



# OSEHRA

*Open Source Electronic Health Record Alliance*

## **Open Source Technical Support and Working Group Services for VA VistA**

**Open Source Software and Product Selection Criteria**



**Contract Number: VA118-16-C-0841**

**November 4, 2016**

**SLIN 0002AD**

## Revision History

Date		
06/23/16	1.0	Initial submittal
11/04/16	1.1	Removed reference to MDWS in RAPTOR candidate analysis

# Table of Contents

## Contents

- 1. INTRODUCTION ..... 4**
  - 1.1. EXECUTIVE SUMMARY ..... 4
  - 1.2. OVERVIEW ..... 4
- 2. APPROACH ..... 5**
- 3. ANALYSIS ..... 7**
  - 3.1. PROCESS OVERVIEW ..... 7
  - 3.2. OSS CANDIDATE SUMMARY ..... 8
- 4. NEXT STEPS ..... 11**
- APPENDIX A: OSS CANDIDATE SUMMARY ..... 12**

# 1. Introduction

## 1.1. Executive Summary

The Open Source Software (OSS) and Product Selection Criteria and the corresponding Scoring Tool are used to screen identified OSS candidates, with the best scoring candidates moving on to the Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis.

For the second quarter (Q2) deliverable cycle, nine products were selected from the list of open source Electronic Health Record (EHR) software candidates that have been identified to date, for review via the Scoring Tool. Items receiving the highest scores in the Scoring Tool will proceed on for SWOT analysis. For the Q2 cycle, the following products will proceed on to SWOT analysis:

- Enhanced XML Utilities for VistA
- RAPTOR
- Perceptive Reach

Candidates not proceeding to the SWOT analysis will remain on the candidate list for potential reevaluation at a later date.

## 1.2. Overview

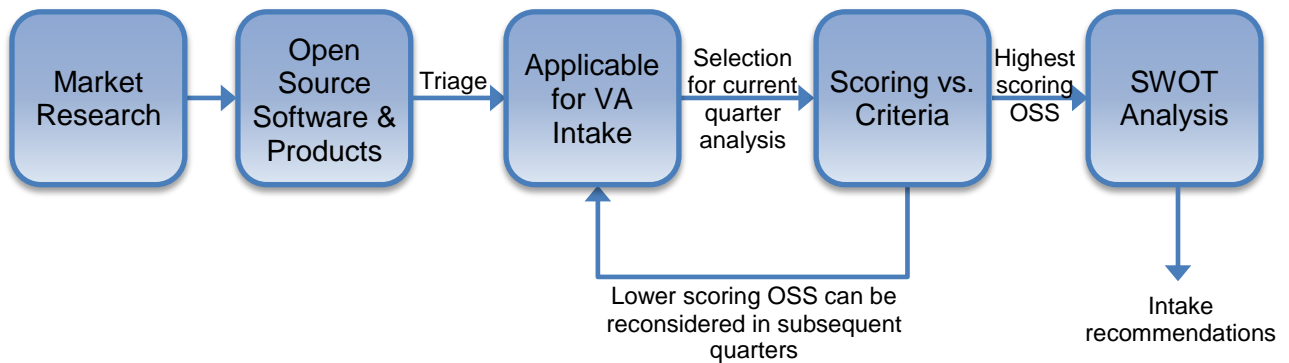
The purpose of this document is to present the results of the analysis performed with the OSS and Product Selection Criteria and Scoring Tool. The criteria are intended to:

1. Consolidate and prioritize the functional, technical, and performance attributes of VistA Feature Set or non-VistA Feature Set variables for further investigation;
2. Document the constraints and assumptions or “boundary conditions” which define imposed limitations that can be physical or programmatic;
3. Elaborate capability gaps identified in the respective BRDs and RSDs;
4. Elaborate the extent to which the code has been vetted and tested by the open source community, and the extent to which that code may have been previously certified via automated testing and peer review which has verified the safety, compliance and functionality of the code both prior to and after new code submissions;
5. Assign a quantitative metric by which to measure open source product attributes against functional, technical, capacity, performance, interoperability, and security requirements criteria, as well as the ease of integrating the open source code in the corresponding VA VistA application and with the application’s internal VA VistA interfaces.

The OSS and Product Selection Criteria are used to measure the degree to which open source candidates may fulfill capability gaps and add business value for VA.

## 2. Approach

The purpose of the OSS and Product Selection Criteria is to screen the identified OSS candidate list to determine which applications have the highest intake potential and therefore proceed to SWOT analysis in the current quarter. The quarterly process to identify and analyze OSS is summarized in Figure 1, below. The open source EHR community is continuously scoured to maintain a comprehensive list of potential OSS candidates for intake. A triage process is applied to the full list on a quarterly basis to determine the subset list of candidates to move forward for analysis using the Scoring Tool. Candidates receiving higher scores in the Scoring Tool will proceed to SWOT analysis, at which point a recommendation will be made regarding potential intake of each software candidate.



**Figure 1. Quarterly Process to Review OSS Candidates**

The Scoring Tool contains six major categories with corresponding lower-level criteria with which to rate each selected OSS candidate. The identified criteria cover the full breadth of relevant elements, including VA-specific elements and gaps. Each criterion supports selection against functional, technical, and performance attributes. Specific VistA / VA criteria from the Gap Analysis and newly emerging information from VA are considered in the Scoring Tool, and the criteria have been phrased to ensure consistent scoring. The categories and criteria included in the Scoring Tool are summarized in Table 1.

Category	Criteria
Programmatic Constraints & Boundary Conditions	<ul style="list-style-type: none"> <li>Fits with Roadmap plans - timing</li> <li>No significant physical, logistical, or other constraints</li> <li>No additional open source version improvements likely, timing of intake good (vs. improvements by others anticipated, too early to use)</li> <li>Speeds substantive time-to-value for VA in the area</li> <li>Complies with mandates relevant to implementation</li> </ul>

Category	Criteria
Functional Fit / Capability Gaps	<ul style="list-style-type: none"> <li>• Fills defined functional gaps – capability gaps identified in BRDs / RSDs</li> <li>• Fills long term vision gaps – capability gaps identified by comparing implementation plans against the broad VistA Evolution (VE) vision</li> <li>• Measurably improves delivery of healthcare and/or access improvements</li> <li>• Software can perform business functions at a high-level of quality and reliability</li> <li>• Software’s interface is user friendly</li> </ul>
Technical, Capacity, Performance, and Interoperability	<ul style="list-style-type: none"> <li>• Application is interoperable and integrates well with VistA architecture, data exchange</li> <li>• High level of code quality and reliability, certified, documented, no licensing or copyright issues</li> <li>• Code has required level of capacity and scalability</li> <li>• Software is acceptably responsive to users (speed of performance)</li> <li>• Minimal-to-no software modifications or infrastructure changes required for implementation</li> <li>• Software is easily maintainable – technical and business rules</li> <li>• Software has minimal-to-no operational support requirements</li> </ul>
Implementation Risks	<ul style="list-style-type: none"> <li>• Low level of business risk for implementation of new processes and cultural change</li> <li>• Low level of software technical integration and complexity risk</li> <li>• Impact and rollout risks are very low</li> <li>• Implementation cost is low</li> </ul>
Specific VistA Gaps to be Filled	<ul style="list-style-type: none"> <li>• Scheduling risks include development of standardized information sharing for scheduling data exchange, both internal and external to the VHA</li> <li>• Ability to use population level data to assess quality of care at the institutional protocol level (e.g., how well is one care team doing versus another with their pool of patients)</li> <li>• Near term opportunity</li> <li>• Feature set implementation gap</li> <li>• Innovations project area, stakeholder input item, security gap or unfunded area</li> <li>• EHR with analytics, cloud, patient experience capabilities (VA CIO LaVerne Council, Congressional Testimony, April 14, 2016)</li> </ul>
Security	<ul style="list-style-type: none"> <li>• Specific security criteria to be determined per (anticipated) Security TWG discussions; will be added in quarter proceeding security TWG set-up.</li> </ul>

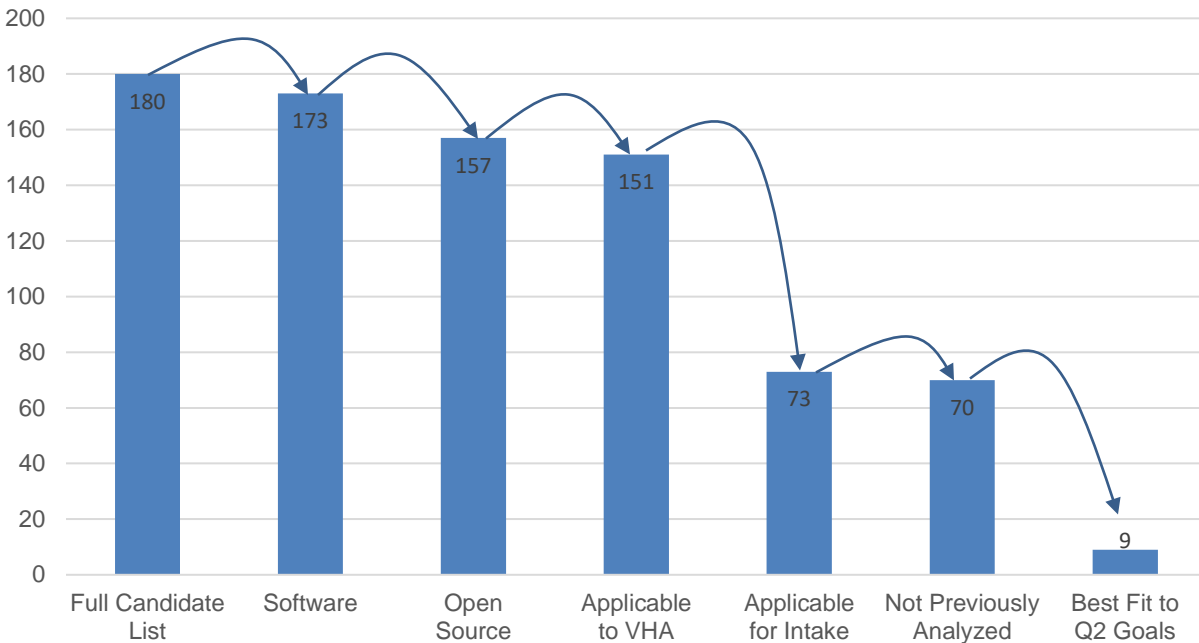
**Table 1. Scoring Tool Categories and Criteria**

### 3. Analysis

#### 3.1. Process Overview

As described in Section 2 (Approach), above, the quarterly OSS review and analysis process begins with the full list of identified candidates. For the Q2 cycle, the full candidate list included a total of 180 candidates. This number will continue to grow in future quarters as the open source EHR community is continuously scoured for candidates to add to the list, although the rate of growth is expected to decline in future quarters. Various filters are then applied during the triage process to focus the list of candidates to include only the most relevant items. This filtering process is depicted graphically in Figure 2.

From the full candidate list of 180 products, items that were classified as web services, development frameworks, registries, or programming languages were removed, resulting in a subset of 173 software products. This subset was then further reviewed to determine which items were truly open source, resulting in an applicable subset of 157 OSS candidates. Of these remaining items, 6 were deemed to be outside VHA’s scope, resulting in a subset of 151 candidates.



**Figure 2. Triage Process to Select Candidates for Scoring Tool**

The subset of 151 open source software candidates within scope to VHA were reviewed at a lower level of detail to determine if they would be applicable for intake. During this phase of analysis, a total of 78 products were removed from the list, leaving 73 as applicable for intake.

Of the candidates removed, the majority (49 items) were removed because they were primarily focused on supporting clinical research rather than healthcare. An additional 16 items were deemed not applicable to the VHA environment, primarily for reasons related to the intended product demographic (e.g. under-resourced countries). Eleven (11) candidates were removed due to inclusion in the One-VA Technical Reference Manual (TRM), indicating the product had already been assessed by VA. Finally, two (2) items were removed from the list as they appeared to be inactive or obsolete. Following this filtering process, a total of 73 OSS candidates were identified as being applicable for VHA intake. Three (3) of these products were reviewed during the Q1 delivery cycle, resulting in a total of 70 remaining potential OSS candidates to be reviewed.

A final filtering process was applied to the resulting list of 70 potential candidates to determine the final group of candidates selected for further review this quarter. A preliminary screening was applied to identify candidates that were anticipated to either fill a known gap, provide a near term intake opportunity, or to align closely with the VistA 4 Product Roadmap. Based on these criteria, a group of nine (9) candidates were selected for further analysis in Q2. These candidates were reviewed using the Scoring Tool. A summary of the candidates and Scoring Tool results can be found in Table 2. The remaining 61 candidates will be reviewed and another set selected for further analysis in Q3.

## **3.2. OSS Candidate Summary**

A summary of the three OSS candidates selected for SWOT analysis during the Q2 cycle are presented in Table 2, below. Six additional OSS candidates that were reviewed, but not submitted for Q2 SWOT, are listed in Appendix A. The table provides a brief description of the software, some key factors influencing the score, and the overall score calculated by the Scoring Tool. The full Scoring Tool detail for each candidate can be found in the Excel document (Appendix B). The candidates receiving the highest scores, where a full analysis could be completed, will move forward for SWOT analysis. The Enhanced XML Utilities for VistA, RAPTOR, and Perceptive Reach candidates will proceed to the SWOT analysis for Q2.



Candidate	Description	Key Analysis Factors	Score
Enhanced XML Utilities for VistA	Enhanced XML Utilities for VistA provides XML parsing capabilities to allow any VistA application to perform XML processing in a more efficient manner. It provides the enabling building block needed to build interface components for XML-based information exchange such as web service and HL7 C-CDA document exchange. Enhanced XML Utilities is one of a few tightly controlled components that make up the OSEHRA VistA Core™ foundation.	<ul style="list-style-type: none"> <li>• Fills a known gap</li> <li>• Near-term opportunity</li> <li>• Low implementation risk</li> <li>• <b>Proceed to SWOT analysis</b></li> </ul>	5.59
RAPTOR	RAPTOR (Radiology Protocol Tool and Recorder) is a VHA Innovations software development project that utilizes mature open source tools (Drupal 7, Apache, MySQL, PHP, d3) and open standards to leverage existing VA enterprise health information systems (VistA CRPS & Imaging), shared services, and web-based delivery to provide a versatile, extensible, and scalable computerized system which optimizes safety, quality and efficiency of advanced medical imaging workflow for VA pilot facilities. RAPTOR was honored as one of the Top 5 Medical Imaging IT Projects by the Society of Imaging Informatics in Medicine, an international society of imaging informatics professionals and the Radiology Business Journal. RAPTOR will replace inefficient paper-based protocol assignment processes, improve radiologist and department efficiency, benefit patient safety, and audit patient consent.	<ul style="list-style-type: none"> <li>• Fills a known gap</li> <li>• Strong fit with VistA 4 Product Roadmap</li> <li>• Measurably improves delivery of healthcare</li> <li>• <b>Proceed to SWOT analysis</b></li> </ul>	4.06

Candidate	Description	Key Analysis Factors	Score
Perceptive Reach	Perceptive Reach is an “upstream suicide prevention” project from the VA Center for Innovation combining technology, outreach and intervention services to improve Veteran care, prevent suicides, and reduce the number of Veterans reaching a crisis stage. The project includes development of a SQL database, risk model, secure messaging and dashboard web application. Using existing VA data from the CDW, EDW, and Suicide Data Repository, the system produces a stratified list of potentially at-risk Veterans and securely notifies outreach and intervention resources, who coordinate appropriate support for these Veterans. The informatics and clinical decision support dashboard web application provides outreach, intervention, and clinical practice support information including demographics and analytic results aimed at supporting upstream intervention. The risk model, secure messaging, and dashboard web application utilize open source tools.	<ul style="list-style-type: none"> <li>• Fills a known gap</li> <li>• Aligns with long-term VHA goals</li> <li>• Low implementation risk</li> <li>• <b>Proceed to SWOT analysis</b></li> </ul>	3.43

**Table 2. Q2 OSS Candidate Scoring Tool Summary**

Candidates which were not selected for SWOT analysis will remain on the candidate list, with the possibility that they may be reassessed in future quarters when additional information is obtained.

## **4. Next Steps**

The highest scoring candidates for which a full analysis could be completed will proceed for further review in the Q2 SWOT analysis. The results of the SWOT Analysis, Gap Analysis, OSS and Product Selection Criteria, and Prioritization Description Document will be combined into the quarterly CBA package. These candidates will be further reviewed during the Q2 In-Progress Review (IPR). Then the next quarterly cycle will be initiated to continue market analysis and assess open source candidates, against an updated Gap Analysis.

## Appendix A: OSS Candidate Summary

Candidate	Description	Key Analysis Factors	Score
OneVA Pharmacy	The One-VA Pharmacy module will provide VHA the capability to allow Veterans travelling across the United States to refill their active VA prescription at any VA Pharmacy regardless of where the prescription originated. The module expands available pharmacy information in VistA to pharmacists providing direct access to any active and refillable prescription from any VA Healthcare System.	<ul style="list-style-type: none"> <li>• Fills a known gap</li> <li>• Aligns well with VistA 4 Product Roadmap</li> <li>• Integrates well with VistA</li> <li>• Promising candidate, but not yet ready for release, so full analysis could not be completed; defer further analysis until product is more mature</li> </ul>	3.88
Maternity Tracker	The Maternity Tracker is an enhancement to CPRS/VistA that assists the coordination of maternity care in a seamless fashion between VA and Non-VA providers to support optimal care of pregnant Veterans.	<ul style="list-style-type: none"> <li>• Fills a known gap</li> <li>• Strong fit with VistA 4 Product Roadmap</li> <li>• Low implementation risk</li> <li>• Multiple unknown scoring factors at this time, so full analysis could not be completed; defer further analysis until additional information can be obtained</li> </ul>	3.80
Protégé	Ontology development environment for the Web that makes it easy to create, upload, modify, and share ontologies for collaborative viewing and editing.	<ul style="list-style-type: none"> <li>• Low implementation risk</li> <li>• Does not align with VistA 4 Product Roadmap</li> <li>• Defer SWOT analysis; return to candidate list for potential analysis in a later cycle</li> </ul>	3.27

Candidate	Description	Key Analysis Factors	Score
HIEOS	This open-architecture platform enables secure health information exchange between disparate health communities (e.g. HIE, RHIO), thereby enabling care providers to have longitudinal perspectives of patients' health records. HIEOS provides core components that enable the exchange, location and/or storage of health information in a federated, hybrid or centralized model.	<ul style="list-style-type: none"> <li>• Potential to fill a known gap</li> <li>• Aligns with VistA 4 Product Roadmap, but may conflict with existing solutions</li> <li>• Requires additional analysis</li> <li>• Defer SWOT analysis; return to candidate list for potential analysis in a later cycle</li> </ul>	3.08
Glucosio	Glucosio is a free and open source project that was created in 2015 to develop Android, iOS and Firefox OS apps for diabetes management and research. Glucosio allows users to track and manage diabetes data from an intuitive, modern interface. It is built with features and a design that matches the users' needs, and gives users the option to opt-in to sharing anonymized diabetes data and demographic info with researchers.	<ul style="list-style-type: none"> <li>• Potential to fill a known gap</li> <li>• Does not align well with VistA 4 Product Roadmap</li> <li>• Process / cultural challenges related to adoption of mobile apps</li> <li>• Do not proceed with further analysis unless substantive additional information becomes available</li> </ul>	2.43
Caisis	Caisis is an open source, web-based cancer data management system that integrates research with patient care. The system is freely distributed to promote standards and collaborative research, and has been downloaded by thousands of institutions around the world.	<ul style="list-style-type: none"> <li>• Does not fill any known gaps</li> <li>• Does not align well with VistA 4 Product Roadmap</li> <li>• Do not proceed with further analysis unless substantive additional information becomes available</li> </ul>	1.53