

Department of Veterans Affairs

Health Management Platform Extended Version

Requirements Specification Document



Version 1.3

October 2014

Revision History

Note: The revision history cycle begins once changes or enhancements are requested after the Requirements Specification Document has been baselined.

Date	Version	Description	Author
October 2014	1.3	PMAS Increment Update	
April 2014	1.2	PMAS Increment Update	
October 2013	1.1	PMAS Increment Update	
May 2013	1.0	Group Edits	
April 2013	0.0	Initial	

Artifact Rationale

The Requirements Specification Document (RSD) records the results of the specification gathering processes carried out during the Requirements phase. The RSD is generally written by the functional analyst(s) and should provide the bulk of the information used to create the test plan and test scripts. It should be updated for each increment.

The level of detail contained in this RSD should be consistent with the size and scope of the project. It is not necessary to fill out any sections of this document that do not apply to the project. The resources necessary to create and maintain this document during the life cycle of a large project should be acknowledged and clearly reflected in project schedules. Do not duplicate data that is already defined in another document or a section in this document; note in the section where the information can be found.

Instructions

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

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1. Introduction

The Veterans Health Administration (VHA) Office of Principal Under Secretary for Health is requesting creation of an IT-based Health Management Platform (HMP) that will transform the health professional experience, increase patient engagement and address population-based aspects of health care delivery through implementation of the Health Management Platform framework and modules. This HMP represents the evolution and modernization of the Department of Veterans Affairs' (VA) Electronic Health Record (EHR) where the infrastructural and functional components for Computerized Patient Record System (CPRS) will be gradually built with additional capabilities to support a team-based care environment along with patient and community focus interactions. The request is in support of VA's major Initiative #16: Transforming Health Care Delivery through Health Informatics.

The Health Management Platform Extended Version (HMP EV) builds on the goals and principles of HMP to implement a modernized electronic health record for clinicians and Veterans. The HMP architecture and system derive from two IT development projects: HMP and HMP EV. The HMP EV project builds on the Team Facing (TF), System Facing (SF), Patient Facing (PF) components and functionality of HMP project. For ease of reference, in all HMP EV documentation, system references will be noted as HMP.

As of October 1, 2014 Hi2 will be organizationally transitioned under Health Solutions Management (HSM). The code produced by HMP EV will be merged and ultimately released by eHMP.

1.1. Purpose

This document identifies the product features being delivered in the production releases of the Health Management Platform and provides traceability between the product features and business needs (documented in the *Health Management Extended Version Business Requirements Document* [BRD]). This project will use agile development techniques to produce next generation Health Information Technology (HIT) prototypes that support the health care team, business stakeholders, Veterans and their families. The agile approach to software development is designed to explore, discover and implement best practices. HMP's implementation of the Agile methodologies means that detailed project requirements are not defined up-front, at the start of a release as is the VA's traditional methodology. Instead, detailed requirements are represented in user stories which are authored and developed during each sprint cycle of a release. Therefore, user stories are delivered throughout the course of a release and are authored in collaboration with the products owners.

1.2. Scope

The scope for HMP-EV is described by the following passage in the embedded HMP-EV BRD (section 1.3).

“The hi² is currently building infrastructure for HMP through prototypes that will be deployed and tested at pilot sites through the third quarter of Fiscal Year (FY) 2014. The aim of this request is to promote some of the successful prototypes developed by the end of FY 2014 to nationally deployable mature products, and transition from pilot site testing to an incremental nation-wide implementation of HMP capabilities starting FY 2015 and beyond. The release of the HMP framework and associated team-based, patient-based, and population health components

will support the health care team, business stakeholders, Veterans and their families. The Initiative is organized into three major work streams that (1) create a collaborative Health Information Technology (HIT) development framework and produce prototypes that will allow modernization of Veterans Health Information Systems and Technology Architecture (VistA)/Computerized Patient Record System (CPRS) into the HMP, (2) strengthen the informatics and analytics capacities of the VA workforce; and (3) lead and manage change through communication and proactive engagement of relevant stakeholders.”

This broad expression of the scope is detailed in, but not limited by, the following goals and objectives for the HMP products:

- Ability to find and retrieve healthcare information within the VA and between health information exchanges and other organizations.
- Ability to deliver a summarized patient record to support patient care and to support the patient’s health.
- Support secure information exchange.
- Ability to match patients to their data.
- Support of harmonized standards, which have been developed by voluntary consensus standards bodies for exchange of health information among all such entities and networks.
- Electronic transmission of patient information (for example mammogram consults) to clinicians.
- Provide the ability to electronically receive results of lab tests.
- Validate and implement security and trust in accordance with VA security policies.
- Enhance content to allow clinicians and patients the ability share health information.
- Enhance content to allow clinicians and patients the ability to choose the specific types of health information to share.
- Deploy this product to all clinicians and patients through incremental expansion to additional pilot sites.
- Conform to interoperability standards, as appropriate, as prescribed in integrated VA and VHA standards profiles:
 - International Classification of Diseases (ICD -10)
 - Logical Observation Identifier Names and Codes (LOINC)
 - Systematic Nomenclature of Medicine Clinical Terms (SNOMED-CT)
 - Health Level 7 (HL7)
 - Current Procedural Terminology (CPT-4)
- Enhance health information technology interoperability with VA/VHA business partners:
 - Department of Defense (DoD) / Military Health System (MHS)
 - Department of Health and Human Services (HHS)
 - Private Sector Health Care Providers
- Ability to support patient preferences regarding the exchange of his or her information, including the ability to choose not to participate.
- Ability to create informatics solutions to support patient generated data.
- Ability to create interoperable informatics solutions that share veteran facing data and applications across a variety of platforms, such as point-of-service, mobile devices, and VA’s PHR.
- Include user centered design focus groups and feedback, and iterative testing of patient components.
- Ability to support data analysis across groups of patients, disease and clinical/business workflow processes.

The HMP deliverables will also include the delivery of documents, guides, and manuals required to comply with the VA and Product Development (PD) documentation standards and/or ProPath

requirements. As the HMP evolves, the capabilities will be refined, expanded, and further conformed to the needs of the business owners and the clinical community. These refinements will be prioritized into subsequent software release versions.

1.3. References

Term	Acronym
AoA	Analysis of Alternatives
BPMN	Business Process Model Notation
AViVA	A Virtual Implementation of VistA
C. Difficile	Clostridium difficile
CMS	Center for Medicare and Medicaid Services
CPRS	Computerized Patient Record System
CPT	Collaborative Program Team
CPT-4	Current Procedural Terminology-4
COTR	Contract Officer's Technical Representative
DoD	Department of Defense
EHR	Electronic Health Record
EMR	Electronic Medical Record
HHS	Health and Human Service
hi ²	Health Informatics Initiative
HIT	Health Information Technology
HL7	Health Level 7
HMP	Health Management Platform
HMP EV	Health Management Platform Extended Version
HSM	Health Solutions Management
IAC	Industry Advisory Council
ICD-10	International Class of Disease
IGCE	Independent Government Cost Estimate
IPO	Interagency Program Office
IV	Intravenous
JCAHO	Joint Commission on Accreditation of Health Care Organization
LOINC	Logical Observation Identifier Names and Codes
MHS	Military Health Service
MOU	Memorandums of Understanding

Term	Acronym
NSR	New Service Request
OHI	Office of Health Information
OHT	Office of Health Care Transformation
OIA	Office of Informatics and Analytics
OIT	Office of Information and Technology
OPR	Office of Primary Responsibility
OLTP	Online Transaction Processing
PDUSH	Principal Deputy Under Secretary of Health
PDLCL	Product Development Lifecycle
PHR	Personal Health Record
PLO	VHA Procurement & Logistics Office
PMAS	Project Management Accountability System
PO	Per os, Latin for by mouth
PWS	Performance Work Statement
RME	Reusable Medical Equipment
SDK	Software Development Kit
SNOMED-CT	Systematic Nomenclature of Medicine Clinical Terms
SOA	Service Oriented Architecture
TSPR	Technical Services Project Repository
UML	Universal Modeling Language
VA	Veterans Affairs
VAi2	Veterans Affairs Innovations Initiative
VHA	Veterans Health Administration
VINCI	VA Informatics and Computing Infrastructure
VLER	Virtual Lifetime Electronic Record

The following references were used in creating this RSD:

- ProPath:
- Project Management Accountability System (PMAS):
- TSPR:
- VAONE EA:
- Health Management Platform Business Requirements Document (BRD):

- Health Management Platform Extended Version System Design Document (SDD)

2. Overall Description

HMP will be building web-based modules (prototypes) using Service Orientated Architecture that will shape the following three platforms:

1. Healthcare-Team-facing
 - Browser-based, healthcare-team user-interface modules
 - Workflow driven, role-based activity systems
 - Knowledge-driven, context-based decision support
 - Team-based, multi-patient-care environment
2. Patient-facing
 - Meaningful patient use, population reach, and value
 - Patient participation in health and healthcare
 - Interoperability of data between the patient and the care teams
3. System-facing
 - Support of evidence-based care across populations
 - Feedback to clinicians for panel management
 - Population and epidemiology-like studies
 - System performance measures real-time visibility

2.1. Accessibility Specifications

User interface framework is standards based and will comply with Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended by the Workforce Investment Act of 1998 (P.L. 105-220); and it will also comply with Clinical Context Object Workgroup (CCOW) standards.

2.2. Business Rules Specification

We will use the business rules specified in VistA. For data not sourced in VistA we will utilize business rules supplied by specific task forces such as the Antimicrobial Stewardship Task Force <http://vaww.national.cmop.va.gov/pre/default/AntimicrobialMainPage/default.aspx>.

2.3. Design Constraints Specification

Design Constraints for HMP-EV include the following:

- Design – CCOW compliance, as prescribed by enterprise requirements

2.4. Disaster Recovery Specification

The system will be located at the Denver and Sacramento Regional Data Centers, and will rely on the Disaster Recovery Plan created for the HMP system. The HMP system is set up to allow for immediate fail-over to the alternate data center, to provide continuous availability of the system.

2.5. Documentation Specifications

All documentation created to support the HMP project will comply with existing Program Management Accountability System (PMAS) policies and utilize ProPath templates.

2.6. Functional Specifications

The following table identifies business-owner requirements or business needs (BNs) documented in the *Health Management Platform Extended Version Business Requirements Document (BRD)*. The HMP project is tasked with transitioning the current clinical-care environment from the patient-chart-based electronic health record (EHR) to a health management platform that supports knowledge- and workflow-driven, patient centered, team-based care. The project team is using agile-development methodologies to accomplish this task.

Agile teams encompass developers, end-users, and other stakeholders, who collaborate to rapidly produce software increments that better meet stakeholders' needs, because stakeholders themselves have early and continuous input into its development. The HMP project team's first deliverable increment was a text-based search prototype that runs within the HMP environment. This environment is based on a multi-tier architecture that provides a browser-based user interface in which future prototype modules will also run. HMP's architecture will serve as the foundation for VA's EHR modernization effort and the effort to rebuild VA's health informatics capacities.

Agile project teams do not gather a comprehensive set of requirements before development begins, as waterfall development teams do. Instead, throughout the development effort, end users submit tightly constructed stories that specify what they want the software to do and why they want the software to do it. When all team members agree to accept these stories, the stories stand as both requirements and acceptance criteria for the software's functionality. The stories that provided requirements for the first incremental delivery are included in the table below. The table also includes user-submitted stories that are pending team-wide acceptance.

HMP requirements will support the release of the HMP software development kit (SDK), which will enable other Web development teams to contribute to HMP and help initiate the migration of CPRS to a Web-based EHR. Long-term expectations include: additional HMP prototypes; further CPRS migration; identification of IT projects defined by population studies; initiation for gap-analyses projects; continued refinement of methodologies incorporating informatics community expertise into IT solutions; integration of patient-facing modules; and expansion of the rapid, iterative development model to other IT projects.

Table 1: Functional Specifications

ReqPro Tag	Business Need (BN)	OWNR Number	Owner Requirement (OWNR)	Priority*
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ReqPro Tag	Business Need (BN)	OWNR Number	Owner Requirement (OWNR)	Priority*
NEED1555	BN 1: Adhere to the Enterprise Level requirements within the Requirements Management Repository (RMR) and as specifically addressed in Appendix D of the Business Requirements Document (BRD).			
NEED2545	BN 2: Utilize nationally standardized terminology for all Health Management Platform Extended Version components.			
OWNR170		2.1	Provide the ability to express all content using nationally recognized reference and authoritative terminology standards (e.g., Logical Observation Identifiers, Names, and Codes [LOINC], Systematized Nomenclature of Medicine Clinical Terms [SNOMED CT], etc.).	High
OWNR8836		2.2	Provide the ability to record observations using standardized terms.	High
OWNR8837		2.3	Provide the ability for users to submit a request to Standards and Terminology (STS) for new standardized terms (e.g., via New Term Rapid Turnaround [NTRT] process).	High
OWNR10366		2.4	Provide the ability for Standards and Terminology Service to distribute the newly standardized terms to each instance of the Health Management Platform.	High
NEED2546	BN 3: Create a Health Management Platform Team-facing component – (The platform for browser-based, clinical user-interface modules that are healthcare team-driven and enable elegant functionality which decrease cognitive load, effectively manage relationships between conditions, interventions and observations, acquire data [including documentation] as a by-product of workflow and ultimately support higher quality, safe patient care and clinician satisfaction).			
OWNR10367		3.1	Provide the ability to use tools to support Veteran/Active-Duty patient aligned care teams.	High
OWNR10368		3.1.1	Provide the ability to utilize a team-based, multi-patient care environment, such as a multi-patient data/list view.	High
OWNR10369		3.1.2	Provide the ability to utilize a clinic-centric view customizable by provider, team, specialty, etc.	High
OWNR10370		3.1.3	Provide the ability to utilize an indexed based search capability.	High
OWNR10371		3.1.4	Provide the ability to utilize workflow driven, role-based activity systems.	High

ReqPro Tag	Business Need (BN)	OWNR Number	Owner Requirement (OWNR)	Priority*
OWNR10372		3.2	Provide the ability to utilize knowledge management capabilities for point of care information availability.	High
OWNR10373		3.3	Provide the ability to utilize clinical decision support capabilities (Incorporate Evidence-Based Clinical Care standards and processes for preventive and chronic disease management).	High
OWNR10374		3.3.1	Provide the ability to utilize knowledge-driven, context sensitive clinical decision support tools capable of maximizing patient-specific computable data.	High
NEED2547	BN 4: Create a Health Management Platform - Patient-facing component – (This platform should provide modular, web-based, device-agnostic applications for Veteran/family/service member engagement in their health and their health care.)			
OWNR10375		4.1	Provide the ability for patients and family caregivers to share data bidirectionally.	High
OWNR10376		4.1.1	Provide the ability for patients to self-enter data.	High
OWNR10377		4.1.2	Provide the ability for patients to enter their non-VA medications via a mobile application.	High
OWNR10378		4.2	Provide the ability for patients to enter data that is available to and consumable by care teams.	High
NEED2548	BN 5: Create a Health Management Platform – Population/System-facing component (This component addresses the need to look across VA’s IT systems and patient populations to improve health. The platform should support research, registries, business and clinical predictive modeling, decision support and other activities that will facilitate population health and achieve a “healthy health system” beyond the current model of one-patient-one-provider at a time.)			
OWNR10379		5.1	Provide the ability to utilize a system-facing Health Management Platform user workspace.	High
OWNR10380		5.1.1	Provide the ability to utilize multiple tools for viewing and analyzing data.	High
OWNR10381		5.2	Provide the ability to utilize new tools with research and operational partners to support system and population health.	High
OWNR10382		5.2.1	Provide the ability to utilize tools to support Antimicrobial Stewardship.	High

ReqPro Tag	Business Need (BN)	OWNR Number	Owner Requirement (OWNR)	Priority*
OWNR10383		5.2.1.1	Provide the ability to utilize intravenous (IV) to by mouth (PO) antibiotic identification, validation, and reporting tools.	High
OWNR10384		5.2.1.2	Provide the ability to utilize double anaerobic antibiotic identification, validation, and reporting tools.	High
OWNR10385		5.2.1.3	Provide the ability to utilize general antibiotic use and resistance reporting tools.	High
OWNR10386		5.2.2	Provide the ability to utilize tools to support Infection Preventionists.	High
OWNR10387		5.2.2.1	Provide the ability to utilize C. Difficile identification, validation, and reporting tools.	High
OWNR10388		5.3	Provide the ability to integrate existing tools to support system and population health through collaborations with research and operational partners.	High
OWNR10389		5.3.1	Provide the ability to utilize tools that would assist in the management of Congestive Heart Failure patients.	High
NEED2549	BN 6: Create and share services and utilities to promote a collaborative development environment to support interaction between the business and technical community for sharing ideas, best practices, and foster dialogue for the next generation of requirements as business challenges emerge.			
OWNR10390		6.1	Provide the ability to add more data domains to the Virtual Patient Record (VPR) ¹ for sharing with partner systems.	High

¹ VPR is a robust data layer that promotes interoperability and data exchange through industry standards and accessible data schemas.

ReqPro Tag	Business Need (BN)	OWNR Number	Owner Requirement (OWNR)	Priority*
OWNR10391		6.2	Provide the ability to utilize the Collaborative Development Environment (CDE) to support collaborative development with various partner systems (e.g., iEHR, OSEHRA, Massachusetts Veterans Epidemiology Research and Information Center [MAVERIC], VA Informatics and Computing Infrastructure [VINCI], Virtual Lifetime Electronic Record [VLER], and Nationwide Health Information Network [NwHIN].)	High
OWNR10392		6.3	Provide the ability to create a framework/architecture that would allow distributed or community development of additional modules and functionalities that would fit into this framework.	High
NEED2550	BN 7: Build common components of Health Management Platform that will be shared across the three components (Team, Patient, and System/Population).			
OWNR10393		7.1	Provide the ability to create common components for cross-Health Management Platform usage.	High
OWNR10394		7.2	Provide the ability to create tools and utilities that would help utilize VA's existing security architecture and services, and provide seamless access for users from one Health Management Platform component to the other.	High
NEED2551	BN 8: Provide interfaces between the Health Management Platform and multiple systems.			

ReqPro Tag	Business Need (BN)	OWNR Number	Owner Requirement (OWNR)	Priority*
OWNR10395		8.1	Provide the ability for the Health Management System to interface with the following applications, including but not limited to: Outpatient Pharmacy, Inpatient Pharmacy, Laboratory, Order Entry, Results Reporting, VistA Imaging, Bar Code Medication Administration (BCMA), Alerts, Clinical Reminders, VistAWeb, Remote Data View, Crisis Notes, Warning Notes, Allergies and Directives (CWAD), Text Integration Utility (TIU), Patient Look-Up, Authorization Subscription Utility (ASU), and Health Factors. Connectivity with NwHIN/Virtual Lifetime Electronic Record (VLER), Austin Information Technology Center (AITC), repositories/registries, the Corporate Data Warehouse (CDW) and the VA Informatics and Computing Infrastructure (VINCI).	High

*All listed requirements are needed by the business community. The Priority is merely a mechanism to suggest a sense of urgency and order to the technical community if the requirements are to be parsed into phases. The order of importance begins with those that are designated as High priority.

2.6.1. Non Functional Requirements:

Table 2: Non Functional Requirements

ReqPro Tag	Operational Environment Requirements
NONF2636	The primary and back-up sites for data storage shall be the same sites used for VistA applications.
NONF2392	The system shall respond to user actions in three seconds or less in 90% of the attempts, and never more than ten seconds.
NONF2393	System response times and page load times shall be consistent with VA standards (e.g., CPRS).
NONF2637	Maintenance, including maintenance of externally developed software incorporated into the Health Management Platform shall be scheduled during off peak hours or in conjunction with relevant maintenance schedules.
NONF1608	Information about response time degradation resulting from unscheduled system outages and other events that degrade system functionality and/or performance shall be disseminated to the user community within 30 minutes of the occurrence. The notification shall include the information described in the current Automated Notification Reporting (ANR) template maintained by the VA Service Desk. The

	business impact must be noted.
NONF2638	Provide a real-time monitoring solution.
NONF1610	Notification of scheduled maintenance periods that require the service to be offline or that may degrade system performance shall be disseminated to the user community a minimum of 48 hours prior to the scheduled event.
	Usability/User Interface Requirements
NONF2639	User acceptance testing personnel shall include clinical staff that is able to confirm acceptable changes to their workflow.
NONF2227	The applications shall include user prompts to guide the use of the applications so that minimal technical support is needed by the user.
NONF2352	The system shall provide context sensitive help.
NONF2353	The system shall provide meaningful prompts and error messages to aid in completing a specific task.
NONF2640	User-centered requirements, design, and testing with engagement of end-users will be utilized throughout the product lifecycle. Processes to ensure this would include provision of user membership on executive management groups and use of focus groups to gather requirements in addition to traditional usability testing.
	Documentation Requirements
NONF2228	Updates shall be made, as necessary, to applicable user manuals and other training tools and shall be delivered to all levels of users. If no user documentation exists, it shall be produced.
NONF2641	Updates shall be made, as necessary, to the applicable technical documentation including Operations and Maintenance (OM) Plans related to the Health Management Platform application located on the VA Software Documentation Library. If no User or OM documentation exists, it shall be produced.
NONF1612	A technical training curriculum shall be developed and delivered to all levels of staff users.
NONF2642	The training curriculum shall state the expected training time for primary users and secondary users to become productive at using the Health Management Platform application.
NONF2643	All training curricula, user manuals and other training tools shall be updated by the Health Informatics Program within the Office of Informatics and Analytics and delivered to all levels of users including but not limited to: providers, PACT, Nursing, Pharmacy, Health Information Management (HIM), Research Office, Quality and Performance. Training tools will be delivered 2-4 weeks in advance of the release of the enhancement through nationwide conference calls and PowerPoint presentations. The curricula shall include all aspects of the new/enhanced HMP application(s) and all changes to processes and procedures.
NONF1613	The training curriculum shall state the expected task completion time for primary and secondary users.
	Implementation Requirements
NONF2644	An implementation plan shall be developed for all aspects of the Health

	Management Platform program.
NONF2645	Technical Help Desk support for the applications shall be provided for users to obtain assistance with system software issues.
NONF1614	The IT solution shall be designed to comply with the applicable approved Enterprise Service Level Agreements (SLA).
NONF2646	The update will be implemented in the following manner: Phased approach starting with a few select pilot sites and gradually moving to the VISN/Region level.
NONF2647	The first release of the Health Management Platform is expected by 12-31-2014.
	Data Protection/Back-up/Archive Requirements
NONF1615	Provide a back-up plan for when the system is brought off-line for maintenance or technical issues/problems.
NONF2405	Data protection measures, such as back-up intervals and redundancy shall be consistent with systems categorized as critical.
	Data Quality/Assurance
NONF2229	A monitoring process shall be provided to ensure that data is accurate and up-to-date and provides accurate alerts for malfunctions while minimizing false alarms.
	User Access/Security Requirements
NONF1616	Due to patient safety considerations, data protection measures such as backup intervals and/or redundancy shall be consistent with systems categorized as critical.
NONF1617	Ensure the proposed solution meets all VHA Security, Privacy and Identity Management requirements including VA Handbook 6500 . (See Enterprise Requirements Appendix).

2.7. Graphical User Interface (GUI) Specifications

GUI will be Web-based, modular, and customizable. It will evolve with user input and will comply with VA's Web development standards including, but not limited to, Section 508 of Rehabilitation Act and the standards for mobile applications in partnership with VA Web & Mobile Solutions Program Office.

2.8. Multi-divisional Specifications

HMP is an enterprise application designed as a system-of-systems that provides the standards-based exchange of VA medical data within VA facilities and with external Federal agencies (e.g., Department of Defense [DoD] and Indian Health Services (IHS)). HMP will support multi-divisional capabilities by:

- Allowing VA Treatment Facilities to perform clinical care activities by receiving data about the medical treatment provided to the patient outside of the treating VA facility.
- Allowing veterans to receive continuity of care by enabling their VA and non-VA medical information to travel with them as they move geographically in the U.S.

2.9. Performance Specifications

HMP is being developed as a successor to CPRS, currently the existing CPRS software system supports clinical teams consisting of physicians, nurses, pharmacists, and other ancillary systems staff including non-clinician users such as Health Information Management staff. Hundreds of users at each VA location use this system during peak and off-peak hours, this could result in possibly 5 to 10 thousand concurrent users with a predictive growth of 0.5 million within the 10 year lifecycle.

These transactions include patient announcements, document queries, and document retrievals. Within five years, this peak number could increase to six transactions per second.

Archived documents must be kept for seven years. An average size for the health summary document is 30 kb. At the peak rate of three queries per second for an eight hour day, the daily storage capacity for seven years would be seven terabytes.

Table 3: Performance Specifications

30 kb per file	times	3 files per second	equals	90 kb per second
90 kb per second	times	60 seconds per minute	equals	5400 kb per minute
5400 kb per minute	times	60 minutes per hour	equals	324,000 kb per hour
324,000 kb per hour	times	8 hours per day	equals	2.5 gigabytes per day
2.5 gigabytes per day	times	365 days per year	equals	.9 terabytes per year
.9 terabytes per year	Times	7 years	equals	6.3 terabytes

2.10. Quality Attributes Specification

Specifications that enhance the supportability, maintainability, portability, testability, or reusability of the system/project are currently being developed. Once finalized, and approved by HMP management, these specifications will be integrated into the detailed design for Team, System, and Patient facing products.

2.11. Reliability Specifications

Specifications that enhance the reliability of the system/product are being developed and will be defined by the RDC or as advised by SDE.

2.12. Scope Integration

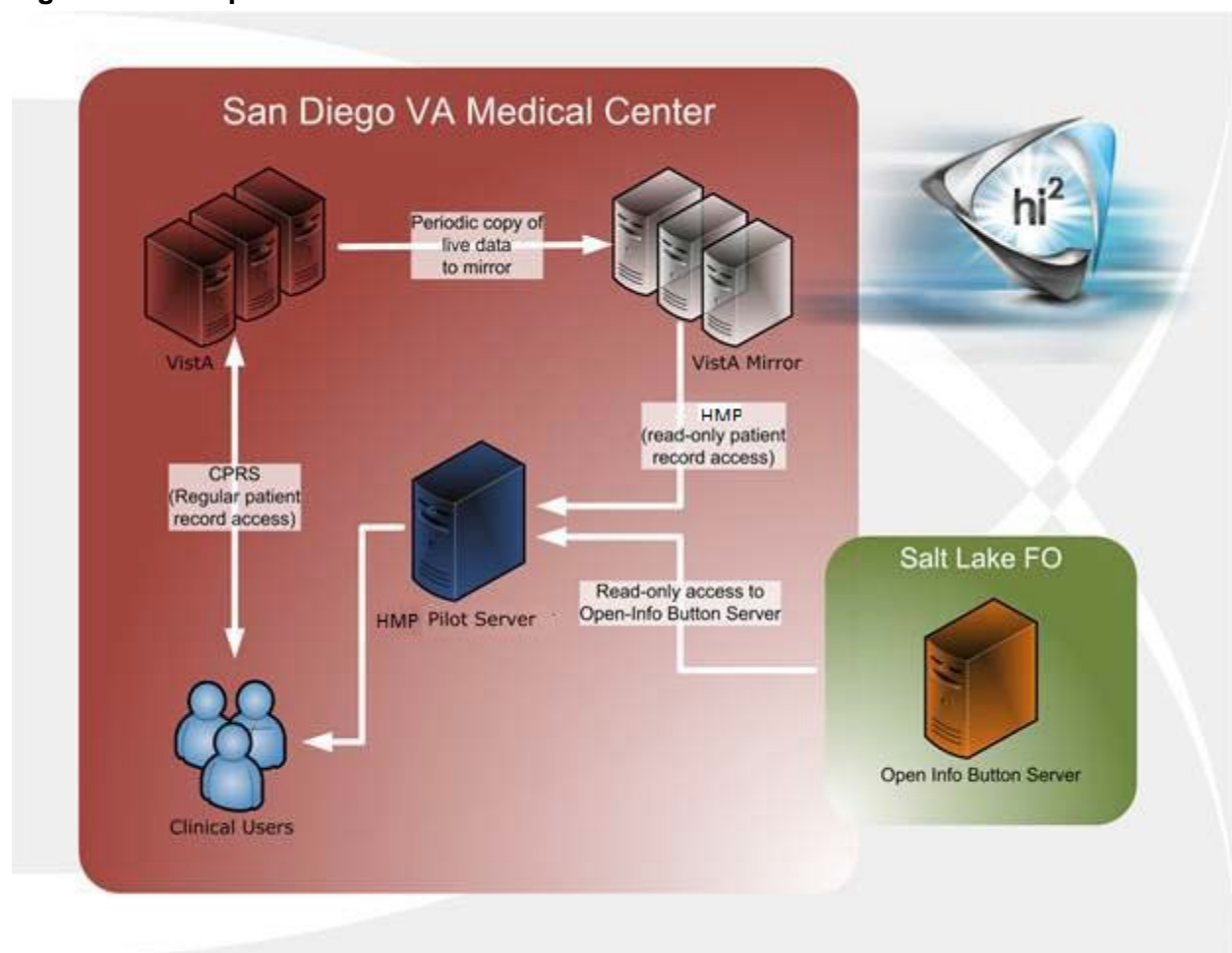
The HMP provides necessary interfaces between several VistA systems and the national database in order to facilitate patient's clinical record sharing. The HMP system is deployed as a single, national instance at

Region One Data Center. The HMP uses Master Patient Index (MPI) from VistA for all patient correlation purposes. Payloads are standards-based Clinical Document Architecture (CDA) Extensible Mark-up Language (XML) documents. Web services-mediated Remote Procedure Calls (RPCs) are used to retrieve data from all relevant VistA systems.

The HMP system performs the following main business functions:

- Use MPI for the correlation of patient identities.
- Retrieve and display healthcare information at the local site of care from the other VA facilities.
- Enforce security and privacy policies of patients and organizations.
- Provide reports.

Figure 1: Conceptual Data Flow



2.13. Security Specifications

The security, privacy, and protection of Veteran's information are priorities of HMP. The HMP system shall comply with all Federal Information Processing Standards (FIPS) and VA Enterprise security guidance. The HMP system shall comply with conformance and interoperability standards as administered by VA.

2.14. System Features

Please refer to section 2.6 Functional Specifications.

2.15. Usability Specifications

Recognizing vast differences in software-use proficiency among diverse user groups, HMP has formed a workgroup (the User Centered Design workgroup) to generate innovative ideas for improving users' experiences with the software. Although the software's focus will change as developers move through the agile process from one deliverable increment to the next, the workgroup will coordinate with developers and the user community to formulate a consistent set of training and education methodologies. Usability specifications will organically grow out of this effort.

Incorporating recommendations from this workgroup, developers will create intuitive, veteran-centric and healthcare-team-driven clinical user-interface modules.

Training will be developed by OIA under the eHMP project.

3. Applicable Standards

The following references represent the applicable standards for HMP:

- Executive Order 13410-Promoting Quality and Efficient Health Care in Federal Government Administered or Sponsored Health Care Programs, *Federal Register*, Monday August 28, 2006.
<http://edocket.access.gpo.gov/2006/pdf/06-7220.pdf>
- Veterans Affairs for Purposes of Defining Data Sharing Between the Departments.
- Nationwide Health Information Network (NHIN) Production Interface Specifications.
http://healthit.hhs.gov/portal/server.pt/community/healthit_hhs_gov_nhin_resources/1194
- HITSP Summary Documents Using HL7 Using Continuity of Care Document (CCD) Component, HITSP/C32, July 8, 2009, version 2.5.
<http://www.hitsp.org/Handlers/HitspFileServer.aspx?FileGuid=e1b99525-a1a5-48f6-a958-4b2fc6d7a5c7>
- National Institute of Standards and Technology (NIST) FIPS Publications.
<http://csrc.nist.gov/publications/PubsFIPS.html>
- VA Policy on Mobile Devices and Mobile Applications.
- VA Section508

4. Interfaces

This is the business community's best understanding of known interfaces and may not be a comprehensive listing. All required interfaces will be researched and documented.

The system will be leveraging existing Vista interfaces and Remote Procedure Calls (RPCs). New RPCs will be built to support web-based development and data exchange. The current CPRS Graphic User

Interface (GUI) application interfaces with several VistA software applications, including but not limited to:

- **Outpatient Pharmacy** - The Outpatient Pharmacy package provides a way to manage the medication regimen of veterans seen in the outpatient clinics and to monitor and manage the workload and costs in the Outpatient Pharmacy.
- **Inpatient Pharmacy** - The Inpatient Medications package provides a method of management, dispensing, and administration of inpatient drugs within the hospital. Inpatient Medications combines clinical and patient information that allows each medical center to enter orders for patients, dispense medications by means of Pick Lists, print labels, create Medication Administration Records (MARs), and create Management Reports.
- **Laboratory** - The Laboratory module is part of the VistA software, which automates the manual procedures used in the following laboratory areas: Ordering of tests and procedures, collection and accessioning of specimens, processing and analysis, review and verification of results, reporting of results, analysis and reporting of quality control data.
- **VistA Imaging** - Captures clinical images, scanned documents, motion images, and other non-textual data files and makes them part of the patient's electronic medical record.
- **BCMA** - A VistA module designed to provide electronic validation and documentation of medication administration, reduce medication misadventures, provide an online patient medication record, and promote a safer inpatient care environment.
- **Alerts** – Notification system with the EHR.
- **Clinical Reminders** - Reminders assist clinical decision-making and also improve documentation and follow-up, by allowing providers to easily view when certain tests or evaluations were performed and to track and document when care has been delivered.
- **VistAWeb** - An intranet web application used to review remote patient information found in VistA, BHIE (DoD), the Health Data Repository (HDR) databases, and the Nationwide Health Information Network (NHIN).
- **Remote Data View** - An application access within CPRS that also allows you to view local and remote data on patients.
- **CWAD** - Crises, Warnings, Allergies/Adverse Reactions, and Directives. These are displayed on the Cover Sheet of a patient's computerized record.
- **TIU** - Text Integration Utilities; a package for document handling, that includes Consults, Discharge Summary, and Progress Notes, and other document types such as surgical pathology reports.
- **Patient Look-Up** – Allows the user to search the EHR for a patient's name and record.
- **ASU** - Authorization/Subscription Utility, a VistA application (initially released with TIU) that allows VAMCs to assign privileges such as who can do what in ordering, signing, releasing orders, etc.
- **Health Factors** - A computerized component that captures patient information that for which no standard code exists, such as Family History of Alcohol Abuse, Lifetime Non-smoker, No Risk Factors for Hepatitis C, etc.
- Connectivity with NwHIN/ VLER, AITC, and repositories/registries is a future goal. Connectivity with CDW and VINCI is being explored.

- The impact to these downstream systems and associated interfaces is unknown at this time and will be evaluated during the Agile development process.

4.1. Communications Interfaces

HMP will utilize a series of remote procedure calls (RPCs) to communicate with VistA via a Java broker it will communicate with users' browsers via secure HTTPS, a method of communication that can support many types of user devices (smart phones and tablets, for example); it will communicate with other (non-VistA) resources via interfaces that are not yet determined.

4.2. Hardware Interfaces

The specific details regarding the hardware interfaces are still under development for HMP.

HMP is deployed in the Region One Data Center and consists of two 2 sites Denver and Sacramento.

Figure 2: Physical Network Diagram - Denver ROC –Team Facing

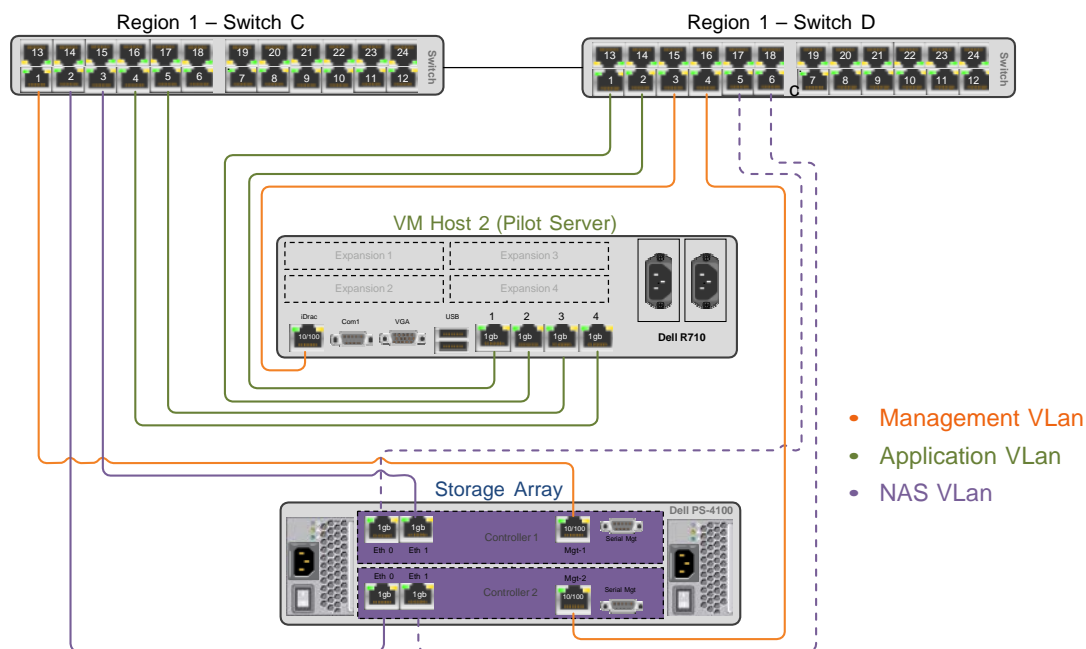


Figure 3: Physical Network Diagram - Sacramento ROC –Team Facing

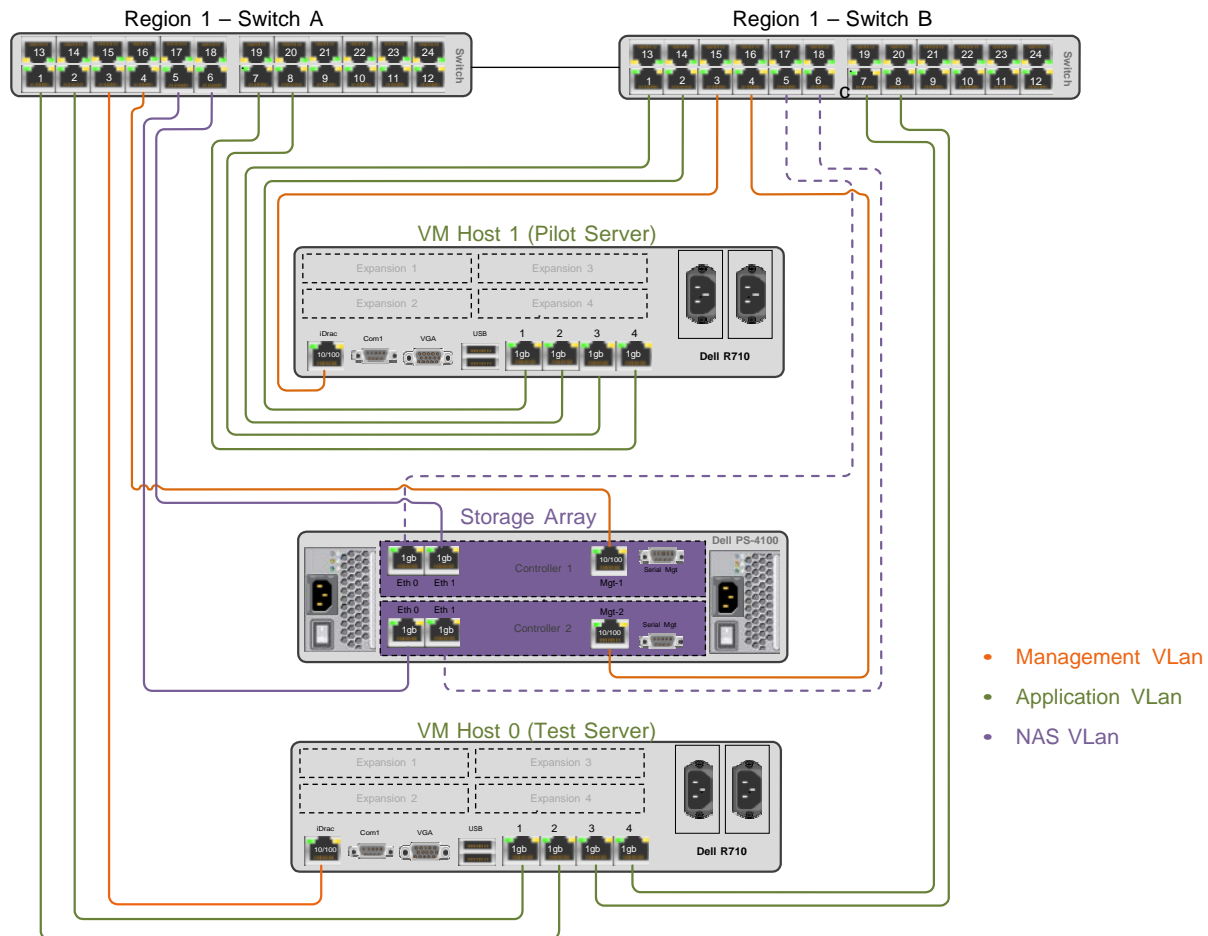


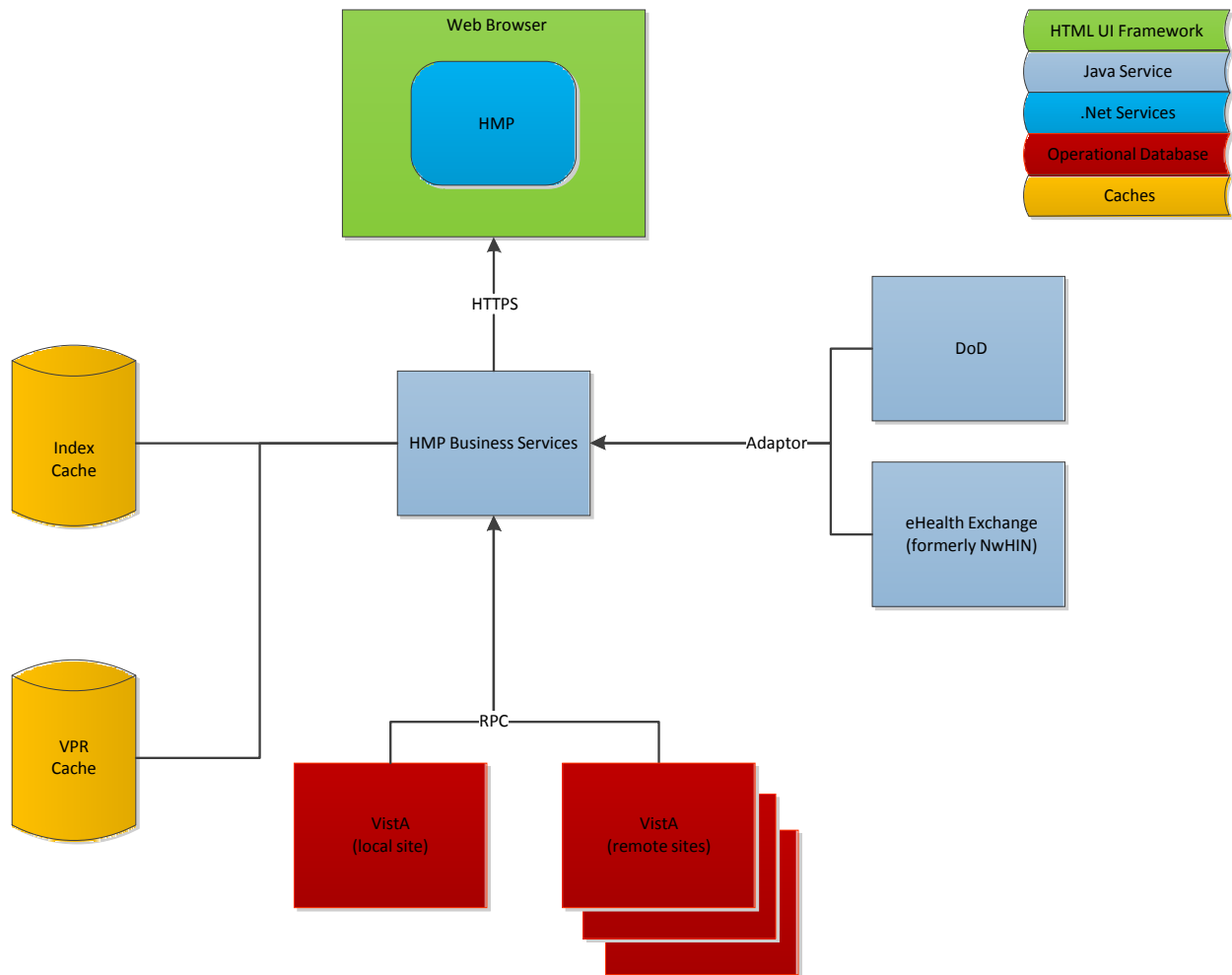
Figure 4A: AITC Physical Network Diagram - Team Facing

IMAGE REDACTED

4.3. Software Interfaces

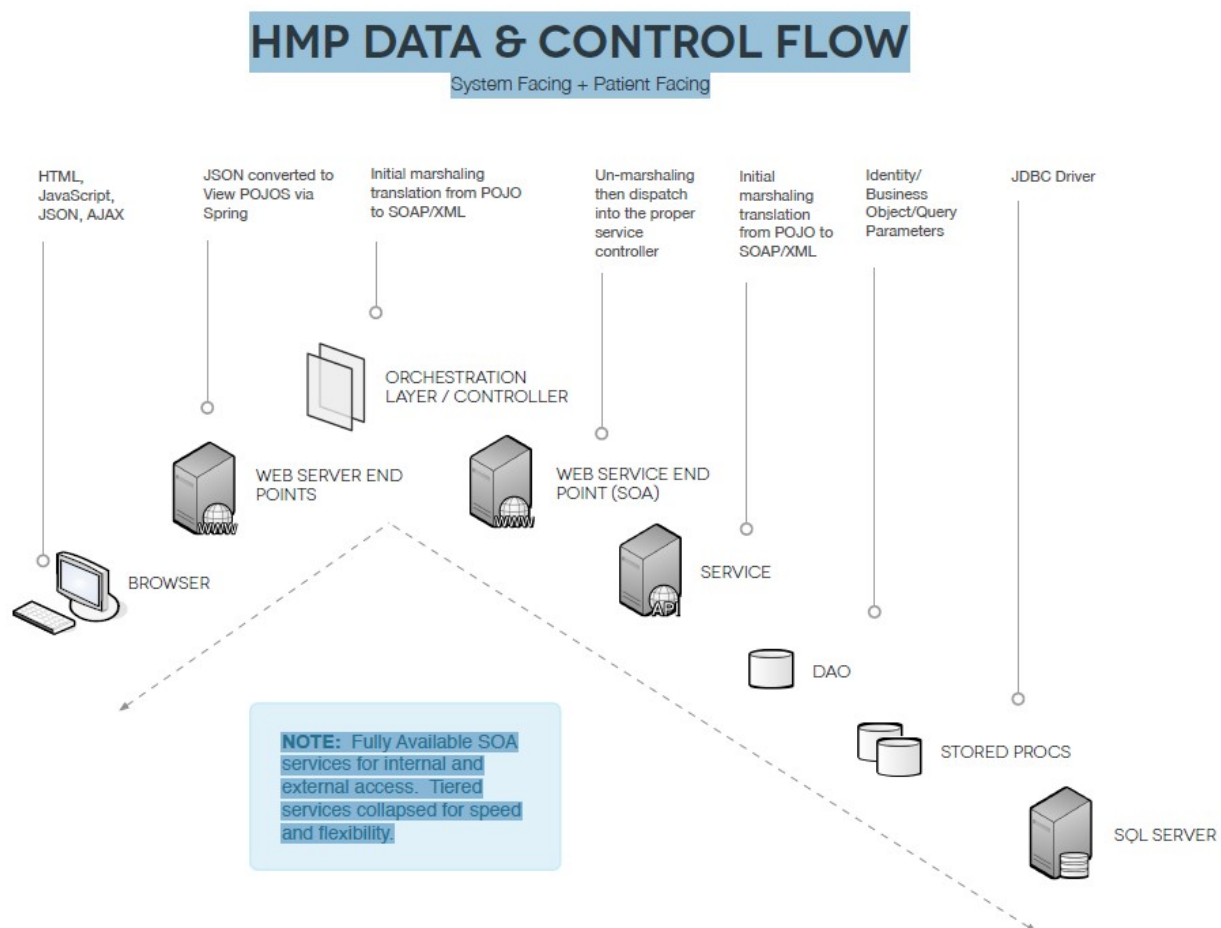
The HMP user interface (UI) runs in a Web browser and communicates with the HMP Web server via Hypertext Transfer Protocol Secure (HTTPS) over Transport Control Protocol/Internet Protocol (TCP/IP). HMP's Web applications communicates with the UI module using Extensible Markup Language-Java, JavaScript Object Notation-Hypertext Markup Language (JSON-HTML) over asynchronous JavaScript (AJAX), and Extensible Markup Language-Hypertext Markup Language (XML-HTML), Atom feed, and action message format-Flex (AMF-Flex) depending upon the service's language. HMP business services access VistA data and functionality using HTTP and (through DMS (Data Management Services) remote procedure calls (RPCs). Business services (including virtual patient record (VPR) services) access operational Caché data stores via RPCs and Java Database Connectivity (JDBC).

Figure 5: High Level Application Design



System and Patient Facing:

Figure 6: Data and Control Flow



4.4. User Interfaces

Users will access HMP via a standard Web browser and mobile applications. See Section 2.7 “Graphical User Interface Specifications” for further information.

5. Legal, Copyright, and Other Notices

The specific details regarding the legal, copyright, and other notices are still under development for HMP code which is released to VA production. HMP code that is released to OSEHRA will contain legal copyright and other notices are is pertinent to OSEHRA.

6. Purchased Components

The specific details regarding the purchased components are still under development for System and Patient facing. The list of components purchased for and installed at the Region one Data centers, Denver and Sacramento for Team facing are detailed below:

Denver:

- 1 Rack - 4 RMU
- 1 Dell PowerEdge R710 Servers
- 1 Dell EqualLogic PS4100XV (3.5 TB) Storage Arrays

Sacramento:

- 1 Rack – 6RMU
- 2 Dell PowerEdge R710 Servers
- 1 Dell EqualLogic PS4100XV (7.0TB) storage arrays

6.1. Defect Source (TOP 5)

As HMP is currently in development, and has recently gone through IOC, at this point we are still in the process documenting and fixing recorded issue. HMP code will be transitioned to eHMP for production release.

7. User Class Characteristics

HMP users will eventually encompass licensed healthcare professionals, researchers, administrators, informaticists, patients, assistive personnel, and other relevant stakeholders. The characteristics of this large user class will vary dramatically. The HMP team plans to address this variability by constructing an application that is as intuitive and adaptable to use as possible, and through education and training. See Section 2.15 “Usability Specifications” for further information.

8. Estimation

In October 2014, Software Metrics & Estimation Team stated that since HMP EV Increment 4 is labeled as IOC (an increment that does not develop nor enhance existing business functionality), function point analysis was not needed. As a result the project’s Functional Size is reported as zero function points.

Project Software Functional Size and Size-Based Effort and Duration Estimate

Application

Table 4: Functional Size Estimates

Item	A	B	C	D	E	Total
Counted Function Points						

Item	A	B	C	D	E	Total
Estimated Scope Growth						
Estimated Size at Release						

Table 5: Size-Based Effort Estimates

Size-Based Effort Estimates	Labor Hours	Probability
Low-Effort Estimate – With indicated probability, project will consume no more than:		
High-Effort Estimate – With indicated probability, project will consume no more than:		

Table 6: Size-Based Duration Estimates

Size-Based Duration Estimates	Work Days	Probability
Low-Duration Estimate – With indicated probability, project will consume no more than:		
High-Duration Estimate -- With indicated probability, project will consume no more than:		

Figure 7: Cumulative Probability (“S-curve”) Chart

[Insert Cumulative Probability (“S-curve”) Charts here]

9. Approval Signatures

Business Sponsor/ Integrated Project Team (IPT) Chair

IT Program Manager

Project Manager

Template Revision History

Date	Version	Description	Author
March 2013	1.1	Formatted to current ProPath documentation standards and edited to conform with latest Alternative Text (Section 508) guidelines	Process Management
January 2013	1.0	Initial Version	PMAS Business Office