

**DEPARTMENT OF VETERANS AFFAIRS**

**Office of Informatics and Analytics**

**Office of Knowledge Based Systems (KBS)**

**Informatics Architecture Support Services**

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**Contractor Project Management Plan (CPMP)**

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# Background

The directive of the Department of Veterans Affairs (VA), Veterans Health Administration (VHA), Office of Informatics & Analytics (OIA), and Health Informatics (HI) is to provide timely, relevant information and data services that support improvements in Veterans’ health. In meeting these goals, OIA strives to provide high quality, effective, and efficient Information and data services to those responsible for providing care to the Veterans at the point-of-care as well as throughout all the points of the Veterans’ health care in an effective, timely and compassionate manner. VA depends on information and data to meet mission goals.

The Veterans Health Administration of the Department of Veterans Affairs has a long and successful, history of using information technology to meet its mission. Within VA, each VA Medical Center (VAMC) is computerized through a Decentralized Hospital Computer Program (DHCP) system that has evolved considerably since its initial deployment in 1983. The implementation of a separate visual layer written in Delphi began the move to a “3-tiered” architecture. As a reflection of this evolution, the system name was changed to Veterans Health Information Systems and Technology Architecture (VISTA) in 1996. The clinical module for VistA, termed Computerized Patient Record System (CPRS) was initially released in 1996. Its installation was mandated nationally in 1999 and virtually all clinicians in the VA now use it. As it stands today, CPRS is an umbrella program that integrates problem lists, pharmacy data, orders, lab results, progress notes, vital signs, radiology results, transcribed documents, and reports from various studies such as echocardiograms in a clinically relevant manner.

Despite numerous past successes, VistA faces important challenges in the near-term and future. Since its inception, the healthcare environment has changed dramatically for providers and patients technically, organizationally and socially. Patients have become consumers and clinicians have become providers, with a significant amount of care delivered outside of traditional venues. Concurrently, important advances have been made in Health Informatics, Information Technology, Information Science, Human Factors engineering, with hardware, software, and knowledge resources that were unattainable then commonly available today. To meet these challenges VistA must evolve and embrace advances beyond its current functionality and scope.

As of today, the VistA Evolution Program is expected to incrementally deliver the 4th generation of VistA through FY2017. Termed VistA 4, it will provide enhanced clinical functionality, expanded interoperability, and a more flexible technical architecture. Concurrently, VistA 4 will aim to exceed current Office of National Coordinator (ONC) EHR certifications standards. These technical enhancements will ultimately benefit the Veteran by allowing the VistA 4 environment to continually change, adapt, and in turn be more responsive to changes in practice, provider and patient needs, system priorities, and advances in technology.

In this area and in general from a VA perspective, Informatics has become increasingly advanced and complex. To support VistA evolution and future VA Health Information Technology (HIT) advances, the VA requires access to top-notch informatics expertise, not presently found within VA staff, to address specific HIT issues. To meet this need, the VA seeks to leverage contracted resources to provide “niche” clinical informatics expertise to address specific informatics issues facing the VA***,*** both present and future.

# Introduction

To meet the need identified, the Book Zurman Team will provide the VA Office of Knowledge Based Systems (KBS) with access to nation leading informatics expertise to help ensure the success of current and future HIT initiatives. The KBS need for clinical informatics expertise is expected to span (but not be limited to) the following areas:

* Data mining and knowledge discovery
* Knowledge representation
* Description-logic classification algorithms
* Data representation
* Clinical Data Standards
* Clinical Decision Support
* Interoperability
* Clinical workflow integration
* Human factors engineering
* Clinical Systems Architecture
* Natural language processing
* Machine learning
* Clinical Information System Lifecycle
* Leading and managing change
* Specialty specific informatics such as nursing, dental, public health, pharmacy
* Terminology modeling
* Informatics intervention impact measurement

Representative activities that Book Zurman subject matter experts (SMEs) in the fields described above would align to multiple aspects of HIT system lifecycle:

* Initiation
* System concept development
* Planning
* Requirements analysis
* Design
* Development
* Integration and Test
* Implementation
* Operations and Maintenance
* Disposition

Not every project will require that the phases be sequentially executed. However, the phases are interdependent. Depending upon the size and complexity of the project, phases may be combined or may overlap, or may be repeated in a cyclic or agile process. Specific tasks are outlined in this document.

# Purpose

This Contractor Project Management Plan (CPMP) will serve as the primary management, planning and control document for the Department of Veterans Affairs, Office of Informatics and Analytics, Office of Knowledge-Based Systems, (KBS) Performance Work Statement (PWS) VA701-16-R-0412-002, Informatics Support Services (ISS.) This PMP describes the project organization, roles, responsibilities, and methods of oversight for tracking the progress of the project and how the Department of Veterans Affairs, the Book Zurman Team (BZ) and other stakeholders will interact during the project. This PMP also provides a work breakdown structure and master project schedule that describes the full lifecycle process of how the Informatics Support Services will be implemented during both the initial Base Period, Option Year, and the Four-Month Extension to the Option Year contract. .

## Approach

This document has been developed to provide an overview of the approach for managing the ISS project. In particular, this CPMP:

* Describes the management philosophy of the project
* Documents the Book Zurman (BZ) team, it’s organizational structure and its relationship to Department of Veterans Affairs stakeholders
* Presents the Master Project Schedule, detailing key milestones and identifying dependencies between tasks
* Documents the agreement between the Department of Veterans Affairs and BZ regarding how the project will be managed
* Describes the tools and methods that the BZ project management team will use to manage the project
* Is a tool to help ensure that all members of the project team understand how the project will be managed and defines their roles within the project
* Correlates and references project plans, as well as supporting documents, to provide details on key aspects of the project. Key project plans supporting this CPMP are detailed in Section 4 of this document.

## Scope

This CPMP includes the tasks that the BZ team will lead and coordinate in support of the VA’s healthcare informatics initiatives. The BZ team support will span the phases of the HIT system lifecycle (initiation through disposition). Many tasks will require input and support from the Department of Veterans Affairs project staff or Subject Matter Experts (SMEs). This CPMP describes activities to be completed during the contract base period. This document is iterative in nature and will be updated as necessary over the project base period, as well as throughout the option period if/when awarded.

## Assumptions and Constraints

The success of the Informatics Architecture Support Services effort depends on the following fundamental features:

* Complete and open collaboration
* Bi-directional inclusion in knowledge sharing and transfer
* Free and open dialogue and information exchange
* Unfettered access to project documentation and collaboration tools

# Project Tasks and Objectives

The objective of the KBS Informatics Architecture Support Services is to provide the VA access to expert healthcare informatics expertise required in order to develop, support, and deploy terminology standards. To address the needs defined in the Performance Work Statement, the Book Zurman Team is expected to engage in the following tasks:

## Task: Terminology Standard Integration

For this task, the Book Zurman Team is expected to complete the following:

* Define and demonstrate a machine-learning approach to terminology standards integration to better support VA terminology and guideline creation and maintenance
* Leverage existing open source connections between standard terminologies.
* Leverage lexical and semantic overlaps between terminology standards
* Demonstrate the impact of these integrations on guideline maintenance and creation
* Leverage existing sources of terminology use to create simulated terminology-based patient encounters.
* Deliver data as RefSets that connect standard terminologies by their native identifiers work and with VA resources to incrementally deploy RefSets against VA patient data sets

## Task: Patient Safety Consultation Regarding Patient Data Artifacts

For this task, the Book Zurman Team is expected to complete the following:

* Create a patient-safety analysis to identify compliant processes pertaining to IEC 62304 (Medical device software—Software life cycle processes)
* Develop and maintain patient data artifacts, including HL7 FHIR resources, HL7 CCDA/CCD, and similar representations proposed for use within VHA data exchange
* Document the current development processes used to author patient data artifacts (HL7 FHIR resources, etc.) as either implemented or proposed by eHMP, and identify strengths, weaknesses, and gaps with regard to IEC 62304 compliant processes for ensuring patient safety related to the use of these decision support artifacts in patient care.
* Define an IEC 62304 compliant future state for the development and maintain patient data artifacts (HL7 FHIR resources, etc.) as either implemented or proposed by eHMP.
* Define a roadmap for transitioning from the current state to the future state.

## Task: Description Logic Consultation

For this task, the Book Zurman Team is expected to complete the following:

* Provide the VHA informatics efforts with description-logic technical expertise and Snorocket support.
* Assist VHA with the environment setup and complete build of the latest SNOROCKET sources and test suites.
* Deliver latest Snorocket feature enhancements and big fixes (Quarterly)
* Provide Bi-Weekly Workshops on recommended topics

### Workshop Topics

The Book Zurman Team is expected to deliver SOLOR workshops as part of this task. The contractor will provide bi-weekly web-based workshops of up to 60 minutes in duration, using a web conference system supplied by the contractor (of the contractors choosing) on topics mutually agreed upon by the contractor and VHA during the option year period of performance. The appropriate SME whose background and area of expertise best aligns with the subject area will deliver the workshop itself. The Option Year contract mandates that there will be twenty-five (25) Workshops, of which fifteen (15) have been completed as outlined below. The Four-Month Extension to the Option Year contract has added eight (8) additional SOLOR Workshops, due to be delivered between 9/30/2018 and 1/29/2019.

For the remaining ten (10), the Book Zurman team was given the equivalent of six (6) workshop credits for entering designated content (see below) into DocBook and four (4) workshop credits for the HL7 write-up and submission to the CIMI Workgroup on the integration of Analysis Normal Form (ANF) with Clinical Input Form (CIF), CIMI and Negation.

The following table (Table 1) outlines completed SOLOR workshops for the KBS ISS Option Year contract. All workshops are recorded, and the link to the recording has been included:

**Table 1 – SOLOR Workshops for Option Year**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Date** | **Topic** | **Presenter** | **Notes/Link to Recording** |
| 1 | 10/10/17 | Data Element efforts and relation to SOLOR | Dr. Walter Sujansky | <https://recordings.join.me/fgU7UAFHCEeE57vATFhcaA> |
| 2 | 10/24/17 | HL7 Negation Requirement Project | Jay Lyle | <https://recordings.join.me/D3jy6Ge3CEC0cglubv8bKg>  <https://recordings.join.me/MGvECWcuCEiowq3X-stqpQ> |
| 3 | 11/1/17 | Clinical Data Elements | Dr. Walter Sujansky | Entered into DocBook (Workshop Credit) |
| 4 | 11/21/17 | Creating a Framework for Extracting Unique Identifiers from Relevant Medical Text | Sravan Elineni | <https://recordings.join.me/lbvrzrWWW0O0GwfpbSiGLw> |
| 5 | 11/28/17 | Taking Stock of Recent Innovations for Interoperability and HIE | Dr. Walter Sujansky | <https://recordings.join.me/HYX8u7oDjUCYPIPsJTAfgA> |
| 6 | 12/19/17 | Organizing the ISAACS/KOMET Documentation: DocBook Source Content, Maven Builds, and Web Publishing | Dr. Walter Sujansky | <https://recordings.join.me/paME7-OpUkS2OGyJhrkeng> |
| 7 | 1/30/18 | Impact of SNOMED’s Description Logic Changes on Distribution Normal Form | Dr. Michael Lawley | Part 1: <https://recordings.join.me/bkngFTE0Y02LKXV1U3_tpw>  Part 2:  <https://recordings.join.me/7SwsR_JXMkW98ATzn2sEEw> |
| 8 | 2/13/18 | FHIR Resources and Profiles in Relation to SOLOR and CIMI | Dr. Walter Sujansky | <https://recordings.join.me/HgI646oSH0WS0BOuXVR88w> |
| 9 | 3/6/18 | Conceptualizing the Utilization of SNOMED, LOINC and RxNorm in place of UMLS in the Machine Learning Model | Sravan Elineni | <https://www.vapulse.net/docs/DOC-145472> |
| 10 | 3/13/18 | Integrated Taxonomy: Aligning AMT with the SNOMED Drug Model | Dr. Michael Lawley | <https://www.vapulse.net/docs/DOC-147506> |
| 11 | 4/17/18 | FHIR Profiles and Consolidated CDA Templates: Data-Modeling Issues With Implications for Patient Safety | Dr. Walter Sujansky | <https://healthservices.atlassian.net/wiki/spaces/SOLOR/pages/232554512/IA+SOLOR+Presentations> |
| 12 | 6/5/18 | International Drug Model | Dr. Michael Lawley | <https://healthservices.atlassian.net/wiki/spaces/SOLOR/pages/232554512/IA+SOLOR+Presentations> |
| 13 | 6/12/18 | Patient Safety Considerations & Analysis Normal Form | Dr. Walter Sujansky | <https://healthservices.atlassian.net/wiki/spaces/SOLOR/pages/232554512/IA+SOLOR+Presentations> |
| 14 | 6/19/18 | Machine Learning Refset - Analysis & Findings Based on Cerner Health Facts Patient Data | Sravan Elineni | <https://healthservices.atlassian.net/wiki/spaces/SOLOR/pages/232554512/IA+SOLOR+Presentations> |
| 15 | 7/10/18 | Analysis Normal Form Model | Kirsten Haake | <https://healthservices.atlassian.net/wiki/spaces/SOLOR/pages/232554512/IA+SOLOR+Presentations> |

In addition to delivery, six (6) of these SOLOR Workshops were designated for DocBook Entry. As stipulated above, each entry was meant to align to a SOLOR Workshop, providing a total of six (6) additional workshops. They are highlighted in Table 2 below:

**Table 2 – SOLOR Workshops for DocBook Entry During Option Year**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Date** | **Topic** | **Presenter** | **Status** |
| 1 | 10/24/17 | HL7 Negation Requirement Project | Jay Lyle | Complete (Entered into DocBook by Joey Coyle) |
| 2 | 11/21/17 | Creating a Framework for Extracting Unique Identifiers from Relevant Medical Text | Sravan Elineni | Complete |
| 3 | 1/30/18 | Impact of SNOMED’s Description Logic Changes on Distribution Normal Form | Dr. Michael Lawley | Complete |
| 4 | 2/13/18 | FHIR Resources and Profiles in Relation to SOLOR and CIMI | Dr. Walter Sujansky | Complete |
| 5 | 3/6/18 | Conceptualizing the Utilization of SNOMED, LOINC and RxNorm in place of UMLS in the Machine Learning Model | Sravan Elineni | Complete |
| 6 | 3/13/18 | Integrated Taxonomy: Aligning AMT with the SNOMED Drug Model | Dr. Michael Lawley | Complete |
| 7 | 4/17/18 | FHIR Profiles and Consolidated CDA Templates: Data-Modeling Issues With Implications for Patient Safety | Dr. Walter Sujansky | Complete\*  (See comment 4 below) |
| 8 | 6/5/18 | International Drug Model | Dr. Michael Lawley | Complete |

Notes:

1. Guidance is for Sravan to combine content from Presentation 2 and Presentation 5 into one DocBook entry
2. Dr. Lawley delivered a SOLOR Workshop on the International Drug Model (IDM) on 5 June; the DocBook entry will cover both Presentation 6 and the content on IDM.
3. The Book Zurman Team will receive one (1) Workshop credit per DocBook entry.
4. There was feedback on the SOLOR Wokshop covering “FHIR Profiles and Consolidated CDA Templates: Data-Modeling Issues With Implications for Patient Safety” which the Book Zurman Team will address.

**HL7 Write-Up:** The Book Zurman Team is drafting a ballot submission to the CIMI Workgroup; the Project Scope Statement (PSS) was submitted and approved by CIMI Workgroup but has not been reviewed/approved by Infrastructure Steering Division (ISD) and will still need to be reviewed and approved by Architecture Review Board (ARB) after ISD approval; this write-up will align to four (4) SOLOR Workshop credits and will likely have to be submitted as a "Ballot for Comment" for the January 2019 submission deadline. Joey Coyle is the Primary Author with Walter Sujansky and Kirsten Haake as SME support; content will also be leveraged to be included in master Architecture Document. The initial draft of this artifact was delivered on 9/28/2018 and will be updated during the 4-month extension period awarded for the Option Year.

## Task: Utilization of OWL 2 EL Profile Semantics

For this task, the Book Zurman Team is expected to complete the following:

* For each specified content area, create two RefSets: one that identifies content that contains the identified content, and one that identifies content that does NOT contain the identified content
* RefSets should be in SNOMED RF2 format or other mutually agreed upon format
* The two RefSets together will be used to identify new content which has not been reviewed for either inclusion or exclusion of that content so that maintenance of this content over time is supported without re-reviewing the entire content
* Provide statistics that determine sensitivity, specificity, and inter-rater reliability of the two RefSets
* For each content area, deliver a Whitepaper describing the process and the sensitivity, specificity, and inter-rater reliability of the processes used to develop the two RefSets
* Provide updated definitions for all content that should be declared as meronomy/partonomy with respect to Anatomy, Pharmacy, and Laboratory (Content Area)
* Provide updated definitions for all content that demonstrate the proper use of logical nesting within SNOMED/SOLOR, and transformation of role groups into properly nested expressions, and proper use of nesting in areas that did not previously use role groups (Content Area) ***Note:*** A **nested expression** is an expression which is defined within another expression, the *enclosing expression*. Due to simple recursive [scope](https://en.wikipedia.org/wiki/Scope_(programming)) rules, a nested expression is itself invisible outside of its immediately enclosing expression. The nesting is theoretically possible to any ideas of depth, although only a few levels are normally used in practice
* Provide updated definitions for all content that should have multiple sufficient sets

## Task: Creation of FHIR Profiles

For this task, the Book Zurman Team is expected to complete the following:

* Deliver a FHIR profile for the Observation and Condition resources that ensure that SNOMED, RxNorm, and LOINC are preferentially and consistently used in HL7 FHIR resources
* Take into account the October 31, 2017 delivery of the first iteration of SOLOR.

## Task: Create a Model Transformation Approach

For this task, the Book Zurman Team is expected to complete the following:

* Define a general transformation approach for conversion of CEMs to CIMI Observation Results.
* Utilize XML-based data structures for input of CEMs, and for export of CIMI observations results
* Utilize XSLT to perform the transformation.
* Define model instance classes that can be used for all instances of a particular test

## Task: Create Validated Modeling Guide and Quality Processes

For this task, the Book Zurman Team is expected to complete the following:

* Provide a validated modeling guide and quality processes that will ensure that the model transformation approach defined is:
  + High Quality
  + Understandable
  + Reproducible
  + Useful

## Task: Transform 25 CEMs to CIMI Observation Results

For this task, the Book Zurman Team is expected to complete the following:

* Use the modeling guide and quality processes to model by human expert review 10 CEMs as CIMI Analysis Normal Form models
* Model an additional 15 CEMs that represent Clinical Input Form models for the same use as the 10 Analysis Normal Form models
* Describe how the Analysis Normal Form and the Clinical Input Form models relate to one another. Collect process metrics so that target LOE regarding individual model transformations can be quantified, and categorized into the low complexity, medium complexity, high complexity, and very-high complexity model-oriented task.

## Task: Identify SOLOR Content that Requires Special Handling

For this task, the Book Zurman Team is expected to complete the following:

* For each specified content area, Contractor will first create a list of candidate concepts using lexical search where they shall identify the 50,000 terms most likely to meet the criterion.
* From the above dataset, create two RefSets: one that identifies content that contains the identified content, and one that identifies content that does NOT contain the identified content. The two RefSets together will be used to identify new content which has not been reviewed for either inclusion or exclusion of that content so that maintenance of this content over time is supported without re-reviewing the entire content.
* Provide statistics that determine sensitivity, specificity, and inter-rater reliability of the two RefSets.
* Identify all content in the SNOMED clinical findings, situation with explicit context, body structures, and procedures that represent the inverse concept (uncooperative is inverse of cooperative); Contractor shall deliver 40 units of 5,000 concepts.
* Identify all concepts in the SNOMED clinical findings and situation with laterality, with a particular emphasis lateralized concepts that give correct, and incorrect lateralized inference results. Contractor shall deliver 20 units of 5,000 concepts.
* Identify all concepts in the SNOMED clinical findings and situation with explicit context which are primitive concepts which can probably be fully defined. Contractor shall deliver 20 units of 5,000 concepts.

## 4.10 Task: Create Transformed Models

For this task, the Book Zurman Team is expected to complete the following:

* Use the model transformation approach provided to transform an agreed number of model instances
* Transform 1000 CEM models to CIMI observation result models, according to the processes defined
* This is not to include the 1000 CEM models transformed during the base year
* CIMI models must be stratified among CIMI Analysis Normal Form Statements and CIMI Clinical Input Form Clinical Statements that pertain to CIMI Phenomenon Measurement Clinical Statements, Phenomenon Goal Clinical Statements, and Action Request Clinical Statements.

# Project Organization and Resources

The BZ Team organizational structure is illustrated below in Figure 1.

Figure 1 – BZ Team Organization



The BZ team member roles and responsibilities are shown below in Table 3:

Table 3 - BZ Project Team Roles and Responsibilities

| **Role** | **Responsibility** |
| --- | --- |
| BZ President (Brian Book) | Senior Executive providing oversight of all company activities. |
| BZ Program Director  (Jayme Welty) | Oversees project delivery activities and provides guidance and oversight to project manager and the project leadership team; facilitates the involvement of key BZ subject matter experts; reviews key project deliverables and provides feedback during the internal review process; meets regularly with project manager and Department management to obtain feedback on project progress and to provide guidance. |
| Project Manager  (Jay Lahiri) | Primary BZ point of contact with responsibility for project staffing, quality, cost, schedule, and adherence to contract requirements; approves project deliverables prior to delivery to the Department; responsible for contractor and subcontractor project staff performance and morale; responsible for ensuring the quality of all project deliverables and work products. Works directly with BZ Leadership, VA Project Manager, Contracting Officer, and Contracting Officer Technical Representative to coordinate overall project activities. |
| Machine Learning SME  (Sravan Elineni) | Senior SME to provide expertise in the area of machine learning and support all tasks attributable to the subject area. Machine learning subject areas were only applicable during the Base Period and initial 12-month Option Year. |
| Clinical SME  (Dr. Joey Coyle) | Senior Clinical SME supporting tasks pertaining to CEM and CIMI models and observation results. |
| Knowledge Engineer  (Dr. Walter Sujansky) | Knowledge Engineer in support of all PWS Tasks. |
| Data Scientist  (Michael Lawley, Ph.D.) | Data Scientist supporting tasks pertaining to SNOROCKET. |

## BZ Subcontractors

The BZ team includes a collection of carefully chosen subcontract partners to complement BZ’s resident skill and experience. These BZ subcontractors bring specific relevant experience to the team enabling the project to be staffed with qualified professionals while ensuring that the project is aligned with meeting and exceeding the Department’s socio-economic procurement goals.

The BZ subcontractors are shown in Table 4. Other qualified companies may be added to the BZ team in the future, if needed, upon government approval.

Table 4: BZ Team Subcontractors

| **Subcontractor** | **Type of Business** |
| --- | --- |
| Deloitte Consulting, LLP | Large Business |
| Sujansky and Associates | Small Business |
| Michael Lawley | Small Business |

# Project Management Approach

## Master Project Schedule

BZ has developed a Master Project Schedule to support the Clinical Informatics PWS. This schedule for the Option Year is shown below in Figure 2 with the schedule for the Four-Month Extension contract captured in Figure 3. This Master Project Schedule has been developed in Microsoft Project. The Master Project Schedule is being updated as needed (monthly at minimum) and is the primary project artifact used to monitor and report project status and progress at the monthly progress/status briefings.

Figure 2 – Master Project Schedule (Option Year)

|  |  |  |  |
| --- | --- | --- | --- |
| **CLIN #** | **PWS** | **Task Requirement** | **Status** |
|  | **5.1** | | |
|  | **5.1.1** | **Technical Kickoff Meeting** | Complete |
|  | 5.1.1.1 | Send agenda to attendees | Complete |
|  | 5.1.1.2 | Hold Technical Kickoff Meeting | Complete |
|  | **5.1.2** | **Contractor Project Management Plan** |  |
| 1001 | 5.1.2.1 | Provide Initial Contractor Project Management Plan | Complete |
| 1002 | 5.1.2.2 | Provide Updated Contractor Project Management Plan (Quarterly Update) | Quarter 1 Update Completed |
| Quarter 2 Update Completed |
| Quarter 3 Update Completed |
| Quarter 4 Update Completed |
|  | **5.1.3** | **Reporting Requirements** | |
| 1003 | 5.1.3.1 | Provide Monthly Progress Reports | All Monthly Progress Reports for the Option Year have been submitted and approved |
| 1003 | 5.1.3.2 | Participate in Weekly Status Calls | Ongoing |
|  | **5.2** | | |
|  | **5.2.1** | **Provide Datasets for Changes in Terminology Standards** | |
| 1004 | 5.2.1.1 | Dataset 1.1: Standard terminologies representation RefSet | Initial version delivered in January 2018; revised version delivered on 3/9; Final Submission on 3/29 |
| 1005 | 5.2.1.2 | Dataset 1.2 - Representation of changes to the terminologies of Dataset 1.1 RefSet | Initial version delivered in January 2018; revised version delivered on 3/9; Final Submission on 3/29 |
| 1006 | 5.2.1.3 | Dataset 1.3 - Patient Care Attribute RefSet (Dataset 1.1 Re-focus) | Initial version delivered in January 2018; revised version delivered on 3/9; Final Submission on 3/29 |
| 1007 | 5.2.1.4 | Dataset 1.4 - Predictions RefSet (Based on Datasets 1.1-1.3) | Initial version submitted on 1/2/2018; Final version submitted on 3/29 |
|  | **5.2.2** | **Support VA Deployment of Terminology Standards** | |
| 1008 | 5.2.2.1 | Deploy Datasets 1.1 as RefSets against patient data | Complete. The Pre-Submission version had been submitted on 5/25 and final VA approval received on 6/28. |
| 5.2.2.2 | Deploy Datasets 1.2 as RefSets against patient data | Complete. The Pre-Submission version had been submitted on 5/25 and final VA approval received on 6/28. |
| 5.2.2.3 | Deploy Datasets 1.3 as RefSets against patient data | Complete. The Pre-Submission version had been submitted on 5/25 and final VA approval received on 6/28. |
| 5.2.2.4 | Deploy Datasets 1.4 as RefSets against patient data | Complete; Final VA approval received |
|  | **5.3** | | |
|  | **5.3.1** | **Document Current State** | |
| 1009 | 5.3.1.1 | Document Current State Whitepaper with respect to patient data artifacts (HL7 FHIR resources, etc.) | Complete |
|  | **5.3.2** | **Document Future State** | |
| 1010 | 5.3.2.1 | Document Future State Whitepaper with respect to patient data artifacts (HL7 FHIR resources, etc.) | Complete |
|  | **5.3.3** | **Roadmap** | |
| 1011 | 5.3.3.1 | Document Roadmap Whitepaper with respect to patient data artifacts (HL7 FHIR resources, etc.) | Delivered on 9/26; Feedback received from VA and deliverable being updated |
|  | **5.4** | | |
|  | **5.4.1** | **Workshops** | |
| 1012 | 5.4.1.1 | Provide Bi-weekly Web-based workshops (25 total) | Fifteen (15) SOLOR Workshops delivered; remaining ten (10) completed as DocBook entries (6 Workshop credits) and HL7 Write-Up (4 Workshop credits) |
|  | **5.4.2** | **SNOROCKET Support** | |
| 1013 | 5.4.2.1 | Setup of SNOROCKET sources and test suites (to be completed in ISAAC for Option Year) | Completed on 3/2 |
| 1014 | 5.4.2.2 | Quarterly delivery of updated SNOROCKET sources and test suites | SNOROCKET Version 2.9.0 released (Q1) |
| SNOROCKET Version 2.9.1 released (Q2) |
| SNOROCKET Version 3.0.0 released (Q3) |
| SNOROCKET Version 3.1.1 released (Q4) |
|  | **5.5** | | |
|  | **5.5.1** | **Meronomy/Partonomy Content** | |
| 1015 | 5.5.1.1 | Meronomy/Partonomy Content RefSet identifying content containing Identified Content with respect to anatomical representation, pharmacy (e.g. ingredients and formulations) and laboratory (e.g. panels and microbiology cultures with organism identification and antibiotic sensitivity) | Initial version delivered in January 2018; revised version delivered on 3/9 with Final Submission on 3/29 |
| 1016 | 5.5.1.2 | Meronomy/Partonomy Content RefSet identifying content not containing Identified Content with respect to anatomical representation, pharmacy (e.g. ingredients and formulations) and laboratory (e.g. panels and microbiology cultures with organism identification and antibiotic sensitivity) | Initial version delivered in January 2018; revised version delivered on 3/9 with Final Submission on 3/29 |
| 1017 | 5.5.1.3 | Create Meronomy/Partonomy Content Whitepaper | Initial version delivered in January 2018; revised version delivered on 3/9 with Final Submission on 3/29 |
|  | **5.5.2** | **Concrete Domain Content** | |
| 1018 | 5.5.2.1 | Deliver two Concrete Domain Content RefSets SNOMED RF2 on proper use of logical nesting within SNOMED/SOLOR, and transformation of role groups into properly nested expressions, and proper use of nesting in areas that did not previously use role groups | Complete. Pre-Submission delivered on 5/17 with final VA approval on 6/15. |
| 1019 | 5.5.2.2 | Deliver Concrete Domain Whitepaper on proper use of logical nesting within SNOMED/SOLOR, and transformation of role groups into properly nested expressions, and proper use of nesting in areas that did not previously use role groups | Complete. Pre-Submission delivered on 5/17 with final VA approval on 6/15. |
|  | **5.5.3** | **Multiple Sufficient Sets** | |
| 1020 | 5.5.3.1 | Provide Updated Role Hierarchies Definition Files | Complete. Pre-Submission version delivered on 6/15 with final VA approval on 7/31. |
| 1021 | 5.5.3.2 | Provide Updated Transitive Roles Definition Files | Complete. Pre-Submission version delivered on 6/15 with final VA approval on 7/31. |
| 1022 | 5.5.3.3 | Provide Updated Right-Identity Roles Definition Files | Complete. Pre-Submission version delivered on 6/15 with final VA approval on 7/31. |
|  | **5.6** | | |
|  | **5.6.1** | **FHIR Profiles for the Observation and Condition Resources** | |
| 1023 | 5.6.1.1 | Deliver an Observation FHIR Profile on top of the October 31st 2017 delivery (based on work completed during the Base Year) of SOLOR | Complete; Delivered on 9/19 |
| 1024 | 5.6.1.2 | Deliver a Condition FHIR Profile on top of the October 31st 2017 delivery (based on work completed during the Base Year) of SOLOR | Complete; Delivered on 9/19 |
|  | **5.7** | | |
|  | **5.7.1** | **Develop Approach for Conversion of CEMS to CIMI Observation Results** | |
| 1025 | 5.7.1 | CEM to CIMI Observation Result Conversion Whitepaper | Complete – Delivered on 3/29 |
|  | **5.8** | | |
| 1026 | 5.8.1 | Provide Validated Modeling Guide and Quality Processes Whitepaper | Complete – Delivered on 3/29 |
|  | **5.9** | | |
| 1027 | 5.9.1 | Provide 25 CEMS to CIMI Modeled Results - Use the modeling guide and quality processes to model by human expert review 10 CEMs as CIMI Analysis Normal Form models and then model an additional 15 CEMs that represent Clinical Input Form models for the same use as the 10 Analysis Normal Form models, | Complete; Delivered on 9/3; VA completed review of Clinical Input Form version – awaiting Analysis Normal Form version |
|  | **5.10** | | |
| 1028 | 5.10.1 | Create a RefSet of 50,000 concepts in SNOMED RF2 format | Completed |
| 1029 | 5.10.2 | Create a RefSet of SNOMED RF2 concepts including inverse concept | Will produce one RefSet in SNOMED RF2 format; Pre-Submission on 7/17 with final VA approval on 9/26 |
| 1030 | 5.10.3 | Create a RefSet of SNOMED RF2 concepts excluding inverse concept | Will produce one RefSet in SNOMED RF2 format; Pre-Submission on 7/17 with final VA approval on 9/26 |
| 1031 | 5.10.4 | Create a RefSet of SNOMED RF2 concepts with for clinical findings and situation regarding laterality | Will produce one RefSet in SNOMED RF2 format; Pre-Submission on 7/17 with final VA approval on 9/11 |
| 1032 | 5.10.5 | Create a RefSet of SNOMED RF2 concepts for clinical findings and situation not regarding laterality | Will produce one RefSet in SNOMED RF2 format; Pre-Submission on 7/17 with final VA approval on 9/11 |
| 1033 | 5.10.6 | Primitive concept results of the RefSet of SNOMED RF2 concepts | Will produce one RefSet in SNOMED RF2 format; Pre-Submission on 7/17 and final VA approval on 10/10 |
| 1034 | 5.10.7 | RefSet of SNOMED RF2 concepts that are not primitive concept results | Will produce one RefSet in SNOMED RF2 format; Pre-Submission on 7/17 and final VA approval on 10/10 |
| 1035 | 5.10.8 | Comprehensive Whitepaper of SNOMED RF2 Concept Analysis describing the processes applied to produce the RefSets, and the statistics collected regarding inter-rater reliability and sensitivity and specificity | Will produce Whitepaper in DocBook form; Pre-Submission on 8/17 and final VA approval on 10/22 |
|  | **5.11** | | |
| 1036 | 5.11.1 | Provide 1000 CEM models transformed to 1000 CIMI models (not to include the 1,000 CEM models transformed during the base year) | Complete; Delivered on 9/3; VA completed review of Clinical Input Form version – awaiting Analysis Normal Form version |

***Note:*** *For Condition FHIR Profile (PWS Task 5.6.1.2, CLIN 1024) further exposition of the “negation scope” concept to be potentially addressed during 4-month extension*

The following outlines the Master Project Schedule for the Four-Month Extension contract:

**Figure 3 – Master Project Schedule (Four-Month Extension)**

|  |  |  |  |
| --- | --- | --- | --- |
| **CLIN #** | **PWS** | **Task Requirement** | **Status** |
|  | **5.1** | | |
|  | **5.1.2** | **Contractor Project Management Plan** |  |
| 1002 | 5.1.2.1 | Provide Initial Contractor Project Management Plan | Complete |
|  | **5.1.4** | **Reporting Requirements** | |
| 1003 | 5.1.4.1 | Provide Monthly Progress Reports | Monthly Progress Report for October has been submitted |
|  | **5.3** | | |
|  | **5.3.1** | **Document Current State** | |
| 1009 | 5.3.1.1 | Document Current State Whitepaper with respect to patient data artifacts | Due in November 2018 |
|  | **5.3.2** | **Document Future State** | |
| 1010 | 5.3.2.1 | Document Future State Whitepaper with respect to patient data artifacts | Due in December 2018 |
|  | **5.3.3** | **Roadmap** | |
| 1011 | 5.3.3.1 | Document Roadmap Whitepaper with respect to patient data artifacts | Due in January 2019 |
|  | **5.4** | | |
|  | **5.4.1** | **Workshops** | |
| 1012 | 5.4.1.1 | Provide Bi-weekly Web-based workshops (8 total) | Eight (8) SOLOR Workshops to be delivered during four-month extension contract |
|  | **5.4.2** | **SNOROCKET Support** | |
| 1014 | 5.4.2.1 | Delivery of updated SNOROCKET sources and test suites (Two Updates due during four-month extension) | November 2018 Update |
| January 2019 Update |
|  | **5.5** | | |
|  | **5.5.1** | **Symmetric Models Content** | |
| 1015 | 5.5.1.1 | Symmetric Models RefSet identifying content containing Identified Content | Due in January 2019 |
| 1016 | 5.5.1.2 | Symmetric Models RefSet identifying content not containing Identified Content | Due in January 2019 |
| 1017 | 5.5.1.3 | Symmetric Models Whitepaper | Due in January 2019 |

## Project Deliverables

The purpose of this section is to define the delivery, review, and approval processes for artifacts submitted under the Option Year contract which are to be considered iterative in nature. Due to the evolving characteristics of the informational content and subject matter covered in a number of contract deliverables, the VA Project Manager (PM) and stakeholders acknowledge that it would be beneficial for VA to allow the Book Zurman Inc. (BZ) Team to revise particular work products (as defined below) and resubmit iterative updated versions (following initial pre-submission) according to a mutually agreed upon schedule. The deliverables in question have been aligned to their respective Performance Work Statement (PWS) task and specifically fall under PWS Tasks 5.2, 5.5, and 5.10. An exception to this is PWS Task 5.10.1 (Create a RefSet of 50,000 concepts in SNOMED RF2 format), which is meant to be predominantly “locked down” upon First Quarter delivery. However, the BZ Team acknowledges that there may be minimal updates required and will coordinate with VA to revise accordingly.

In alignment with quantity stipulations included within the PWS, a number of deliverables are on a quarterly submission schedule. As such, these artifacts will be delivered on a 3-month cycle, with initial First Quarter deliverables submission due at the 3-month mark, Second Quarter at the 6-month mark, Third Quarter at the 9-month mark and (where applicable) Fourth Quarter at the 12-month end of Period of Performance (PoP) date. Under approved guidelines, the initial submission will be considered the first iteration, with an updated version due three (3) months after initial delivery. The quarterly due dates are as follows:

First Quarter: 12/29/2017

Second Quarter: 3/29/2018

Third Quarter: 6/29/2018

Fourth Quarter: 9/29/2018

As recommended by VA, there will be two (2) separate for invoices for each quarterly invoicing cycle, one for iterative deliverables and one for non-iterative deliverables.

Following initial delivery (Pre-Submission) of defined project artifacts, the Book Zurman Team will coordinate with VA stakeholders to schedule review sessions to aggregate additional feedback and update as needed. Any comments and questions from VA will be logged and tracked via the HSPC Jira site, with each item assigned to the appropriate Book Zurman Team SME. This particular SME will ensure that all updates identified are then incorporated, with all suggested edits to be completed for inclusion in the final deliverable (see schedule above). Additionally, the BZ Team has committed to spending the last month of the contract period of performance refining (as necessary) these iterative deliverables, such that the “end of contract” versions of all artifacts meet VA expectations and needs to the greatest extent possible.

### Deliverables Schedule

The Informatics Architecture Support Services Project Deliverable Schedule for the Option Year is shown below in Table 5 with the Project Deliverable Schedule for the Four-Month Extension captured in Table 6. These Tables list the agreed upon contents for each project deliverable required within the PWS, along with the associated due dates. This delivery schedule is based on a project start date of September 29, 2017 for the Option Year and a project start date of September 30, 2018 for the Four-Month Extension. These dates will be refined, as needed, based on project progress as reported in the monthly status briefings.

**Table 5 – Deliverable Schedule (Option Year)**

| **Task** | **Deliverable Description** | **Due Date** |
| --- | --- | --- |
| 5.1.2 | Contractor Project Management Plan (CPMP) | 1 month after award |
| 5.1.2 | Updated CPMP | Quarterly |
| 5.1.3 | Monthly Progress Report | Every month after award |
| 5.1.3 | Weekly Status Call | Every week after award |
| 5.2.1 | Datasets as RefSets | Initial delivery 3 months after award; Updated version due 6 months after award |
| 5.2.2 | Deploy Datasets as RefSets against patient data | Initial delivery 7 months after award; Contingent on availability of patient data |
| 5.3.1 | Document Current State Whitepaper with respect to patient data artifacts (HL7 FHIR resources, etc.) | 6 months after award |
| 5.3.2 | Document Future State Whitepaper with respect to patient data artifacts (HL7 FHIR resources, etc.) | 9 months after award |
| 5.3.3 | Document Roadmap Whitepaper with respect to patient data artifacts (HL7 FHIR resources, etc.) | 12 months after award (Pre-Submission 11 months after award) |
| 5.4.1 | Bi-weekly Web-based Workshops | Every 2 weeks after award (until all 25 workshops are completed) |
| 5.4.2 | Setup of SNOROCKET Sources and Test Suites | Per VA Program Manager Dr. Keith Campbell, this task will be due 5 months after award. Original contract due date was 3 months after award. |
| 5.4.2 | Quarterly delivery of updated SNOROCKET sources and test suites | Updates due by Quarter. Initial delivery 3 months after award; Quarter 2 updates due 6 months after award; Quarter 3 updates due 9 months after award; Quarter 4 updates due at end of contract |
| 5.5.1 | Meronomy/Partonomy Content RefSet identifying content containing Identified Content with respect to anatomical representation, pharmacy (e.g. ingredients and formulations) and laboratory (e.g. panels and microbiology cultures with organism identification and antibiotic sensitivity) | Per VA Program Manager Dr. Keith Campbell, the draft version will be due 3 months after award and the final delivery due 6 months after award to ensure that the refset is sufficient for an accepted deliverable. Original contract had listed delivery due date of 3 months after award. |
| 5.5.1 | Meronomy/Partonomy Content RefSet identifying content not containing Identified Content with respect to anatomical representation, pharmacy (e.g. ingredients and formulations) and laboratory (e.g. panels and microbiology cultures with organism identification and antibiotic sensitivity) | Per VA Program Manager Dr. Keith Campbell, the draft version will be due 3 months after award and the final delivery due 6 months after award to ensure that the refset is sufficient for an accepted deliverable. Original contract had listed delivery due date of 3 months after award. |
| 5.5.1 | Meronomy/Partonomy Content whitepaper | Per VA Program Manager Dr. Keith Campbell, the draft version will be due 3 months after award and the final delivery due 6 months after award to ensure that the whitepaper is sufficient for an accepted deliverable. Original contract had listed delivery due date of 3 months after award. |
| 5.5.2 | RefSets in SMOMED RF2 on proper use of logical nesting within SNOMED/SOLOR, and transformation of role groups into properly nested expressions, and proper use of nesting in areas that did not previously use role groups. | Initial delivery 8 months after award; |
| 5.5.2 | Concrete Domain Content Whitepaper on proper use of logical nesting within SNOMED/SOLOR, and transformation of role groups into properly nested expressions, and proper use of nesting in areas that did not previously use role groups. | Initial delivery 8 months after award; |
| 5.5.3 | Updated Definition Files | Initial delivery 9 months after award; |
| 5.6.1 | FHIR Profiles on top of the October 31st 2017 delivery (based on work completed in Base Year) of SOLOR | 12 months after award (Pre-Submission 11 months after award) |
| 5.7.1 | CEMs to CIMI Observation Whitepaper | 6 months after award |
| 5.8 | Validated Modeling Guide Whitepaper -  Provide a validated modeling guide and quality processes that will ensure that the model transformation approach defined by 5.7.1 is understandable, reproducible, and useful, particularly with respect to the relationship of the Clinical Input Form and Analysis Normal Form. | 6 months after award |
| 5.9 | CEM TO CIMI Modeled Results - Use the modeling guide and quality processes to model by human expert review 10 (*was 25 in the base year*) CEMs as CIMI Analysis Normal Form models and then model an additional 15 CEMs that represent Clinical Input Form models for the same use as the 10 Analysis Normal Form models, and describe how the Analysis Normal Form and the Clinical Input Form models relate to one another. Collect process metrics so that target LOE regarding individual model transformations can be quantified, and categorized into the low complexity, medium complexity, high complexity, and very-high complexity model-oriented task. | 12 months after award (Pre-Submission 11 months after award) |
| 5.10 | RefSet of 50,000 Concepts in SNOMED RF2 format | 3 months after award |
| 5.10 | RefSet of concepts that includes inverse concept and a RefSet that excludes inverse concept | Initial delivery 10 months after award |
| 5.10 | RefSet of SNOMED RF2 concepts for clinical findings and situation regarding laterality and RefSet of SNOMED RF2 concepts for clinical findings and situations not regarding laterality | Initial delivery 10 months after award |
| 5.10 | RefSet of the concepts that are primitive concept results and a RefSet of the concepts that are not primitive concept results | Initial delivery 10 months after award |
| 5.10 | Whitepaper describing the processes applied to produce the RefSets, and the statistics collected regarding inter-rater reliability and sensitivity and specificity | Initial delivery 11 months after award |
| 5.11 | 1000 CEM models transformed to 1000 CIMI models | 12 months after award (Pre-Submission 11 months after award) |

The following table highlights the anticipated schedule for deliverables under the Four-Month Extension contract:

**Table 6 – Deliverable Schedule (4-Month Extension)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Deliverables** | | | | **Delivery Schedule & Tasking** | | | |
| **CLIN** | **PWS Task** | **Description** | **Quantity** | **October 2018** | **November 2018** | **December 2018** | **January 2019** |
| 1002 | 5.1.2 | Updated Contractor Project Management Plan (CPMP) | 1 |  |  |  |  |
| 1003 | 5.1.4 | Monthly Progress Report | 4 |  |  |  |  |
| 1009 | 5.3.1 | Current State Whitepaper | 1 |  |  |  |  |
| 1010 | 5.3.2 | Future State Whitepaper | 1 |  |  |  |  |
| 1011 | 5.3.3 | Roadmap Whitepaper | 1 |  |  |  |  |
| 1012 | 5.4.1 | Bi-Weekly Web-based Workshops | 8 |  |  |  |  |
| 1014 | 5.4.2 | Updated SNOROCKET Sources/Test Suites | 2 |  |  |  |  |
| 1015 | 5.5.1 | Symmetric Models RefSet identifying content containing Identified Content | 1 |  |  |  |  |
| 1016 | 5.5.1 | Symmetric Models RefSet identifying content not containing Identified Content | 1 |  |  |  |  |
| 1017 | 5.5.1 | Symmetric Models Whitepaper | 1 |  |  |  |  |

The Department of Veterans Affairs reviews draft deliverables and provides comments back to the BZ team along with a deliverable rating. This rating defines the acceptance of the deliverable by the Department as follows:

* 5 – acceptable
* 4 – acceptable with minor changes
* 3 – acceptable with moderate changes
* 2 – acceptable with major changes
* 1 – unacceptable

The deliverables are reviewed within 5-15 business days. If the VA requires additional time for review, the BZ team accommodates and, if necessary, adjusts the project schedule accordingly.

## Communication Management

The purpose of the BZ Communications Plan (CP) is to describe the methodology for sharing complete, accurate, and timely information about the project. It addresses how program information, both formal and informal, will be communicated to all interested and involved internal and external stakeholders. The objectives of the CP are to:

* Provide multiple communications channels,
* Provide quality and timely communications,
* Provide ease of access to program information,
* Consider resources that mitigate the cost of disseminating program information, and
* Protect the integrity of sensitive information.

The CP identifies the following information:

* **Who**: The individuals, organizations and other stakeholders who need information
* **What**: The type of information needed, e.g. budget and schedule status
* **When**: The frequency, i.e., daily, weekly, monthly, of information needs
* **How**: The media used to disseminate information
* **Roles** **and** **Responsibilities**: Those of the BZ team and VA stakeholders in carrying out the CP

The BZ Program Manager will work with the VA Program Manager, Contracting Officer, and Contracting Officers Technical Representative to identify interested stakeholders, the type of information they need and their preferred communications medium.

## Risk Management

The BZ risk management methodology provides a rigorous, quantitative approach and decision-making process that effectively reduces/eliminates risk exposure.

The specific objectives of the BZ risk management methodology as outlined in Figure 4 are to provide consistent and standardized methodology to:

* Ensure key risks impacting cost, schedule and/or performance are proactively identified, assessed, reviewed/validated, mitigated, and communicated in a timely manner
* Facilitate attention to, and escalation of, critical risks impacting the project
* Produce meaningful information that allows program/project management to focus efforts on high probability/impact risks with an effective coordination of effort
* Ensure communication channels are defined so that stakeholders are informed and, if applicable, able to participate in the mitigation
* Record an audit trail of discussions and mitigation of program/project risks

The methodology consists of the following key activities that are performed on a continuous basis:

* Risk Identification
* Risk Analysis
* Risk Response Planning

**Figure 4: Risk Management Methodology**

* Risk Response Plan Implementation
* Risk Tracking

A Risk Register is maintained throughout the risk management process to track relevant risk data and provides ongoing monitoring and control of identified risks and issues.

A corollary process for the identification, tracking, and mitigation of issues is employed as well. The BZ issue management methodology as outlined in Figure 5 consists of the following primary process steps, which are repeated for each new issue:

* Issue Identification
* Issue Quantification
* Issue Mitigation Planning
* Issue Mitigation Plan Implementation
* Issue Tracking

All risks will have the following defined:

* Unique Risk ID
* Risk Category
* Risk Description
* Risk Mitigation
* Risk Timeline
* Risk Impact
* Risk Probability

### Project Risks

**Figure 5: Issue Management Methodology**

There are no active project risks at the present time. The following risk was tracked as an active project risk and closed:

Risk ID: KBS-ISS OY1\_Risk 0001

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CLIN/ Activity** | **Active Risk Description** | **P** | **I** | **Score** | **Mitigation** | **Contingency** |
| 5.4.2.1 | If Book Zurman Team cannot collaborate with VA to identify an acceptable alternate deliverable for Task 5.4.2.1, then BZ will not be able to submit or complete tasks that meet VA expectations and approval. | M | L | 15 | Book Zurman Team has been communicating with VA Customer to identify alternate deliverable for Task 5.4.2.1 | Book Zurman Team to coordinate with VA Customer to extend delivery deadline for Task 5.4.2.1 |

Notes: Task 5.4.2.1 (Setup of SNOROCKET sources and test suites) was completed during the Base Year as a one-off activity. Dr. Michael Lawley was responsible for this deliverable and communicated with Dr. Keith Campbell to identify a viable alternate task for the Option Year. Dr. Campbell provided guidance and instructions as follows:

1. The basics are to take the current implementation that uses SNOROCKET 2.7.6, and upgrade it to the latest implementation.
2. Where VA requires particular help is ensuring correct representation and write back of inferred forms.
3. The project as a whole is located here: <https://github.com/OSEHRA/ISAAC>
4. The specific logic provider is within the project, located here: <https://github.com/OSEHRA/ISAAC/tree/develop/provider/logic>
5. As a first step, the guidance is for Dr. Lawley to just download and build the project, and then have a look at the current implementation.
6. A few classes to look at include:

(1) GraphToAxiomTranslator

(2) AggregateClassifyTask

A meeting was held on 2/1 to discuss completion of PWS Task 5.4.2.1 (Setup of SNOROCKET Sources and Test Suites). Attendees at this meeting were Dr. Michael Lawley and Jay Lahiri from the Book Zurman Team and Dr. Keith Campbell and Stephanie Klepacki from VA. The purpose of this meeting was to discuss VA expectations, garner feedback from the Dr. Lawley (as the SNOROCKET SME) and ultimately define requirements for completion and set the timeframe for delivery. Based on discussion, this task was completed on 2 March 2018 and covered the following elements as defined by VA:

1. Best way to remove redundant relationships using SNOROCKET
2. Creation of short/long/distribution normal form
3. Particulars of concrete domains
4. Handling of necessary and sufficient on write back
5. Identifying potential grouper locations that have no defined concept
6. Necessary/multiple sufficient handling on inferred writeback
7. Migration from old SNOROCKET to new SNOROCKET
8. Writing to and reading from the OWL reference set
9. Code snippets/pointers provided as examples for these items

## Configuration Management

The purpose of Configuration Control is to control changes to configuration items, e.g., documents, deliverables, source code, and physical assets such as hardware. The strategy, approach, procedures, and tools for configuration management are outlined in Table 7 below.

Table 7 – Specific Project Team Members with CM Responsibilities

| **Project Role** | **Responsibilities/Authority** |
| --- | --- |
| **BZ Team Member** | * Identify change and complete a Change Request (CR) * Submit CR to VA Configuration Manager |
| **VA Configuration Manager** | * Evaluate the CR and forward to the Configuration Control Board (CCB) * Conduct configuration verification and audit (as needed) |
| **Configuration Control Board** | * Perform Impact Analysis * Approve, disapprove or defer CR * Submit approved CRs to BZ team for implementation |
| **BZ Team** | * Develop, test, and implement approved CR |

### Version Control for Formal Deliverables

All BZ deliverable documents will include a version number in the header. Document versioning will adhere to the following scheme.

**0.1** is the first draft of a document available for team/peer reviews

**0.2 through 0.n** are subsequent drafts with modifications incorporated from team/peer reviews

**1.0** is the final document approved by team/peer reviews and is the official draft document submitted to the G5 Project Manager for distribution and review by the G5 functional team

**1.1 through 1.n** are subsequent draft revisions, if necessary

**2.0** is the final approved document

**2.1 through 2.n** are subsequent revisions and/or updates to a final approved document

All BZ deliverable documents will include a version history table identifying the version number, publication date, and description of a change.

## Project Management Process Reviews

On a periodic basis (at least annually) the BZ Team will conduct a review of ‘in practice’ processes and procedures to ensure that approved processes, procedures, and methodologies as documented in various plans, i.e., Quality Management, Risk Management, Configuration Management, Communications Management, etc. are being adhered to. Adjustments will be made, as necessary, to planning documents and/or actual practices.

### Quality Control

The BZ Quality Management Plan (QMP) establishes the quality system for the Department of Veterans Affairs to ensure the quality of program management processes and program deliverables. The quality management methodology described provides guidelines for verifying that all products and documentation to be delivered meet all technical requirements. This methodology will be applied to all Performance Work Statement (PWS) processes, deliverable products, and documentation to determine compliance with technical and performance requirements.

The QMP guidelines call for a quality management approach that is focused not only on product/service quality but also on the means to achieve it. Therefore, the QMP outlines tasks to ensure both the quality of program deliverables, as well as the processes used to develop them. The specific objectives of the QMP are to:

* Establish the QA/QC activities performed
* Define the BZ Team QA/QC tasks and responsibilities
* Provide reference documents and guidelines to perform QA/QC activities
* Provide techniques and methodologies to support QA/QC activities and reporting
* Establish an independent reporting channel from the quality management team to senior management in order to avoid influence from the project leads on QA/QC findings

The QMP utilizes the Plan-Do-Check-Act process for quality management, as shown in Figure 6. This methodology promotes continuous improvement for ongoing efforts to increase the value provided by products, services, or processes. Quality assurance activities include the Plan and Do steps of the process; quality control activities include the Check and Act steps of the process.

Figure 6: Quality Management Methodology

QA monitors processes to ensure the integrity of the processes used to create high-quality products. Process and product audits will be performed at the appropriate milestone of each project phase to verify that processes are consistent with those defined in the planning documents and products maintained in accordance with those processes. In addition, spot-checks (unscheduled audits) will be made during each phase of development to verify that the processes, desktop procedures, and interim products (when appropriate) are being accomplished. At the completion of a project life cycle phase, QA will review and report whether all steps required to transition to the next phase have been accomplished.

QC checks whether deliverables satisfy the technical and quality requirements of clients and stakeholders. All deliverables will be subject to QC evaluation to ensure the electronic exchange of information is secure and transmitted correctly to the right place, at the right time, and to the right user.