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

March 20, 2017

SLIN 1002AD

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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. The candidates receiving the highest scores, and deemed to be most consistent with current quarter goals, will move forward for Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis.

For the 2017 first quarter (Q1) deliverable cycle, eight 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 and deemed most consistent with current quarter goals will proceed on to the SWOT analysis. For this cycle, the following candidates will proceed to SWOT analysis:

- NDC Code Capture
- vxPatient Picture Module and Patient Picture Display in CPRS/BCMA
- Auto Resize Margins to Fit Terminal Size

Candidates not proceeding on to the SWOT analysis are listed in Appendix A and will remain on the candidate list for potential reevaluation in the future.

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. 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.

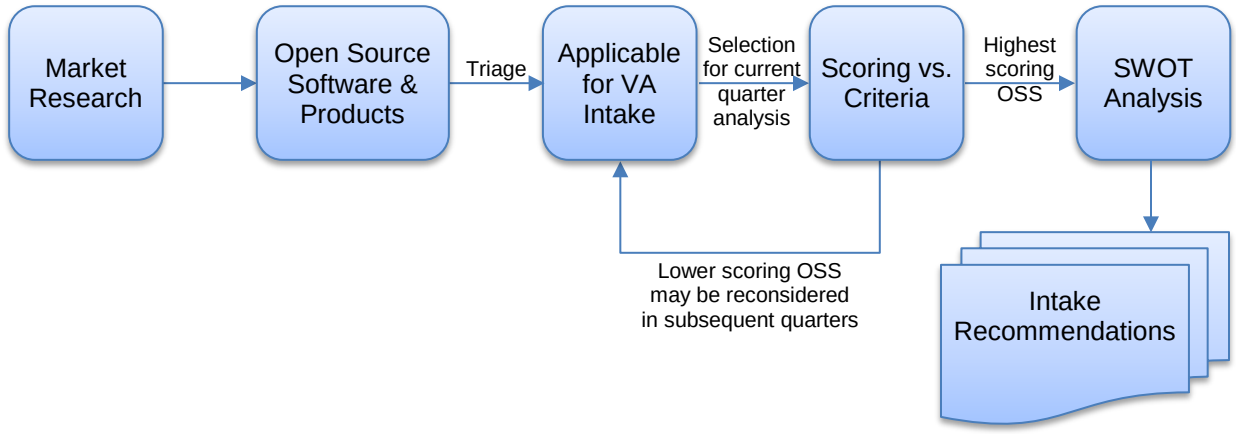

Figure 1. Quarterly Process to Review OSS Candidates

The Scoring Tool contains six major categories with corresponding lower-level criteria with which to rate each 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	• 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) • Provides rapid time-to-value due to potential speed of intake through Existing Product Intake Program (EPIP) items and bug fixes • Complies with mandates relevant to implementation • Business owner is known and/or identified

Category	Criteria
Functional Fit / Capability Gaps	• Fills defined functional gaps – capability gaps identified in Business Requirements Documents (BRD) or Requirement Specification Documents (RSD) or bug fixes to existing code • 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	• Application is interoperable and integrates well with VistA architecture, data exchange • Code is 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, infrastructure changes, additional hardware or software, or new database required for implementation • Software is easily maintainable – technical and business rules • Software has minimal-to-no operational support requirements
Implementation Risks	• 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 (Has candidate been piloted at VA?) • Implementation cost is low
Specific VistA Gaps to be Filled	• 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 or bug fix • Feature set implementation gap • Innovations project area, project in transition, or area without major ongoing efforts • Transformation gap areas (standardization, virtualization, decoupling, Digital Health Platform [DHP], enterprise-level security, single sign-on) • Items below the funding cut line • Stakeholder input on vision and/or implementation gaps

Category	Criteria
Security	• Supports improved security for VistA and VA health IT • Software does not use Personally Identifiable Information (PII) • Supports logging and audits • Supports single sign-on

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 2017 Q1 cycle, the full candidate list included a total of 342 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.

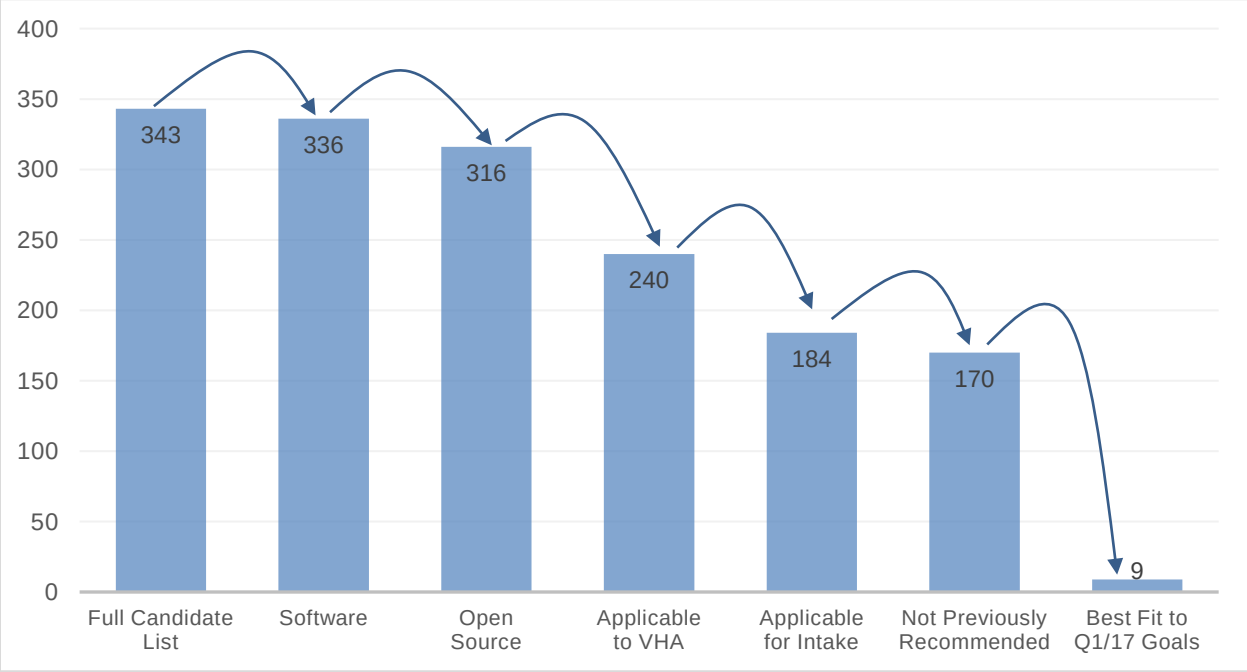

Figure 2. Triage Process to Select Candidates for Scoring Tool

From the full list of 343 candidates, items that were classified as registries, web services, development frameworks, or programming languages were removed, resulting in a subset of 336 software candidates. This subset was then further reviewed to determine

which items were fully open source, resulting in an applicable subset of 316 OSS candidates. Of these remaining items, 76 were deemed to be outside VHA's scope, resulting in a subset of 240 candidates. An additional 56 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 184 candidates applicable for intake left, 14 were previously reviewed and recommended for intake, resulting in a total of 170 remaining potential OSS candidates to be reviewed.

A final filtering process was applied to the resulting list of 170 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 9 candidates were selected for further analysis in this deliverable cycle. Two of the candidates were designed to work together and were evaluated in combination, resulting in a total of 8 candidates assessed using the Scoring Tool. A summary of the candidates and Scoring Tool results can be found in Table 2. The remaining 162 candidates, plus any additional candidates identified, will be reviewed and another set will be selected for further analysis in future quarters.

3.2. OSS Candidate Summary

A summary of the three OSS candidates selected for SWOT analysis during the 2017 Q1 cycle are presented in Table 2 below. The additional OSS candidates that were reviewed, but not proceeding to the 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, and deemed to be most consistent with current quarter goals, will move forward for SWOT analysis. The NDC Code Capture, vxPatient Picture Module and Patient Picture Display in CPRS/BCMA, and Auto Resize Margins to Fit Terminal Size candidates will proceed to the SWOT analysis.

Candidate	Description	Key Analysis Factors	Score
NDC Code Capture	NDC Code Capture allows clinicians to scan the barcode on products and capture the National Drug Code (NDC) for the exact product used on extra units dispensed, enter units dispensed, pick list, and prescription release, as well as during Bar Code Medication Administration (BCMA) administration for improved safety & precise cost/billing processing (Medicare D). The code also allows for barcode scanning to update inventory and dispense history for return to stock. This code was developed by DSS, Inc. for vxVistA.	• Integrates well with VistA • Low implementation risk • Speeds time-to-value	4.40

Candidate	Description	Key Analysis Factors	Score
vxPatient Picture Module and Patient Picture Display in CPRS/BCMA	This candidate consists of two integrated modules evaluated together. The vxPatient Picture Module is a new VistA module that allows users to quickly capture, securely store, and link a photo to the patient record. The Patient Picture Display in CPRS/BCMA displays a patient photo for safer "right patient" confirmation before charting in CPRS or administration of medications in BCMA, meets the Joint Commission requirement for positive patient identifier, and displays at patient selection and during the session. This code was developed by DSS, Inc. for vxVistA.	• Integrates well with VistA • Low implementation risk • Measurably improves delivery of healthcare	3.89
Auto Resize Margins to Fit Terminal Size	Many modern applications that use terminals (e.g. Midnight Commander, Vim, Emacs) are able to resize themselves to take all the available real-estate on the screen. This has not been done in the VistA world by and large, except by creating special terminal types. The changes in this build make a few adjustments to be able to use all the available screen real estate. It is believed that the change will improve patient safety. This code was developed by DSS, Inc. for vxVistA.	• Integrates well with VistA • Low implementation risk • Speeds time-to-value • Minor bug fix	3.74

Table 2. Current 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 candidates in Table 2 will proceed for further review in the 2017 Q1 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 2017 Q1 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
Demographic Edit from CPRS	Demographic Edit from CPRS is a module that allows users to modify patient demographic information from CPRS Patient Inquiry rather than leaving CPRS and logging into VistA's DG Patient menu options, allowing clinical staff to easily update address and other patient data. This code was developed by DSS, Inc. for vxVistA.	• Involves a change to CPRS, which may present some challenges for intake • Integrates well with VistA • Measurably improves delivery of healthcare	3.63
Enhanced Audit of Chart Access	Enhanced Audit of Chart Access allows for additional logging of audit information for improved HIPPA/PHI protection, including a "view" of a record even if no modifications were made. This code was developed by DSS, Inc. for vxVistA.	• Multiple unknown scoring factors at this time; defer further analysis until additional information can be obtained • Integrates well with VistA • Improves security	3.12
Redis	Redis is an open-source software project that implements data structure servers. It is networked, in-memory, and stores keys with optional durability.	• Known security concerns • TRM analysis of prior version resulted in “unapproved” disposition	1.18
Mobile Technology for Community Health (MOTECH)	MOTECH is a modular, extensible open source software project originally designed for mobile health (mHealth). It allows organizations to use mobile technology to communicate information to patients, collect data about patients, alert caregivers to patients’ status, and schedule caregivers’ work. The modular system allows organizations to choose among multiple mHealth technologies and to enable data sharing for users of the system.	• Platform is relatively immature • Not easily maintainable	1.16

Candidate	Description	Key Analysis Factors	Score
OpenStack	OpenStack is a free and open-source software platform for cloud computing. The software platform consists of interrelated components that control diverse, multi-vendor hardware pools of processing, storage, and networking resources throughout a data center. Users either manage it through a web-based dashboard, through command-line tools, or through a RESTful API. OpenStack began in 2010 as a joint project of Rackspace Hosting and NASA. As of 2016, it is managed by the OpenStack Foundation, a non-profit corporate entity established in September 2012 to promote OpenStack software and its community. More than 500 companies have joined the project.	• Technical integration and complexity risks associated with implementation • Known security concerns	1.11