◆ Extend
 - Federate or incorporate
 - Map (computer terminologies)
 - Translate (human languages)
 - Report
 - Review and approve Version (snapshot)
 - Submit “terms”
 - Process submissions
 - Maintain
 - Reevaluate
 - Migrate
 - Replace
- **Deploy** (for test *and* production)
 - Publish
 - Extract
 - Transform
 - Load
 - Review in context
- **Apply**
 - Access
 - Post-coordinate
 - Submit “terms”

... with multiple terminologies

... along the supply network

... on multiple platforms

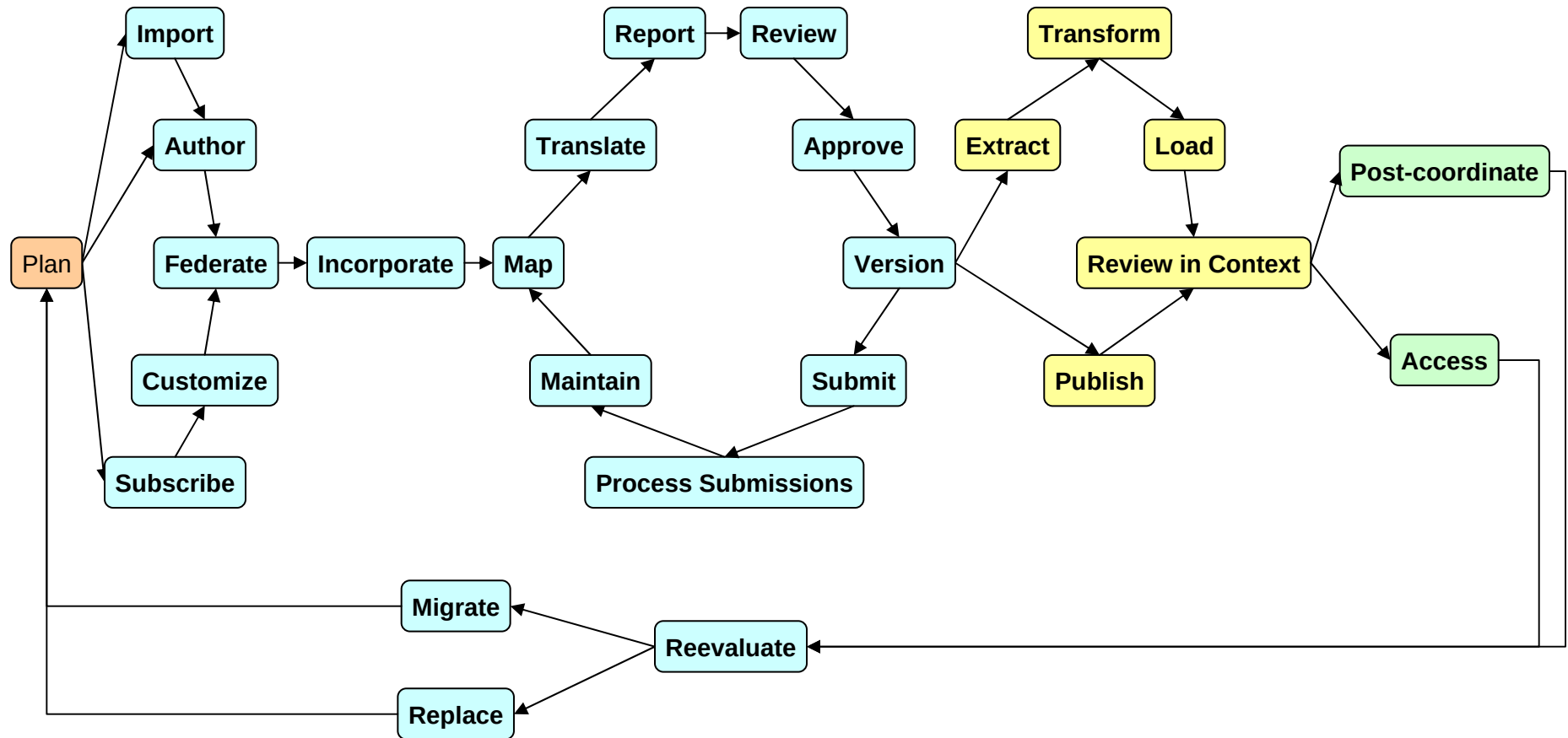
... for multiple applications

... and diverse stakeholders

... throughout a life cycle

... over time

Process (Example Sequencing)



Additional Foci Today

■ Processes

- Publication / subscription
- Customization
- Feedback
- Internationalization / localization

■ Case studies

- SNOMED SDO
- NEHTA
- VHA

Publication and Subscription

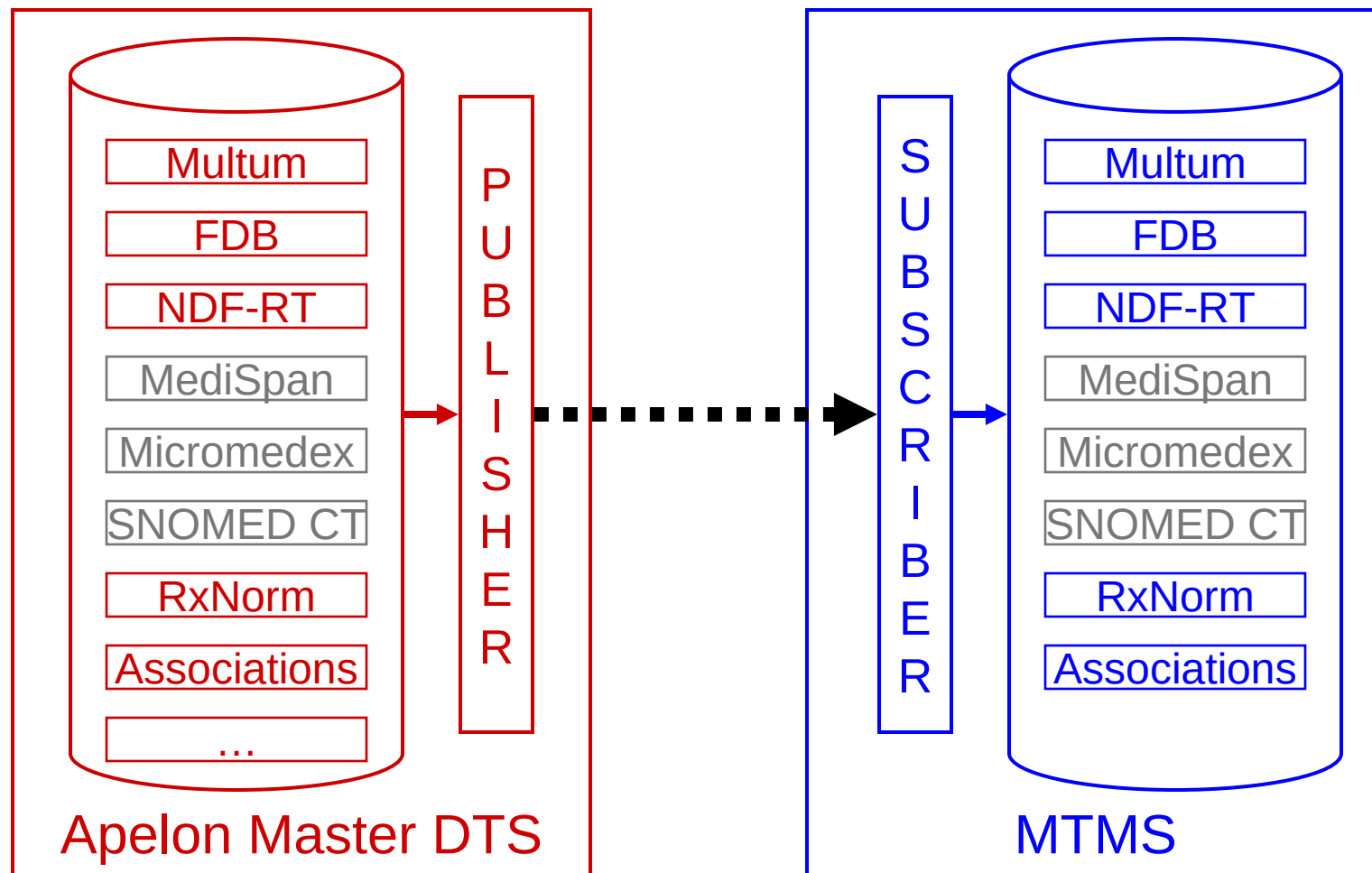
■ Publish

- Deliver terminologies or mappings in standard form (with updates expected)

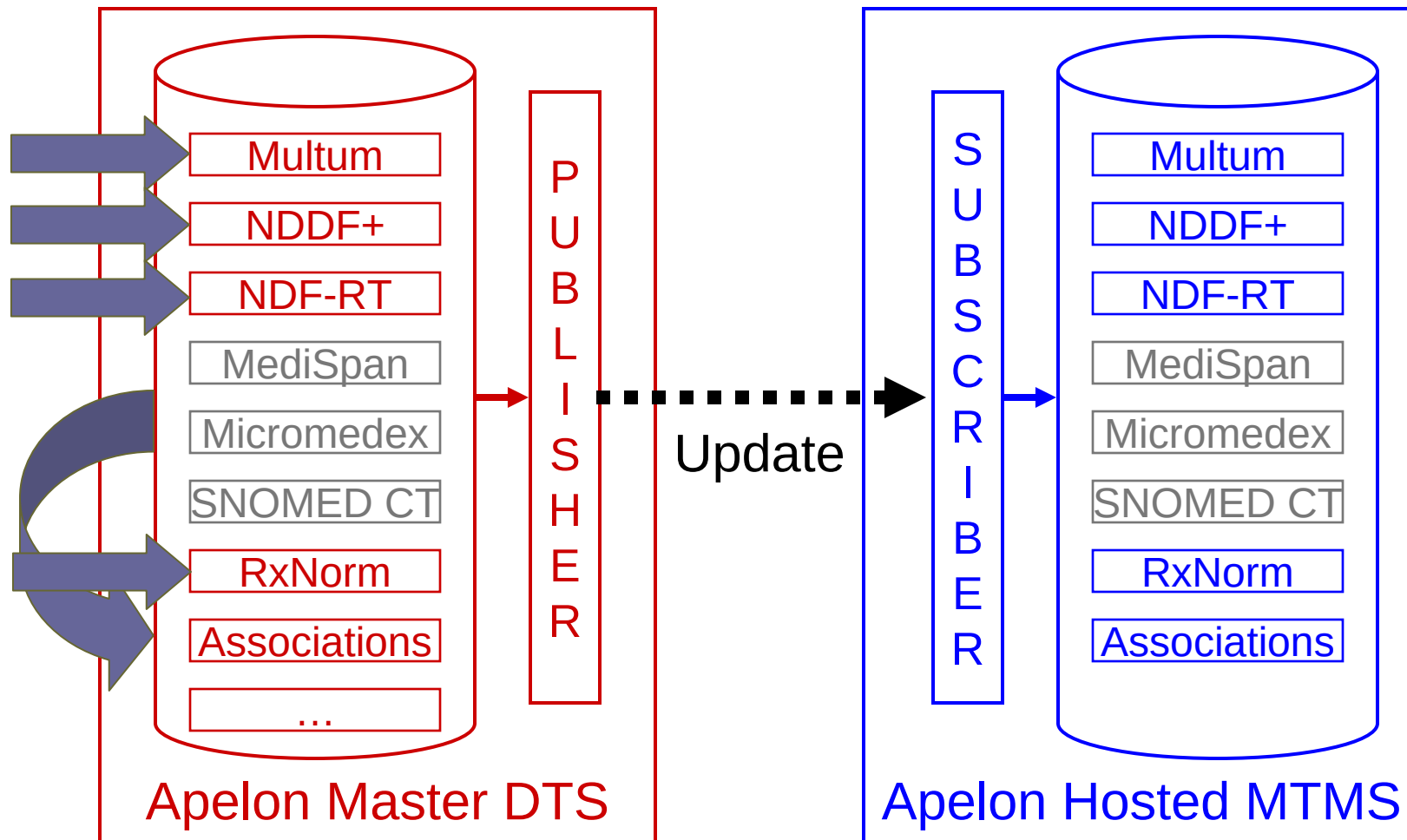
■ Subscribe

- Receive terminologies or mappings in standard form (with updates expected)

Subscription Update Example



Subscription Update Example

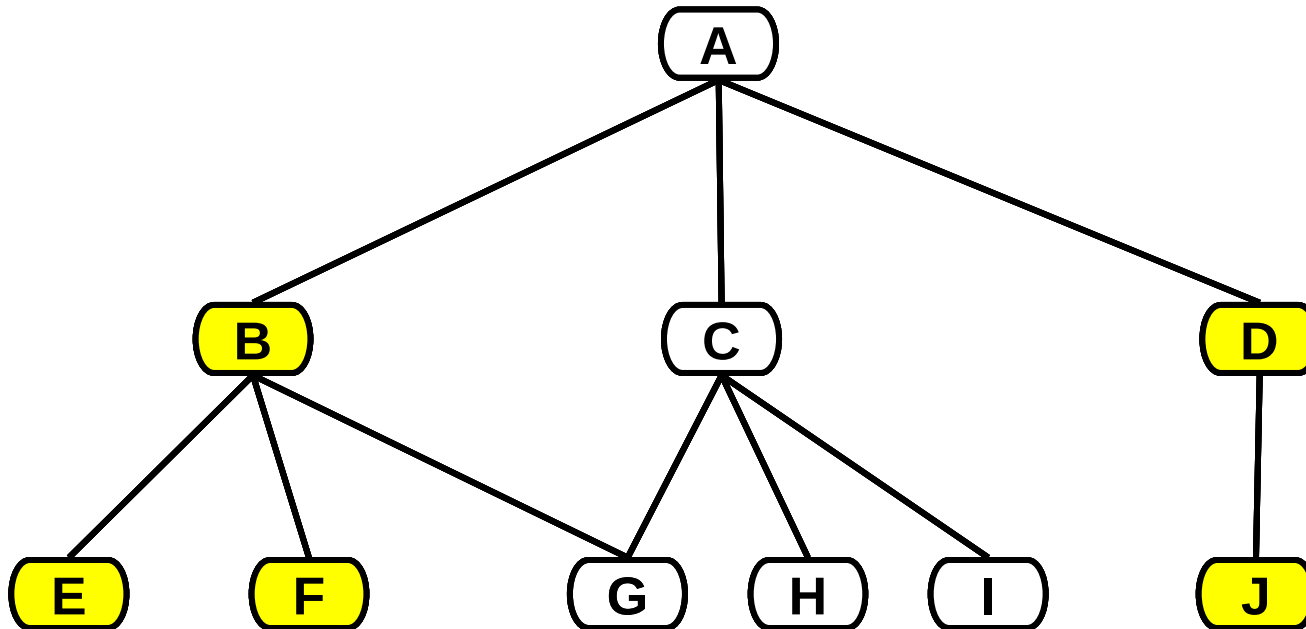


Customize ...

- Tailor terminology to fit local needs
 - Subset
 - Enhance
 - Extend
- At multiple organizational levels

Customize (Choose Subset)

- Select from existing concepts



Considerations for Subsets

- *How can focused choices help?*
- Potential benefits
 - Limit scope to actual needs
 - Focus search for retrieval
 - Populate user interface (pick lists)
 - Facilitate data collection
 - Hone data analysis

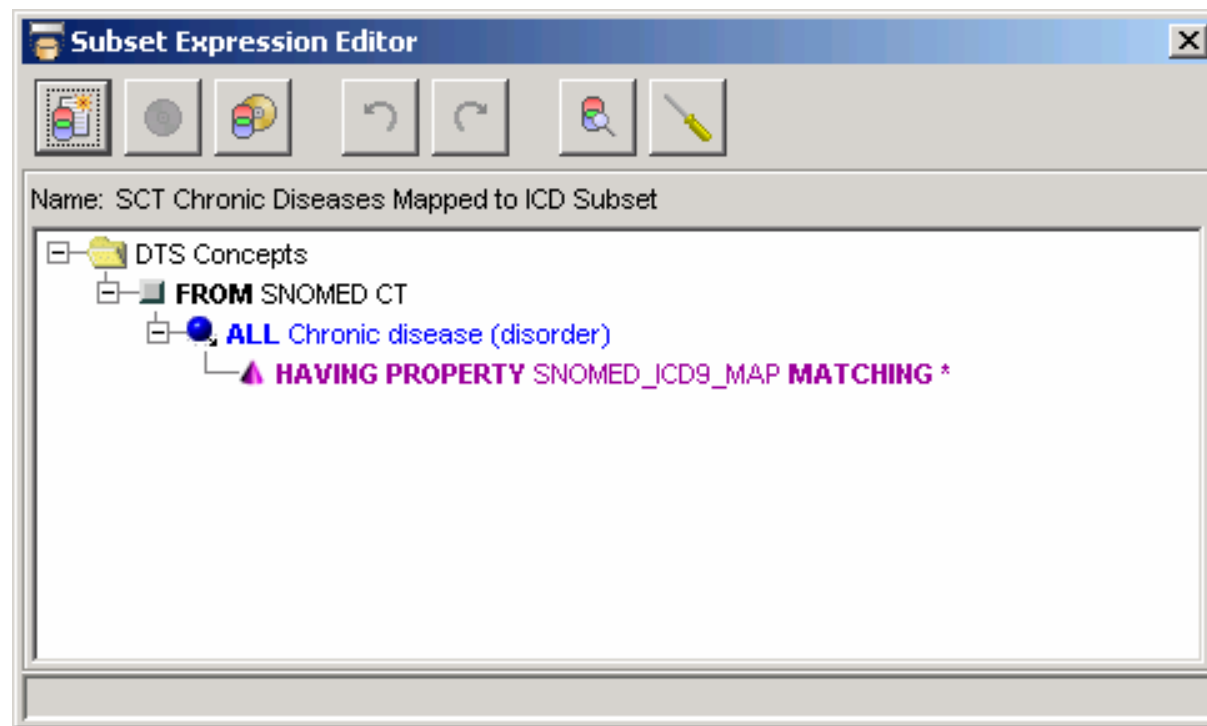


DTS Subsets

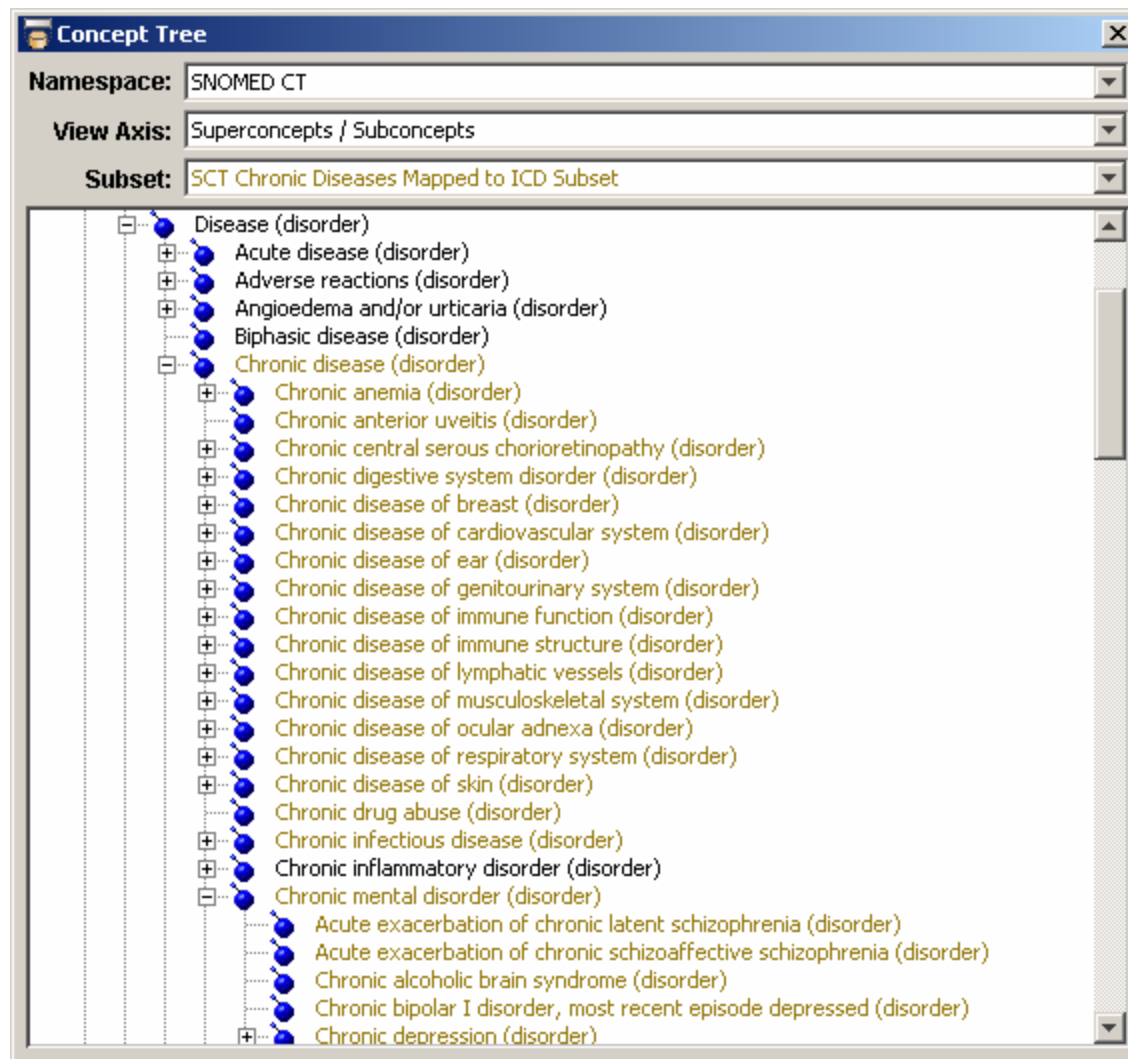
The screenshot shows a software window titled "Subset List". It has a search bar at the top with a dropdown menu set to "Namespace" and a text field containing "SNOMED CT". Below the search bar is a section labeled "Subsets" containing four buttons: "Review", "Refresh", "Export", and "Delete". Below these buttons is a table with four columns: "Name", "Concept Count", "Modified Date", and "Current". The table lists three subsets, all of which are checked in the "Current" column. Below the table is a section labeled "Detail" with five input fields for "Name", "Created By", "Created Date", "Modified By", and "Modified Date". At the bottom of the window are "Apply" and "Close" buttons. A status bar at the very bottom shows "Searching ... done!" and a progress indicator.

Name	Concept Count	Modified Date	Current
SCT Extension Concepts Under My Local Concept	176	06-Mar-2006 04...	☒
SCT Chronic Diseases Mapped to ICD Subset	1232	06-Mar-2006 10...	☒
SCT Diagnostic Imaging Subset	68	06-Mar-2006 08...	☒

Subset Expressions

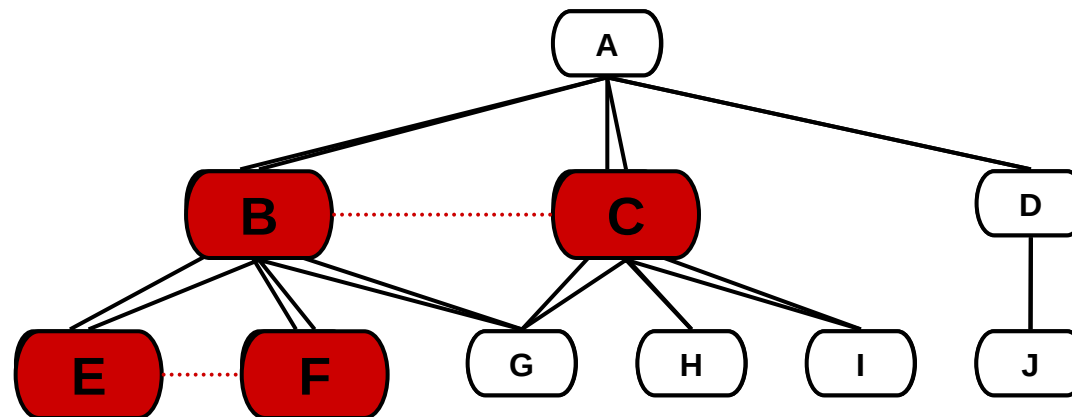


Subset Hierarchy



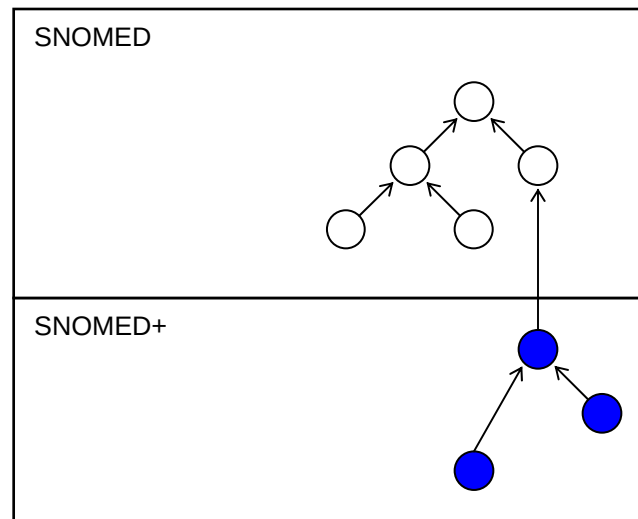
Customize (Enhance)

- Elaborate on existing concepts
 - Synonymous terms
 - Local identifiers and properties
 - Local associations



Customize (Extend)

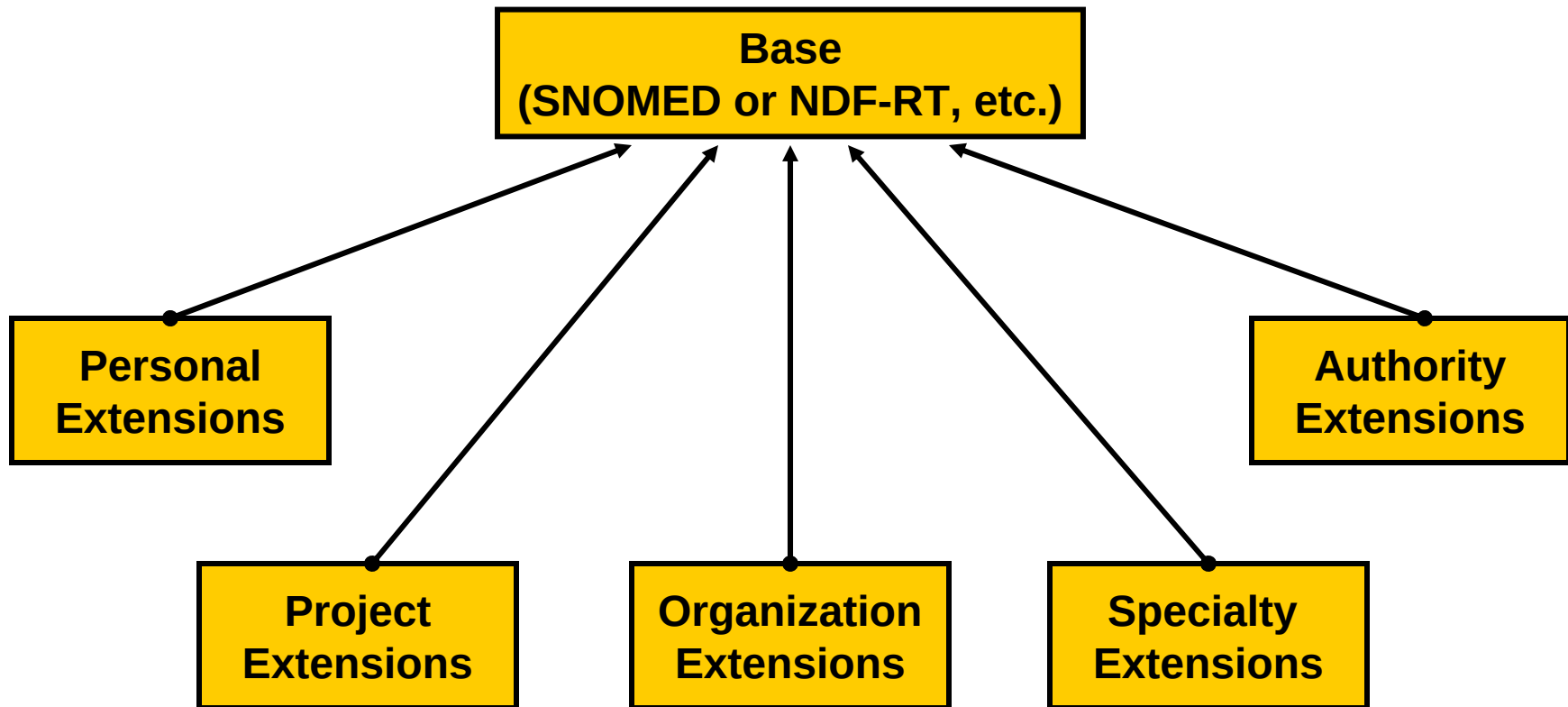
- Create additional concepts to increase breadth and/or depth of coverage



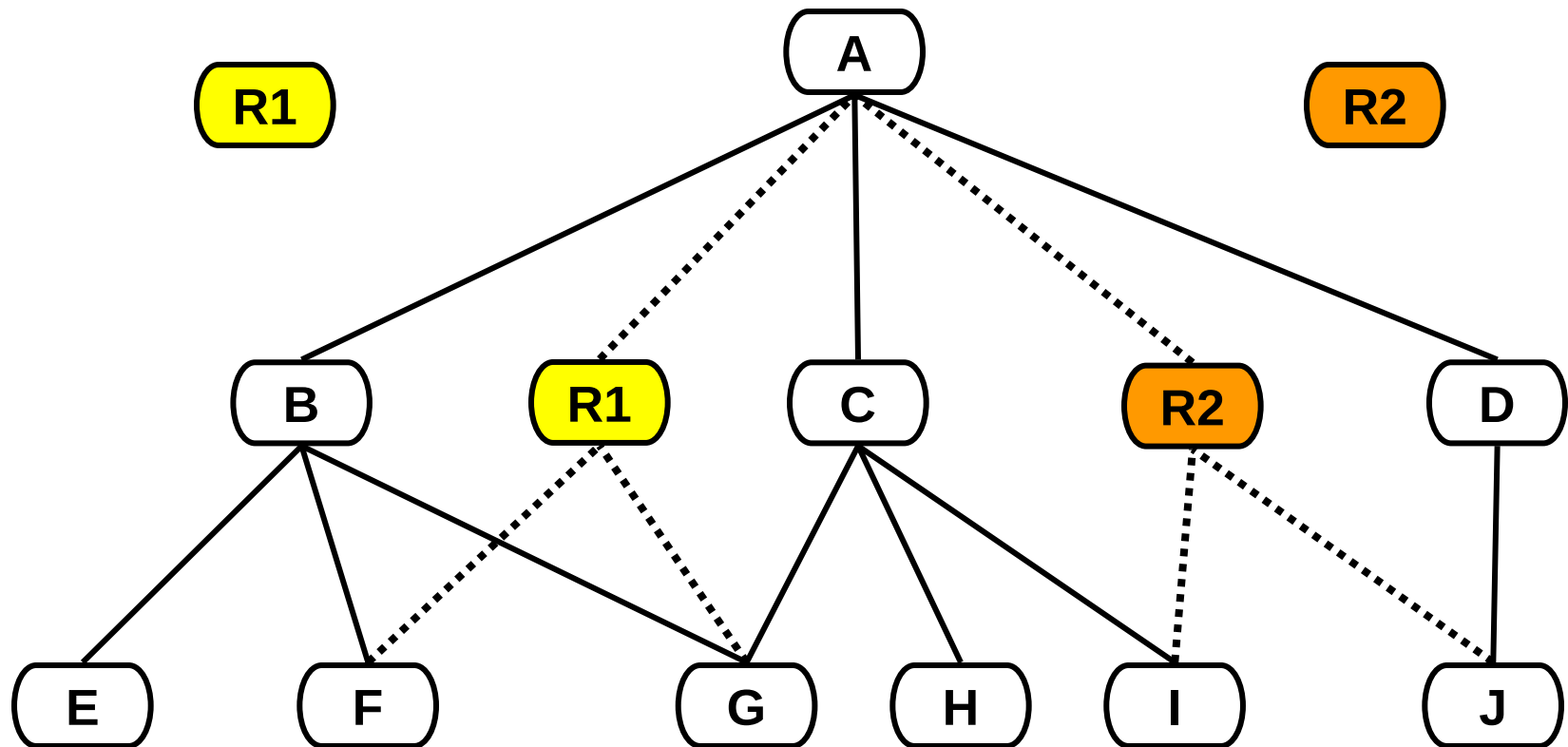
Modular Classification

- Extend Ontylog terminologies
 - Such as SNOMED CT, NDF-RT, ... eventually CPT, ICD
 - Easily and accurately
 - Using the same language
 - To meet local needs
 - In a timely manner
 - For multiple purposes
- Expedite requests to curators

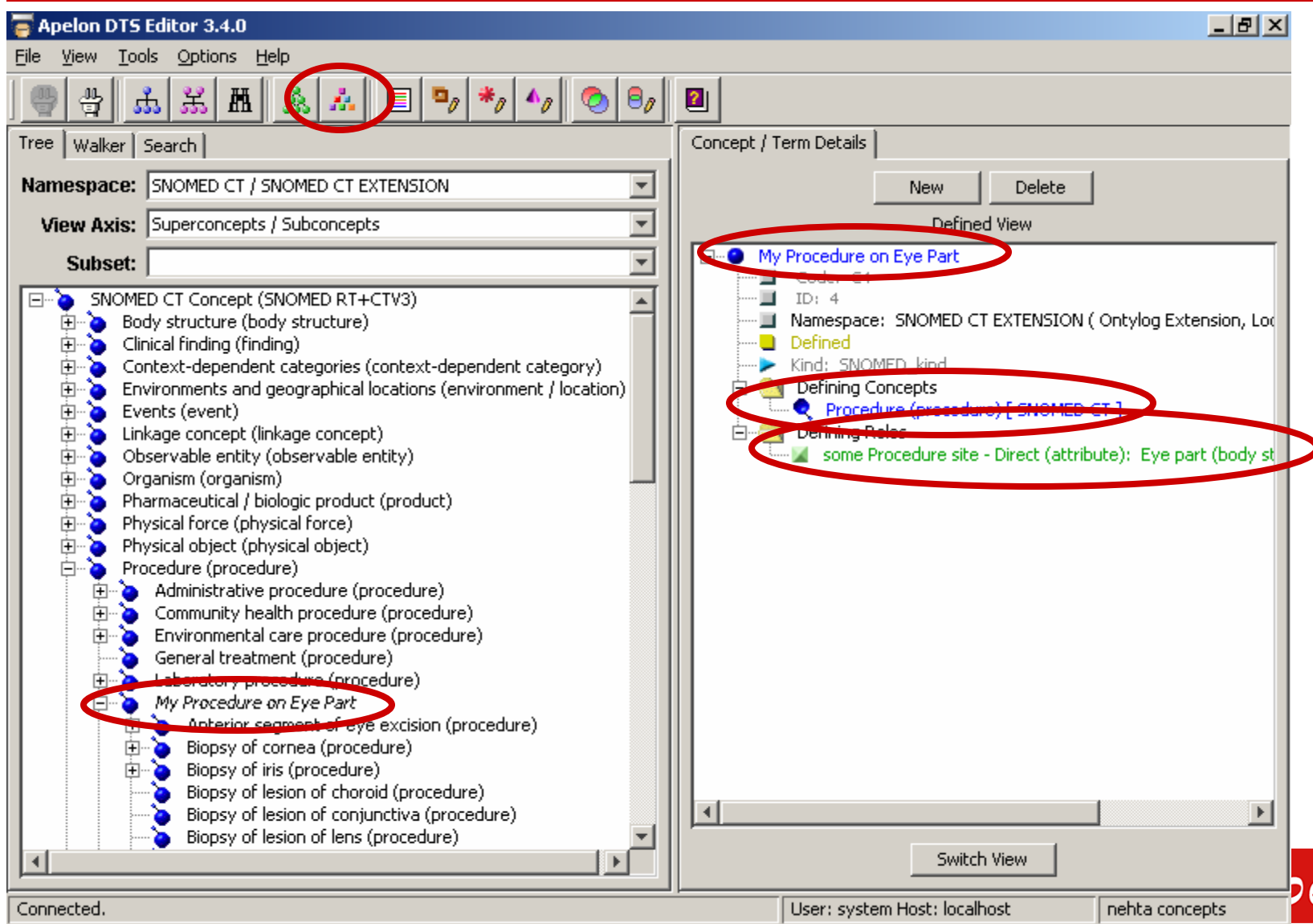
Multiple Extensions



Independent Extensions



Example of Modular Classification



International SNOMED SDO

- The International Health Terminology Standards Development Organization
- Danish Society
 - Non-profit
 - Formation sought by Dec 31, 2006
- Agreement with CAP (October 4 – 5)
 - Transfer of SNOMED CT intellectual property
 - CAP as initial support organization
- National release centers



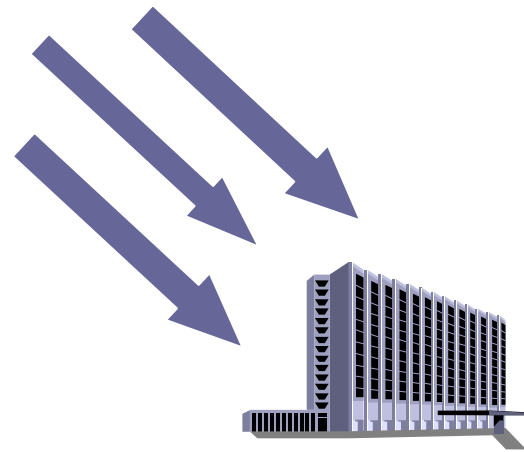
SDO Participation

- Charter members
 - Australia
 - Canada
 - Denmark
 - Lithuania
 - New Zealand
 - United Kingdom
 - United States
- In discussion
 - Netherlands
 - Sweden
- Non-member states
 - Vendor license
 - Affiliate license (R&D)

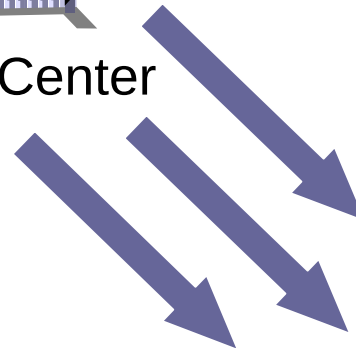


National Terminology Centers

International,
National and Local
Standards

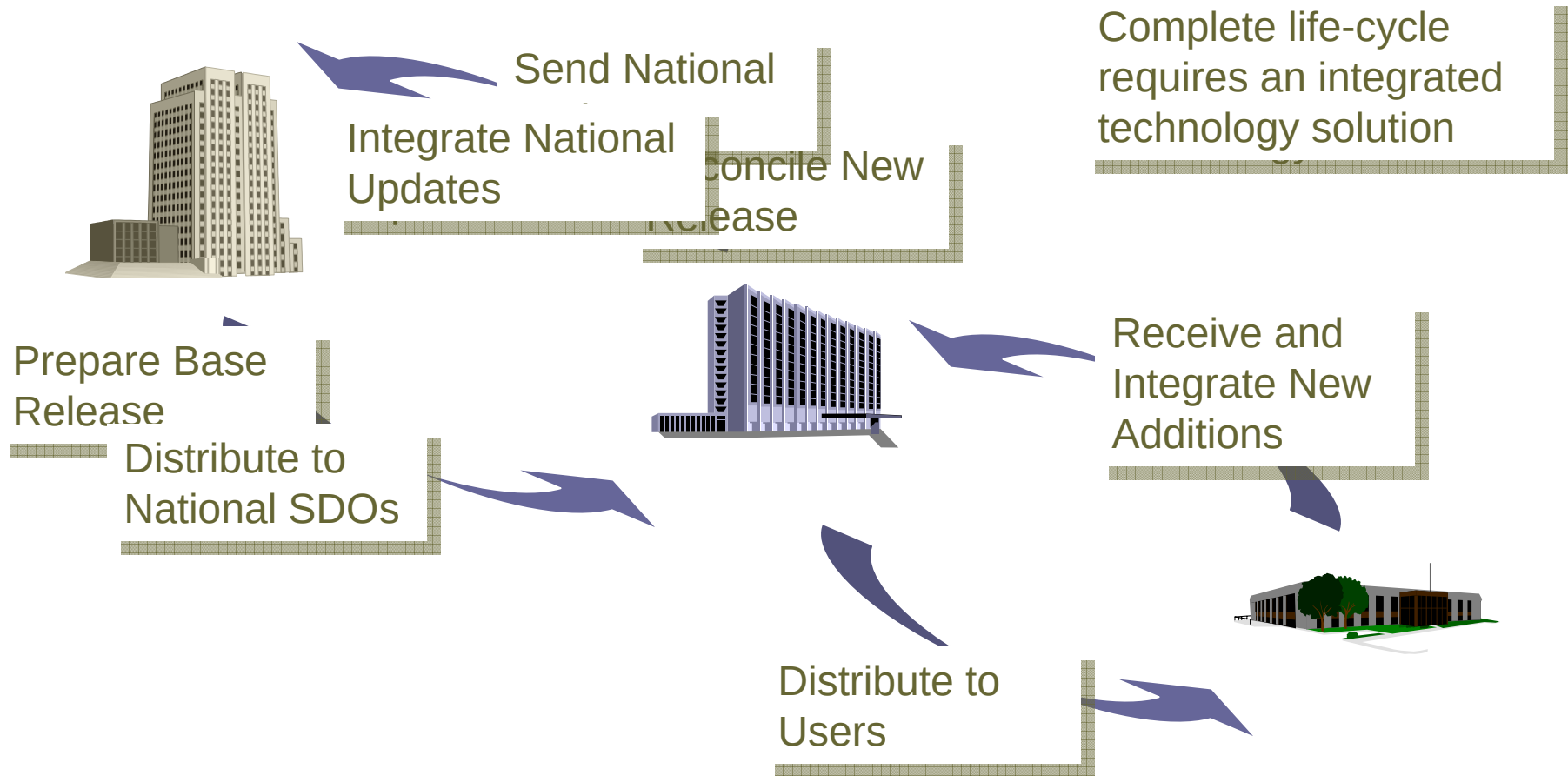


National Center



National Vendors
and End Users

SNOMED SDO Data Flow



SNOMED Customization

- Editions
 - English
 - ◆ US
 - ◆ UK
 - Spanish
 - German
- Extensions
 - US Drug
 - UK Drug
- Subsets
 - Human
 - Anatomic pathology
 - Allergens

NEHTA Case Study

- National e-Health Transition Authority (Australia)
- TDE
 - Develop formal medication terminology
- DTS
 - Subscribe for, integrate, customize and distribute multiple terminologies
- TermWorks
 - NEHTA-wide mapping for consolidation and standardization, e.g., pathology
- Mycroft – Australia-wide dissemination



Australian Medicine Terminology (AMT)

- Extends SNOMED CT
- Subsets planned as core elements of model
- Details new and subject to change!

AMT Subset: TF

- TF = Trade Family
 - Product “family” identified by brand name or supplier
 - Corresponds to brand name in other drug terminology models
- Examples
 - Amoxil
 - Zoloft
 - Aspirin (Bayer)



AMT Subset: TPUU

- TPUU = Trade Product Unit of Use
 - Single dose unit of a finished dose form (containing specified ingredient amounts) from an identified supplier
 - Corresponds to “branded drug” in other drug terminology models
- Examples
 - Tenormin 100 mg tablets
 - Augmentin Duo tablets
 - Aspirin 300 mg tablets (Bayer)

AMT Subset: TPP

- TPP = Trade Product Pack
 - A packaged product intended from an identified supplier
 - May contain sub-packs (e.g., oral contraceptives)
 - Corresponds to “branded packaged drug product” in other drug terminology models
- Examples
 - Tenormin 100 mg tablets (20 tablets)
 - Augmentin Duo tablets (10 tablets)
 - Aspirin (Bayer) 300 mg tablets (20 tablets)



AMT Subset: AP

- AP = Abstract Product
 - Active ingredients, without strength or dose form
 - Corresponds to generic name in other drug terminology models
- Examples
 - Atenolol
 - Fluorouracil
 - Paracetamol



AMT Subset: APUU

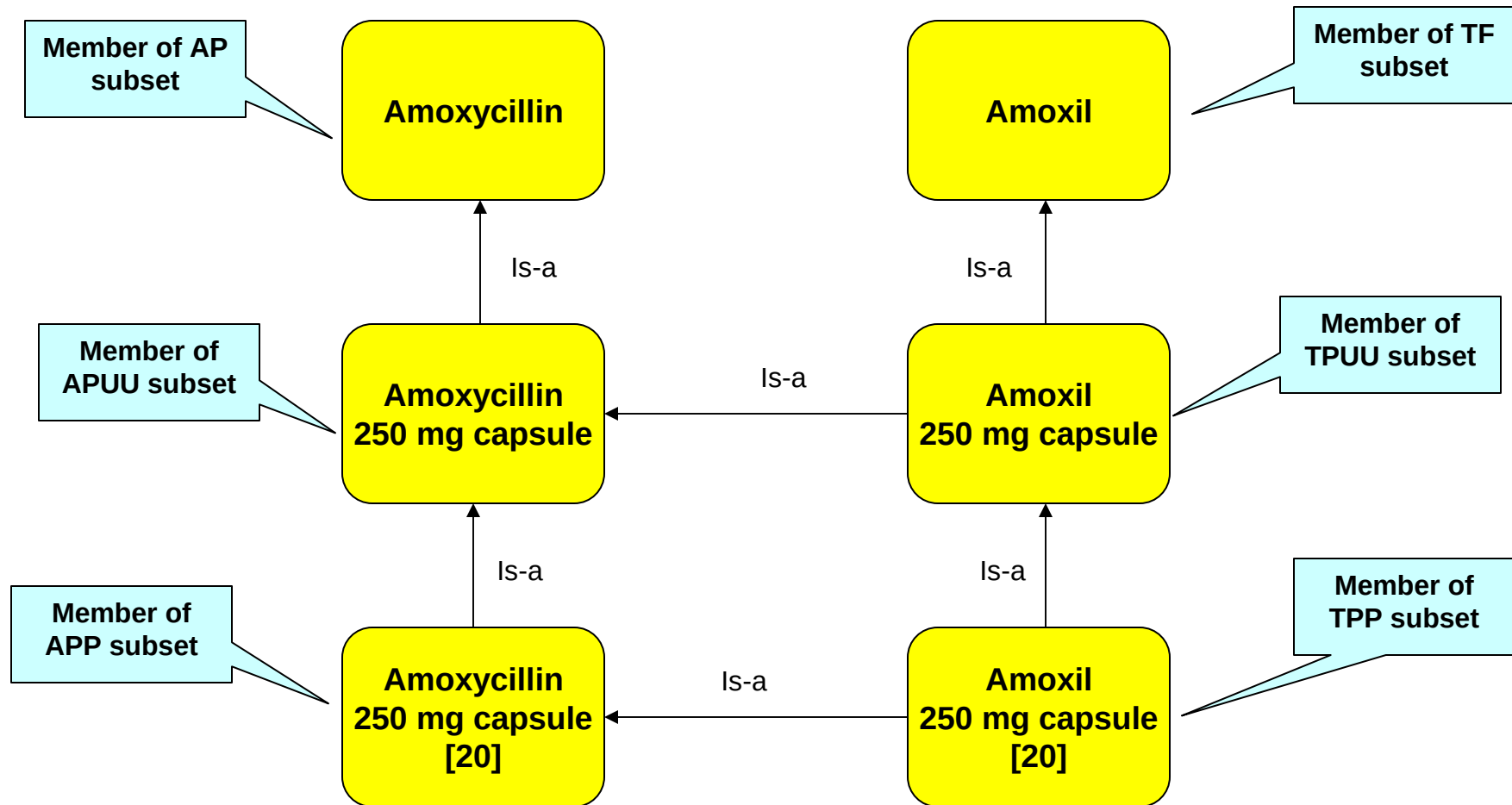
- AP = Abstract Product Unit of Use
 - Active ingredients and their strengths, plus a dose form
 - May represent multiple Trade Product Units of Use
 - Corresponds to “clinical drug” in other drug terminology models
- Examples
 - Atenolol 100 mg tablets
 - Fluorouracil 5% cream



AMT Subset: APP

- AP = Abstract Product
 - A packaged form of a particular APUU
 - May represent multiple Trade Product Packs
 - Corresponds to “packaged drug product” in other drug terminology models
- Examples
 - Atenolol 100 mg tablets (30 tablets per bottle)
 - Fluorouracil 5% cream (20 g tube)

AMT Hierarchy Example



NEHTA Pathology Terminology Data Collection

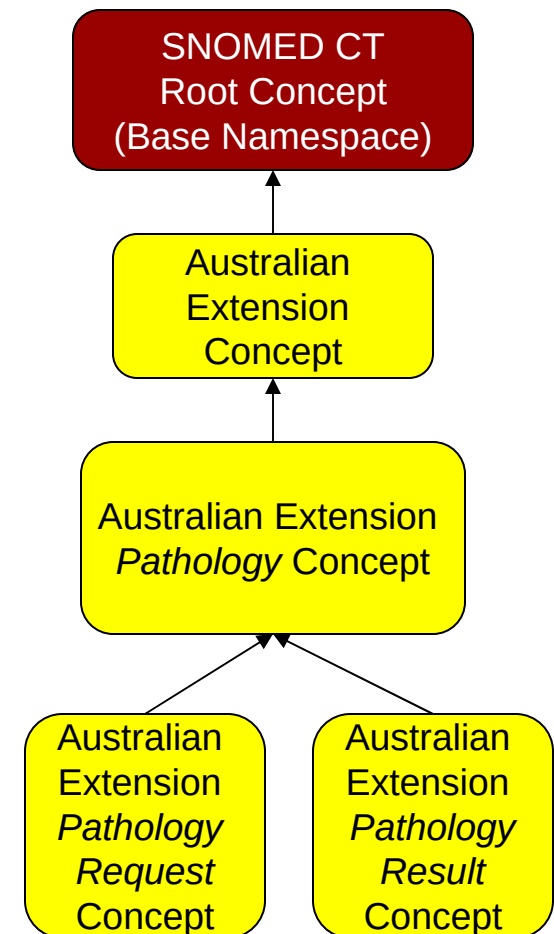
1. Collect names of laboratory test requests and results from Australian states
2. Consolidate the list
3. Match the consolidated list to SNOMED CT [UK Edition] using TermWorks
4. Request expert clinical review of the matches



NEHTA

Pathology Terminology in DTS

- Create a simple “upper hierarchy” in a SNOMED extension namespace
- Load “good matches” into DTS as local synonyms of SNOMED CT concepts
- Load remaining *request* terms as new concepts under “Australian Extension Pathology Request Concept”
- Load remaining *result* terms as new concepts under “Australian Extension Pathology Result Concept”



VA Enterprise Reference Terminology

- Veteran Health Administration (VHA)
- Enterprise Terminology Services (ETS)
 - Apelon TDE, DTS and TermWorks
 - National Drug File – Reference Terminology (NDF-RT)
 - ◆ Model development
 - ◆ Software
 - ▶ Model (TDE)
 - ▶ Maintenance (TDE extension)
 - ▶ Term submission and processing (Web / TDE extension)

Terminology Submission

- Formally propose new or updated concepts to terminology authority

The screenshot shows the NTRT (New Term Rapid Turnaround) web application interface. The header includes the Department of Veterans Affairs logo, the text "NTRT New Term Rapid Turnaround", and the "Apelon" logo. Navigation links include Home, Search, Add New, Help, and Log Off. The main section is titled "New Term Request Form" with a "<< Back" link. The form contains the following fields:

Based On	ACETAMINOPHEN 500MG TAB [NDC: 00395000460]		
*Ingredient/Strength/Unit	ACETAMINOPHEN	500	MG
Ingredient/Strength/Unit			UNASSIGNED
Ingredient/Strength/Unit			UNASSIGNED
Ingredient/Strength/Unit			UNASSIGNED
* Dose Form	ORAL TABLET		
Manufacturer	WALMEAD		
NDC	00395000460		
Trade Name	ACETAMINOPHEN EXTRA STRENGTH TABLETS		
Package Size	60		
Package Type	BOTTLE		
VA Drug Class			
* Comments			

A "Submit" button is located at the bottom of the form.



Process Submissions

- Receive, evaluate and potentially adopt terminology and mapping submissions

NTRT New Term Rapid Turnaround

Home Search Add New Admin Help Log Off

Apelon

Hello Don.

This site was developed for the new orderable drug items from the VA.

To submit a new term request, click the 'Add New' button.

Check Requested Term Status

Search Type

☐ Tracking Number

☒ Show All

☐ Show History

Search

Show Current Status

☒ Submitted

☒ Received

☒ Denied

☒ Accepted

☒ Published

Sort By

☒ Tracking Number

☐ Date

☐ User Name

☐ Status

☐ Drug Name

Order

☒ Descending

☐ Ascending

Change Status

☐ Submitted

☒ Received

☐ Denied

☐ Accepted

☐ Published

Update

Create Transaction Files

File name

Selected Requests **All Requests**

Select Page Clear Page Clear All Pages

Requests 1 - 18 of 18

	Tracking No.	User Name	Drug Name	Status	Date
☒	1161	dlees	ACETAMINOPHEN 500 MG TOTAL Oral Capsule	Received	2003-07-09 03:24 PM
☒	1160	dlees	ACETAMINOPHEN 500 MG Oral Tablet	Received	2003-07-09 03:24 PM
☐	1145	dlees	VALPROIC ACID 250MG CHEWABLE TABLET	Accepted	2003-06-19 04:01 PM
☐	1144	dlees	PEMOLINE 37.5 MG Chewing Gum	Denied	2003-06-19 03:10 PM
☐	1143	dlees	APAP 325MG/BUTALBITAL 50MG/CAFN 40MG CAP	Accepted	2003-06-19 03:10 PM

Locale-specific Software

- Internationalization
 - Make software and data model capable of supporting multiple languages, etc.
- Localization
 - Customize internationalized software and data model for a specific locale

Local Dimensions

- Linguistic
 - Language and dialect
 - Usage conventions, idioms and slang
 - Punctuation
 - Specialized terminology
- Orthographic
 - Character sets
- Visual
 - Icons, symbols and images, animation, color coding, controls ...
- Layout
 - Text may be right-to-left or top-to-bottom
 - Size of strings, etc. may vary
- Audio
- Measurement
 - Units of currency, volume, ...



Aspects of Localization

- Software
 - API
 - GUI
- Data elements
- Content
 - Terminology, e.g., US and UK drug extensions
- Documentation
 - Online help
 - External documentation

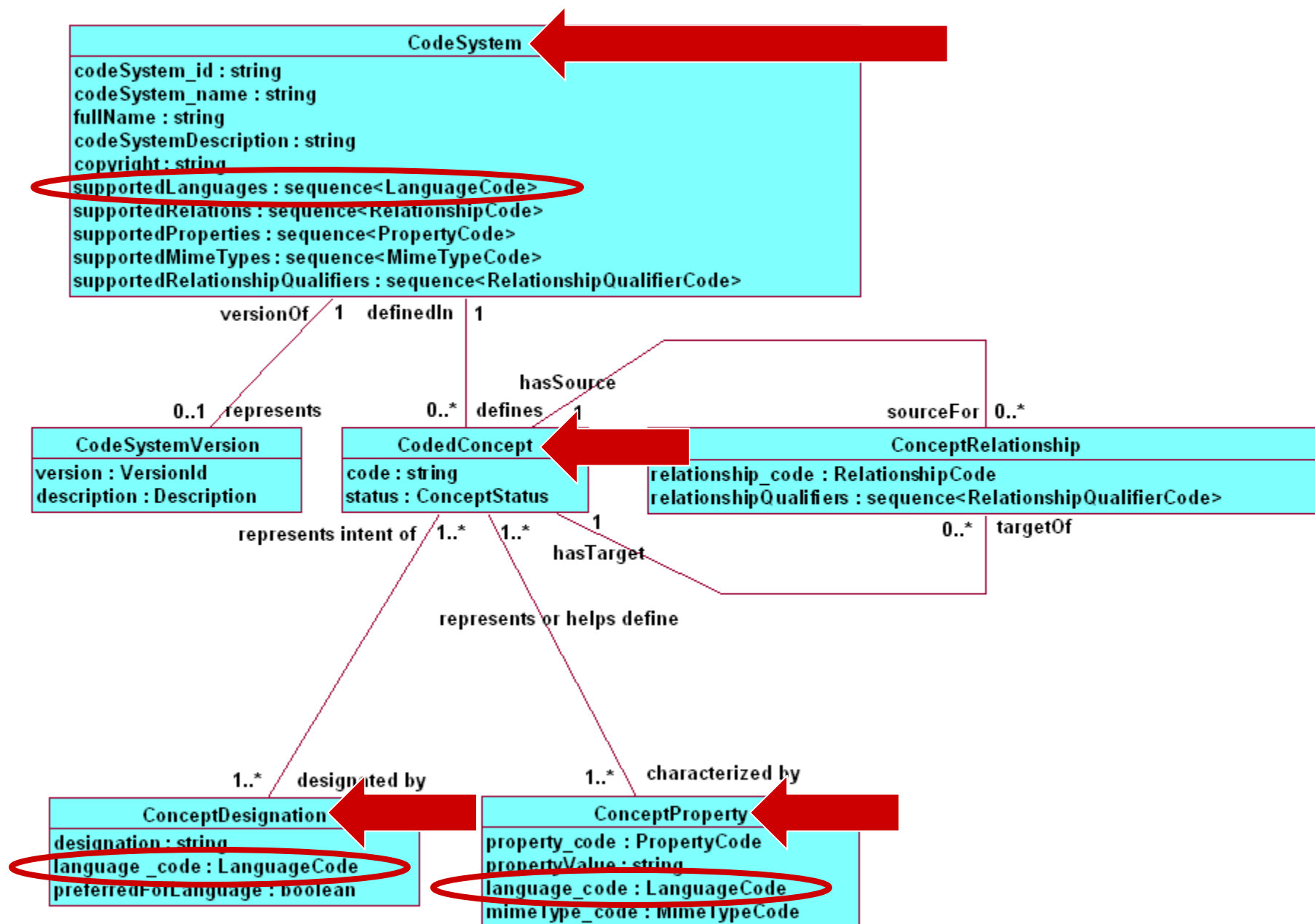
Common Terminology Services (CTS)

- Application Program Interface (API) specification
- HL7 / ANSI / ISO adoption
- Version 1.0
 - Generic access to terminologies
 - Support for creating and validating coded data elements in HL7 version 3 messages
- Version 2 pending

CTS APIs

- Messaging API
 - Supports HL7 v3 messaging applications
 - Uses objects derived from HL7 v3 RIM
- Vocabulary API
 - Supports generic terminology applications
 - Uses generic terminology objects
 - Suitable for use with HL7 v2
- Mapping (translation) API





Sample Method: lookupDesignation

- Looks up the preferred designation and associated language for the supplied code in the specified language
 - StringAndLanguage
lookupDesignation(ConceptId concept_id,
java.lang.String language_code)

Discussion

Medical Terminology in Practice

Apelon

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