



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



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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 third quarter (Q3) deliverable cycle, seven candidates were selected from the list of open source health software candidates that have been identified to date for review. Via the Scoring Tool, items receiving the highest scores will proceed on to the SWOT analysis. The Q3 cycle includes the following candidates:

- bbClear
- Veteran Appointment Notification System (VANS)
- Maternity Tracker

Candidates not proceeding on 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 U.S. Department of Veterans Affairs (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.

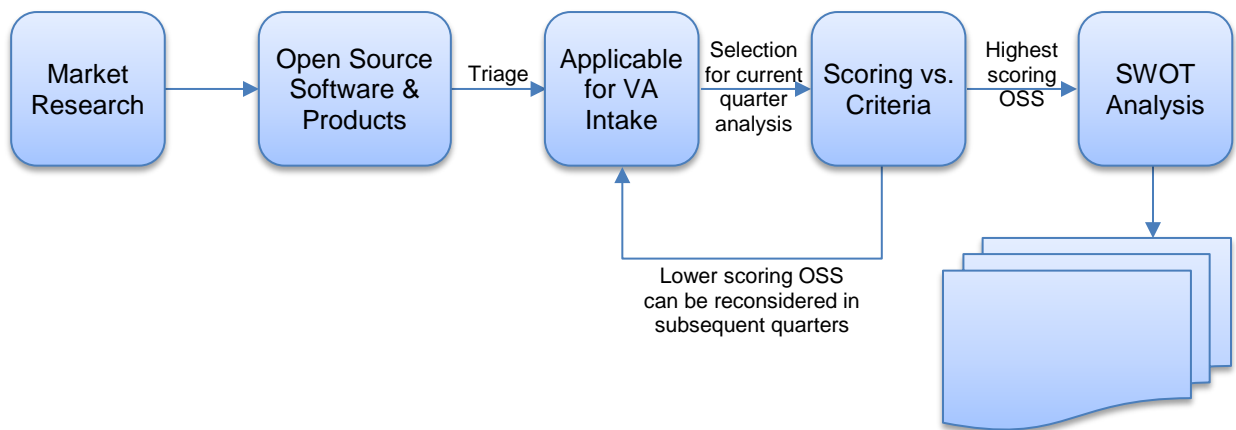


Figure 1. Quarterly Process to Review OSS Candidates

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"> Fits with Roadmap plans - timing No significant physical, logistical, or other constraints No additional open source version improvements likely, timing of intake good (vs. improvements by others anticipated, too early to use) Speeds substantive time-to-value for VA in the area Complies with mandates relevant to implementation

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

Table 1. Scoring Tool Categories and Criteria

3. Analysis

3.1. Process Overview

As described in Section 2 (Approach), the quarterly OSS review and analysis process begins with the full list of identified candidates. For the Q3 cycle, the full candidate list included a total of 215 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. 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 list of 215 candidates, items that were classified as registries, web services, development frameworks, or programming languages were removed, resulting in a subset of 208 software candidates. This subset was then further reviewed to determine which items were truly open source, resulting in an applicable subset of 188 OSS candidates. Of these remaining items, 67 were deemed to be outside VHA’s scope, resulting in a subset of 121 candidates. An additional 27 products were removed from the list because they were not primarily focused on healthcare, were already in use at VA, appeared to be inactive or obsolete, or were reviewed in a prior quarter and received a low score in the Scoring Tool. Of the 94 candidates applicable for intake left, 7 had been previously reviewed and recommended for intake, resulting in a total of 87 remaining potential OSS candidates to be reviewed.

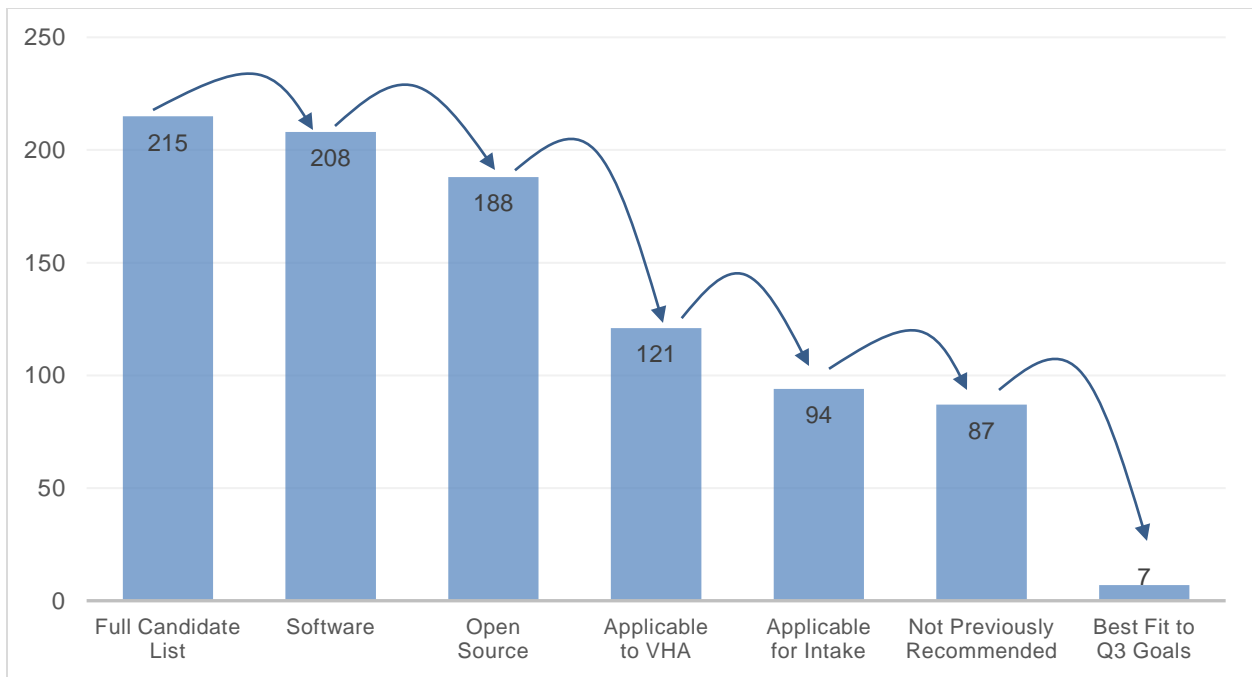


Figure 2. Triage Process to Select Candidates for Scoring Tool

A final filtering process was applied to the resulting list of 87 potential candidates to determine the final group of candidates selected for further review this quarter. A preliminary screening was applied to identify candidates anticipated to either fill a known gap, provide a near term intake opportunity, or align closely with the VistA 4 Product Roadmap. Based on these criteria, a group of 7 candidates were selected for further analysis in Q3. 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 80 candidates, plus any additional candidates identified, will be reviewed and another set selected for further analysis in Q4.

3.2. OSS Candidate Summary

A summary of the three OSS candidates selected for SWOT analysis during the Q3 cycle are presented in Table 2, below. The four additional OSS candidates that were reviewed, but are not proceeding to the Q3 SWOT analysis, 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 bbClear, Veteran Appointment Notification System (VANS), and Maternity Tracker candidates will proceed to the SWOT analysis for Q3.

Candidate	Description	Key Analysis Factors	Score
bbClear	bbClear is an open-source framework for rendering more user-friendly health records. It enables developers of electronic health record systems to output a printed health record that is more helpful for patients, their families, and caregivers.	<ul style="list-style-type: none"> • Low business risk • Integrates well with VistA • Strong fit with VistA 4 Product Roadmap 	4.53
Veteran Appointment Notification System (VANS)	VANS is a web-based application that enables schedulers to preview, edit and send appointment letters electronically. With this system, patients receive clear and organized letters with all the information they need to successfully attend appointments via the My Health@Vet application. VANS was developed through the VA Center for Innovation. The project's objectives were to reduce cost per notification, reduce the "no show" rate, increase appointment scheduling efficiency, and increase Veteran satisfaction by improving the notification process.	<ul style="list-style-type: none"> • Low business risk • Integrates well with VistA • Fills a known gap (supports access, increases scheduling efficiency) 	4.17

Candidate	Description	Key Analysis Factors	Score
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. Maternity Tracker was developed through the VA Center for Innovation.	<ul style="list-style-type: none"> • Low business risk • Integrates well with VistA • Fills a known gap (Feature Set 4 requirement) 	4.16

Table 2. Q3 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. The Elasticsearch and Apache Flume candidates will be reassessed in the future as possible parts of an open source logging architecture.

4. Next Steps

The candidates in Table 2 will proceed for further review in the Q3 SWOT analysis. 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 Q3 In-Progress Review (IPR). The next quarterly cycle will then be initiated to continue market analysis and assess open source candidates against an updated Gap Analysis.

Appendix A: OSS Candidates Reviewed but Not Proceeding to SWOT Analysis

Candidate	Description	Key Analysis Factors	Score
Elasticsearch	Elasticsearch is a distributed, open source search and analytics engine, designed for horizontal scalability, reliability, and easy management. It combines the speed of search with the power of analytics via a sophisticated, developer-friendly query language covering structured, unstructured, and time-series data.	<ul style="list-style-type: none"> • Low business risk • Low implementation risk • Supports improved security features • Defer SWOT analysis; return to candidate list for potential analysis in a later cycle 	4.08
Apache Flume	Flume is a distributed, reliable, and available service for efficiently collecting, aggregating, and moving large amounts of log data. It has a simple and flexible architecture based on streaming data flows. It is robust and fault tolerant with tunable reliability mechanisms and many failover and recovery mechanisms. It uses a simple extensible data model that allows for online analytic application.	<ul style="list-style-type: none"> • Low business risk • Low implementation risk • Supports improved security features • Defer SWOT analysis; return to candidate list for potential analysis in a later cycle 	4.05
Drishiti	Drishiti is a volumetric visualization package for viewing computer tomography data with the ability to import DICOM image stacks. It is used to display a 2D projection of a 3D discretely sampled data set, such as 2D slice images acquired by a CT, MRI, or Micro CT scanner, making visualization of image data easier for clinicians.	<ul style="list-style-type: none"> • Low business risk • Integrates well with VistA • Defer SWOT analysis; return to candidate list for potential analysis in a later cycle 	3.59

Candidate	Description	Key Analysis Factors	Score
Personal Grid Methodology	<p>The Personal Grid Methodology is a format that can prevent hackers from accessing an entire database full of patient records. Hospitals or IT vendors can use the tactic – for free – to force cybercriminals to decrypt one record at a time.</p>	<ul style="list-style-type: none"> • Supports improved security features • Would require re-architecting the data storage • Process / cultural challenges related to implementation • Do not proceed with further analysis unless substantive additional information becomes available 	0.10