



# OSEHRA

*Open Source Electronic Health Record Alliance*

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

**Gap Analysis**



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

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**SLIN 0002AC**

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# 1. Introduction

## 1.1. Executive Summary

For the second quarter (Q2) deliverable cycle, the Gap Analysis has been matured to the next level of detail. Multiple sources of implementation and vision gaps have been identified. Key gaps for Open Source Software (OSS) include:

- Cyber security
- Electronic health record (eHMP and CPRS updates)
- Scheduling and pharmacy enhancements
- Population health, resource utilization metrics

During the first SWOT Analysis the following candidates were identified: the Appointment Postcard Notification Letter v4.0 and OpenInfobutton applications, which fill smaller functional gaps, while the XU Digital Signature and Enhanced XML Utilities for VistA applications fill smaller technical gaps.

Next steps include generating the OSS candidate recommendations for Q2 and continuing to mature the Gap Analysis for Q3.

## 1.2. Overview

The purpose of this document is to produce a Gap Analysis of priority features and functions required to make progress with VA's VistA vision. Primary emphasis is on how the vision is elaborated in the Feature Set delivery schedule per the VistA 4 Product Roadmap.

Several factors are critical to the success of the OSS intake process. The emphasis must be on providing business value by identifying functional and technical gaps which focus efforts on identifying applicable OSS and working with VA to "lay the pathway" for integration of OSS into VistA to fill identified gaps. Additionally, there must be a flexible approach to content and document development that accommodates continued content maturation based on usefulness and feedback, the inclusion of more detailed VistA Evolution (VE) content and stakeholder input over time, and a focus on gaps that can be quickly remedied.

## 2. Approach

The Gap Analysis adds value in conjunction with the other work products. The identification of gaps demonstrates where OSS products would add value, and drives the candidate evaluation documented in other work products. The Product Selection Criteria is iterated in conjunction with the Gap Analysis findings to best screen for the most relevant SWOT candidates. The OSS and Product Selection Criteria and Scoring Tool is

used to screen OSS candidates for SWOT analysis. The SWOT analysis results in recommended intake candidates to fill identified gaps. The Prioritization Description Document for VA Open Source Intake Candidates provides additional detail regarding each candidate for VistA intake. The work product relationship overview diagram (Figure 1) depicts these relationships.

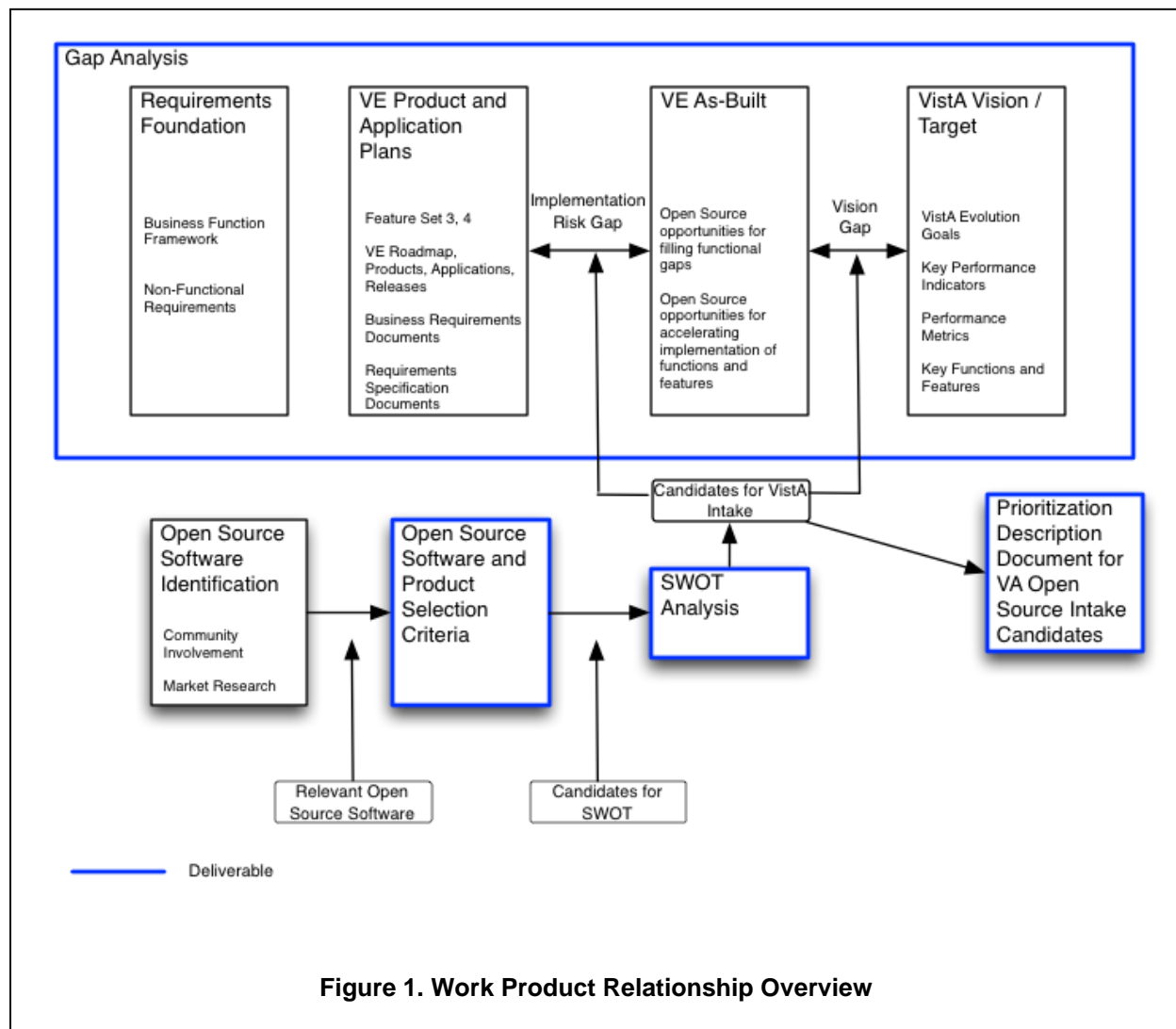
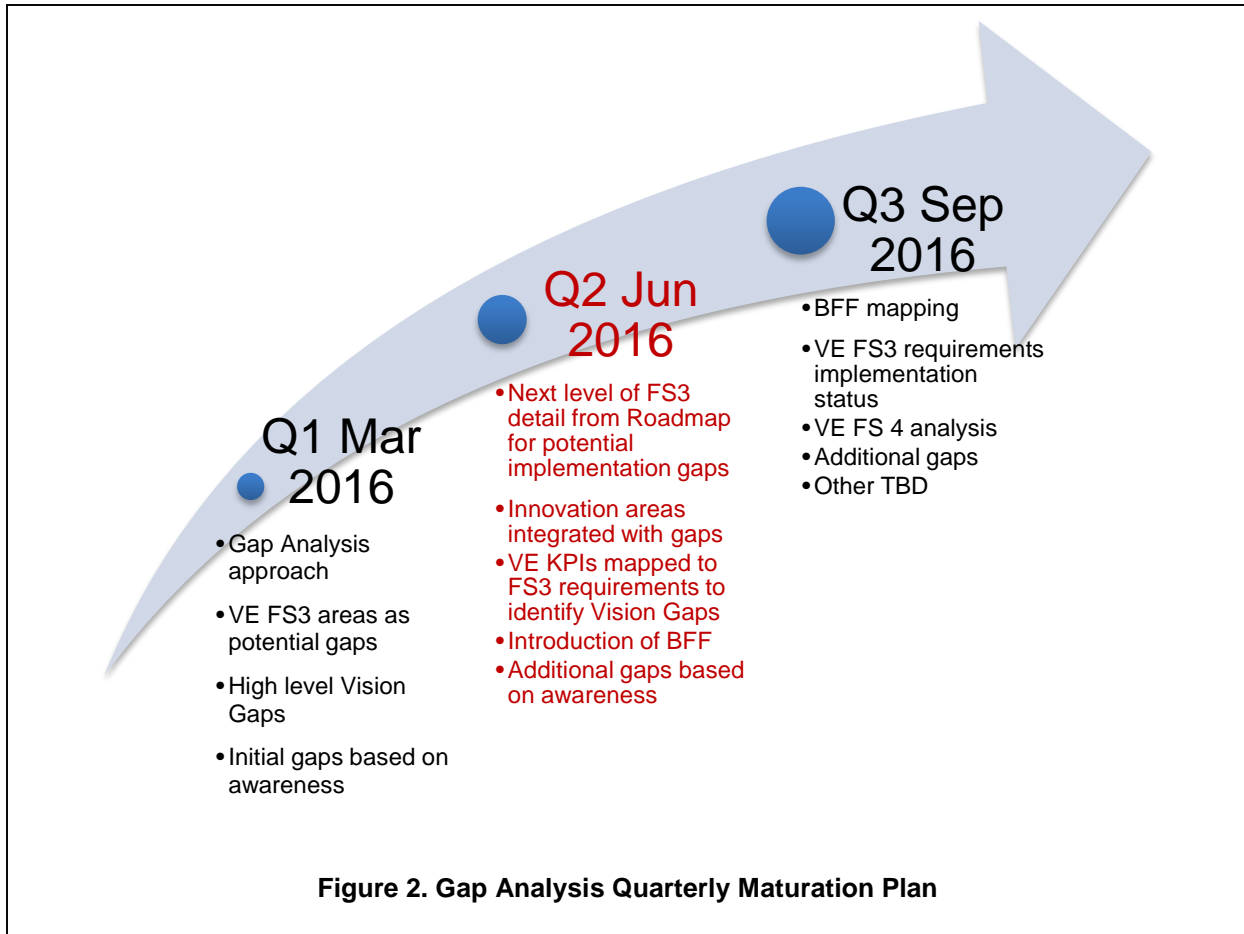


Figure 1. Work Product Relationship Overview

As demonstrated in Figure 1, there are two possible types of gaps, implementation risk gap and vision gap, which could be filled by OSS candidates. An *implementation risk gap* exists when specific tactical implementation plans (such as applications or feature sets) may not be met. Questions to consider when identifying an implementation risk gap include: what VistA development projects are at risk of not meeting schedule, functional, performance or milestone goals in the next two years, and what open source products can be used to mitigate this risk? A *vision gap* exists when the VE strategic vision may not be met by currently planned implementations. Questions to consider when identifying a vision gap include what areas of VistA are not being developed due to other higher priority needs, and what long term goals of VistA are not being met with current efforts?

To develop the Q2 Gap Analysis, open source gaps and opportunities were identified across VistA. The focus for this quarter continued to be on the VistA 4 Product Roadmap Feature Set 3 (FS3) elements. The next level of detail was assessed and additional gaps were identified. The relationships of other work products to the Gap Analysis were refined, and the content of these work products was matured and synergized. The work performed to generate the Q1 Gap Analysis was leveraged to generate the Q2 deliverable. Figure 2 depicts the quarterly maturation plan for the Gap Analysis, with emphasis on the current quarter's progress.



## **3. Analysis and Findings**

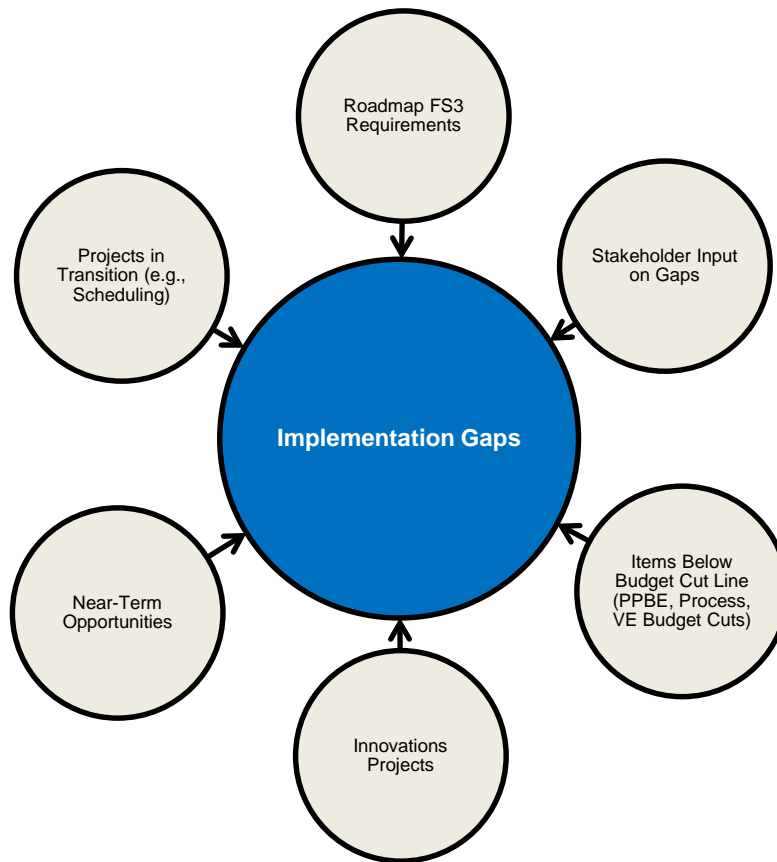
### **3.1. Process**

The following activities were undertaken to develop the Q2 Gap Analysis:

- The VistA 4 Product Roadmap was reviewed to gather the next level of detailed information for FS3;
- The requirements and project areas were identified and assessed for potential implementation gaps. Information regarding innovations projects, stakeholder input, near-term successes, and items not implemented due to funding constraints were integrated to identify additional gaps;
- VistA Evolution (VE) Key Performance Indicators (KPIs) were mapped to FS3 requirements to identify vision areas not covered by FS3; and
- A high level look-ahead vision gap assessment was performed for FS4.

### **3.2. Implementation Risk Gaps**

There are multiple sources of VistA implementation risk gaps, as displayed in Figure 3 below. These sources include VistA 4 Product Roadmap FS3 requirements, items below the funding cut-line, Innovations projects, stakeholder input, near-term opportunities, and projects in transition. Each category will be reviewed below.



**Figure 3. Sources of Implementation Risk Gaps**

### **3.2.1. Roadmap Feature Set 3 Requirements**

To generate the Q2 Gap Analysis, requirements were identified across the major FS3 areas. Each Roadmap line item was analyzed and categorized to identify specific requirements. Out of a total of 97 line items, 63 items were defined as requirements and 34 were defined as milestones or informational. Requirements were identified by overall feature set area. All requirements listed have the potential to be implementation risk gaps. The full list of FS3 requirements are displayed in Table 1 below.

<b>Feature Set Area</b>	<b>Feature Set Requirement</b>
eHMP	Achieve certification of ONC 2014 Edition EHR Criterion
eHMP	Develop structured data management
eHMP	Develop basic orders
eHMP	Develop patient goal management
eHMP	Develop patient self-description
eHMP	Develop image viewer
eHMP	Develop scanned document search
eHMP	Develop Clinical Decision Support (CDS) (e.g., Immunizations)
eHMP	Develop Medication Reconciliation
eHMP	Develop Alert Management
eHMP	Develop basic care team & plans
eHMP	Develop Women's Health / Family, Military & Social History
eHMP	Develop complete outpatient encounter
eHMP	Develop After Visit Summary/Patient Education
eHMP	Develop Patient List Creation
eHMP	Develop multi-patient views
eHMP	Develop Advance Directives
eHMP	Develop Secure Messaging
eHMP	Develop enterprise orders selection/management services
eHMP	Develop advanced task/team management
eHMP	Develop Goal-based care plans
eHMP	Develop Advanced Clinical Decision Support (CDS)
eHMP	Develop Clinical Reconciliation
eHMP	Develop Outbound ePrescribing
Interoperable EHR	Deliver interoperability enabling capabilities that meet FY14 NDAA directives
Interoperable EHR	Update eHMP and VistA Exchange to include all remaining data domains (for which there are structured data sources) with national standard terminologies
VistA Scheduling Enhancements (VSE)	VSE GUI will include an interface to the mobile Veteran Appointment Request servers that will allow schedulers to book appointments for appointments requested by Veterans
VistA Scheduling Enhancements (VSE)	Appointment request GUI that the Welcome to VA call center can use to create appointment requests on behalf of new Veterans
VistA Scheduling Enhancements (VSE)	Single Queue of Request Lists: Improve schedulers' ability to effectively sort, filter and manage scheduling resources



Feature Set Area	Feature Set Requirement
VistA Scheduling Enhancements (VSE)	Single Queue of Request Lists: Consolidate all appointment request lists in a single queue; allow scheduler to view all open appointment requests collectively
VistA Scheduling Enhancements (VSE)	Aggregated View of Clinic Profile Scheduling Grids: Provide aggregated view of clinic profile scheduling grids; allow schedulers to view resource availability and schedule the appointment for the Veteran from the same screen
VistA Scheduling Enhancements (VSE)	Resource Management Dashboard: Allow enterprise to use VistA scheduling data more effectively, provide greater visibility for scheduling operations, and better manage scheduling resources
VistA Scheduling Enhancements (VSE)	Resource Management Dashboard: Display pertinent resource management metrics in a single view; allow individual facilities and staff at various levels to measure and track supply, demand, and efficiency metrics related to outpatient scheduling operations
VistA Scheduling Enhancements (VSE)	Resource Management Dashboard: Develop a comprehensive dashboard that will display metrics at the facility, VISN and National level
VistA Service Assembler (VSA), Phase 2	Improve compatibility with 'open source' participation objectives by incorporating Node.js functionality into the architectural design
VistA Service Assembler (VSA), Phase 2	The Vista.js solution uses the following new technologies: Node.js, EWD.js, EWD Federator, Node Package Manager, Node Version Manager, Sinopia, Cache.node
Enhancements to Pharmacy	SUMPM: Modify the algorithm to associate the appropriate IV additive to the correct orderable item, based on additive strength
Enhancements to Pharmacy	Pharmacy Interface Automation: bi-directional interface between VistA Inpatient Medication Package and Pharmacy Automated Dispensing Units for inpatient and outpatient care settings
Enhancements to Pharmacy	MOCHA FY16: implement enhancements that refine the current alert system for Remote Order Allergy Checks and Clinical Reminder Order Checks
Enhancements to Pharmacy	MOCHA FY17: implement enhancements to add an alert for maximum daily dose for simple orders (MOCHA 2.1)
Enhancements to Pharmacy	PECS FY16: update software to be compliant with current IT policies including migrating from file transfer protocol (FTP) to secure FTP (sFTP) (PECS v6.0)
Enhancements to Pharmacy	SUMPM FY16: allow greater than 90-day fill for outpatient prescriptions and greater than 90-day interval for administration frequency of inpatient and clinic orders, where appropriate for a given medication
API Exposure, 2.0	Expose up to 250 APIs and associated RPCs in VistA clinical applications

Feature Set Area	Feature Set Requirement
API Exposure, 2.0	Integrate foundational suite of VistA packages with the DoD/VA interoperability infrastructure
API Exposure, 2.0	Provide a read or write of data to and from VistA that serves as an “event driver” (trigger) to notify when a noteworthy write has taken place within VistA
API Exposure, 2.0	Allows integration of data from legacy clinical packages with the EHR
API Exposure, 2.0	Services will be compliant with OneVA Enterprise Architecture, accessible through eMI, and secured using IAM Services
FileMan Modernization	Data standardization to permit FileMan-based querying and aggregation of structured data between all VistA databases, allowing for a FileMan-based enterprise-wide view of patient data
FileMan Modernization	Provide Internationalization Enhancements (FileMan 22.2E Capability)
FileMan Modernization	Improved Data Analysis Tools (FileMan 22.2E Capability)
FileMan Modernization	Enhance User interface (FileMan 22.2E Capability)
FileMan Modernization	Data Dictionary Enhancement (FileMan 22.2E Capability)
VistA Immunizations Enhancements (VIMM), 2.0	Accommodate standardized data required for immunization capture and interoperability
VistA Immunizations Enhancements (VIMM), 2.0	Fulfill the required vocabulary standard for the 2014 EHR certification
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc1) Standardization: 09/16/14 – 03/13/15. Establish new unidirectional interfaces between CDC's IIS and DAS and between DAS and STS to allow VistA to obtain the CVX/MVX codes from STS (leveraging existing integration between STS and VistA)
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc2) Meaningful Use: 03/15/15 – 09/11/15. Back end file structures to access, record, update immunization information and transmission to immunization registries criteria
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc2) Meaningful Use: 03/15/15 – 09/11/15. Create a standardized Health Summary that includes all new Immunization data
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc2) Meaningful Use: 03/15/15 – 09/11/15. Standardize Units of Measure for all VistA packages

Feature Set Area	Feature Set Requirement
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc3) Interoperability: 09/14/15 – 03/11/16. Create capability in VistA immunization files for clinicians and providers to read, write and edit all new fields for Immunizations and Skin Test data
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc4) CDS: 03/14/16 – 09/16/16. Provide CDS via recommended immunization treatments, alerts/reminders and ad hoc reporting to meet Meaningful Use Stage 3 requirements for Immunizations
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc4) CDS: 03/14/16 – 09/16/16. Send immunization data outbound to external partners outside VA, to include DoD, to state Health Department Immunization Registries; meet Meaningful Use Stage 2 requirements for Immunizations
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc4) CDS: 03/14/16 – 09/16/16. Intake immunization data from external partners outside VA (including DoD); transmit VA data to other healthcare systems and state agencies
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc4) CDS: 03/14/16 – 09/16/16. Create capability in CPRS and eHMP for clinicians and providers to read, write and edit all new fields for Immunizations and Skin Test data

**Table 1. VistA 4 Roadmap Feature Set 3 Requirements**

Implementation risk gaps can occur as a result of issues encountered during execution of a project. The major VistA Evolution projects associated with each FS3 area were identified, and the status was reviewed using the VE PMO Weekly Program FY16 Report (status reported as of March 10, 2016). Program Manager ratings of overall status in the Cost, Schedule, Staffing, Scope, and Cyber Security categories were reviewed. Ratings of “red” (below target) and “yellow” (at risk) point to potential implementation risk gaps. Issues and concerns presented in the report were reviewed for evidence of specific implementation gaps. Table 2 displays a summary of FS3 project status and potential implementation risk gaps.

Several potential implementation risk gaps were noted:

- Interoperable EHR, Pharmacy Safety Updates – Additive and intravenous (IV) Strength, and portions of VistA Service Assembler (VSA) at risk for gaps due to funding and/or budget issues
- eHMP, portions of VistA Scheduling Enhancements (VSE), Enhancements to Pharmacy – MOCHA, and VistA Immunization Enhancements (VIMM, 2.0) at risk for gaps due to schedule dependencies with other projects
- Enhancements to Pharmacy – PECS at risk for gaps due to ongoing remediation of security vulnerabilities
- VSA at risks for gaps due to reduction in scope for IAM services

Feature Set Area	Project	Cost	Schedule	Staffing	Scope	Cyber Security	Potential Implementation Gaps
Interoperable EHR	Collaborative Terminology Tooling & Data Management	Y	G	G	G	R	FY17 funding issue related to ISAAC Terminology Tooling development effort
Interoperable EHR	VistA Evolution Interoperability	Y	Y	Y	Y	R	Budget priorities increasing risk of meeting requirements by 12/31/16
eHMP	Enterprise Health Management Platform (eHMP)	G	R	R	G	G	Resource gaps related to deployment of v1.2 may have downstream impact
VistA Scheduling Enhancements (VSE)	VistA Scheduling Enhancements (VSE)	G	R	R	G	G	W2VA GUI functionality may be at risk if required patches to the Claims system are not completed in a timely manner
Enhancements to Pharmacy	Medication Order Check Healthcare Application (MOCHA)	G	G	G	G	R	Prerequisite patch could delay start of MOCHA Enhancement 2 national deployment
Enhancements to Pharmacy	Pharmacy Enterprise Customization System (PECS)	Y	R	G	R	R	Schedule at risk due to unknowns in developing fixes for all Fortify security vulnerabilities
Enhancements to Pharmacy	Pharmacy Safety Updates – Additive and IV Strength	G	G	G	G	R	National release may be delayed due to VistA Evolution funding
VistA Service Assembler	VistA Services Assembler (VSA) Phase 2	G	G	G	Y	G	VistA.js IOC release will not include 2 planned IAM services; local platforms may require FY17 funding to complete implementation and national deployment; VSA Wizard contract award on hold due to VE funding cap, potential impact to API Exposure 2.0 project
VistA Immunization Enhancements (VIMM, 2.0)	VistA Immunization Enhancements (VIMM) 2.0	G	G	G	Y	G	Delays in deployment of VSA may result in VIMM project concluding before meeting project requirements

	Above Target		At Target		At Risk		Below Target
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**Table 2. FS3 Project Status and Potential Implementation Risk Gaps**

### **3.2.2. Items Below the Funding Cut-Line**

Development items which have not received funding indicate a potential implementation risk gap. The primary focus is on items ranked just below the funded items. Gaps could result from VE budget cuts and adjustments, including features removed from the VistA 4 Product Roadmap due to funding constraints. In comparing the Roadmap published version 3.11 against the draft version 4.0, two requirements were removed due to funding concerns. The iMedConsent Platform Migration (Feature Set 2) was removed from the Roadmap due to lack of funding. This migration was intended to convert the current application from a client/server to a web-based framework. The National Center for Ethics in Health Care had requested that iMedConsent be migrated to a centralized platform to permit updates to be more responsive to ensure consistency in consent throughout the enterprise.

Additionally, a portion of the Enhancements to Pharmacy area, PPS-L 1.0 Foundations (Feature Set 2), will not be continued until adequate funding is available. The effort was intended to upgrade the existing PPS-L code to a Technical Reference Model (TRM) compliant code, and to add data tables necessary to support a host of local attributes such as orderable items, medication instructions, and intravenous (IV) additives and solutions. In addition to these items, implementation gaps can arise due to Planning, Programming, Budgeting, and Execution (PPBE) decisions and other re-prioritizations. Funding cut-line opportunities will be further developed in the Q3 Gap Analysis.

### **3.2.3. Innovations Projects**

The VHA Innovations Program identifies, tests, and evaluates innovative solutions to help VA better serve Veterans. Innovations projects were initiated to address gaps and OSS innovations have the potential to fill these gaps. Current Innovations projects were collected and reviewed for alignment with the VistA 4 Project Roadmap Feature Sets 3 and 4. Within the projects aligned with FS3, 13 of 14 projects align with the eHMP requirement areas. eHMP features included in Roadmap are very broad. Innovations projects highlight potential lower-level requirements gaps within this area.

Within the projects aligned with FS4, the Roadmap specifically calls out the Maternity Tracker Innovations project as a requirement in the Women's Health portion of the Specialty Clinical Applications area. The majority of Innovations projects are currently in the development cycle. Two Innovations projects have already initiated the OSEHRA certification process. The Increase Enrollment in My HealthVet (IEMHV) project is currently certified to OSEHRA Level 4™. Additionally, the Alert Watch And Respond Engine (AWARE) submitted initial OSEHRA documentation in January 2016. The Innovations projects aligned with Feature Set 3 are represented in Table 3, and projects aligned with Feature Set 4 are represented in Table 4.

FS Area	Application	Description
eHMP	Mobile VistA Exchange	Mobile VistA Exchange for veteran-facing applications using eHMP code as the basis
eHMP	InfoButtons	Context-sensitive links embedded in the EHR; use contextual information to help find answers to clinicians' and patients' questions using online health information resources
eHMP	After Visit Summary (AVS)	Automatically capture data from CPRS including visit information, orders, instructions, etc. and reformat into an easy to understand patient-centered discharge summary
eHMP	Pressure Ulcer Resource (PUR)	Mobile performance support tool to prevent pressure ulcers through education and enhanced communication between medical providers, Veterans, caregivers
eHMP	ehmp-app	eHMP ADK and Applets; a Single Page Application (SPA) written with Marionette/Backbone.js for implementing a VistA EHR User Interface
eHMP	Alert Watch And Respond Engine (AWARE)	Automated tool enabling clinicians, supervisors, and administrations to monitor and track alert responses in CPRS
eHMP	PseudoVet	Automated patient data fabrication engine; provides a set of active synthetic patients and clinical data that can be used for healthcare software development
eHMP	MyGuide	Waiting room application used by patients to obtain visit information and treatment goals with a survey component
eHMP	FamilyHistoryCPRS	Enhancement to the CPRS GUI application that adds the ability to enter a patient's family history data
eHMP	Enhanced Lab Order Management Menu (ELOMM)	Enhancements to the current Lab Order Menu system to allow caregivers more immediate access to time-sensitive lab test results
eHMP	Pre-Procedural Checklist Tool	Allows multiple authors to work together in completing pre-procedure statuses for patients in VistA
eHMP	REVAMP (Remote Veteran Apnea Management Platform)	Personalized, interactive web application designed to improve management of Veterans with obstructive sleep apnea (OSA)
eHMP	Increase Enrollment in My HealtheVet (IEMHV)	Modified the Preregistration Interface (PI) within the current VistA Registration package to increase enrollment in the MyHealtheVet web portal
VistA Scheduling Enhancements	VANS	Web-based application to enable schedulers to preview, edit and send appointment letters electronically

**Table 3. Innovations Projects Aligned with Feature Set 3**

FS Area	Application	Description
Specialty Clinical Applications	PerceptiveReach	Combines technology, outreach and clinical support to deliver a clinically based data-driven early intervention and treatment solution aimed at suicide prevention
Specialty Clinical Applications	Benefits Claims Decision Support System (BCDSS)	Repository for predictive analysis platform for VBMS models
Specialty Clinical Applications	Mental Health eScreening (MHE)	Allows patient-directed reporting of health symptoms, immediate patient feedback and results documented to CPRS, real-time scoring of screens for staff notification of high-risk veterans for same-day care
Women's Health	Maternity Tracker	Assists the coordination of maternity care in a seamless fashion between VA and Non-VA providers, in order to support optimal care of pregnant Veterans
Surgical Risk Calculator	Automated Surgical Risk Calculator for Mortality (ASRCM)	CPRS tool that automatically populates pertinent information into the developed risk calculator; allows for manually entered data to support clinical decision-making regarding perioperative risk; updates patient file in CPRS
Enhancements to Ancillary Systems	RemoteOrdering	This project aims to provide a means of remotely ordering and receiving results of tests for transplant patients through the VA's Computerized Patient Record System (CPRS)
Enhancements to Ancillary Systems	Chemotherapy Ordering Management System (COMS)	Web-based application providing oncology teams with ordering, preparation, and documentation of chemotherapy
VistA Imaging (in support of Radiology)	Radiology Protocol Tool Recorder (RAPTOR)	Automated, electronic tool for capturing data that is needed by radiologists to optimize advanced medical imaging protocols including CT, MRI and nuclear medicine
VistA Imaging (in support of Radiology)	Telepathology	Stores and forwards reviews of anatomical pathology images for primary diagnosis and consultive services
Pharmacy Inbound ePrescribing	OneVA Pharmacy	Provide pharmacists direct access to any active refillable prescription from any VA Healthcare System facility; allows the Pharmacist to fill a prescription for the Veteran
PPS-N 3.0	Hazardous-Pharmaceuticals	Adds handling precautions and disposal instructions of hazardous pharmaceuticals within VistA and the Bar Code Administration (BCMA) application

**Table 4. Innovations Projects Aligned with Feature Set 4**

**3.2.4. Stakeholder Input**

Based on stakeholder feedback, a gap currently exists in the area of Cyber Security. This is a critical area for VA, and any available OSS has the potential to bring rapid value. Again referencing the VE PMO Weekly Program FY16 Report (status reported as of March 10, 2016) as a source, it appears that 50% of VE projects aligned with Feature Set 3 have a PM assessment of “red” (below target) for Cyber Security (Table 5).

Feature Set Area	Project	Cyber Security
Interoperable EHR	Collaborative Terminology Tooling & Data Management	R
Interoperable EHR	VistA Evolution Interoperability	R
eHMP	Enterprise Health Management Platform (eHMP)	G
eHMP	Image Viewer for eHMP	G
VSE	VistA Scheduling Enhancements (VSE)	G
Enhancements to Pharmacy	Medication Order Check Healthcare Application (MOCHA)	R
Enhancements to Pharmacy	Pharmacy Enterprise Customization System (PECS)	R
Enhancements to Pharmacy	Pharmacy Safety Updates – Additive and IV Strength	R
Enhancements to Pharmacy	State Prescription Monitoring Program Enhancement	R
Enhancements to Pharmacy	Pharmacy Interface Automation – Automated Dispensing Units	R
VistA Service Assembler	VistA Services Assembler (VSA) Phase 2	G
VIMM, 2.0	VistA Immunization Enhancements (VIMM) 2.0	G
API Exposure, 2.0	VistA API Exposure 2.0	G
FileMan Modernization	FileMan 22.2E	G



**Table 5. VE Projects Rated "Red" for Cyber Security**

An additional gap identified by stakeholders is modernized, modular EHR code - OSS usable as part of eHMP, aligned with the Healthcare Services Platform Consortium (HSPC), which leads to the replacement of CPRS code. This code would also support workflow for end-to-end business functions, and enables standardization. Code elements which have waivers without defined endpoints would also represent a gap.

Database requirements information would be useful in identifying gaps; VA is currently checking on the accessibility of this database for contractor analysis. Technical improvements to VistA may lead to implementation gaps. Printing issues are an example of a technical improvement which can lead to an implementation gap.



The Business Function Framework (BFF) provides a business function standard that is useful in understanding gaps. Initial Feature Set to BFF mappings are included in Table 7 found in Section 3.3.3.

### **3.2.5. Near-Term Opportunities**

Efforts such as FileMan and Immunization display successes that were achieved in the long-term. In conjunction with those types of efforts, it is important to make sure to be successful at filling gaps in the short-term. Opportunities for short-term success come from candidates that already fit the Existing Product Intake Program (EPIP) requirements, as well as those that clearly fit the needs for active development teams. The Q1 SWOT candidates aimed to fill both short-term and long-term gaps. Table 6 below depicts the outcomes of the Q1 SWOT Analysis candidates.

Candidate	Outcome
Appointment Postcard Notification v4.0	Rejected by EPIP, a potential solution is to create a small implementation contract to implement this application.
OpenInfobutton	Recommended for further analysis and potential intake. A version of Infobutton was previously brought into eHMP, but was not launched due to server issues. Per discussion during the IPR, OSEHRA will contact ASMR to verify the version.
XU Digital Signature	Per discussion during the IPR, a decision is needed to determine if the software should go to EPIP or be done as part of active kernel work.

**Table 6. Q1 SWOT Analysis Candidates**

In addition to the Q1 SWOT candidates, the Enhanced XML Utilities for VistA software package has been identified as a potential near-term success. Although this candidate was not originally listed in the Q1 candidate set, the need for this package has been deemed critical and the process expedited in order to best address the needs of VA. This software is an XML package that includes templating tools, XML querying using XPATH, and XML Authoring facilities. These utilities address the need for XML parsing capabilities, allowing any VistA application to perform XML processing in a more efficient manner.

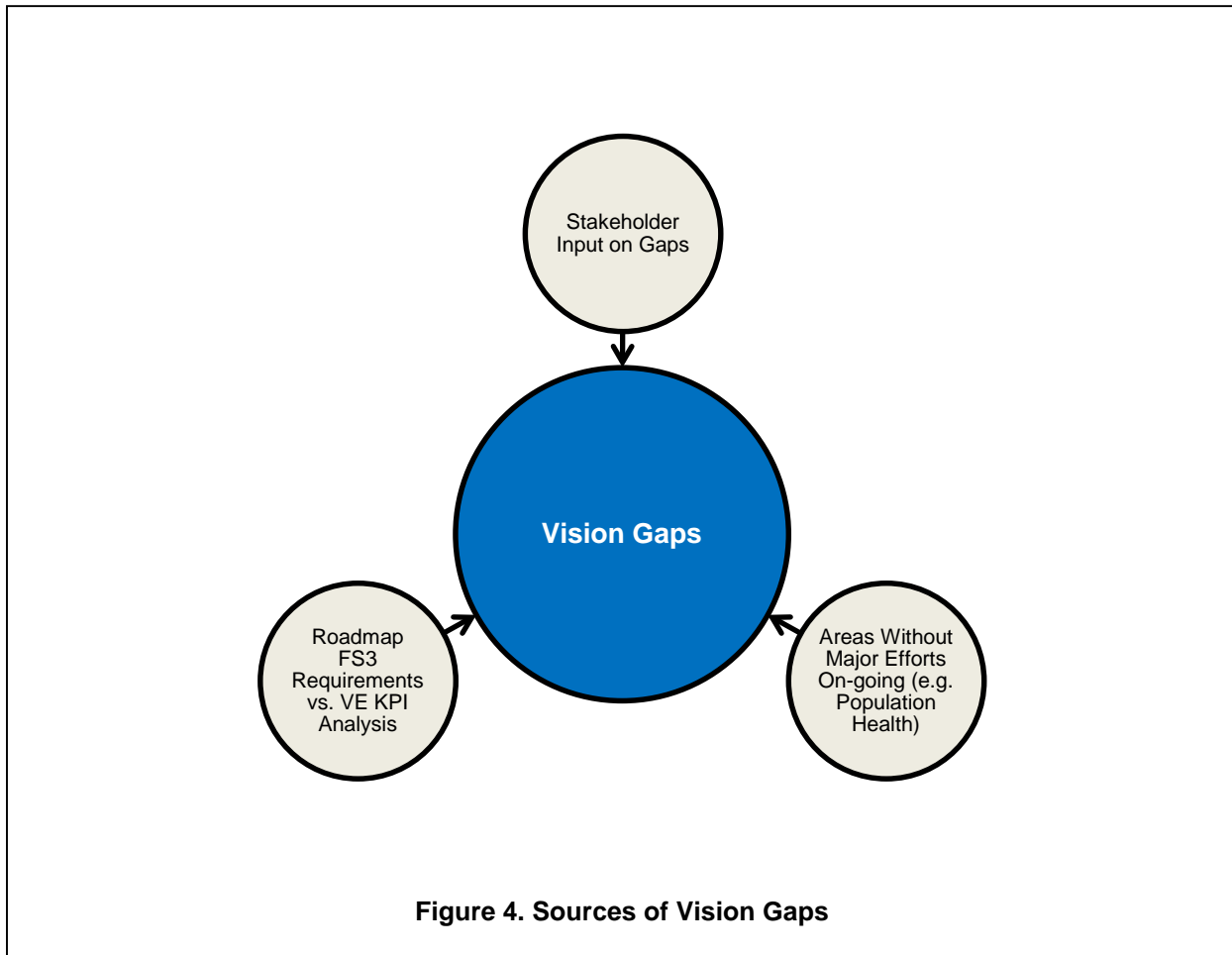
### **3.2.6. Projects in Transition**

Projects in transition provide an opportunity for OSS to fill the gap and accelerate aspects of projects with scope adjustments, changes in business or technical direction, funding changes, and changes in business urgency of requirements.

The Medical Appointment Scheduling System (MASS) transition to Scheduling has all of the above issues and is a gap OSS could fill. Scheduling risks include development of standardized information sharing for scheduling data exchange, both internal and external to the VHA (outside MASS core function). This has potential impact on VHA's ability to manage service demand and schedule staff resources.

### 3.3. Vision Gaps

There are multiple sources of VistA vision gaps, as displayed in Figure 4. These sources include stakeholder input, areas without major efforts on-going, and VistA 4 Product Roadmap versus VE KPI analysis. Each category is discussed below.



#### 3.3.1. Stakeholder Input on Gaps

Based on stakeholder input, population health is viewed as a significant vision gap area. Also, according to VA CIO LaVerne Council's Congressional Testimony on April 14, 2016, an additional vision gap area is an EHR with analytics, cloud, and patient experience capabilities<sup>1</sup>.

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<sup>1</sup> Sullivan, T. (2016, April 14). CIO LaVerne Council says VA needs new EHR with analytics, cloud, patient experience capabilities. Retrieved June 07, 2016, from <http://www.healthcareitnews.com/news/cio-laverne-council-says-va-needs-new-ehr-analytics-cloud-patient-experience-capabilities>

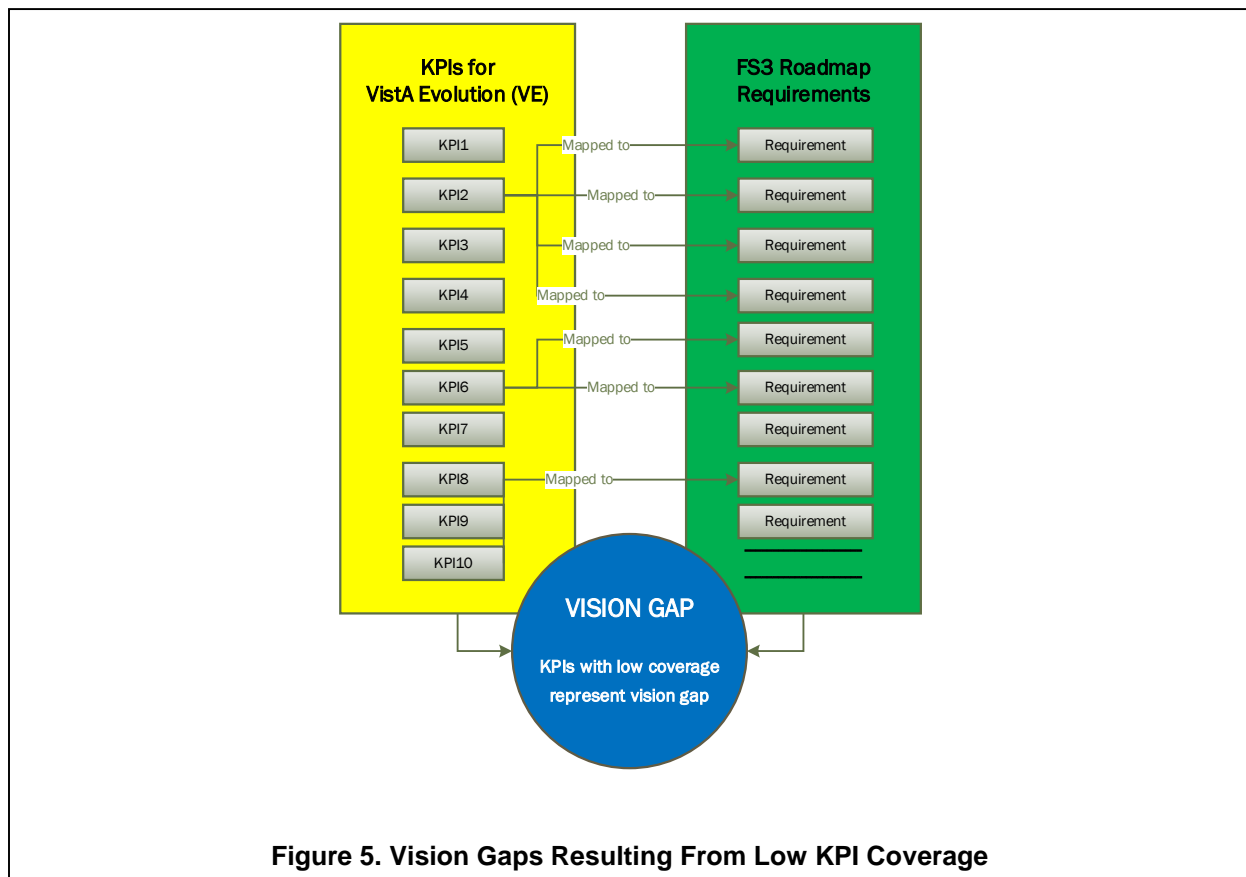
### 3.3.2. Areas Without Major Efforts On-Going

Areas without major on-going development efforts indicate vision gaps. Population health functionality falls into this category, which includes capabilities for clinicians, managers, and researchers to define and manage patient populations. While a placeholder for analytics and population health product line exists, no programs are assigned, resulting in a vision gap.

The 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) is another area without major on-going efforts resulting in a vision gap. This area includes the ability to use common/standard electronic clinical quality measures, integrate broader care coordination activities with non-VHA healthcare professionals, and display, share, and disseminate population health reporting.

### 3.3.3. VistA 4 Roadmap Requirements versus VE KPIs

Analysis was performed to align the VistA 4 Product Roadmap Feature Set 3 requirements with the VistA Evolution KPIs to further identify vision gaps. The ten VE KPIs were mapped to the 63 FS3 requirements identified in the Roadmap to identify vision areas not covered by FS3, as depicted graphically below in Figure 5. (Refer to Table 1 for the full list of FS3 requirements.) To determine the degree of alignment, the total number of requirements tied to each KPI was calculated, using a weighting of 1.0 for full alignment, and 0.5 for partial alignment.



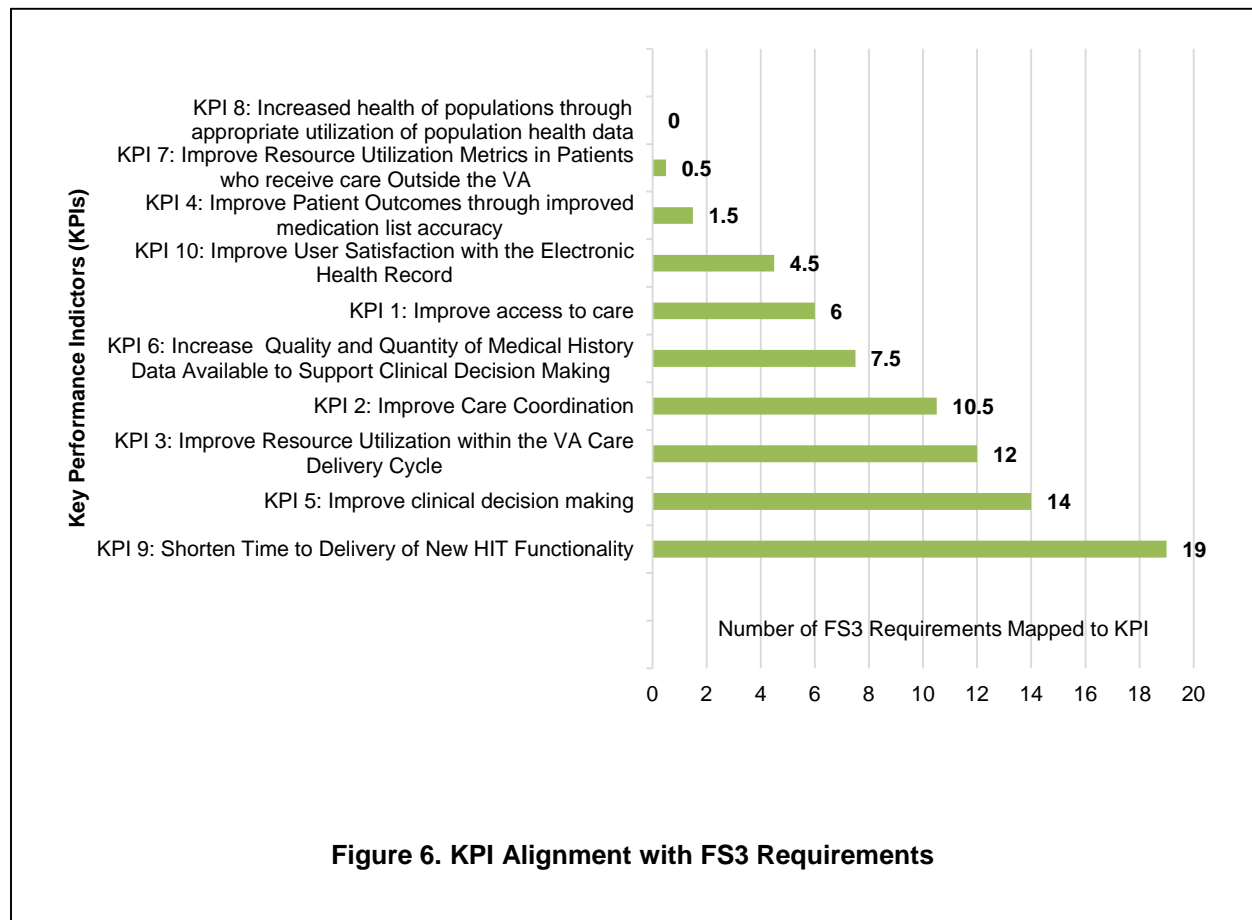
After mapping the FS3 requirements to each VE KPI, the KPIs with the lowest number of FS3 requirements mapped to KPIs indicate vision gaps. The three KPIs with the lowest coverage in FS3 are:

- KPI 8 – Increased health of populations through appropriate utilization of population health data
- KPI 7 – Improve resource utilization metrics in patients who receive care outside the VA
- KPI 4 – Improve patient outcomes through improved medication list accuracy.

Performing a preliminary look-ahead vision gap assessment for FS4 indicates vision gaps in the following areas:

- KPI 1 – Improve access to care and
- KPI 8 – Increased health of populations through appropriate utilization of population health data.

The number of FS3 requirements mapped to each KPI are summarized in Figure 6, below. The full list of KPI to requirements listing is detailed in Appendix A.



### **Use of the Business Function Framework**

VHA’s Business Function Framework (BFF) provides a standard description and functional baseline of the business functions performed at VHA. Mapping Feature Set requirements to the BFF can highlight functional areas that are not fully addressed. Areas not addressed are potential gaps that OSS could fill. For the Q2 Gap Analysis, an initial high-level mapping has been performed. As seen in Table 7, four FS3 areas had functions that could be directly mapped to the BFF. The BFF mappings will be further developed as part of the Q3 Gap Analysis.

Feature Set Area	Business Function Framework (BFF)
eHMP	Provide Patient Care Education [4.2.1] Provide Clinical Decision Support [4.3] Deliver Alerts for Patient Care [4.3.1] Provide Treatment Plans [4.4.5] Manage Orders [4.7.6] Provide Pharmacy Services [4.8.6] Provide Imaging Services [4.8.13] Record Patient History [4.11.4] Capture Data and Documentation from External Sources [4.11.5] Capture Patient Care Encounter Information [4.11.6] Maintain Patient Summary Lists [4.11.8] Obtain Patient Preferences and Directives [4.11.10]
VistA Scheduling Enhancements (VSE)	Manage Appointments [1.1.5] Provide Enterprise Reporting [7.7]
Enhancements to Pharmacy	Provide Medication Order Checks [4.3.3] Provide Pharmacy Services [4.8.6]
VistA Immunization Enhancements (VIMM), 2.0	Deliver Alerts for Patient Care [4.3.1] Provide Medication and Immunization Information [4.8.6.7] Capture Patient Care Encounter Information [4.11.6] Maintain Patient Summary Lists [4.11.8]

**Table 7. Mapping of FS3 Areas to the BFF**

## 4. Next Steps

The OSS Selection Criteria and Scoring Tool will be applied to screen OSS candidates for SWOT analysis. SWOT analysis will be conducted on appropriate candidates, and the Prioritization Description Document will be generated to incorporate additional detail. Feedback received during the Q1 IPR will be incorporated into the process, as will feedback captured during stakeholder interviews.

The Gap Analysis will continue to be matured for Q3. Additional gaps for OSS candidates will be identified and sources of data for identifying additional gaps will be gathered. The content and level of detail per approach will be expanded, and the depth of analysis will increase. There will be a focus on near-term opportunities and the integration with other work products will continue to be enhanced.

Ongoing interviews are being conducted with relevant stakeholders to gather information and additional perspective. Several interviews have been conducted to date, and will continue throughout the next several quarters. Refer to Table 8 for a list of stakeholder interviews.

Stakeholder	Comments
Jane Parsons (VA)	Conducted April 13
Aneel Advani (Global Virtual Group)	Initial conducted April 21, multiple follow-ups
Fred Mingo (VA)	Conducted April 27
Alex Hacala (VA)	Initial conducted April 27, follow-up May 5
Chris Rhodes (VA)	Initial conducted April 27, follow-up May 5
David Alvey (Savvee)	Initial conducted May 13, follow-up quarterly
Dr. Paul Tibbits (VA)	Conducted June 1
Jonathon Nebeker (VA)	Scheduled for June 6
Linda Hebert (VA)	
Michael O'Neil (HP)	
Wendell Ocasio (Accenture)	
Larry Albert (Accenture)	
Bill Synder (Accenture)	
Dave Parker (Defined IT)	
Rick Miller (Red Hat)	
Oscar Diaz (HSPC)	
Intermountain Health	

**Table 8. Stakeholder Interviews**

## Appendix A – VistA Evolution KPI Mapping to FS3 Requirements

### KPI 1: Improve access to care

Feature Set Area	Feature Set Requirement	Fit
VistA Scheduling Enhancements (VSE)	VSE GUI will include an interface to the mobile Veteran Appointment Request servers that will allow schedulers to book appointments for appointments requested by Veterans	Full
VistA Scheduling Enhancements (VSE)	Appointment request GUI that the Welcome to VA call center can use to create appointment requests on behalf of new Veterans	Full
VistA Scheduling Enhancements (VSE)	Improve schedulers' ability to effectively sort, filter and manage scheduling resources	Full
VistA Scheduling Enhancements (VSE)	Consolidate all appointment request lists in a single queue; allow scheduler to view all open appointment requests collectively	Full
VistA Scheduling Enhancements (VSE)	Provide aggregated view of clinic profile scheduling grids; allow schedulers to view resource availability and schedule the appointment for the Veteran from the same screen	Full
VistA Scheduling Enhancements (VSE)	Display pertinent resource management metrics in a single view; allow individual facilities and staff at various levels to measure and track supply, demand, and efficiency metrics related to outpatient scheduling operations	Partial
VistA Scheduling Enhancements (VSE)	Develop a comprehensive dashboard that will display metrics at the facility, VISN and National level	Partial

### KPI 2: Improve care coordination

Feature Set Area	Feature Set Requirement	Fit
eHMP	Develop basic orders	Full
eHMP	Develop patient goal management	Partial
eHMP	Develop Basic care team & plans	Full
eHMP	Develop Secure Messaging	Partial
eHMP	Develop Advanced task/team management	Full
eHMP	Develop Goal-based care plans	Full
eHMP	Develop Outbound ePrescribing	Full
Interoperable EHR	Update eHMP and VistA Exchange to include all remaining data domains (for which there are structured data sources) with national standard terminologies	Partial

Feature Set Area	Feature Set Requirement	Fit
Enhancements to Pharmacy	Pharmacy Interface Automation: bi-directional interface between VistA Inpatient Medication Package and Pharmacy Automated Dispensing Units that are used in both inpatient and outpatient care settings	Full
VistA Immunizations Enhancements (VIMM), 2.0	Accommodate standardized data required for immunization capture and interoperability	Partial
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc4) CDS: 03/14/16 – 09/16/16. Send immunization data outbound to external partners outside VA, to include DoD, to state Health Department Immunization Registries; meet Meaningful Use Stage 2 requirements for Immunizations	Full
eHMP	Develop Secure Messaging	Partial
eHMP	Develop Advanced task/team management	Full
eHMP	Develop Goal-based care plans	Full
eHMP	Develop Outbound ePrescribing	Full
Interoperable EHR	Update eHMP and VistA Exchange to include all remaining data domains (for which there are structured data sources) with national standard terminologies	Partial
Enhancements to Pharmacy	Pharmacy Interface Automation: bi-directional interface between VistA Inpatient Medication Package and Pharmacy Automated Dispensing Units that are used in both inpatient and outpatient care settings	Full
VistA Immunizations Enhancements (VIMM), 2.0	Accommodate standardized data required for immunization capture and interoperability	Partial
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc4) CDS: 03/14/16 – 09/16/16. Send immunization data outbound to external partners outside VA, to include DoD, to state Health Department Immunization Registries; meet Meaningful Use Stage 2 requirements for Immunizations	Full
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc4) CDS: 03/14/16 – 09/16/16. Intake immunization data from external partners outside VA (including DoD); transmit VA data to other healthcare systems and state agencies	Full
API Exposure, 2.0	Integrate foundational suite of VistA application packages with the DoD/VA interoperability infrastructure	Partial



### KPI 3: Improve resource utilization within the VA care delivery cycle

Feature Set Area	Feature Set Requirement	Fit
eHMP	Develop Patient List Creation	Full
eHMP	Develop Multi-patient views	Full
eHMP	Develop Advance Directives	Partial
eHMP	Develop Enterprise orders selection/management services	Full
eHMP	Develop Clinical Reconciliation	Full
VistA Scheduling Enhancements (VSE)	Improve schedulers' ability to effectively sort, filter and manage scheduling resources	Partial
VistA Scheduling Enhancements (VSE)	Consolidate all appointment request lists in a single queue	Partial
VistA Scheduling Enhancements (VSE)	Provide aggregated view of clinic profile scheduling grids; allow schedulers to view resource availability and schedule the appointment for the Veteran from same screen	Partial
VistA Scheduling Enhancements (VSE)	Allow enterprise to use VistA scheduling data more effectively, provide greater visibility for scheduling operations, and better manage scheduling resources	Full
VistA Scheduling Enhancements (VSE)	Display pertinent resource management metrics in a single view; ability to measure and track supply, demand, and efficiency metrics related to outpatient scheduling operations	Full
VistA Scheduling Enhancements (VSE)	Develop comprehensive dashboard to display metrics at facility, VISN, national level	Full
Enhancements to Pharmacy	SUMPM: Modify the algorithm to associate the appropriate IV additive to the correct orderable item, based on additive strength	Full
Enhancements to Pharmacy	FY16: change to allow greater than 90-day fill for outpatient prescriptions and greater than 90-day interval for administration frequency of inpatient and clinic orders, where appropriate for a given medication	Full
FileMan Modernization	Enhance User interface (FileMan 22.2E Capability)	Full

### KPI 4: Improve patient outcomes through improved medication list accuracy

Feature Set Area	Feature Set Requirement	Fit
eHMP	Develop Medication Reconciliation	Full

Enhancements to Pharmacy	SUMPM: Modify the algorithm to associate the appropriate IV additive to the correct orderable item, based on additive strength	Partial
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**KPI 5: Improve clinical decision making**

Feature Set Area	Feature Set Requirement	Fit
eHMP	Develop patient goal management	Full
eHMP	Develop image viewer	Full
eHMP	Develop scanned document search	Full
eHMP	Develop Clinical Decision Support (CDS) (e.g. Immunizations)	Full
eHMP	Develop Alert Management	Full
eHMP	Develop Complete outpatient encounter	Full
eHMP	Develop Advance Directives	Full
eHMP	Develop Goal-based care plans	Partial
eHMP	Develop Advanced Clinical Decision Support (CDS)	Full
Enhancements to Pharmacy	MOCHA FY16: implement enhancements that refine the current alert system for Remote Order Allergy Checks and Clinical Reminder Order Checks	Full
Enhancements to Pharmacy	MOCHA FY17: implement enhancements to add an alert for maximum daily dose for simple orders (MOCHA 2.Full)	Full
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc3) Interoperability: 09/14/15 – 03/11/16. Create capability in VistA immunization files for clinicians and providers to read, write and edit all new fields for Immunizations and Skin Test data	Full
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc4) CDS: 03/14/16 – 09/16/16. Provide CDS via recommended immunization treatments, alerts/reminders and ad hoc reporting to meet Meaningful Use Stage 3 requirements for Immunizations	Full
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc4) CDS: 03/14/16 – 09/16/16. Create capability in CPRS and eHMP for clinicians and providers to read, write and edit all new fields for Immunizations and Skin Test data	Full
FileMan Modernization	Enhance User interface (FileMan 22.2E Capability)	Partial

**KPI 6: Increase quality and quantity of medical history data available to support clinical decision making**

Feature Set Area	Feature Set Requirement	Fit
eHMP	Achieve certification of ONC 2014 Edition EHR Criterion	Full
eHMP	Develop patient self-description	Full
eHMP	Develop Women's Health / Family, Military & Social History	Full
VistA Immunizations Enhancements (VIMM), 2.0	Fulfill the required vocabulary standard for the 2014 EHR certification	Partial
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc2) Meaningful Use: 03/15/15 – 09/11/15. Create a standardized Health Summary that includes all new Immunization data	Partial
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc2) Meaningful Use: 03/15/15 – 09/11/15. Standardize Units of Measure for all VistA packages	Partial
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc3) Interoperability: 09/14/15 – 03/11/16. Create capability in VistA immunization files for clinicians and providers to read, write and edit all new fields for Immunizations and Skin Test data	Partial
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc4) CDS: 03/14/16 – 09/16/16. Create capability in CPRS and eHMP for clinicians and providers to read, write and edit all new fields for Immunizations and Skin Test data	Partial
API Exposure, 2.0	Allows integration of data from legacy clinical packages with the EHR	Full

**KPI 7: Improve resource utilization metrics in patients who receive care outside the VA**

Feature Set Area	Feature Set Requirement	Fit
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc4) CDS: 03/14/16 – 09/16/16. Intake immunization data from external partners outside VA (including DoD); transmit VA data to other healthcare systems and state agencies	Partial

## KPI 8: Increased health of populations through appropriate utilization of population health data

Feature Set Area	Feature Set Requirement	Fit
No Alignment		

## KPI 9: Shorten time to delivery of new HIT functionality

Feature Set Area	Feature Set Requirement	Fit
eHMP	Develop structured data management	Full
Interoperable EHR	Deliver interoperability enabling capabilities that meet FY14 NDAA directives	Full
Interoperable EHR	Update eHMP and VistA Exchange to include all remaining data domains (for which there are structured data sources) with national standard terminologies	Partial
Enhancements to Pharmacy	FY16: update software to be compliant with current IT policies including migrating from file transfer protocol (FTP) to secure FTP (sFTP) (PECS v6.0)	Full
VistA Service Assembler (VSA), Phase 2	Improve compatibility with 'open source' participation objectives by incorporating Node.js functionality into the architectural design	Full
VistA Service Assembler (VSA), Phase 2	The Vista.js solution uses the following new technologies: Node.js, EWD.js, EWD Federator, Node Package Manager, Node Version Manager, Sinopia, Cache.node	Full
VistA Immunizations Enhancements (VIMM), 2.0	Accommodate standardized data required for immunization capture and interoperability	Full
VistA Immunizations Enhancements (VIMM), 2.0	Fulfill the required vocabulary standard for the 2014 EHR certification	Full
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc1) Standardization: 09/16/14 – 03/13/15. Establish new unidirectional interfaces between CDC's IIS and DAS and between DAS and STS to allow VistA to obtain the CVX/MVX codes from STS (leveraging existing integration between STS and VistA)	Full
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc2) Meaningful Use: 03/15/15 – 09/11/15. Back end file structures to access, record, update immunization information and transmission to immunization registries criteria	Full
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc2) Meaningful Use: 03/15/15 – 09/11/15. Create a standardized Health Summary that includes all new Immunization data	Full

Feature Set Area	Feature Set Requirement	Fit
VistA Immunizations Enhancements (VIMM), 2.0	Schedule (Inc2) Meaningful Use: 03/15/15 – 09/11/15. Standardize Units of Measure for all VistA packages	Full
API Exposure, 2.0	Expose up to 250 APIs and associated RPCs in VistA clinical applications	Full
API Exposure, 2.0	Integrate foundational suite of VistA application packages with the DoD/VA interoperability infrastructure	Full
API Exposure, 2.0	Allows integration of data from legacy clinical packages with the EHR	Full
API Exposure, 2.0	Services will be compliant with OneVA Enterprise Architecture, accessible through eMI, and secured using IAM Services	Full
FileMan Modernization	Data standardization to permit Fileman-based querying and aggregation of structured data between all VistA databases, allowing for a Fileman-based enterprise-wide view of patient data	Full
FileMan Modernization	Provide Internationalization Enhancements	Partial
FileMan Modernization	Improved Data Analysis Tools	Full
FileMan Modernization	Data Dictionary Enhancement	Full

**KPI 10: Improve user satisfaction with the electronic health record**

Feature Set Area	Feature Set Requirement	Fit
eHMP	Develop Complete outpatient encounter	Full
eHMP	Develop After Visit Summary/Patient Education	Full
eHMP	Develop Secure Messaging	Full
eHMP	Develop Outbound ePrescribing	Partial