# 2016.12 Technical Face-To-Face Meeting Notes

**Document Information**

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The **purpose of this document** is to document the technical face to face meeting details between the NCI and the LexEVS Team**.**

## 2016 November/December Face-to-Face Meeting Notes

### Wednesday, November 30th, 2016

| Time | Location | Topics | Participants |
|---|---|---|---|
| 9:00 AM - 10:00 AM | 4W030 | **User Group Discussion**<br>• Team to share how they are using LexEVS and additional usage requirements they may have.<br>• What components of LexEVS do you currently use?<br>  ◦ LexEVS API<br>  ◦ LexEVS Remote API<br>  ◦ CTS2 RESTful services<br>• Are there LexEVS services that you would like to use, but they don't meet your requirements?<br>• Are there any other road blocks preventing you from using LexEVS?<br>• What version of LexEVS are you currently using? | CTRP, caDSR, GDC |

Attendees: Larry, Jason, Kim, Craig, Scott, Cory, John, Liz, Sima, Rui, Natalia, Tracy, Sana, Tin, Gilberto

Discussion Points:

- caDSR Team represented by Sima, Natalia, Vikram
- caDSR Applications that use EVS
  - Sentinel - Alerts for concepts, job that does concept clean up (compares concepts)
  - Curation tooling - links to concepts, and search results.
  - CDE Browser - Concepts used from search results.
  - Semantic integration workbench - concepts used from search results
  - CDEs
    - Utilize the NCIT, NCI meta,
    - Look into NCIT - will use the concept to describe the CDE.
    - Organizing concepts to build CDE terminology.
    - CDEs are used for forms (permissible values on forms)

- Tooling hasn't changed or been replaced.
    - Currently use JARS and put in /lib
    - Using Remote API today.
    - Recently removed EJB
    - Need to consider architecture in the future.
    - MDR is planning to architect a solution moving forward.
    - Currently searches are restricted to preferred terms.
        - Building data element - definitional information, preferred name
        - Existing CDE - pull back perferred name.
- Current Tooling Issues
    - Need to have a data load completed to PROD.
    - Confirmed data load and ready once things move to production.
    - New LexEVS Jars will be included in next release.
- Remote API Architecture
    - Issues
        - Replacement of JARS
        - Serialization of objects.
- Proposed Architecture?
    - REST-ful API

Decision Points:

- Identify current JAVA API usage by caDSR
    - EVS team to provide feedback as to how to do things better.
    - EVS team to ensure that if REST-ful API is created, functionality to be prioritized.

| Time | Location | Topics | Participants |
|---|---|---|---|
| 10:00 AM - 11:00 AM | 4W030 | **RESTful API Discussion**<br>• Discuss requirements for continued development of REST services. This will include both CTS2 and separate REST-ful API.<br>• Browser: Discuss requirements for remote API and CTS2 REST-ful API. | |

Attendees: Larry, Jason, Kim, Craig, Scott, Cory, John, Liz, Sima, Rui, Natalia, Tracy, Sana, Tin, Gilberto, Jacob

Discussion Points:

- Browser use cases reviewed.
    - Additional cases
        - History - the browser currently uses.
        - Security - for Medra or other licensed vocabularies.
    - May be able to use CTS2 APIs, but may need to have separate REST-ful services for customized/specialized content.
    - Current browser wouldn't use REST services.
    - Unknown coverage for REST possibilities.  So additional investigation required.
- Previous F2F considerations.
    - Custom Lucene may need to be provided for clinical trials.
    - Group Value Sets - may be useful.
    - Restrict to Properties - need to better understand this usecase.
    - History - suggested by the CTRP but has some requirements in scope of the Browser.
    - Graph and Association
        - No need from caDSR
- Additional requirements
    - Bulk Download
        - ability to download full or part of a complete terminology.
- Align rest calls to support Moonshot API services.
- Make others aware services are available.
- Tracy suggested to look at Data.gov
- Browser team not going to use REST at this time
- caDSR not going to use REST at this time.

Decision Points:

- Identify Moonshot Clinical Trial API services to be supported by REST services.
- Identify ways to promote REST services.
- Identify possibilities of participating in Data.gov

| Time | Location | Topics | Participants |
|---|---|---|---|

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|---|---|---|---|
| 11:00 AM - 12:00 PM | 4W030 | **Triple store/RDF Discussion**<br>• Discuss what triple stores would be used for in parallel and in conjunction with LexEVS<br>• Text searching<br>• NCBO SPARQL white paper and it's implications<br>• Searching on Roles (Gilberto, Kim) | |

Attendees:

Discussion Points:

- There is a pilot ongoing to review triple stores
  - selected 3 triple stores (StarDog, Allegrograph (http://allegrograph.com/), Viritouso) and have been working for the past 6 months
  - evaluations covering restricting operations, loading data, performance testing, examine security (secured and anonymous access via proxies)
  - nature of queries haven't been as representative of what is needed for production.
  - more focus on real use queries.
  - operations - hosting model not supported by CBIIT - so no support. (ie, patching support not provided)
  - all can be queried with standard SPARQL
  - will still want REST services available to the end users.
- Transition to SPAQRL gives raw access to the data (unlike API)
  - However, you need to understand the data - and this could differ from endpoint to endpoint.
- What do TripleStores provide - that differ (better than) LexEVS
  - Representation of Hierarchy
  - Level of expressivity
- 3 use cases for triplestore evaluation:
  - Expressivity (reasoning support)
  - Linked open data
    - use vocabulary as a "glue" between different data repositories. Ability to "join" distributed repositories.
  - Closer integration of vocabulary and meta data (part of the MDR).
- Report writer now uses the triple store
  - Loading of Value sets take much less time
  - Access of Value Sets is better, but not hugely different.

- Need to determine where Triple Store is better and where LexEVS is better.

Decision Points:

- Investigate where Triple Store usage may augment LexEVS.

| Time | Location | Topics | Participants |
|---|---|---|---|
| 1:00 PM - 2:00 PM | 5E030 | **EVS Project Group Discussion (During regular call-in time)**<br>• User/content priorities for value set, mapping, and other services.<br>• Specialized search and other capabilities for complex chemical names and genetic names.<br>• Current capabilities and browser implementation<br>• Possible expert system extension | EVS project meeting |

Attendees: Larry, Kim, Craig, Scott, Cory, John, Liz, Gilberto, Lori, Tin, Teri, Sharon, Sana, Nick, Nels, Margaret, George, Brenda, Abigail, Erin, Joanne

Discussion Points:

- Value Sets
  - Would like LexEVS to support production of value sets with more rich structure. (to more efficiently assemble this deliverable)
  - 100K downloads from FTP site. Fewer users use the browser to download the value sets.
- Mapping
  - On a mapping page, you can download an excel or cvs file.
  - ie, chebi has mapping.
  - For GDC - ICD9 or 10 coding - to be able to use NCIT coding, there needs to be way to translate between ICD9 and NCIT codes. There currently isn't a good way to do that today.
    - ie ICD9 - Brest cancer - corresponds to ABC in NCIT
    - Determine how such a map could be published (browser and LexEVS)
- Other Services
  - IUPAC - there are 2 flavors to be considered - but can be managed.
  - HUGO - the slash and hyphens have been problematic, but have been mostly resolved in the NCI Browser.
  - Review of 4 identified searching issues (differences between results in LexEVS and Protege).
  - NGram tokenizers may provide solution if we implement an Expert System.

Decision Points:

- Identify additional mapping requirements from the EVS Project group.
- Investigate the use of the expert system solution to support specialized search capabilities for complex chemical and genetic names.
- Investigate the usage of NGrams in Lucene to support specialized search.

| Time | Location | Topics | Participants |
|---|---|---|---|
| 2:00 PM - 3:00 PM | 5E030 | **LexEVS Mapping Discussion**<br><br>Determine requirements and propose solution for mapping.<br><br>• User requirement: One terminology to many terminologies mapping.<br>• Other topics:  Current, conditional, external relationships | |

Attendees:  Larry, Kim, Craig, Scott, Cory, John, Liz, Gilberto, Tracy

Discussion Points:

- Use case provided by external LexEVS user.
- one to many (one terminology to many) is currently not a priority.
- There may have been time when loading maps from UMLS, but not sure why it wasn't completed.  Brian may have more information.
- Ability to capture synonymous (non-) - Query API, Loader.  Would want a use case to specifically describe this mapping.
- Consider loading MRMAP and review how it is loaded.

Decision Points:

- Investigate the MRMAP load and determine why that work wasn't completed.

| Time | Location | Topics | Participants |
|---|---|---|---|
| 3:00 PM - 4:30 PM | 5E030 | **Lucene Discussion**<br><br>Propose additional features of Lucene to be used within LexEVS.<br><br>• Discuss specialized search use cases.<br>• Possible Lucene enhancements for coding scheme categorizations, auto complete aids, Lucene services. | |

Attendees: Larry, Kim, Craig, Scott, Cory, John, Liz, Gilberto, Tracy

Discussion Points:

- Facets - ability to perform categorical search
    - Coding Scheme Types
    - Value Set Categories
- Auto complete
    - Interest for the browser and caDSR
    - concerns about the results being overwhelming
    - might be more useful if combined with facets - i.e. search cancers with facets of neoplasms
- Elastic Search
    - There are still many custom analyzers
    - If possible to make search more portable - across LexEVS and TripleStore - may want to look at this.
- Prefer to have a single interface - instead of having the user decide if they use LexEVS or TripleStore.
- SOLR vs Elastic Search
    - SOLR documents more flat
    - Elastic Search document more complex.
- Search down NeoPlasms and then stop at a certain level.  There is no mechanism to capture that.  Similar cases for drug searches.
- http://www.immport.org/
    - John demoed - this uses facets and auto complete (based on 3 chars or more and typing speed).

Decision Points:

- Investigate ability to use Lucene Facets and identify where it could be used.
- Investigate ability to design a usable auto complete and where it could be used.

| Time | Location | Topics | Participants | Resources |
|---|---|---|---|---|
| 4:30 PM - 5:00 PM | 5E030 | **Overflow/Additional Topics** | | |

Attendees:

Discussion Points:

Decision Points:

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## Thursday, December 1st, 2016

| Time | Location | Topics | Participants |
|---|---|---|---|
| 9:00 AM - 11:00 AM | 3W030 | **Value Set management and workflow**<br>• Discuss requirements for value set version management and workflow management and supporting technology.<br>• Rob to give a demo of their current workflow and the scripts they use.<br>• Discuss latest issues on PROD. | Rob, Tracy |

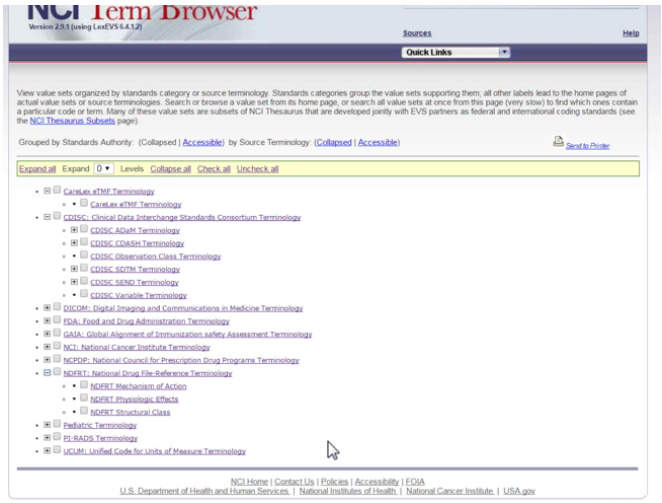
| Time | Location | Topics | Participants |
|---|---|---|---|
| 11:00 AM - 12:00 PM | 3W030 | **Value Set and Mapping Data with Hierarchical structure Discussion**<br>• Determine requirements and propose options to hierarchical structure and mapping.<br>• Discuss how VS could retain their multiple hierarchical structure that it came from.<br>• Discuss what changes would be needed to CTS2 for this. | |

Attendees:  Jason, Gilberto, Rob, Tracy, Scott, Cory, Craig, Tin, Larry, Kim, Sana, Liz

Discussion Points:

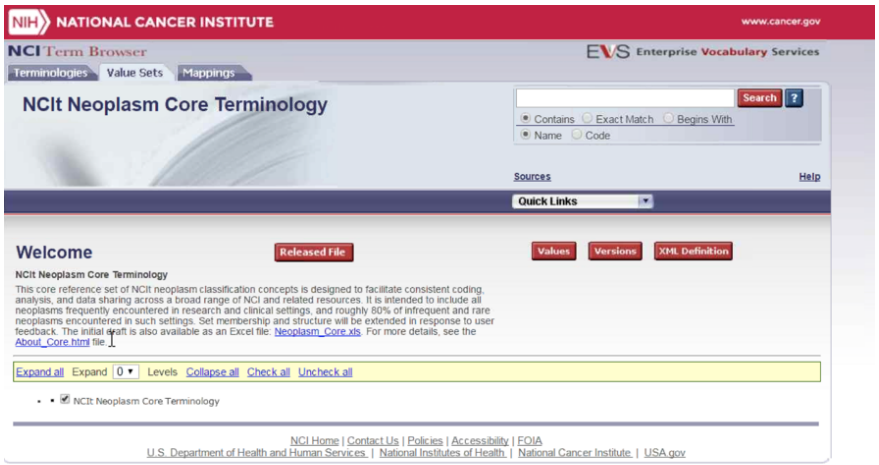
- Properties in Thesaurus that support the browsers
    - Subsets in Thesaurus (Protege)
        - Publish_Value_Set
        - Term_Browser_Value_Set_Description
        - Value_Set_Location - where browser fetches the report from (ftp location and path within evs, and filename, BNF)
        - TVS_Location - Terminology Value Set OWL file - hierarchy and components
    - Properties are scrubbed before loading into LexEVS - these are private/internal properties.
- Baseline - A diff is done on the value sets from month to month.  Triggers update load procedures monthly.
    - Load, Remove and Resolve scripts are generated for changes
- OWL file provides information about where the value set lives in the hierarchy.
- NCI Thesaurus and TVS  (provides structure to value sets)  - used by the browser
- Process was created to provide structure/hierarchy to value sets
- Value Set loads - 700 coding schemes - loaded in 24 hours
- If value set resolution is performed against a new version of the code system, does LexEVS handle the versions?
- Process currently isn't limited to NCIT.
- Script created to create a txt file that views hierarchy of concepts on value set.
- value set downloads are ~10k a month and used across agencies by diverse set of consumers.
- curation and delivery processes are driven by the users and consumers.
- EVS editors work directly with CDISC and other groups.
- CDISC and FDA have different formats and standards
- Resolved value sets as coding schemes - done that way for performance.
- Process can be error prone for the EVS Editors.  The editors need to do specific things to drive Browser.

- Hierarchy (value set groupings)
    - TVS_CDISC provides information for the browser to display the value set hierarchy




- Possibly add hierarch to the NCIT to replace the complexity today.
    - hierarchy (value set groupings) could be captured in lucene index (using Lucene Facets).

- Hierarchal representation in value set
    - A coding scheme with custom hierarchy




- Neoplasm core is a starting point for coding neoplasms. It is a starting point which then allows to branch out.
- Could extend the current implementation of resolved value sets so that that coding scheme would provide hierarchy. This is very much like a vocabulary.
- Could Provide "Hierarchal Value Sets"

        - Browser could provide another tab "Hierarchal Value Sets" that would show the coding schemes that are the resolved hierarchal value sets.
        - This might require an different value set loader or an extension to it.
        - It could be complicated if the hierarchal value set hierarchy doesn't  match the original coding scheme hierarchy.
    - CTS2 representation would need to be extended to support the idea of a Hierarchical Value Set.

- Considerations for investigation

    - Investigate ability to be able to determine if Resolved VS coding scheme has changed.
    - Investigate ability to be able to determine if Value Set Definition has changed.
    - Investigate ability to update as needed (not have to load all 700 at the same time).
    - Investigate ability to capture value set groupings in lucene index (using Lucene Facets and the NCIT).
    - Investigate ability to capture "Hierarchal Value Sets" as coding schemes with hierarchy.

Decision Points:

- Investigate ability to be able to determine if Resolved VS coding scheme has changed.
- Investigate ability to be able to determine if Value Set Definition has changed.
- Investigate ability to update as needed (not have to load all 700 at the same time).
- Investigate ability to capture value set groupings in lucene index (using Lucene Facets and the NCIT).
- Investigate ability to capture "Hierarchal Value Sets" as coding schemes with hierarchy.

| Time | Location | Topics | Participants |
|---|---|---|---|
| 1:00 PM - 3:30 PM | 3W030 | **NCI Systems Discussions**<br>• Nexus Deployment Discussion<br>  ◦ Current status of LexEVS artifacts on NCI Nexus server<br>  ◦ Discuss current technical challenges.<br>• CI and Docker Status/Roadmap<br>  ◦ Discuss the current status of the Docker scripts used to build/test LexEVS components.<br>  ◦ Discuss NCI's current status and future plans to use Docker.<br>  ◦ Discuss security challenges associated with NCI's environment and Docker.<br>• Discuss a separate DEV environment for CI server deployment<br>• Tech Stack Upgrades<br>  ◦ Discuss DB upgrade:<br>  ▪ MySQL 5.6 vs. MariaDB (10.1 Supported 2017.01)<br>  ◦ Discuss CentOS 7 upgrade<br>• Tier Deployment testing responsibilities<br>  ◦ Mayo development team responsibilities<br>  ◦ NCI development team responsibilities | Sara, Shireesha, Phil<br><br>Jacob, Yeon (Systems Team) |

Attendees:  Larry, Sherri, Rob, Tracy, Jacob, Sarah, Scott, Cory, Craig, Kwan, Yeon, Sherri, Tin, Sana, Shireseha, Jason

Discussion Points:

Nexus Server Configuration

- Testing on DEV tier - config of security permissions
- Manual publishing until configured
- CTS2 - Maven build was the simplest case, so that's the focus.
- ANT publishing not currently available.  Will need to look at public and private key possibilities.  Sara's team should be able to support. (LexEVS requires ANT build).

Tech Stack Updates

- DB
  - Currently at 5.5
  - Tech stack is moving to 5.6 and migration has started.
  - Preliminary tests show that we can support 5.6.
  - 5.6.33 is the current version.  Yeon can update each tier for EVS team.
  - No plan for 5.7, but MarieDB (in 6 months to year)
  - Need to move to 5.6 as soon as we can.
- CentOS 7
  - LexEVS is ready to upgrade to CentOS 7
  - CentOS 7 is available.
  - Blade servers would need to be ordered or current blades would need to be re-imaged.
  - May be able to shuffle the upgrade and swap servers so it moves up.
- Java 1.8
  - LexEVS is ready with 1.8
  - Waiting on other tooling to support 1.8

Dev Environment

- Set up secondary Dev instance for Jenkins and application servers.
- Need to consider what database connection is needed.
- Suggested - set up a VM for this Dev
- Can submit tickets to Jacob to get this started.

Docker and CI Discussion

- Overview of Mayo usage and configuration.
  - NCI uses Jenkins 2.19
  - Docker differences between what NCI has and Mac version.
  - Would require move from Ubuntu.
  - Image repository not ready, testing Nexus 3.x for Docker Image Storage.
- NCI can support Docker configuration.
- Need to negotiate timelines.

Decision Points:

- Plan to migrate to 5.6.33 as soon as possible.
- Plan to migrate to CentOS7 (work with Jacob).
- Plan configuration of DEV instance (work with Jacob).
- Plan to further investigate Docker configuration.

| Time | Location | Topics | Participants |
|---|---|---|---|
| 3:30 PM - 4:00 PM | 3W030 | **FHIR and terminology services (CTS2)**<br>• Harold to provide update on CTS2 and FHIR. | Harold |

Attendees: Tin, Jason, Rob, Tracy, Scott, Craig, Cory, Larry, Sherri, Harold, Gilberto

Discussion Points:

- Harold noted that the OMG process stalled by no further participation by Mayo.
- Remaining issues:
  - SOAP WSDL
  - Miscellaneous issues
- Additional Features:
  - Columnar Format
  - Cannonical RDF
  - SNOMED CT implementation guide
- FHIR and CTS2 are similar in that both are complex but much is not required - only use what you need.
- Clinical Research and Biomedical informatics groups are taking note of FHIR and beginning participation in FHIR.
- FHIR Terminology - possible integration of CTS2 services.
- Grahm Grieve (HL7 FHIR) is in support of CTS2 services for FHIR.
- Current Planning
  - Plan on implementing entity description in native FHIR to demonstrate the differences and begin discussing with the FHIR community.
  - Review FHIR terminology and CTS2 terminology to describe overlap and gaps.  A paper will be written and published.
- Other project - CIMI HSP - Determined that CTS2 wasn't a candidate for services.
- FHIR does offer:
  - Provides extensibility
  - Not to be fully implemented.
- HL7 and OMG HSSP process was not successful in that the standard wasn't successfully integrated back to HL7.
- A better model would have been what FHIR is doing within HL7 - collaborative within HL7.
- Harold to be at the January HL7 meeting to listen in on the FHIR sessions.

Decision Points:

| Time | Location | Topics | Participants |
|---|---|---|---|
| 4:00 PM - 5:00 PM | 3W030 | **OWL Restrictions in LexGrid Model**<br>• Discuss approach and propose additional features.<br>• Determine if there are LexEVS model changes needed.<br>• Loader considerations.<br>• Additional problems and solutions | |

Attendees: Larry, Sherri, Jason, Rob, Tracy, Cory, Scott, Craig, Harold, Gilberto, Kim

Discussion Points:

- Much of OWL2 is similar to OWL1.
- OWL2 includes property chains, but thy aren't being used.
- The entire semantic meaning in LexEVS isn't required for OWL2. For example, reasoners would use OWL2 source - not out of a terminology server.
- There is no requirement to include additional OWL2 representation in LexEVS. Instead, use triple store and expand RESTful services.
- Current OWL2 issues have been resolved.
- Need to revisit the OBO JIRA item - and close it.

Decision Points:

- No additional OWL2 representation needed in LexEVS.
- Review OBO JIRA issue and resolve.

| Time | Location | Topics | Participants |
|---|---|---|---|
| 5:00 PM - 5:30 PM | 3W030 | **Overflow/Additional Topics** | |

Attendees: Larry, Sherri, Jason, Rob, Tracy, Cory, Scott, Craig, Harold, Gilberto, Kim

Discussion Points:

- Browser issue - search issue when value sets don't return content.
- Noted that QA could be done in Protege before publishing
- Value Set Loader should not load a value set with no content.

Decision Points:

- Implement fix for Value Set Loader to not load value set with no content. LEXEVS-2510 - Getting issue details... STATUS

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# Friday, December 2nd, 2016

| Time | Location | Topics | Participants |
|---|---|---|---|
| 9:00 AM - 10:00 AM | 1W030 | **LexEVS Admin**<br>Discuss current and future requirements.<br>• GUI<br>  ◦ Consider a web based tool. A simple way to look at the data.<br>• Command Line loader requirements<br>• Other considerations | |

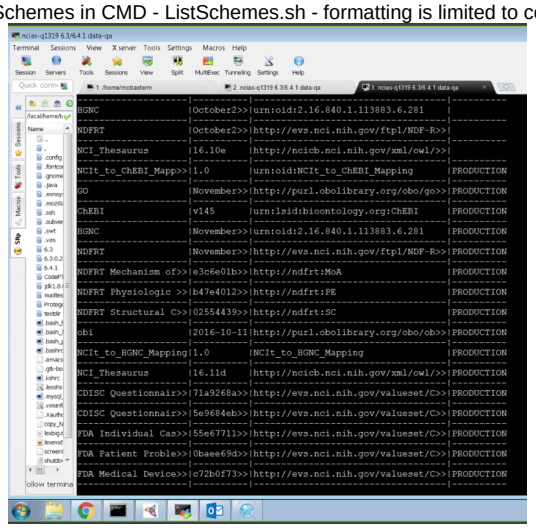
Attendees: Larry, Rob, Tracy, Cory, Craig, Scott, Tin

Discussion Points:

- Ability to look at data in a graphical way would be important.
- Command Line usage - List Schemes - can return 700+, so prefer to use the UI.

- Usage of the UI for troubleshooting to review the data in the database.
- Minimal ability to look at data would be preferred (fully graphical is not required)
- Administrative tasks not required in the GUI (only in the cmd line tooling)
- Ability to load metadata at the same time as the load.
- Web based tool.
- We need to replace based on functionality used by Browser
    - graphical hierarchy representation (tree extension?)
    - Optimal or best practice as an alternative
- providing code snippets for end users as options
- Secure any admin code (Loading, changing code systems) on a web based gui is a concern
- Could be potentially be used as a browser for technical users on an NCI Production server (Discussed)
- There is a request for admin ability for editing the preferences and manifest.
- Currently, there is no way to view what metadata is loaded.
- Investigate ability to combine data from the metadata and manifest files into one file.
    - This would make administration/loading easier.
    - Post load options may be an issue.
- History loader creates multiple errors when loading - there is an existing JIRA item.
    - May be caused by DB timeout.
    - Investigate what is causing.

- LG xml Loader is used to load maps. However, it doesn't take in account of the type of maps (it could). Not sure the rankings can be applied.
    - No existing issues, but may find some loading additional maps
    - SY relationships and Ranking are provided.
    - Monthly changes are applied.

- GUI Performance during x-forwarding noted by Rob.
- File system preferences - lock?
- UI is good for Tagging to Production
- UI is good for Removing a Coding Scheme
- Listing Schemes in CMD - ListSchemes.sh - formatting is limited to column width.
    - 
    - Default, do not show entire width.
    - Minimailly add 10 chars to URL
    - Minimally add 5 chars to Versions
    - Add option to see full length's of all fields.
    - Add option to see minimal information.

Decision Points:

| Time | Location | Topics | Participants |
|---|---|---|---|
| 10:00 AM - 12:00 PM | 1W030 | **Prioritization and Debrief**<br>• Discuss OWL2, RRF, LexEVS, CTS2, Browser, and all previous topics<br>  ○ Discuss future architecture<br>• Determine next steps/road map and priorities | |

Attendees: Kumar, Larry, Jason, Sherri, Rob, Tracy, Cory, Scott, Craig

Discussion Points:

Architecture

- Future considerations.
    - Smaller services -
        - For example, Coding List listing service as a separate service.
    - Concerns around ability to deploy up the tiers
        - Current requirements will prohibit how quickly services can be exposed.
        - Concerns about tech stack upgrades across services.  Micro Services may or may not be impacted by upgrades (some or all).
    - If addressed well, we can get rid of silos and duplication.
    - Resources are a concern,
        - Containers, JETTY, and how to balance.
    - Security
        - Scanning will take nearly as long as the large service.
    - Instead of re-architecting all, focus on new and additional functionality (along side existing LexEVS)
    - No longer would need clients to include jars, dependencies.
    -

Decision Points:

- Investigate services architecture to support new and additional functionality.

| Time | Location | Topics | Participants |
|---|---|---|---|
| 1:00 PM - 2:00 PM | 1W030 | **Prioritization and Debrief (Continued if needed)** | |

Attendees:

Discussion Points:

Strategic direction - RESTful services

- Moving to micro architecture in new areas in functionality for LexEVS
- Integrated REST services across LexEVS, Triple Store, Clinical Trials (Integrated REST Services)
- Future MDR redesign effort - areas of service support of terminologies.
- Future CTRP support

Decision Points: