Department of Veterans Affairs

Enterprise Health Management Platform (eHMP)
Increment 1 and 2

Operational Acceptance Plan (OAP)



October 2014

Version 1.5

Revision History

Note: The revision history cycle begins once changes or enhancements are requested after the Lessons Learned Report has been baselined.

Date	Version	Description	Author
10/17/2014	1.5	Updated for eHMP Increment 2	ASM Research
9/15/2014	1.4	Final Review and Approval	[redacted]
9/15/2014	1.3	PMO Reviews	PMO Team
9/5/2014	1.2	Updated for eHMP 1.0 Release	P. [redacted] RM
6/13/2014	1.1	Updated for Increment 2	A [redacted] PMO
3/14/2014	1.0	Final Approval for MS 1	[redacted] PM
2/24/2014	0.3	Final Updates for submission to SDE	[redacted] PM
02/13/2014	0.2	Updates to Original Draft Plan	D. Brewster, PMO
11/18/2013	0.1	Draft Plan	Project Management (PM) Liaison Support

Artifact Rationale

An Operational Acceptance Plan enables an organization to document a project's challenges and successes to understand causes of difficulties and to achieve greater success in the future. The benefits of looking back at past experience include process improvement, risk management, and other project activities. This facilitates the organization's continuous improvement.

The Operational Acceptance Plan is a required artifact, as identified in the Project Management Accountability System (PMAS) Guide.

Activity	New Capability (1)	Feature Enhancement (2)
Field Deployment (A)	Yes	Yes
Cloud/Web Deployment (B)	Yes	Yes
Mobile Application (C)	Yes	Yes

Table of Contents

1. Product / Project Description 4
2. Product / Project Document/Artifact Repository 6
3. Assessment & Authorization Risk Vision Status 7
4. Physical Support Requirements 7
5. Primary Operational Support Entities & FTE 11
6. Recurring Contracts, Licenses, and Warranties 12
7. Electronic Inventory List and Asset Management 13
8. Service Level Requirements 13
9. End User Support and Training 13
10. Lifecycle Support Requirements 14
11. Architecture / Dependencies 14
12. Anomaly / Risk Summary 16
13. Other Issues 16
14. Next Review 16
15. OAP Signatures 17

1. Product / Project Description

The Enterprise Health Management Platform (eHMP) project represents the portion of the VistA 4 Product that implements end-user facing features—i.e. the User Experience—for the clinical users (the team members that are responsible for direct patient care). As such, it includes the Graphic User Interface (GUI) as well as underlying supporting services and access to data. eHMP is an extension/evolution of VistA and does not represent a system wholly separate from VistA. Specifically, eHMP is not meant to produce a separate System of Records (SOR) apart from the existing VistA SOR.

The eHMP project, was initially developed as the User Experience (UX) project which created a VistA Exchange to extract and cache patient domain data from the VistA instances and DoD sources to establish an Enterprise Virtual Patient Record (eVPR). The eHMP project builds on UX to develop the Clinical Practice Environment (CPE), a new GUI that incorporates capabilities currently provided by the Joint Legacy Viewer (JLV) and the hi2 HMP. eHMP CPE will eventually replace the Computerized Patient Record System (CPRS) as VA's primary point of care application.

This project will take a foundational suite of VistA application packages, and undertake necessary work to integrate these applications with the VA/DoD interoperability infrastructure.

Business Processes Enabled: Simplified access to information that is reliable and securely available whenever and wherever needed by users; Standardization, Meaningful Use Information and Transmission, public health sentinel awareness, decision support, and interoperability with VA/DoD and community sources are supported- consistent with national Health Information Technology HIT standards.

The eHMP project will address these problems in the context of three major VA mandates:

- DoD Integration as defined by the 2014 National Defense Authorization Act (NDAA) legislation and 2014 Consolidated Appropriation acts;
- Meaningful Use EHR certification using the 2014 ONC criteria (stage 1 and 2);
- Generation 3 EHR capabilities

Increment Capabilities:

The eHMP project includes the following increments, which originated under the User Experience (UX) PMAS project. This version of the OAP is updated to address eHMP Increment 1 and eHMP Increment 2 capabilities.

Delivery Increment 1 (UX): Create a VistA Exchange and establish an eVPR. Establish the infrastructure and services to enable the enterprise wide data aggregation and enterprise virtual patient record consisting of nine patient domains

Delivery Increment 2 (UX): Create additional eVPR patient domains. Extend eVPR to include additional domains (anatomic pathology, discharge summary, immunizations, orders and consults) and to accept data from external sources

Delivery Increment 1 (eHMP): Create the initial version of the eHMP CPE to access patient data cached in the eVPR. This graphical user interface (GUI) will be connected to the VistA Exchange developed (tested and installed under the UX Increments 1 and 2). The eHMP CPE will include JLV "view" and HMP IOC functionality with access to DoD data.

Delivery Increment 2 (eHMP): Create three initial functions toward achieving Office of the National Coordinator (ONC) certification for Meaningful Use (MU). First will be the Computerized Provider Order Entry (CPOE) for Medications, Laboratory, and Radiology/Imaging orders. Second, develop the functionality surrounding drug-drug/drug-allergy interaction checking. The third focus area surrounds the management of Consolidated Clinical Document Architecture (C-CDA) documents.

EPS Number	01-02-03-05-08-001
PMAS State	Active
Proposed Production Install Date	12/19/2014 (IOC), 6/15/2015 (30 Sites)
System Owner	[redacted]

eHMP should incorporate advanced, evidence-based design principles proven to improve users' ability to find, understand, and use health information. eHMP should evolve the information environment away from long, static documents (such as narrative progress notes) toward modular, interactive displays of smaller and more meaningful pieces of information. Users should be able to interact with and organize information in novel, intuitive ways. For example, a selection of lab results may be associated with a list of medication orders through simple, intuitive actions and gestures to trigger powerful data visualizations combining multiple sets of information.

Computerized Patient Record Systems (CPRS) provides very limited capability for accessing patient information that may have been recorded in many different locations both during and after a Veteran's military service. When eHMP is integrated with a shared VA/DoD interoperability platform it will provide access to a Veteran's complete longitudinal electronic health record, comprised of data collected from every military and VA treatment facility in which the Veteran has received care. For many Veterans, health data from other government and non-government providers would be available as well. eHMP will also incorporate the Clinical Data Service (CDS) to retrieve data from remote VistAs via the Health Data Repository (HDR). Once all sites install VistA Exchange then this service will no longer be needed.

The rich, multi-sourced data comprising a Veteran's longitudinal health record must be understood by all systems accessing and adding to it, including eHMP. The common understanding of data between different systems, referred to as 'semantic interoperability', is critical to the success of eHMP. Modern team-based, goal oriented, seamless patient care between specialties, locations, and Departments demands a level of semantic interoperability not provided in any current EHR system. eHMP will drive advances in the application of national standards for coding, sharing, and interpreting health information both in VA and the nation.

The goal of the eHMP effort is to create a presentation structure and backend infrastructure for VA that will enable clinicians to view and edit VA patient data and images in a format that is seamless. The clinical application and GUI will facilitate integration into the workflow and simplify access to information that is reliable and securely available whenever and wherever needed by users. This effort will leverage and potentially reuse components of CPRS, the Joint Legacy Viewer (JLV) and other VA services or components as identified.

The scope of the eHMP Program involves three layers: presentation, services, and data. The Presentation Layer encompasses end user interactions with a web-based clinical application. This allows the provider to view normalized data and input data in a portable environment. The service layers are applications that provide for the standard integration of the data layer components by leveraging enterprise patterns. Finally the data layer is an enterprise caching of clinical data that uses a common terminology set and is normalized for Meaningful Use.

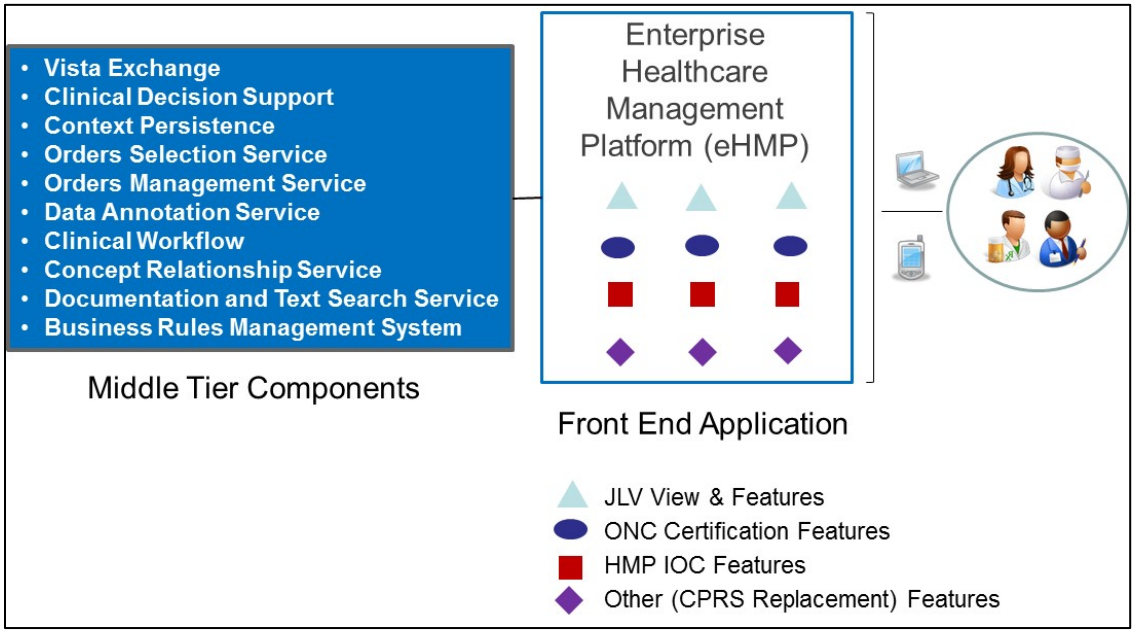


Figure 1 eHMP Layered Architecture with Planned Components

2. Product / Project Document/Artifact Repository

The project document and artifact repository are located in TSPR:
([redacted]anotebk.asp?proj=1718&Type=Active)

3. Assessment & Authorization Risk Vision Status

eHMP received a Temporary Authority To Operate on September 30th, 2014 for 120 days. The ISO for this project is John Rinkema. The Risk Vision name for this project is e-Health Management Platform.

4. Physical Support Requirements

SDE Intake Request 7800 is being worked to establish the hosting environment for the eHMP system. The eHMP project team is working with the Enterprise Development Environment (EDE) team to establish the development and integration environments. Pre-production and production environments will be hosted under the AITC EO cloud services under SDE Intake Request 7963.

The supporting architecture of development and production environments has been designed for use within a cloud computing environment. To support the near term acceptance, performance and integration testing needs of the eHMP project, a true cloud environment with programmatic access to the hypervisor and enough virtual resources to support the testing environments and related deployment infrastructure are required. Deployment into the test environment will be, at a minimum, once per sprint (every two weeks) with increasing frequency to multiple times per day during test cycles. Here are server specs for the EDE environment.

Environment – IP	RAM (GB)	CPUs	Disk Space (GB) (OS)	Disk Space (GB) (Additional Partitions)	O/S
Integration Test 1 eHMP UI	8	2	32GB	15GB /var 10GB /usr	LINUX
Integration Test 1 JDS	8	2	32GB	15GB /var 50GB /usr	LINUX
Integration Test 1 SOLR	8	2	32GB	15GB /var 10GB /op	LINUX
Integration Test 1 PDP	8	2	32GB	15GB /var	LINUX
Integration Test 1 FHIR API	8	2	32GB	15GB /var	LINUX
Integration Test 1 VistA 1	8	2	32GB	15GB /var 25 GB /usr	LINUX
Integration Test 1 VistA 2	8	2	32GB	15GB /var 25 GB /usr	LINUX
Integration Test 2 eHMP UI	8	2	32GB	15GB /var 10GB /usr	LINUX
Integration Test 2 JDS	8	2	32GB	15GB /var 50GB /usr	LINUX
Integration Test 2 SOLR	8	2	32GB	15GB /var 10GB /op	LINUX
Integration Test 2 PDP	8	2	32GB	15GB /var	LINUX
Integration Test 2 FHIR API	8	2	32GB	15GB /var	LINUX
Integration Test 2 VistA 1	8	2	32GB	15GB /var 25 GB /usr	LINUX
Integration Test 2 VistA 2	8	2	32GB	15GB /var 25 GB /usr	LINUX
Acceptance Test 2 eHMP UI	8	2	32GB	15GB /var 10GB /usr	LINUX
Acceptance Test 2 JDS	8	2	32GB	15GB /var 50GB /usr	LINUX
Acceptance Test 2 SOLR	8	2	32GB	15GB /var 10GB /op	LINUX
Acceptance Test 2 PDP	8	2	32GB	15GB /var	LINUX
Acceptance Test 2 FHIR API	8	2	32GB	15GB /var	LINUX

Environment – IP	RAM (GB)	CPUs	Disk Space (GB) (OS)	Disk Space (GB) (Additional Partitions)	O/S
Acceptance Test 2 VistA 1	8	2	32GB	15GB /var 25 GB /usr	LINUX
Acceptance Test 2 VistA 2	8	2	32GB	15GB /var 25 GB /usr	LINUX
Performance 2 eHMP UI	8	2	32GB	15GB /var 10GB /usr	LINUX
Performance 2 JDS	8	2	32GB	15GB /var 50GB /usr	LINUX
Performance 2 SOLR	8	2	32GB	15GB /var 10GB /opt	LINUX
Performance 2 PDP	8	2	32GB	15GB /var	LINUX
Performance 2 FHIR API	8	2	32GB	15GB /var	LINUX
Performance 2 VistA 1	8	2	32GB	15GB /var 25 GB /usr	LINUX
Performance 2 VistA 2	8	2	32GB	15GB /var 25 GB /usr	LINUX

The physical specifications for the EO Pre-Prod/Prod environment are:

Environment – IP	RAM (GB)	CPUs	Disk Space (GB) (OS)	Disk Space (GB) (Additional Partitions)	O/S
Apache Load Balancer 1	8	2	65GB	swap 6 / 6 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 14 Unallocated space 9	LINUX
Apache Load Balancer 2	8	2	65GB	swap 6 / 6 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 14 Unallocated space 9	LINUX
VE Web Service 1	8	2	65GB	swap 6 / 6 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 14 Unallocated space 9	LINUX
WE Web Service 2	8	2	65GB	swap 6 / 6 /tmp 4 /home 2 /opt 4	LINUX

Environment – IP	RAM (GB)	CPUs	Disk Space (GB) (OS)	Disk Space (GB) (Additional Partitions)	O/S
				/var 20 /usr/ 14 Unallocated space 9	
eHMP CPE UI 1	8	2	65GB	swap 6 / 6 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 14 Unallocated space 9	LINUX
eHMP CPE UI 2	8	2	65GB	swap 6 / 6 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 14 Unallocated space 9	LINUX
SOLR 1	8	2	65GB	swap 6 / 6 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 14 Unallocated space 9	LINUX
SOLR 2	8	2	65GB	swap 6 / 6 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 14 Unallocated space 9	LINUX
PDP Server 1	8	2	65GB	swap 6 / 6 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 14 Unallocated space 9	LINUX
PDP Server 2	8	2	65GB	swap 6 / 6	LINUX

Environment – IP	RAM (GB)	CPUs	Disk Space (GB) (OS)	Disk Space (GB) (Additional Partitions)	O/S
				/tmp 4 /home 2 /opt 4 /var 20 /usr/ 14 Unallocated space 9	
JDS 1	8	2	65GB	swap 6 / 6 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 14 Unallocated space 9	LINUX
JDS 2	8	2	65GB	swap 6 / 6 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 14 Unallocated space 9	LINUX
DB 1	16	2	346GB	swap 8 / 4 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 54 Unallocated space 250	LINUX
DB 2	16	2	346GB	swap 8 / 4 /tmp 4 /home 2 /opt 4 /var 20 /usr/ 54 Unallocated space 250	LINUX
Centralized Logging 1	8	2	132GB	15GB /var 25 GB /usr	LINUX
Centralized Logging 2	8	2	132GB	15GB /var 25 GB /usr	LINUX
Monitoring and Performance 1	8	2	132GB	15GB /var 25 GB /usr	LINUX
Monitoring and Performance 2	8	2	132GB	15GB /var 25 GB /usr	LINUX

5. Primary Operational Support Entities & FTE

The System will be supported by the VA National Service Desk Tier 1 and Tier 2 support. The project team will work with the NSD to define the standard operating procedures in regards to triaging defects, providing knowledge documentation and supporting initial help desk training. The support will address the plan for IOC sites and national release.

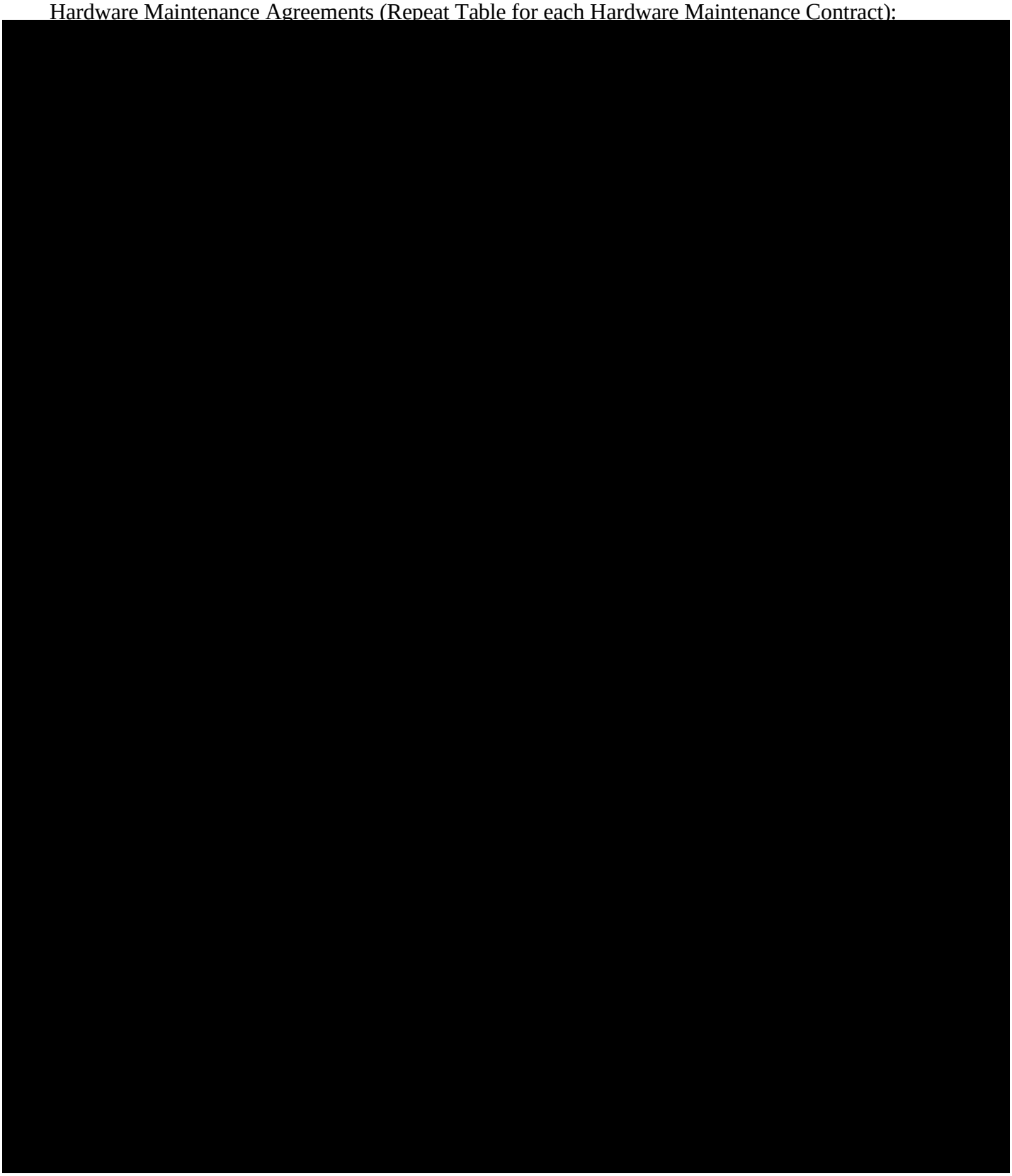
Tier 3 support will be provided by the Software Development Team (Team ASMR) and will support both the Triage and resolution of Tier 3 related issues. This will include addressing maintenance of the infrastructure, security patching, and updates to software. Specific personnel will be listed in later editions of the plan.

The EO Cloud environment also provides Gold Level Support from the AITC which provides quicker response times and higher priority in terms of support. Items the AITC provides includes: Allocation of VMs, disk storage, installation of OS (RHEL), IP allocation and Network Security (Firewall support).

6. Recurring Contracts, Licenses, and Warranties

The necessary Recurring Contracts, Licenses, and Warranties are listed in the tables below.

Hardware Maintenance Agreements (Repeat Table for each Hardware Maintenance Contract):





The necessary Recurring Contracts, Licenses, and Warranties will be hosted in the eHMP TSPR site ([redacted]anotebk.asp?proj=1718&Type=Active)

7. Electronic Inventory List and Asset Management

The environments and assets are hosted in the AITC EO Cloud. As a result the machines are virtualized and the physical hardware is maintained by AITC.

8. Service Level Requirements

Although there are not specific Service Level Requirements for this project, there are Performance Requirements that can be found in the Requirements Specification Document (RSD).

9. End User Support and Training

For eHMP Increment 1 there will be a select group of users from six IOC sites. The eHMP IOC Training plan, to be delivered on 11/1/2014, details the scope and approach to training IOC users at the 6 sites. The training will be conducted in a classroom setting. The necessary End User Support and Training is still in development and will be available 12/1/2014 for the Operational Readiness Review (ORR). Once complete this section will be updated and the necessary End User Support and Training, and Warranties will be posted in the eHMP TSPR site ([redacted]anotebk.asp?proj=1695&Type=Active)

The approach for eHMP Increment 2 training is being coordinated with Employee Educational Services (ESS). The scope and format of this training will be defined in the Training Plan for this increment once finalized.

10. Lifecycle Support Requirements

Life Cycle Support Requirements outlined in the quad chart are detailed in the table below.

Dollars in Millions	Prior Year(s)	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	Total
Lifecycle Costs									
Pay		**0.000**	**0.532**	**0.532**	**0.532**	**0.000**	**0.000**	**0.000**	**1.596**
Non-Pay									
Non-Pay DME		**0.000**	**50.223**	**63.410**	**15.062**	**0.000**	**0.000**	**0.000**	**128.695**
Non-Pay SUS			**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Total	**0.000**	**0.000**	**50.755**	**63.942**	**15.594**	**0.000**	**0.000**	**0.000**	**130.291**
All Other Non-IT*									**0.000**

11. Architecture / Dependencies

The following figure provides graphical depiction of the VistA Exchange architecture.

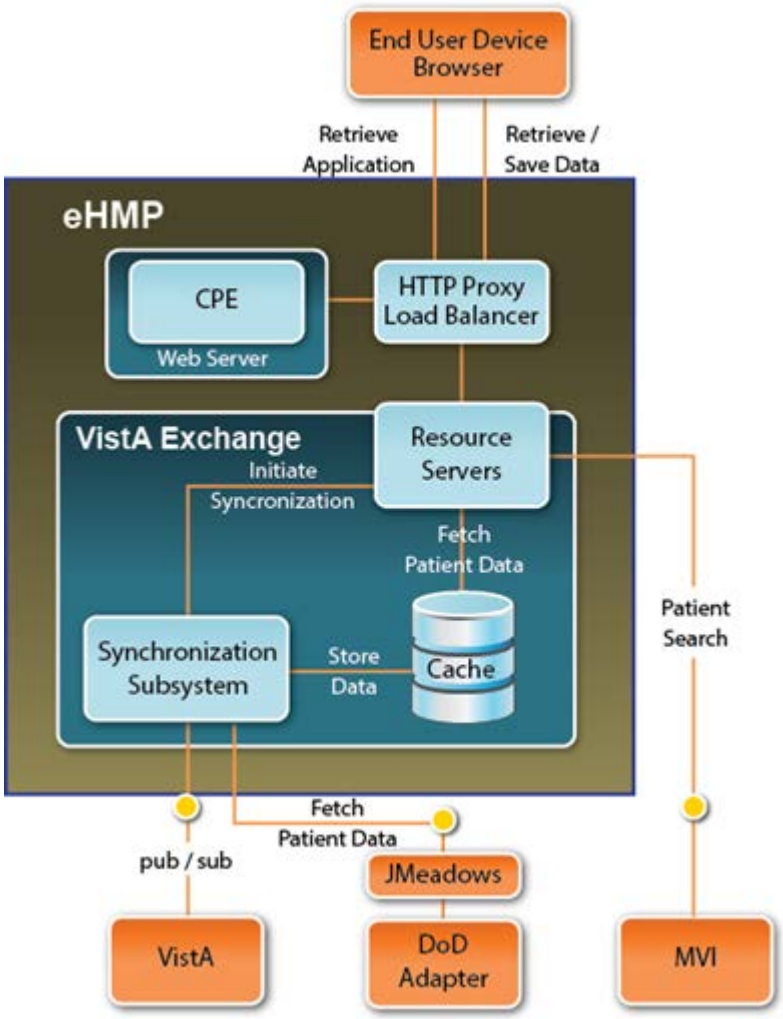


Figure 2 Architectural View of the eHMP

VistA Exchange

VistA Exchange is responsible for providing an enterprise patient record, including data from the VA and DoD. Based upon business triggers (such as an appointment, admission, or patient search), VistA Exchange begins to aggregate data from source systems for a selected patient. The data is normalized using standard terminologies to include consistent terms; that data is stored in an indexed method to ensure rapid retrieval based upon the patient identifier or through free text search.

VistA Exchange will leverage the HMP Virtual Patient Record (VPR) logic. During early deployment of VistA Exchange, the eVPR will be used essentially as-is. VistA Exchange will then be evolved to achieve scalability and performance goals as features and users are added. This evolution may iteratively happen during Increment 1, or in future increments. The primary influencer to drive these changes will be in the ability to acquire direct connections to VistA and DoD Adapter (or the ability for the Enterprise Service Bus (ESB) to mediate these connections) and the ability to deploy the HMP VPR pub/sub remote procedure calls (RPCs) across the enterprise.

The VistA Exchange web API allows a user to retrieve a patient's record by ICN. If that patient has not been synchronized (does not currently have a valid record in the cache), a synchronization request is initiated. This establishes a subscription against a "local" site using a set of HMP VPR RPCs. Within VistA, the existing data for the patient is gathered and made available to the cache. All future changes to the patient's record will be made available to the cache.

In addition to getting data from the local site, Vista Exchange retrieves data from remote VA and DoD sites via the Clinical Data Service (CDS) (pull) and the DoD Adaptor. Eventually, VistA Exchange data will be retrieved from all VistA's via pub/sub (push/pull). The data is normalized using a set of terminology tables. This process ensures that the data has a standards based term for certain concepts within the patient record, such as using a LOINC based term for a lab test.

Data is cached in two ways. First, the data is stored within a custom document store (JDS), developed as part of HMP, and hosted by an InterSystems Caché database. This is used for primary retrieval of data by patient. Second, the data is stored within Searching On Lucene w/Replication (SOLR), optimized for free text searches across a patient's record.

eHMP CPE

The eHMP CPE provides functionality to support a clinician at point of care with a patient. This application that will ultimately perform many of the functions of CPRS. It utilizes VistA Exchange as its source of patient data. The web application is developed as a Single Page Application, with client-side model view controller (MVC). This approach will limit the impact on the user experience associated with network latency as all behavior logic is contained within the client, not the server.

The application provides a development time Software Development Kit (SDK) and a runtime container in which small units of functionality can be developed and run. This approach is further defined in the eHMP System Design Document.

12. Anomaly / Risk Summary

The eHMP risk register is maintained on the eHMP SharePoint site and updated on a weekly basis.

13. Other Issues

No other issues exist at this time.

14. Next Review

The next review of the OAP will occur prior to Milestone 2.

15. OAP Signatures

The signature below is an acknowledgement that the signatory understands the purpose and content of this document. By signing this document, you agree to this as the formal Operational Acceptance Plan for the User Experience project.

REVIEW DATE: 10/17/14
SCRIBE: [redacted] [redacted]

[redacted] Date
IPT Co-Chair, Project Manager

[redacted] Date
SDE PAO Project Manager

[redacted] Date
SDE ESE Lifecycle Manager

Date
Executive Director of the supporting SDE Organization

Appendix A

Responsibilities of the Programmatic System Owner

- Coordinate sustainment efforts
  - Serve as overall point person for sustainment of the product
  - Coordinate the efforts of all entities involved in product sustainment, including Product Support, Enterprise Operations, Field Operations, a vendor, Network Security and Operations Center, National Service Desk, Enterprise Systems Engineering, and Product Development
  - Act as liaison to the business owner
- Manage sustainment budget
  - Assure continual funding for all aspects of sustaining the product, such as hosting, application maintenance, enhancements, and hardware refreshes
  - Coordinate with ITSM assuring sustainment budget for out years
- Manage contracts for hardware, software, maintenance, etc.:
  - Serve in PM role and assure a Contracting Officer Representative (COR) is assigned for sustainment contracts
  - Coordinate with the Technology Acquisition Center (TAC) as necessary
  - Coordinate with vendor(s) as necessary
  - Assure renewal of contracts and develop future sustainment contracts as needed (develop acquisition packages and coordinate technical evaluations)
  - Review and accept contract deliverables in tandem with COR
  - Assure invoices are approved timely
  - Assure service level agreement (SLAs) are met
- Ensure upgrades are planned and performed
  - Coordinate the implementation schedule for upgrading layered system components, including when to apply new releases from commercial-off-the-shelf (COTS) vendors
  - Liaise the scheduling of needed downtime with all affected parties
- Ensure hardware refreshes
  - Monitor technology advancements associated with and/or affecting the product
  - Determine when to refresh hardware – work with business owner to request funding in timely manner and establish refresh projects as necessary
- Handle disaster procedures
  - Orchestrate determination of when to declare a disaster and invoke disaster procedures in tandem with business owners, IT leadership and system administrators
  - Orchestrate determination of when to resume normal operations and execute the rollback strategy with business owners, IT leadership and system administrators