Health Management Platform

Work Effort Unique Identifying #20100803, 20100804, 20100805

Business Requirements Document

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Business Requirements Document

1. Purpose

The Business Requirements Document (BRD) is authored by the business community for the purpose of capturing and describing the business needs of the customer/business owner. The BRD provides insight into the AS IS and TO BE business area, identifying stakeholders and profiling primary and secondary user communities. It identifies what capabilities the stakeholders and the target users need and why these needs exist, providing a focused overview of the request requirements, constraints, and Information Technology (IT) options considered. This document does not state the development methodology. The intended audience for this document is the Office of Information & Technology (OI&T).

2. Overview

The Veterans Health Administration (VHA) Office of Patient Care Services (PCS) is requesting creation of an IT-based "health management platform" that will transform the health professional experience, increase patient engagement and address population-based aspects of health care delivery through implementation of AViVA (A Virtual Implementation of Veterans Health Information Systems and Technology Architecture (VistA)) framework and modules. This health management platform represents the evolution and modernization of the Department of Veterans Affairs's (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 (HI) and has been endorsed by the Chief Officer for VHA (PCS).

3. Customer and Primary Stakeholders

4. Scope

Health Informatics Initiative is a pathway for modernization of the Health Management Platform. It does not subsume IT development nor does it prescribe the functionality of an advanced EHR.

The Health Informatics Initiative 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 initiative is organized into three work streams that (1) create a collaborative HIT development framework, (2) produce prototypes that will allow modernization of the Health Management Platform and (3) strengthen the informatics and analytics capacities of the VA workforce.

The Health Informatics Initiative is promoting an innovative, Agile approach to software development and is designed to explore, discover and implement best practices. To the extent possible, "known" barriers and expectations will be addressed; however, it is anticipated that by the nature of traveling uncharted waters, "unknowns" will be encountered and forward progression may not always follow a linear path. Regaining and maintaining VA's edge in health IT will be an evolving journey.

The Health Informatics Initiative includes a prototypical model and foundation for future development of clinical software solutions. This IT foundation encourages cooperative relationships between the Health Informatics Initiative and other VA Transformational Initiatives dependent upon

IT solutions to support clinical processes. The Health Informatics Initiative will proactively assess and evolve its role and responsibilities with regard to other Transformational Initiatives.

A unique relationship exists between the Health Informatics Initiative and the Virtual Lifetime Electronic Record (VLER) Initiative. The Health Informatics Initiative is focused on delivery of foundational and clinical modules for incorporation into the AViVA architecture (see AViVA architecture model graphic included in Appendix B). The AViVA architecture promotes interoperability and data exchange through standards based, accessible data schemas. The Health Informatics team will coordinate with the VLER team to avoid duplication of efforts, optimize utilization of resources and stimulate an ongoing exchange of information and ideas.

5. Goals, Objectives and Outcome Measures

This initiative will shape the future of VHA clinical information systems through deliberate application of health IT and informatics to deliver solutions that transform health care delivery to Veterans directly improving quality and accessibility while optimizing value and ensuring VA regains and continues industry leadership in the use of health informatics and health information technology. Once this solution is implemented, VA care teams, patients, and community partners would transition from an antiquated information system to a robust customizable and flexible plug and play environment. While the current VistA system is fraught with process challenges and incomplete information capture and display, thereby creating an incomplete patient record and added challenges of workaround for team communication, patient provider messaging, knowledge management, clinical decision support, and clinical practice guidelines availability at the point of care; the new system will mitigate several of these risks to the patient care and promote user satisfaction.

Objectives:

1) Provide cross-cutting health informatics tools to support major clinical initiatives such as Patient Aligned Care Team (PACT.)
2) Implement an extensible and sustainable VHA/OI&T collaborative approach to streamline software development.
3) Promote a new methodology for collaborative, iterative requirements identification and elaboration throughout the development process.
4) Develop a modern, predominantly web-based Electronic Health Management Platform as a successor to CPRS.
5) Support health professionals to optimize performance in terms of quality, efficiency and increased job satisfaction through the use of health informatics.
6) Provide informatics solutions that encourage and facilitate increased patient and family engagement in care and decision-making.
7) Create informatics solutions to support population and evidence-based care focused on preventive and chronic disease management.
8) Establish sustainable workforce capacity to support healthcare modernization and improved care delivery through health informatics.
9) Support business requirements and needs of secondary users by ensuring requirements are interwoven into development processes.

Goal/Objective	Desired Outcome	Measurement	Impact
Support other initiatives with health informatics tools	Cross-cutting health informatics tools to support major clinical initiatives such as PACT. will be available	Build at least one cross cutting tool (such as, Virtual Patient Record (VPR) with search capability) as prototype within 12 months of approval	Tools developed by this initiative will be leveraged upon by other initiatives thereby promoting the concept of sharing and reusability of organizational assets
Streamline software development through a collaborative approach	Implement an extensible and sustainable VHA/OI&T collaborative approach to streamline software development	Collaborative development teams, sites, tools, and strategies will be in place where cross-functional user groups will be supporting development teams with functional and business process expertise within the 12 months of approval	End-users will be actively engaged with the development team throughout the product development lifecycle thereby leading to rapid, high quality products development
Promote iterative requirement elicitation	Establish a new methodology for collaborative, iterative requirements identification and elaboration throughout the development process	A new methodology for requirements management will be evolved and piloted at least in one of the Program Management Accountability System (PMAS) approved deliverables within 12 months of approval	Requirements management will be agile and iterative so that the development teams have most current, validated, and prioritized set of requirements available to them for their sprints
Modernize CPRS	Develop a modern, predominantly web-based Electronic Health Management Platform as a successor to CPRS	A modern predominant web-based electronic health management platform conceptual design with prototype of at least one capability will be available within 12 months of approval	CPRS will evolve from its current monolithic, thick client, integrated tool to a practice centric interactive capability rich tool set with tiered service oriented architecture (AViVA) where tools, utilities, and functionality components could be independently developed and plugged into AViVA thereby reducing the development, testing, and release timeframe and fostering rapid innovation
Enhance quality and efficiency in clinical workflow	Support health professionals to optimize performance in terms of quality, efficiency and increased job satisfaction through the use of health informatics	The clinical providers will be able to more effectively use and apply principles and practices of standards based care, clinical decision support, and knowledge management on a comprehensive care record	The safety and quality of care will improve with the availability of patient data from various sources with the capability to apply clinical decision support through process automation with minimal user intervention thereby improving the efficiency of care processes and enhancing user satisfaction through a team

Goal/Objective	Desired Outcome	Measurement	Impact
			centric approach
Increase family and patient engagement	Provide informatics solutions that encourage and facilitate increased patient and family engagement in care and decision-making	Patient and provider care team interaction tools and strategies will be built	Patients will have opportunity to share their data with the care team in timely fashion, which will help the care teams in better decision making through patient/family interaction and empowerment. Collaborative decisions and timely interventions help to improve treatment compliance leading to better outcomes for individuals in particular and communities at large
Support population health	Create informatics solutions to support population and evidence-based care focused on preventive and chronic disease management with the goal of creating a healthy health care system	Systems facing Health Management Platform will be built to support population health and facilitate performance assessment by providing capabilities to assess and improve overall performance of specific healthcare management vehicles	Evolve CPRS from a single patient centric record to a population based toolset with capabilities to apply data analytics to population cohorts
Establish and support informatics workforce	Establish sustainable workforce capacity to support healthcare modernization and improved care delivery through health informatics by building capacities and enhancing literacy	Tools and processes will be built to engage and support informatics capacity and literacy	Informatics workforce will help in user centered requirements, design, testing, training, and release support, as well as, collaboration centers and pilot site selection and support
Support business needs and requirements	Business needs and requirements are considered prospectively and interwoven into all development	Business needs and requirements will be addressed during the development phase	An EHR that meets all business needs and requirements prospectively, eliminating the need for retrofitting and rework.

6. Enterprise Need/Justification

The VHA has long been considered a world leader in using IT to deliver higher quality, cost effective healthcare to patients. In the past few years, however, VHA has failed to keep pace with IT advances and is in danger of slipping from this hard won position as a world leader in IT innovation. More importantly, VHA finds itself in an untenable position where aging software and tortuous, process-laden development models threaten to impact VHA's status as a leader in healthcare efficiency and effectiveness.

The projects within Health Informatics initiative will provide the basic organizational foundation for developing and piloting VHA prototypes in a rapid, Agile and iterative fashion, integrating PMAS concepts while promoting establishment of a strong relationship between the development team and the end users. This collaboration will lay the foundation for the structures and processes necessary to pilot new requirements gathering and refinement methodologies before and during the iterative development process. This project will transform VA's IT product development into two environments: (1) Prototype requirements identification and software development, and (2) Product refinement, field testing and national release. Both environments will be jointly governed by VHA and OI&T. These projects will transform the health professional experience, increase patient engagement, and address population-based aspects of health care delivery through implementation of an open, extensible architecture and modern technologies to accelerate innovation in co-existence with legacy VistA. These projects represent the modernization of VA's Electronic Health Record. The IT foundation for these projects will be AViVA.

7. Requirements

7.1. Business Needs/Owner Requirements

The Health Informatics Initiative is promoting an innovative, Agile approach to software development and is designed to explore, discover and implement best practices. To the extent possible, "known" requirements will be addressed in the table below; however, it is anticipated that by the nature of Agile and iterative requirements management processes, deeper level requirements will be solidified and prioritized through User Stories and User Scenarios.

This request will establish the foundation for the Health Information transformational initiative including: strategic plans outlining the road to success; gap analyses; a pilot software development methodology using rapid, iterative prototype modules; a plan transitioning from CPRS to a Health Management Platform; prototype modules based on the AViVA environment which includes a browser-based user interface and multi-tiered architecture which will serve as the foundation for VA's EHR modernization; and foundational work for rebuilding VA's health informatics capacities. The requirements will support release of the AViVA Software Development Kit enabling other web development teams to contribute; and initiation of legacy CPRS migration to a web-based EHR. The Health Informatics Capacities component will build on the successes of field based informatics program with continued development of curriculum for informatics education, training, and best practices, delivery of coursework and assessment of coordination strategies amongst the local, Veterans Integrated Service Network (VISN) and national health informaticists. Long term expectations include: additional AViVA modules; further CPRS migration; identification of IT projects defined by population studies; project 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.

Business Need (BN)	OWNR Number	Owner Requirement (OWNR)	Priority*
BN 1: Adhere to the Enterprise Level requirements within the Enterprise Requirements Repository (ERR) and as specifically addressed in Appendix D of this document.			

Business Need (BN)	OWNR Number	Owner Requirement (OWNR)	Priority*
BN 2: Create a Team-facing Health Management Platform - 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			
	1.1	Create AViVA Prototype Module 1	H
	1.1.1	• Establish User Application platforms based on AViVA architecture	H
	1.1.2	• Establish data cache capability for Virtual Patient Record	H
	1.1.3	• Create log-in module for AViVA	H
	1.1.4	• Expand Medical Domain Web Services (MDWS) data adapter	H
	1.1.5	• Build a search module for search on VPR – basic search version	H
	1.2	Create AViVA Prototype Module 2	H
	1.2.1	Develop components of Integrated Medication Management capability	H
	1.2.2	Enhance basic search to expanded search	M
BN 3: Create a Patient-facing Health Management Platform - identify gaps, overlaps and potential for common patient access, functionality, development and infrastructure. It will provide strategic planning, alignments and a platform to create solutions that achieve meaningful *patient* use, population reach and impact.			
	2.1	Create AViVA prototype modules for Patient-facing Health Management Platform	M
	2.1.2	• Build tools for patient engagement	M
BN 4: Create a Healthcare System-facing Health Management Platform - addresses the need to look across VA's IT systems and patient populations to improve health. It develops a platform to 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.			
	3.1	Create AViVA prototype modules for the Systems-facing Health Management Platform	M
	3.1.2	• Build clinical decision support capabilities - Incorporate Evidence-Based Clinical Care standards and processes for preventive and chronic disease management	M
	3.2	Build knowledge management capabilities for point of care information availability	M
	3.2.1	Build knowledge-driven, context sensitive clinical decision support tools capable of maximizing patient-specific computable data	M

*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.

7.2. Non-Functional Requirements

This initiative requires full support from the VA OI&T in use of rapid, Agile and iterative development teams and methodologies.

7.2.1. Performance, Capacity, and Availability Requirements

7.2.1.1. Performance

If this is a system modification, how many users does the current system support?
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 hours and even at off-peak hours.
How many users will the new system (or system modification) support?
The user population will not change due to this system modification.
What is the predicted annual growth in the number of system users?
Minimal growth. VA has somewhat stable population of clinical staff.

7.2.1.2. Capacity

What is the predicted size (average) of a typical business transaction?
Varies from 100 words to perhaps 600 words and is expected to expand further as additional data sources and clinical decision support capabilities come on line.
What is the predicted number of transactions per hour (day, or other time period)?
Five transactions per hour initially then increase as capabilities rise.
Is the transaction profile expected to change (grow) over time?
Eventually every clinician (of different types) in the VA will use this software. This is not expected to occur until 2-3 years after initial pilot site testing. On any given weekday, approximately 70,000 users.
What are the dependencies-interactions-interfaces with other systems?
If interoperability plans are successful, this software will eventually be exchanging data [securely] with healthcare entities outside VA. This will primarily occur via the Nation WideHealth Information Network (NWHIN). Data exchange outside VA will increase the need for capacity planning. This application will be best suited by utilizing secure "cloud" capabilities.

7.2.1.3. Availability

Describe when the envisioned system will need to be available (business hours only, weekends, holidays, etc) to support the business.
The system needs to be available 24 x 7 due to front end clinical care support. Continuity of operations and disaster recovery are critical for this system.

7.3. Known Interfaces

This is the business community's best understanding of known interfaces and may not be a comprehensive listing. All required interfaces will be stated as Business Needs in section 7.1.

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, Inpatient Pharmacy, Laboratory, Order Entry, Results Reporting, VistA Imaging, Bar Code Medication Administration, 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), and repositories/registries is a future goal.

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

7.4. Related Projects or Work Efforts

Project/Work Efforts

There are no active projects or other work efforts related to this request.

8. Other Considerations

8.1. Alternatives

None

8.2. Assumptions

1. Necessary IT resources will be available.

2. Enterprise support for Agile development methodologies.

3. OI&T processes, policies and gatekeepers will not unduly inhibit progress.

4. Necessary hardware and software will be available.

5. Changing business requirements, processes and needs will not unduly inhibit progress

8.3. Dependencies

1. Full support from Standard Terminology Services (STS.)

8.4. Constraints

Use of new technology framework of Web services with tiered architecture and agile development methodology.

8.5. Business Risks and Mitigation

Risks:

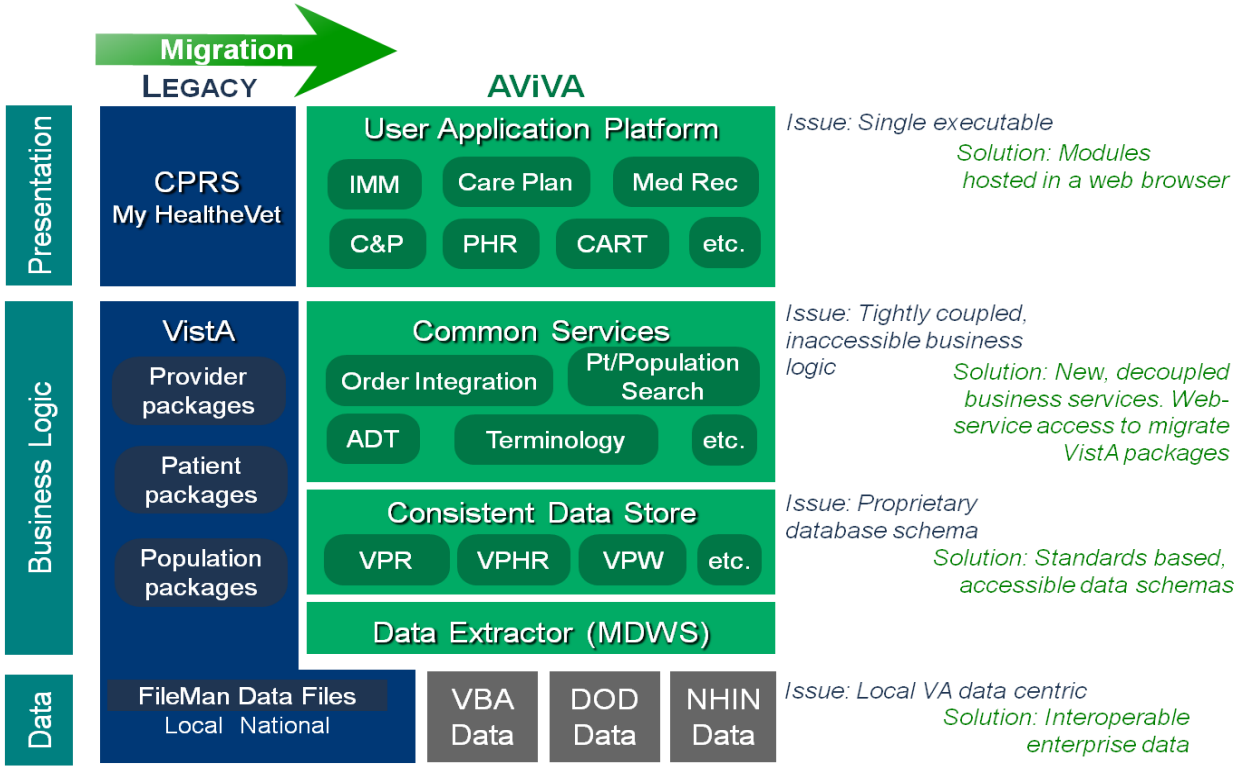
1. Ineffective VHA-OI&T Collaboration
    a. Mitigations:
        i. Leadership consensus/support at startup
        ii. Maintain active communication
        iii. Establish PMAS milestones
        iv. Ensure collaborative OI&T and VHA involvement

2. Resistance to Agile methodologies – Resistance to changing the current requirements gathering and development model to accommodate Agile, iterative development.
    a. Mitigations:
        i. Leadership support to remove barriers
        ii. Educate VA staff at all levels regarding mutual benefits
3. Insufficient IT funding
    a. Mitigations:
        i. Backup plan – small teams/narrow focus
        ii. Educate and Evangelize Leadership
        iii. Alternative funding sources
        iv. Donated/shared staff
4. – Rejection of the AViVA model, framework, principles and architecture by OI&T
    a. Mitigations:
        i. Leadership consensus/support at startup
        ii. Brief enterprise architects
        iii. Ensure collaborative OI&T involvement

Lack of adequate resources and support will prevent this initiative from achieving the identified IT deliverables and interfere with the modernization of VA's Electronic Health Record and will directly impact VA's ability to deliver safe, high-quality and cost-effective health care to Veterans.

Models

A high-level graphical representation of what the migration to AViVA may look like.



The key points highlighted on the right are:

At the top or presentation layer, where end-users interact with the clinical information systems is the issue of a single executable. This has numerous drawbacks such as slow releases, having to deploy fixes to 128 VistA systems and limited display capabilities. With AViVA, the solution is modules hosted in a web browser, which facilitates faster release cycles and meaningful display of information.

In the middle tier or Business Logic Layer, where now we have VistA Packages, we have the problems of tightly coupled, inaccessible business logic and proprietary database schemas. Our current system is monolithic, not modular, nor component based. With migration to AViVA we decouple the logic and allow web service access that is standards –based. This gives us a scalable and reusable foundation promoting agility and innovation.

In the bottom tier or Data layer, we currently have VistA FileMan data that is local VA centric. Information is location-based rather than patient-based. AViVA will support interoperable enterprise data not only from within VA, but from our partners in the Department of Defense (DoD) and the health care community.

Acronyms and Abbreviations

Term	Definition
AITC	Austin Information Technology Center
ASU	Authorization Subscription Utility
AViVA	A Virtual Implementation of VistA
BN	Business Need
BRD	Business Requirements Document
CPRS	Computerized Patient Record System
CWAD	Crisis Notes, Warning Notes, Allergies and Directives
DoD	Department of Defense
EHR	Electronic Health Record
ERR	Enterprise Requirements Repository
FIPS	Federal Information Processing Standard
GUI	Graphic User Interface
HI	Health Informatics
HIT	Health Information Technology
IT	Information Technology
MDWS	Medical Domain Web Services
MIO	Medical Informatics Office
NWHIN	Nation Wide Health Information Network
NIST	National Institute of Standards and Technology
OI&T	Office of Information and Technology
OWNR	Owner Requirement
PACT	Patient Aligned Care Team
PCS	Patient Care Services
PMAS	Program Management Accountability System
RPCs	Remote Procedure Calls
SME	Subject Matter Expert
STS	Standard Terminology Services
TIU	Text Integration Utility
VA	Department of Veterans Affairs
VHA	Veterans Health Administration
VISN	Veterans Intgrated Service Network
VistA	Veterans Health Information Systems and Technology Architecture
VLER	Virtual Lifetime Electronic Record
VPR	Virtual Patient Record