HSPC healthcare services platform consortium™
THE HEALTHCARE INNOVATION ECOSYSTEM

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HSPC Terminology Server and Services RFP: Request for Proposals

Document Management

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Name	Title	Date
Stan Huff	HSPC Board, Chair	06/21/2019

Glossary of Terms

Term / Abbreviation	What it stands for
FHIR	Fast Health Interoperability Resources
HSPC	Health Services Platform Consortium
LOINC	Logical Observations Identifiers Names and Codes
SNOMED CT	SNOMED Clinical Terms
SSO	Single Sign-On
OIDC	OpenID Connect
Solor	SNOMED LOINC RxNorm
CIMI	Clinical Information Modeling Initiative
RxNorm	Normalized naming system for generic and branded drugs
STAMP	Status, Time, Author, Module, and Path

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Contents

1 Introduction/Background

The Health Services Platform Consortium (HSPC) is a provider-led organization of leading clinical societies, healthcare organizations, IT vendors, systems integrators, and venture firms dedicated to unlocking the power of entrepreneurial innovation to improve healthcare outcomes. HSPC's mission is to improve health by creating a vibrant, open ecosystem of interoperable platforms, applications, and knowledge assets. HSPC's vision is to draw diverse organizations together to accelerate the delivery of innovative healthcare applications to improve health and healthcare. The Health Services Platform Consortium (HSPC) is seeking information on the best strategy for deploying a terminology server and associated software products to support an integrated HSPC terminology environment and its related dependent requirements.

The purpose of this Request for Proposal (RFP) is to solicit proposals from parties providing the terminology services capabilities and functionalities to meet the needs of HSPC. HSPC intends to include a terminology server within our architecture to support services and terminology related tools required for the development and testing of Clinical Information Modeling Initiative (CIMI) models, FHIR profiles, SMART on FHIR applications, and other applications within the HSPC sandbox. (For information on the HSPC Sandbox, please see https://developers.hspconsortium.org/build)

2 Project Goals and Scope of Services

HSPC plans to procure a terminology server as part of an integrated toolset to support the business operations of HSPC. Other tools HSPC is or will be using include (but are not limited to) a model request tool for clinicians, logical model development tools, a model/FHIR profile repository, the HSPC sandbox, and Solor. Solor is clinical terminology content generated from a transformation process that represents and brings together different terminology standards by using a single model that can encompass any customized content. Each of these tools will be accessing the terminology server and terminology services in some fashion.

HSPC project pipelines include the development of Clinical Element Models (CEMs). Currently, the models, model attributes, and value sets are encoded with numeric concept identifiers from Intermountain's terminology server. The plan for the future is to encode the models and model content with Universally Unique Identifiers (UUIDS) from Solor. UUIDs are the base representation so we can integrate content (LOINC, RxNorm, CVX, others) that do not have SNOMED ids into a single system.

The following scenarios depict how the terminology server will be used. Please describe how your terminology and terminology services meet (or do not meet) the requirements outlined in the following scenarios:

Scenario 1 – Solor using the procured terminology server

HSPC has a SNOMED Clinical Terms (SNOMED CT) extension namespace and a collaborative relationship with Solor. Solor currently consists of – but is not limited to – SNOMED CT, LOINC, and RxNorm. These terminology standards are "integrated" by transforming the source terminologies (SNOMED CT, LOINC, RxNorm) into a common model that provides a uniform representation scheme and additional metadata needed for semantic integration and advanced versioning. This common model is substantially equivalent to SNOMED RF2, with some specific extensions (support for non-SNOMED identifiers and enhanced versioning for all content that includes author and path in the data structure).

Solor has 3 release formats. Any one of these formats could be used for importing into the procured terminology server:

1. A SNOMED Release Format 2 (RF2) compatible release format (see https://confluence.ihtsdotools.org/display/DOCSTART/13.+Release+Schedule+and+File+Formats). We expect this format will be the easiest format to import, and in many cases we expect it is importable with no modifications by software that already supports SNOMED RF2 imports. Alternative identifiers are used and SNOMED compatible identifiers are generated for UUIDs, RxNorm, and LOINC by utilizing unused partition identifiers within the SNOMED identifier standard.
2. A Solor Object Format. This format is the most efficient to process, but will require integration or development of new libraries to support the Solor Object Format.
3. A Solor Relational Format. This format makes use of UUIDs as the primary identifiers of all content, utilizes the alternative identifiers table for RxNorm, SNOMED, LOINC, and other codes, and also provides for representation of Author and Path.

A scenario describing how Solor will be used with the terminology server is described below.

HSPC projects request model content using the model request spreadsheet. The spreadsheet is analyzed and loaded into HSPC Jira for curation into Solor. A new extension is created that includes concepts, reference sets, relationships, and descriptions. Solor extensions are then released using the Solor formats. A terminology server will load these extensions using one of the provided formats (probably the RF2 compatible format initially).

Scenario 2 – Logical model binding

HSPC project pipelines include the development of logical models. These logical models contain unique textual identifiers that must be added to the terminology server and mapped to standard terminologies such as SNOMED CT or SOLOR identifiers.

Currently, this mapping is accomplished in the logical model by using unique textual representations with the pattern SomeDescription_CODE for codes and SomeDescription_VALUESET_CODE for value sets. These logical model code representations are then mapped to a code in the terminology server. Currently this is done by making the logical model code representation a unique representation in the logical model context of the Health Data Dictionary (HDD), thus making it a representation for a given HDD Numeric Concept Identifier (NCID). This HDD NCID is then mapped to standard terminologies.

Modeling use cases:

1. Finding existing logical model code representations so as to avoid the creation of duplicates.
2. Creating new logical model code representations and adding these as the valid representation in the logical model context for an HDD NCID.

Operational use cases:

1. A data validation engine uses logical models to ensure data instances conform to logical models. The logical models contain unique textual identifiers but the data instances will contain standard terminology codes. The engine must resolve these using the terminology

server. In other words, given a unique textual identifier, the terminology server should deliver the mapped standard code or value set.

Scenario 3 – HSPC Internal Terminology Development

HSPC experts in the areas of clinical data modelling and clinical terminologists will interface with the terminology server via a web based interface. They will be able to search existing terminology as well as create new terminology and value sets. They will be able to view all versions of terminology, changes to terminology, and roll back to any previous version.

Scenario 4 – Querying the Terminology Server

a. An individual wants to query for code equivalents from a SNOMED concept to another and knows the SNOMED id for the term. For example, “Wound Edge Color (observable entity)” has an equivalent term in LOINC. A query of the LOINC Mapping Refset, using the “has LOINC equivalent” relationship would return the LOINC id and code, if it exists, for Wound Edge Color.
b. Obtaining the preferred display for a given code.
c. Fetching synonyms for a given code.
d. Getting parent, children, and all descendants or siblings for a given code
e. Getting the code for a text string (e.g., what is the SNOMED code for asthma?)
f. Obtaining a value set. For example, the FHIR profile for Wound Edge Color has a binding to a specific value set for the color. The binding is a universal resource identifier (URI).
    - An application uses the URI to query the terminology server (via RESTful FHIR services) to retrieve and expand the value set to display the allowed colors for data input.
    - A system receiving instance data from the application uses the URI and the FHIR services to validate that the data for the Wound edge color received is correct.

Scenario 5 – HSPC Toolchain

The HSPC modelling toolchain will require the creation of terminology and value sets for development and testing purposes via a REST based interface. These terminology and value sets will be flagged as development or test for these purposes and will be able to be namespaced as such for use for development and testing.

Scenario 6 – Terminology Authoring and Rollback

A User updates a concept definition within the terminology server. STAMP versioning is required to track the history of the update to all aspects of the update. STAMP provides a means to generically represent the revisions to a component over time and to index those revisions by status (active, inactive), effective time of change, author of change, and module within which the change occurred (international edition, HSPC extension, etc.), and the development path of the change (development, release candidate, etc.). Taken together, these fields (status, time, author, module, and path) can be referred to as a version. STAMP versioning is required to track the history of the update to all aspects of the update. The User, at any later time, will be able to roll back to a previous version of the terminology.

Scenario 7 – Authentication and Roles

HSPC's broader toolchain is reliant on the OAuth 2.0 protocol for numerous purposes. Any solution MUST support OpenID Connect (OIDC) for the purposes of user authentication: that is, establishing user identity using an established, centralized single sign-on (SSO) system maintained externally by HSPC. (At the time of this writing it is Keycloak 5.) Support for SAML 2 may potentially be sufficient, but OIDC SSO is highly preferred.

Additionally, HSPC uses this same SSO systems for purposes of course-grained authorization. To minimize managerial and operational overhead, any solution should:

1. "role map" after SSO login to automatically update any necessary access rights and role and/or group memberships. This is a common feature of auth clients that have complex internal privilege and role structures. HSPC membership is fluid, thus IAM functions must be dynamic.
2. Support automatic OAuth configuration and cryptographic key cycling by inputting a standard .well-known URL JSON endpoint.
3. Support automated access token refresh.
4. Probe for user information using the provided OAuth endpoint for user information such as given name, family name, email etc. In other words, the solution should not introduce a duplicative set of user data that can drift from the SSO system.
5. Support notification of logout to the provided OAuth endpoint upon explicit session termination events.

HSPC FHIR Sandbox Scenarios

Scenario 1 – Using terminology search features to find concepts

A User is using the Patient Data Manager (PDM) in the HSPC FHIR Sandbox to enter or edit a FHIR resource instance (e.g., Condition, Observation) in their personal sandbox. To enter a coded field such as a condition, the user may enter a string and then search the appropriate domain or value set using RESTful services to find a match. The search would return the matching strings and the associated codes (e.g., SNOMED CT). The user would select the appropriate value and then save the resource instance in their personal sandbox repository. The user would not have to authenticate for each search (there may be an authentication/authorization at the beginning of the session which would produce a key the user would use for subsequent uses of the terminology server).

Scenario 2 – Using terminology services to validate a FHIR resource instance

A user has entered a FHIR resource instance for a patient in their personal sandbox (using the FHIR Sandbox PDM tool, their own app, or by uploading a FHIR bundle). The user uses the Sandbox validation tool to validate the resource instance selecting an appropriate FHIR profile for the resource type. The validation tool uses terminology services to validate coded attributes entered in the resource instance, ensuring the entered coded data are part of the associated domain/value set and the codes themselves are valid codes. The user would not have to authenticate for each validation (there may be an authentication/authorization at the beginning of the session which would produce a key that the user would use for subsequent uses of the terminology server).

Scenario 3 – A SMART on FHIR app being developed/tested against the FHIR Sandbox using terminology services as part of its functionality

A third party is developing a SMART on FHIR app using their personal sandbox instance. As part of the functionality of their app, they provide the ability to search for and enter coded values (e.g., select

Body Site when entering data about a wound). The app would be able to use FHIR terminology services to search for and select appropriate values from a domain/value set. This would include returning the entire Range of a Domain if needed. The User would authenticate at the beginning of the app testing session, which would produce a key/token that would be used for subsequent uses of the terminology server.

3 Anticipated Selection Schedule

1. RFP release June 25th, 2019
2. Q&A period - first 4 weeks after RFP release (by July 22nd)
3. RFP replies from vendors - within 6 weeks from RFP release (by August 5th)
4. Review RFPs - 2 weeks after RFP close (by August 19th)
5. Software demonstrations from front runners - 2 week period after RFP close (by Sept. 9th)
6. Final selection - 5 weeks after RFP close (by Sept. 16th)

4 Time and Place of Submission of Proposals

HSPC may follow up on selected responses from suppliers after a review of returned questionnaires. Interested parties that have questions should submit them via email to susan.matney@imail.org.

- Complete the requirements and cost spreadsheets

5 Timeline

We anticipate pilot rollout within six months but we are open to negotiation regarding timing for the right candidate.

6 Vendor Questions

We intend to respond to all queries / questions raised within 4 working days of receipt. Questions and responses will be shared with all vendors via email and posted on the Terminology Procurement page on the HSPC web site. Deadline for question submission is July 22, 2019.

7 Elements of Proposal

- Background and history of your firm in delivering terminology services
- Implementation Timeline
- Training plan
- Available documentation to be provided
- Technical approach
    - Hosting – remote/local (if locally hosted the solution needs to be containerized according to our HL7 Marketplace specification packaging requirements.)
    - Integration with SOLOR
    - Single sign-on
    - Implementation
    - Security

- Requirements spreadsheet
- Scenario illustrations using your terminology server and services, for each scenario in the RFP describe the capabilities your product provides and how provided.
- Cost spreadsheet
- References – 3 customers active in the past 3 years with requirements similar to HSPC's

Customer	Customer PoC	PoC Contact Information	Contract Start and End Dates	Services/Products Provided

Response Format

- Respond to topics/questions in the body of the RFP
- Complete the requirements and cost spreadsheets
- All responses should be accompanied by a cover letter signed by a corporate representative binding the company to the assertions and commitments presented in the proposal and confirming the cost proposal is firm for 90 days.

8 Evaluation Criteria

1. Requirements met in the requirements document
2. Scenario completion
3. Costs
4. Timeframes/Schedules
5. Track record or delivery
6. Hardware/Software requirements
7. Support requirements
8. Technical burden on HSPC for long-term use of the product

Much of this depends on how closely aligned we are in terms of requirements and mind-set for installation, timeframes, etc. There could be wide discrepancies we will need to work out. We will need to work with the vendors to ensure we are all on the same page to bring these into alignment.

HSPC may conduct interviews and request software demonstrations as part of the evaluation process.

9 Anticipated Challenges

Please describe how you would address the following challenges:

Challenge #1: HSPC is a non-profit organization with limited income.

Challenge #2: HSPC has multiple member organizations. Therefore, the selected vendor may be talking to people from different organizations with different viewpoints… but leadership is talking from the viewpoint of HSPC as a single entity.

Challenge #3: Differing versions of FHIR and the churn behind FHIR and its API's may present significant challenges for support now as well as in the future as the standard continues to evolve.

Other Challenges that your firm would like to include

10 Budget

Please review and complete the cost spreadsheet. HSPC prefers to procure a non-production terminology server and services at little or no cost.