

VA



U.S. Department
of Veterans Affairs

Fiscal Year 2018–2024
VA Enterprise Roadmap

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Purpose

The U.S. Department of Veterans Affairs (VA) is undergoing an unprecedented information technology (IT) modernization and digital transformation through innovative partnerships, enhanced focus on customer service, and seamless interoperability with internal and external partners. The Veteran population entering the VA healthcare system with more complex physical and emotional conditions and regardless of where they live, they expect and deserve effective and efficient service.

To facilitate its evolution, VA is making the voices and needs of the Veteran its primary focus. The Department is working to provide Veterans with a coordinated experience in delivering the highest quality of care, benefits, and services. To achieve this, VA will build a unified enterprise of integrated and interoperable business processes and technical services.

The Fiscal Year (FY) 2018–2024 VA Enterprise Roadmap documents the Department’s current business and technology environment from an architecture perspective and depicts the transformative initiatives and modernization timelines that will enable VA to achieve its future environment. It provides an integrated view of the IT capabilities across VA and operational milestones supporting the Department’s FY 2018–2024 Strategic Plan and the IT Strategic Plan. The integrated view supports IT planning, prioritization, budgeting, and decision making across VA. Additionally, the VA Enterprise Roadmap addresses oversight concerns that VA lacks an IT modernization plan, reflects the evolution of VA’s Enterprise Architecture (EA) environment, and informs Annual Integrated Planning Guidance (AIPG). AXXB

“Customer service is my prime directive and first priority. We are driven by customer feedback, unified Veteran data, and employees characterized by a customer-centric mindset to make accessing VA services seamless, effective, efficient, and emotionally resonant for our Veterans.”

- VA Secretary Hon. Robert Wilkie

The VA Enterprise Roadmap shows the Department’s shift from a stove-piped environment of redundant systems, complex processes, and non-authoritative data sources to a Department

that is optimized through managed and shared services, commercial off-the-shelf (COTS) solutions, and strategic sourcing. The collection of information from across the department enables VA to better identify IT investments that have outlived their effectiveness and effectively plan for the

modernization or replacement of these investments. It demonstrates how VA IT will improve customer experience (CX), care coordination, access to benefits, interoperability, trust in the Department, and stewardship of taxpayer dollars. AXXB

**VA Enterprise Roadmap:
Where VA is, where it must go,
and how it will get there.**

Structure

The VA Enterprise Roadmap contains seven major sections. Section 1 introduces the document’s alignment and use. The Strategic Capability Integration Framework (SCIF) is an internal VA Office of Information and Technology (OIT) framework that supports the VA Enterprise Roadmap. OIT identifies 17 Capabilities within the SCIF that drive care, services, and benefits among its Product Line Management (PLM) Portfolios. As OIT institutionalizes PLM and Technology Business Management (TBM) Product Lines, it will replace the SCIF Capabilities in the Enterprise Roadmap to most effectively represent OIT’s organizing construct. Sections 2–5 of the VA Enterprise Roadmap provide an integrated view of the following PLM Portfolios across their related SCIF Capabilities.

Section 2: Health Services Portfolio

- 2.1 Electronic Health Record
- 2.2 Telehealth
- 2.3 Community Care
- 2.4 Other Health Information Technology
- 2.5 Supply Chain Management

Section 3: Benefits and Memorial Services Portfolio

- 3.1 Benefits
- 3.2 Memorials

Section 4: Corporate Services Portfolio

- 4.1 Customer Relationship Management
- 4.2 Finance and Acquisition
- 4.3 Human Resources

Section 5: Technology and Platform Services Portfolio

- 5.1 Digital Modernization
- 5.2 Contact Center Modernization
- 5.3 IT Infrastructure
- 5.4 Migration of Applications to the Cloud
- 5.5 Data Center Optimization & Consolidation
- 5.6 Trusted Information Sharing
- 5.7 Analytics

The VA Enterprise Roadmap provides a narrative overview for these four PLM Portfolios. It depicts the current environment, drivers, transformative initiatives, future environment, and architecture diagrams/graphics for each of the 17 Capabilities organized within these Portfolios. The fifth PLM Portfolio, Veteran Business Services, will be incorporated into the next iteration of the document. Additionally, when the document’s SCIF Capabilities shift to Product Lines, the

Product Lines will be realigned to their respective PLM Portfolios in accordance with VA’s PLM organizing construct.

Section 6 highlights OIT Transformation, and Section 7 includes next steps for maturing the VA Enterprise Roadmap. The appendices contain internal and external strategic alignment graphics as well as acronyms and abbreviations used in the VA Enterprise Roadmap. Particularly, Appendices I–L include detailed timelines depicting transformative initiatives and decommissioning milestones for the 17 Capabilities from FY 2018 to 2025.

The VA Enterprise Roadmap advances enterprise integration by aggregating the transformation plans of VA’s Administrations—the Veterans Health Administration (VHA), Veterans Benefits Administration (VBA), and National Cemetery Administration (NCA)—along with OIT and VA Staff Offices. The document was developed in collaboration with OIT’s Account Management Office (AMO); Enterprise Program Management Office (EPMO); Information Technology Operations and Services (ITOPS); Office of Electronic Health Record Modernization (OEHRM); Office of Information Security (OIS); Office of Strategic Sourcing (OSS); Office of Quality, Performance, and Risk (QPR); U.S. Digital Service (USDS); Veterans Experience Office (VEO); Office of Human Resources and Administration (HR&A); and the Office of Business Process Integration (OBPI).

1. Strategic Alignment

The VA Enterprise Roadmap aligns with the VA Secretary Priorities, VA Strategic Plan, IT Strategic Plan, OIT Digital Transformation Strategy, President's Management Agenda (PMA), Business Reference Model (BRM), VHA Health Information Strategic Plan (HISP), and Office of Management and Budget (OMB) Memorandum 13-09 and Circular A-11. There is clear traceability between the VA Enterprise Roadmap and these guiding documents and principles. This traceability will enable leaders to gain greater insight into activities and align resources to support them. It also provides operations teams the opportunity to communicate their needs and role within the organization. AXXB

VA Secretary Priorities

In a September 2018 testimony, the VA Secretary reported many of VA's challenges are "not with the quality of medical care but with getting our Veterans through the door to reach that care." Many of VA's challenges are decades in the making, and solving these challenges is critical to better serving Veterans, their families, and caregivers.¹

Accordingly, the VA Secretary's vision for VA is to improve the culture to focus on offering world-class customer service and to increase access to care and benefits. The Department will achieve this increase in access in part through greater customer service, implementation of the Maintaining Internal Systems and Strengthening Integrated Outside Networks (MISSION) Act, Electronic Health Record Modernization (EHRM), and transformation of the Department's business systems. While VA has made incremental progress, the Department will continue working toward a comprehensive modernization effort built on the four VA Secretary Priorities, as shown in Figure 1.



Priority 1: Customer Service – Our goal is to make accessing VA service seamless, effective, efficient, and emotionally resonant.



Priority 2: MISSION Act Implementation – This landmark legislation will fundamentally transform VA healthcare and improve Veterans benefits and services.



Priority 3: Electronic Health Record – VA is working closely with DoD to implement a modern and fully interoperable common electronic health record (EHR) system inside and outside the departments.



Priority 4: Business Systems Transformation – We empower employees to provide world-class customer service to Veterans by reforming IT systems responsible for HR management, finance, acquisition, and supply chains.

Figure 1: VA Secretary Priorities

Additional VA Secretary Priorities include accountability, suicide prevention, women's health, Community Living Centers, hiring and vacancies, and wait times.²

¹ Statement of the Honorable Robert Wilkie Before the Senate Veterans' Affairs Committee, September 26, 2018

² Statement of the Honorable Robert Wilkie Before the Senate Veterans' Affairs Committee, September 26, 2018

VA Strategic Plan

The VA Strategic Plan communicates the vision for VA’s future and the major changes the Department will undergo over the next five to seven years to deliver better choices for Veterans. VA’s strategic goals, objectives, and strategies guide decision making to improve the Department. The VA Strategic Plan incorporates the four VA Secretary Priorities, which continue the progress the Department has embarked upon and accelerates its transformation. The Department’s path is shaped by the VA Secretary Priorities, which define the operational focus of VA and which will make VA a stronger organization that provides better outcomes.³ Achieving these priorities requires the implementation of the VA goals found in Table 1, three of which address what VA will do specifically for Veterans. These goals are not separate from each other, instead they form an integrated whole. The fourth goal is an enabling goal focused on what VA must do to achieve the outcomes required by the first three goals.⁴

VA seeks to build an organization that is people-centric, results-driven, and forward-looking. These goals focus the Department on improving customer service through the alignment of strategic direction, business processes, technology, and data. Achievement of that alignment will enable VA to better serve Veterans by delivering the right service, to the right people, at the right place, at the right time. Broadening options for Veterans to receive care, benefits, and services will enable VA to compete for Veteran customers. The Department is empowering Veterans and ensuring they receive the best benefits, care, and services available. Attention to these priorities and goals and the diligent implementation of the strategic objectives and strategies in the VA Strategic Plan will result in positive and enduring outcomes for the Veterans and their families.⁵ Table 1 documents VA Strategic Goals and Objectives, which align to OIT Imperatives/Goals. AXXA DXXA

³ U.S. Department of Veterans Affairs FY 2018–2024 Strategic Plan, Refreshed May 31, 2019

⁴ U.S. Department of Veterans Affairs FY 2018–2024 Strategic Plan, Refreshed May 31, 2019

⁵ U.S. Department of Veterans Affairs FY 2018–2024 Strategic Plan, Refreshed May 31, 2019

VA STRATEGIC GOALS			
1. Veterans choose VA for easy access, greater choices, and clear information to make informed decisions.	2. Veterans receive highly reliable and integrated care and support and excellent customer service that emphasizes their well-being and independence throughout their life journey.	3. Veterans trust VA to be consistently accountable and transparent.	4. VA will transform business operations by modernizing systems and focusing resources more efficiently to be competitive and to provide world-class customer service to Veterans and its employees.
VA STRATEGIC OBJECTIVES			
1.1: VA understands Veterans’ needs throughout their lives to enhance their choices and improve customer experiences. 1.2: VA ensures Veterans are informed of, understand, and can get the benefits, care, and services they earned in a timely manner.	2.1: VA has collaborative, high-performing, and integrated delivery networks that enhance Veteran well-being and independence. 2.2: VA ensures at-risk and underserved Veterans receive what they need to end Veteran suicide, homelessness, and poverty.	3.1: VA is always transparent to enhance Veterans’ choices, to maintain trust, and to be openly accountable for its actions. 3.2: VA holds personnel and external service providers accountable for delivering excellent customer service and experiences while eliminating fraud, waste, and abuse.	4.1: VA’s infrastructure improvements, improved decision-making protocols, and streamlined services enable VA to adapt to changing business environments and Veteran needs. 4.2: VA will modernize its human capital management capabilities to empower and enable a diverse, fully staffed, and highly skilled workforce that consistently delivers world-class services to Veterans and their families. 4.3: VA IT modernization will deliver effective solutions that enable VA to provide improved customer service and a secure, seamless experience within available resources in a cost-effective manner. 4.4: VA will institutionalize data supported and performance focused decision making that improve the quality of outcomes.

Table 1: VA Strategic Goals and Strategic Objectives

VA IT Strategic Plan

The VA IT Strategic Plan, which encompasses this VA Enterprise Roadmap, documents how IT activities across the Department will integrate and accomplish VA’s mission. The VA Enterprise Roadmap is Appendix A to the VA IT Strategic Plan. In conjunction, they show how strategic planning; the Planning, Programming, Budgeting, and Execution (PPBE) process; performance management; and risk management are integrated to support VA mission execution. OIT Divisions collaborated to develop the VA IT Strategic Plan. VA’s Chief Information Officer (CIO), supported by the QPR Enterprise Strategic Planning Directorate and IT Resource Management (ITRM), is responsible for the development and maturation of VA’s IT Strategic Plan. OIT partners with VA’s Administrations and Staff Offices. AXXB DXXA

In combination, the VA IT Strategic Plan and VA Enterprise Roadmap satisfy all of the reporting tasks required by OMB. Together, the VA IT Strategic Plan and VA Enterprise Roadmap, provide an integrated view of the Department’s IT modernization vision and journey. Figure 2 illustrates the Strategic Planning Ecosystem and the major elements and activities that drive it. Additionally, it divides the relevant strategic and operational activities, demonstrating clear traceability between major strategic planning documents and VA’s PPBE process. Appendix G further demonstrates this relationship by aligning the SCIF Capabilities in the Enterprise Roadmap to VA’s major IT investments. AXXB



Figure 2: Strategic Planning Ecosystem

VA Digital Transformation Strategy

OIT is focused on digital transformation, which involves digitizing VA’s business processes to streamline workflows and automate paper-based work. VA is harnessing the power of personalization, application programming interfaces (APIs), and Veteran-centered design. The Department will continue to challenge VA’s industry partners and the community to identify ways of how to improve Veteran experience through digital transformation.

OIT’s vision is a world-class IT organization that provides seamless, unified Veteran experience through the delivery of state-of-the-art technology. OIT’s mission is to collaborate with business partners to create the best experience for all Veterans through four OIT Guiding Principles, which can be identified in Figure 3.⁶



Figure 3: OIT Guiding Principles

The five OIT Imperatives/Goals align to the VA Secretary Priorities and the VA Strategic Goals and Objectives defined in the FY 2018–2024 VA Strategic Plan. The VA Enterprise Roadmap describes transformative initiatives and modernization efforts to achieve OIT’s Imperatives/Goals in Figure 4. AXXB

⁶ VA Digital Transformation Strategy, Final

- 
1 Exceptional Customer Experience
 Deliver exceptional customer service by reinvigorating partnerships with VA business lines to understand customer needs, align them with true business problems, and deliver IT solutions based on Veteran-centered design and product management, culminating in a world-class customer experience.
- 
2 IT Modernization
 Drive IT and VA capability modernization through digital transformation, refreshing and decommissioning software and infrastructure, and an OIT business value framework that are designed around customer-driven requirements, with an objective to improve ROI by 10%.
- 
3 Strategic Sourcing
 Transform procurement and acquisition processes to support aggressive modernization efforts by optimizing all available sourcing capabilities and streamlining processes for selecting the right capability for each digital transformation requirement.
- 
4 IT Workforce Transformation
 Inspire a culture of digital transformation, IT modernization, and customer service in every OIT employee through education, training, reskilling, and professional certifications while transforming recruiting efforts to make OIT an employer of choice for next generation IT workers, boosting recruitment of next generation professionals from 0.5% to 10%.
- 
5 Seamless and Secure Interoperability
 Achieve seamless and secure data interoperability across VA, Department of Defense (DoD), Federal, and commercial partners by identifying, documenting, and disseminating well-defined, standardized, and secure design, interfaces, and processes to access authoritative data that streamlines the Veteran experience.

Figure 4: OIT Imperatives/Goals

OIT is changing the way it procures services by taking a buy-first approach to new systems, transitioning away from in-house IT development, and relying more on Cloud, managed and shared served, and COTS products. To be successful, OIT is focusing on the six areas in Figure 5.⁷

⁷ VA Digital Transformation Strategy, Final

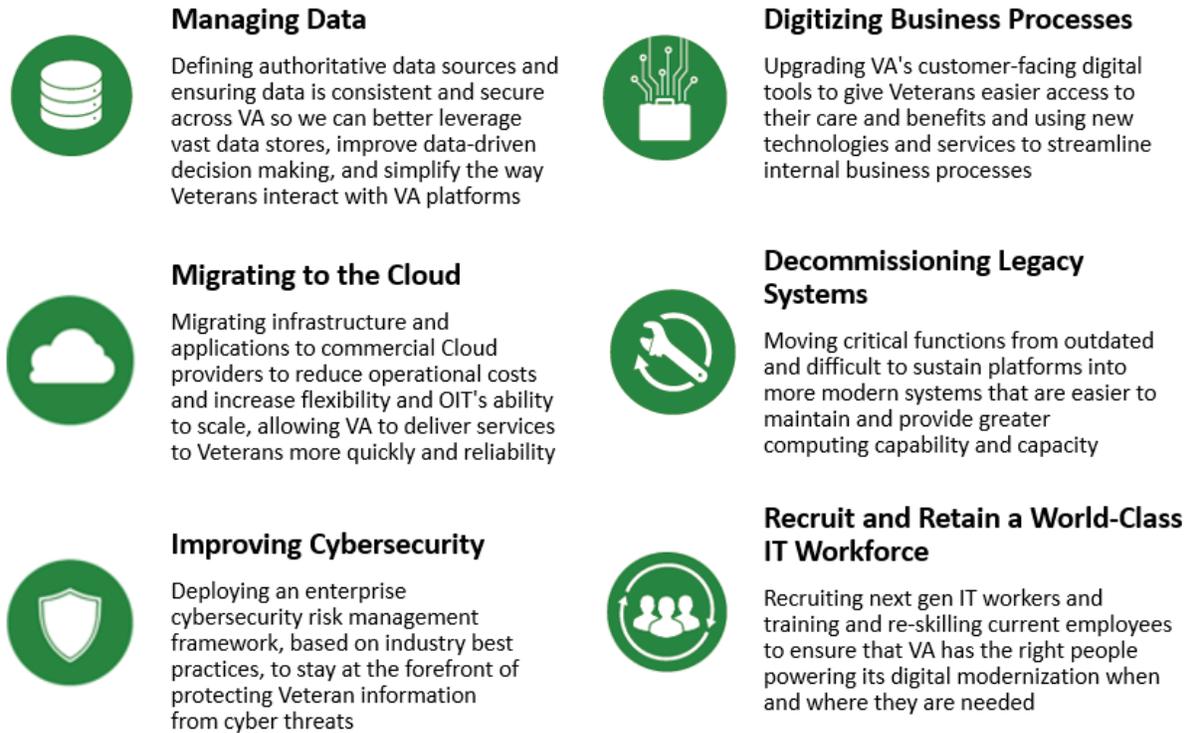


Figure 5: OIT Focus Areas

Appendix E identifies the dependencies between the SCIF Capabilities which are critical to achieving IT modernization and the SCIF Capability alignment with OIT Imperatives/Goals.

President’s Management Agenda

The President’s Management Agenda (PMA) lays out a long-term vision for modernizing the Federal Government in key areas that will improve the ability of agencies to deliver mission outcomes, provide excellent service, and effectively steward taxpayer dollars on behalf of the American people.⁸ The Administration has chosen to focus on three key drivers of transformation: IT Modernization, Data Accountability and Transparency, and Workforce of the Future. The PMA establishes Cross-Agency Priority (CAP) goals for each of the three key areas. An interagency team of federal leaders will lead these CAP Goals. Multiple agencies must collaborate to effect change related to the CAP Goals and are required to report progress online quarterly. Additionally, VA identifies priority initiatives that are led by a partnership of VA senior leaders and leadership teams who are responsible to deliver initiative outcomes.⁹ Appendix C documents the alignment of the SCIF Capabilities, VA Priority Initiatives, and PMA CAP Goals.

⁸ The President’s Management Agenda 2018, Final

⁹ U.S. Department of Veterans Affairs Accountable Management and Strategic Communication of VA Enterprise Priorities, June 14, 2018

OIT Division Operations Plans

OIT Division Operations Plans are intended to operationalize and execute IT Strategic Plan Imperatives/Goals at the business unit level. These plans are time bound—usually 12 to 18 months. Major components of OIT Operations Plans include goals, objectives, critical success factors, key result indicators, key initiatives, and resource considerations. While business, technology, and legislative drivers inform the development of the Enterprise Roadmap, Division Operations Plans further guide and constrain the Enterprise Roadmap by clarifying initiatives and milestones in a discreet timeframe.

VA Business Reference Model

The VA Business Reference Model (BRM), created by the VA Office of Enterprise Integration (OEI), is the authoritative model that incorporates all VA business Mission Areas, Capabilities, Service Lines, and Business Functions into a holistic view of VA’s business operations. It integrates the lower-level Business Functions of the Administrations and Staff Offices to provide a complete view of the work that VA is performing. This integrated model establishes a common functional taxonomy that can be used across the Department to support PPBE and other processes. BRM also includes the services contained in the Federal Integrated Business Framework as well as the unique capabilities and business functions performed by VA. Appendix D displays the alignment between the SCIF Capabilities and VA’s BRM. This will ensure alignment with strategic business requirements to IT capabilities and mitigate duplicate investments.

VHA Health Information Strategic Plan

The VHA Health Information Strategic Plan (HISP) defines the strategic direction for health information technology (HIT) within VHA and informs IT strategic planning and investment decisions to best meet VHA and Veteran needs. HIT enables VHA to capture and share clinical data and implement advanced clinical processes to realize improved clinical outcomes. The VHA HISP also informs the approach being followed by VHA’s National Leadership Council IT Committee as it aligns and prioritizes VHA IT investments with VHA business strategies and leads development of business requirements for IT solutions. This enables VHA’s clinical and business leaders to articulate and meet strategic and tactical objectives. In turn, the VHA Office of Health Informatics (OHI) works with leaders, subject matter experts, and the IT governance community to define the interconnectivity and characteristics of the various IT programs that are required to achieve strategic objectives. VHA OHI also identifies and documents interdependent business requirements to help ensure interoperable IT capabilities in support of workflows that transcend individual work units. The Enterprise Roadmap leverages the characterization of the future VHA health IT environment, including current IT initiatives and respective planning elements, and aligns them to the SCIF Capabilities in the Health Services Portfolio.

OMB Memorandum 13-09

The Enterprise Roadmap is Appendix A to the IT Strategic Plan. In alignment with the IT Strategic Plan, the Enterprise Roadmap documents VA’s current and future views of its business

and technology environment from an architecture perspective.¹⁰ It does so by reflecting the implementation of new or updated business capabilities and enabling technologies that support VA’s strategic goals and initiatives. OMB Memorandum 13-09 identifies 24 reporting requirements for agencies to address between an IRM Strategic Plan and Enterprise Roadmap but allows each agency to determine how it will address these requirements. The VA Enterprise Roadmap addresses OMB Memorandum 13-09 reporting requirements, substantively. Appendix B includes a traceability matrix that identifies the sections in which VA fully addresses the OMB Reporting Tasks in the IT Strategic Plan and Enterprise Roadmap.

OMB Circular A-11

Strengthening IT portfolio management is a continued focus and commitment to assess the effectiveness of current IT management practices and improve management of IT resources. Authoritative data is key to enabling data-driven decisions about IT cost and value in order to support business goals. An agency’s IT investment management and reporting of IT investments must clearly demonstrate that each investment is necessary to help meet the agency’s strategic goals and mission. Each IT investment should demonstrate the enabling and improvement of mission and program performance. Agencies demonstrate the IT investment requirements and governance process through Agency Major IT Business Cases, an IT Strategic Plan, an Enterprise Roadmap, and Agency IT Portfolio Summary submissions.¹¹ VA will demonstrate how investments support a business line or enterprise service performance goal, as documented in VA’s IT Strategic Plan and annual Enterprise Roadmap submission to OMB.

Legislation and Policy

The legislation and policies identified in Table 2 below are key drivers of VA modernization.

Legislation and Policy	Purpose
Veterans’ Electronic Health Record Modernization Oversight Act of 2017	Improve oversight and reduce programmatic risks for EHRM
Veterans Appeals Improvement and Modernization Act of 2017 (AMA)	Dramatically improve time, quality, and understandability of decisions on appeals resulting from adjudication at VBA, VHA, and NCA
VA’s Federal Rule – Anywhere to Anywhere (ATA)	Expand telehealth by allowing healthcare providers to treat patients across state lines
VA Maintaining Systems and Strengthening Integrated Outside Networks (MISSION) Act of 2018	Consolidate VA’s community care programs into a new Veterans Community Care Program (CCP) that will help ensure Veterans choose VA by getting them the right care at the right time

¹⁰ OMB Memorandum 13-09, FY 2013 PortfolioStat Guidance: Strengthening Federal IT Portfolio Management, March 27, 2013

¹¹ OMB Circular No. A-11, Preparation, Submission, and Execution of the Budget, July 2016

	from the right provider (Section 132 references information Sharing; Section 151 codifies ATA for telehealth modalities.)
Modernizing Government Technology (MGT) Act	Establish a Working Capital Fund for IT projects, IT modernization, reuse, and cost savings and avoidance
President’s Management Agenda (PMA)	Establish a strategic IT vision, priorities, and the President’s Agenda and enhance CX—all via CAP Goals
Federal Information Technology Acquisition Reform Act (FITARA)	Strengthen CIO authority, increase transparency and improve risk management in IT investments, implement the Federal Data Center Consolidation Initiative (FDCCI), and improve strategic sourcing/purchasing
Data Center Optimization Initiative (DCOI)	Establish policy to support federal agencies in meeting OMB requirements to consolidate data centers as well as modernize and optimize IT infrastructure
Health Insurance Portability and Accountability Act (HIPAA)	Provide guidance on the flow of healthcare information, especially as it relates to personally identifiable information (PII) to protect from fraud and theft
Forever GI Bill	Increase access to education benefits to provide the same benefits to all Veterans and eliminate the issue of using Post-9/11 GI Bill benefits within a set timeframe (Refer to Section 3.1 for more information.)
Deborah Sampson Act	Increase capabilities that support women Veterans as they transition out of service
21st Century Cures Act	Confront information blocking, build on the 2015 edition of the Office of the National Coordinator for Health Information Technology’s (ONC) Health IT Certification criteria by calling for the development of modern APIs that do not require special effort to access and use, and call for ONC to develop a Trusted Exchange Framework to facilitate

	trust between disparate health information networks
Foundations for Evidence-Based Policymaking (FEBP) Act of 2018	Require federal agencies to develop and maintain an Open Data Plan, which describes agency efforts to make government data open to the public, and enable agencies to maintain comprehensive data catalogs, ensure that all-non-sensitive data is machine-readable, and designate a nonpolitical chief data officer (includes the Open, Public, Electronic, and Necessary [OPEN] Government Data Act)
21st Century Integrated Digital Experience Act (IDEA)	Digitize government services and modernize federal agencies’ public-facing websites and digital services

Table 2: Legislation and Policy Driving VA Modernization

How to Use the VA Enterprise Roadmap

The VA Enterprise Roadmap is the primary IT strategic planning document that provides visibility and context into the Department’s IT Modernization journey and is available to Congress, OMB, the Government Accountability Office (GAO), and the public. The VA Enterprise Roadmap contains valuable information for use across multiple levels at VA. Table 3 contains a short description of the potential uses of the VA Enterprise Roadmap by specific VA roles. AXXB

Resource	Enterprise Roadmap Purpose and Use
Deputy Secretary	<ul style="list-style-type: none"> Obtain a comprehensive view of the Department’s enterprise transformation and report on progress to OMB
Administration Leader	<ul style="list-style-type: none"> Reflect their participation in business capability transformation, within the context of change across VA, through Administration-specific and enterprise-wide IT activities
Chief Information Officer (CIO)	<ul style="list-style-type: none"> Demonstrate alignment of transformational IT programs and initiatives to VA strategic goals and objectives Communicate with oversight entities (GAO, Congress, and OMB) on IT investment and risk
Administration Architect	<ul style="list-style-type: none"> Ensure integration of the Administration’s architecture into the EA and Enterprise Roadmap Represent the Administration’s current and future views of its business and technology environment from an architecture perspective Present a transition plan to show the sequence of actions needed to implement the VA IT Strategic Plan; also develop decommissioning plans
Administration Program Manager	<ul style="list-style-type: none"> Reflect Administration program information to verify alignment to VA strategic goals and objectives Increase awareness of programs and initiatives across the enterprise to leverage existing capabilities, identify gaps, and avoid overlap
VA Chief Enterprise Architect	<ul style="list-style-type: none"> Increase awareness of the EA value—through its linkages with strategy, business, and IT Integrate and streamline VA reporting
Office	Enterprise Roadmap Purpose and Use
Account Management Office (AMO)	<ul style="list-style-type: none"> Align, budget for, and prioritize business IT

<p>IT Resource Management</p>	<ul style="list-style-type: none"> • Ensure strategic alignment • Utilize for Portfolio management • Leverage for Prioritization • Institutionalize as a key input into PPBE • Utilize for Governance decisions • Leverage as a guide for PLM • Support Technology Business Management (TBM) • Shape workforce of the future
<p>Enterprise Program Management Office (EPMO)</p>	<ul style="list-style-type: none"> • Drive design patterns • Inform acquisition • Enforce standards and interoperability • Migrate applications to the Cloud • Integrate Development Operations (DevOps)
<p>Office of Strategic Sourcing (OSS)</p>	<ul style="list-style-type: none"> • Formulate acquisition strategies and enterprise licensing
<p>Office of Information Security (OIS) and Office of Quality, Performance, and Risk (QPR)</p>	<ul style="list-style-type: none"> • Manage risk • Align with cybersecurity strategy
<p>Information Technology Operations and Services</p>	<ul style="list-style-type: none"> • Support solution engineering • Inform IT Service Management (ITSM)
<p>Other Offices (Office of Enterprise Integration [OEI], Veterans Health Administration [VHA], Veterans Benefits Administration [VBA], etc.)</p>	<ul style="list-style-type: none"> • Align with VA Strategy, PPBE, modernization, and Administration priorities

Table 3: Purpose and Use of the VA Enterprise Roadmap by Role

Transformative initiatives and modernization timelines are accurate at the time of publication and will be updated annually to represent changes in resources and evolving priorities. Appendix E highlights where the SCIF Capabilities are most reliant upon one another to complete their objectives.

2. Health Services Portfolio

The Health Services Portfolio will modernize care and service delivery by operationalizing the four VA Secretary Priorities (Customer Service, MISSION Act Implementation, Electronic Health Record, and Business Systems Transformation). Supporting the VA Secretary Priorities, VHA's three priorities are to Restore Trust, Create a Learning Organization, and Modernize Systems. Modernization is VHA's roadmap to deliver on both sets of priorities to create a VHA that always anticipates and meets the needs of Veterans, its employees, and those who depend on VHA. To meet its priorities and become a highly reliable, integrated healthcare system, VHA is taking a strategic and coordinated approach to modernization through its 10 Lanes of Effort:

1. Commit to Zero Harm (High Reliability Organization [HRO])
2. Streamline VHA Central Office
3. Develop Responsive Shared Services
4. Reduce Unwarranted Variation Across Integrated Clinical and Operational Service Lines
5. Engaging Veterans in Lifelong Health, Well-Being, and Resilience
6. Revise Governance Processes and Align Decision Rights
7. VA MISSION Act: Improving Access to Care
8. Modernize Electronic Health Records
9. Transform Financial Management System
10. Transform Supply Chain

This section documents the current environment, drivers, transformative initiatives, and future environment for the Health Services Portfolio and contains the following the SCIF IT Capabilities:

- 2.1 Electronic Health Record
- 2.2 Telehealth
- 2.3 Community Care
- 2.4 Other Health IT (Suicide Prevention and Veteran Homelessness)
- 2.5 Supply Chain Management

Current Environment

The Veterans Health Administration's (VHA) current organizational design does not support the aim of becoming a high reliability, clinically-integrated, and Veteran-driven organization. Improvements are needed in the delivery of services and benefits, diffusion of best practices, and enhanced employee engagement. VA's goal is to provide Veterans with the care they need at the right time, at the right place, and from the right provider. Accordingly, the Department is modernizing the way it delivers healthcare to over nine million Veterans by transitioning VHA from legacy IT systems to a modern, commercially-focused suite of applications. The

Health Services Portfolio provides advanced technology solutions to enable this transition and ensure modern, high-quality, and efficient medical care delivery.

Drivers

VHA has been the subject of several critical assessments over the last four years that highlight deficiencies in care, customer service, Veteran access, and integrated service delivery between VHA and the community. Enterprise risks contributing to its organizational deficiencies include lack of reliable data and analysis, inefficient human capital management, and disjointed performance management. Additionally, legislation such as the VA MISSION Act and Anywhere to Anywhere (ATA) are fundamentally transforming the way that VA provides care and services to Veterans.¹²

The MISSION Act increases access to care through community providers and telehealth modalities. Section 132, Improving Information Sharing with Community Providers, amends the existing statute to allow enhanced sharing of previously protected health information and brings VA into conformance with community providers and health plans. As a part of the MISSION Act, ATA will increase Veterans' access to care by connecting them to providers across state lines through the development of a national telehealth network. Section 151, Licensure of health care professionals of the Department of Veterans Affairs providing treatment via telehealth, established a new section—1730C in Title 38, US Code—that statutorily authorizes VA-employed healthcare professionals to practice, regardless of their location in any state, their healthcare profession through the practice of telemedicine. This authority extends to situations where the provider or beneficiary are not on federal property.

Transformative Initiatives

The Health Services Portfolio includes the following key transformative initiatives:

- Electronic Health Record (EHR)
- Telehealth Modernization
- VA Video Connect (VVC)
- Community Care Modernization
- Community Care Referral and Authorization (CCRA)
- Suicide Prevention Package (SPP)
- Status Query and Response Exchange System (SQUARES)
- Defense Medical Logistics Standard Support (DMLSS)

See Appendix I for the FY 2018–2025 milestones associated with the Health Services Portfolio and its respective capabilities. The milestones represent initiatives that VA will complete to achieve the future environment of the Health Services Portfolio.

Future Environment

The Health Services Portfolio will provide innovative solutions to support VHA in becoming a high reliability organization (HRO) and delivering exceptional, coordinated, and connected care

¹² Systems within the Health Services Portfolio are helping VA meet MISSION Act Sections 101, 102, 105, 108, 111, 112, 113, 114, 122, 131, 132, 143 requirements.

for Veteran health and well-being. More specifically, it will modernize care and service delivery by operationalizing the VA Secretary Priorities. VA's Veteran-centric health modernization initiatives will enhance CX and improve Veterans' trust in VA through consistent and accessible customer interaction channels. By striving to eliminate regulatory barriers, VA will increase Veterans' access to care in their local communities and particularly improve access for those in rural or underserved areas. Other HIT systems will provide clinicians, administrators, and patients with the IT tools that are not part of the EHR but are needed to support healthcare delivery. VHA technology will ultimately align with its structures, processes, and people to deliver new experiences for employees, partners, and Veterans.

2.1 Electronic Health Record

Current Environment

The Veterans Information Systems and Technology Architecture (VistA) consists of over 170 clinical, financial, and administrative applications. The legacy system supports more than 1,600 VA facilities nationwide as part of the largest integrated delivery network in the U.S. As VA's legacy electronic health record (EHR) system, VistA has been essential to the Department's ability to deliver healthcare to more than nine million Veterans and their families. Multiple modernization initiatives to enhance the legacy EHR system have led to more than 130 unique instances of VistA. As a result, VA lacks a comprehensive definition of VistA and cannot accurately report VistA costs. These disparate instances create challenges in coordinating care across medical facilities and result in a lack of standardized processes and non-authoritative data sources. Providing quality healthcare is one of VA's highest priorities, and to operationalize this Veteran-centric approach, VA established the Office of Electronic Health Record Modernization (OEHRM) to oversee the implementation of the Cerner EHR, which will replace VistA. VA is in the process of implementing the Cerner EHR at initial operating capability (IOC) sites and has successfully transferred 23.5 million Veterans' health records to a shared data center with DoD—a significant accomplishment setting the stage for the go-live of the EHR solution next year.

Drivers

VA was a pioneer of EHR development with VistA. However, after more than 40 years of use, VistA lacks the interoperability with DoD and community care partners required to better serve Veterans. VistA is extremely costly to maintain as VA's sole health information system. VistA limits the Department's ability to provide Veterans with a seamless care experience. VA has explored various options to modernize VistA since 2001. However, previous VistA modernization initiatives have failed to truly transform the EHR system or achieve interoperability.

In recent years, Congress and government agencies have increased oversight of VA's EHR, interoperability, and data activities (e.g., the MISSION Act and Veterans' Electronic Health Record Modernization Oversight Act). Technology advancements—such as open APIs, SMART on FHIR apps, platform architecture, Cloud deployments, digital disruptors (e.g., Apple and Amazon), robotic process automation (RPA), artificial intelligence (AI), machine learning (ML), genomics, blockchain, and big data analytics—are shaping the evolution of EHR platforms.

Transformative Initiatives

Electronic Health Record Modernization

In June 2017, VA announced that the Electronic Health Record Modernization (EHRM) program will implement the Cerner EHR system. In accordance with VA's buy-first strategy, the Department will acquire the COTS solution rather than continue to enhance VistA. In May 2018, VA awarded a 10-year contract to Cerner Government Services, Inc., to replace VistA with the same EHR solution that DoD is deploying. In the interim, VA will continue sustaining VistA and is conducting site assessments to define the scope of each VistA instance, enabling the transition. EHRM will develop a single longitudinal clinical health record from active duty to Veteran status and ensure interoperability with DoD; it will be a catalyst for fundamental change in the way VA delivers Veteran-focused, provider friendly care.

Interoperability is a key expected outcome of VA's transition to the Cerner EHR system. In July 2015, DoD awarded Cerner a \$4.3 billion contract to implement the commercial EHR system known as Military Health System (MHS) GENESIS. DoD's transition began at IOC sites in February 2017, and it expects this transition to be complete by 2022. To ensure interoperability with DoD and community providers, VA ordered an independent study to determine an interoperability approach for adopting the Cerner EHR system. Recommendations from the January 2018 study included improving imported data, addressing data rights and patient safety risks, and improving data access for patients. As a result of the assessment, VA built provisions into the Cerner contract to address the study's 51 recommendations and ensure that the Department will achieve interoperability with DoD and community providers once it has implemented the Cerner EHR system.

In order to achieve efficiency and implementation synergies, VA is aligning the deployment of the commercial EHR system with DoD's ongoing rollout of Cerner, starting in the Pacific Northwest. Deployment will initiate at IOC sites (i.e., Mann-Grandstaff, American Lake, and Seattle VA Medical Centers [VAMCs]) in 2020 and continue with a phased implementation at all remaining sites through 2027. In the interim, each VA facility will continue to utilize VistA until the Department fully deploys the commercial system. Because VA has unique needs that may differ from DoD requirements, the Department will build on the Cerner EHR to meet its unique requirements while implementing a single common system. VA innovation and quality of care will continue to improve as the Department strengthens collaboration with DoD, community providers, commercial partners, and Cerner. BXXB GXXA

Future Environment

Full integration of the Cerner EHR will take several years, beginning with the IOC sites in March 2020. VA will deploy the Cerner EHR system to all VAMCs, clinics, Veterans Centers, mobile units, and ancillary facilities. Once fully implemented in FY 2028, the Cerner EHR system will be VA's single authoritative source of Veteran health information for patients and providers. VA and DoD will share a single database in Kansas City that is aligned with DoD's cybersecurity standards. The EHR system will support improved health outcomes, patient safety, and quality of VA care. VA is at the forefront of IT for women's health and will also redesign its electronic medical record to track breast and reproductive healthcare.

Implementing the Cerner EHR system will allow patient data to reside in a single hosting site using a common system. It will enable interoperability with DoD, improve care coordination, and strengthen overall care delivery. The EHR system will also enable seamless transfer of records between providers and enhance VA's collaboration with DoD and community care providers. It will facilitate deeper engagement with patients, which will improve Veteran experience. Additionally, the Cerner EHR will employ analytical tools to drive faster, smarter connections between military service and health outcomes. Other VHA entities including Consolidated Patient Account Centers (CPACs) for patient billing, Consolidated Mail Outpatient Pharmacies (CMOPs), and the Telehealth Hub in VISN 23 that serves VISN 20 will leverage Cerner's capabilities. The system will ultimately provide a full picture of Veterans' medical history. Figure 6 displays the key EHRM architecture components that will enable seamless interoperability as well as improve access to healthcare and Veteran experience. BXXB GXXA

VA and DoD Leaders will establish the Federal Electronic Health Record Modernization Program Office (FEHRM) to align strategies to implement an integrated EHR system. The DoD/VA Interagency Program Office (IPO) will be re-chartered into the FEHRM and will provide a comprehensive and agile management authority to execute requirements necessary for a single, seamless integrated EHR. The FEHRM will serve as a single point of authority for the Department's EHRM program decisions. FEHRM leaders will have the authority to direct each Department to execute joint decisions for technical, programmatic, and functional functions under its purview and will provide oversight as necessary.

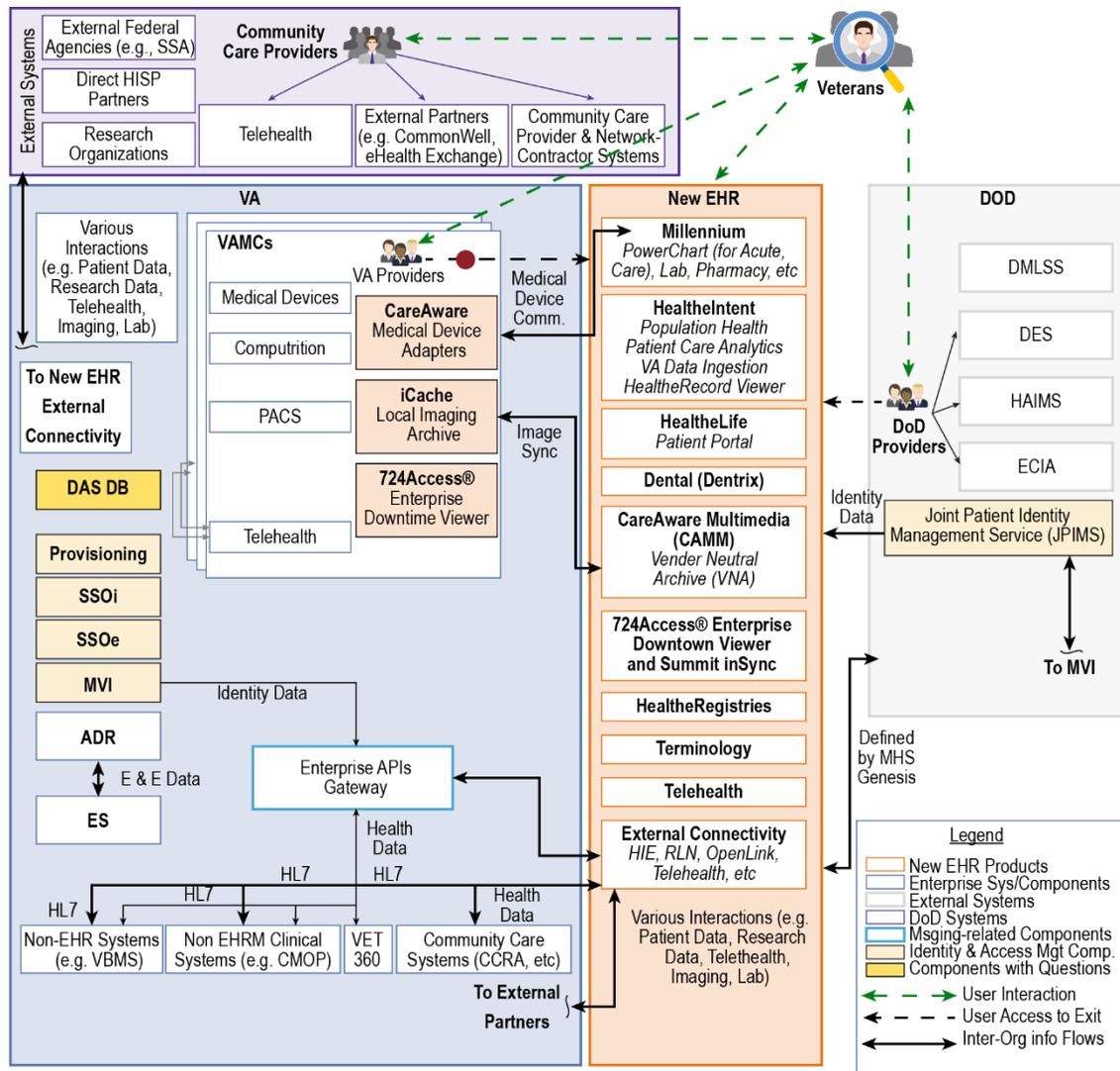


Figure 6: EHRM Future Environment Full Operating Capability Overview

2.2 Telehealth

Current Environment

VA is a leader in providing telehealth services and leverages technologies to provide care through three primary telehealth modalities: Clinical Video Telehealth, Home Telehealth, and Store and Forward Telehealth. In FY 2018, VA achieved more than one million video telehealth visits, a 19% increase in video telehealth visits over the prior year, and an 88–90% satisfaction rate. In the same year, more than 782,000 Veterans—or 13% of Veterans obtaining care at VA—had one or more telehealth episodes of care, which equates to more than 2.29 million telehealth episodes of care among 50+ primary and specialty areas. Of these Veterans, 45% live in rural areas and may have otherwise had limited access to VA healthcare. However, less than 1% received care through a telehealth modality in the comfort of their home or other non-VA location. Relatedly, VA’s outdated network infrastructure presents a significant barrier to telehealth expansion. Currently, over 50% of VA’s healthcare facilities require circuit upgrades

to provide sufficient network bandwidth capacity to support the expansion of telehealth services from VA locations to Veterans' homes. To address this gap, VA initiated a bandwidth expansion project to upgrade the circuits at over 700 VA facilities.

To increase access to telehealth services, VA is implementing the ATA Healthcare Program. Additionally, the Department is partnering with Walmart, Philips Healthcare, T-Mobile, Verizon, the Veterans of Foreign Wars (VFW), and the American Legion to expand its Advancing Telehealth through Local Access Stations (ATLAS) Initiative, which allows Veterans who lack the necessary technology in their home and or are unable to easily access a VA facility to receive remote healthcare at a convenient location. To improve efficiency and reduce operating costs, VA has also migrated the Office of Connected Care's (OCC) Mobile Application Infrastructure Support (e.g., MyHealthVet) to VAEC, culminating in all VHA mobile apps being migrated from the IBM commercial data center (formerly Terremark) to the VA Cloud. BXXB

Drivers

Recognized as a pioneer in the provision of care through telehealth technologies, VA has one of the largest telehealth programs in the country, increasing patient access to high-quality healthcare by providing services when geographical distance separates the patient and practitioner. VA now considers telehealth mission critical for effectively delivering quality healthcare to Veterans, as it improves Veterans' access to VA health providers and services that may otherwise be unobtainable. VA is committed to ensuring that America's Veterans have access to the healthcare they have earned and will continue to expand telehealth services to meet the growing demand.

The Veterans E-Health and Telemedicine Support (VETS) Act of 2017 provided legislative authority to ATA, allowing VA clinicians to provide telehealth services to Veterans regardless of where they live. Section 151 of the VA MISSION Act authorizes VA to establish the authority for its healthcare providers to deliver care through telehealth modalities across state lines, regardless of where a Veteran is located. According to Advisory Board, there are nationwide provider shortages in certain specialty areas. VA expects telehealth demand to increase as access improves and Baby Boomers age.

Veteran demographics are evolving, and the increasing trend of women and younger Veterans will also impact future demand. Digitally-savvy Veterans are more comfortable with technology, desire transparency, and have different expectations for their care. These trends will impact and disrupt how VA provides care and services. Technology advancements—such as the Internet of Things (IoT), 5G, genomics, AI, wearable sensors, robotics, virtual reality, personal health apps, digital health assistants, direct-to-consumer and retail clinic kiosks, and clinical contact centers—are shaping future virtual care platforms.

Transformative Initiatives

Telehealth Modernization

New telehealth technology is transforming VA's ability to deliver convenient, accessible healthcare to Veterans. VA recognizes three telehealth modalities to deliver services to Veterans in 50 clinical specialties. The first category, Clinical Video Telehealth, is the use of real-

time interactive video conferencing to assess, treat, and provide care to a patient remotely. The second category, Store-and-Forward Telehealth, is the use of technologies to asynchronously acquire and store clinical information that is then clinically evaluated by a provider at another location. The third category, Home Telehealth, uses VA-provided devices to connect Veterans with a provider. A bandwidth expansion project that will upgrade healthcare facility's circuits was implemented in FY 2018 to support the expansion of telehealth services from VA locations to Veterans' homes.

VA is expanding accessibility, increasing service capacity, and improving the quality of care through telehealth. In terms of accessibility, more Veterans are receiving virtual care closer to their community and preferred location. VA is also matching supply and demand enterprise wide, closing clinical service gaps in rural and other underserved areas with providers that are underutilized and connecting Veterans with rare, complex, or unique conditions with clinical experts irrespective of their locations. The Home Telehealth Reporting Enhancements Phase 3 (HTRE P3) project supports the VHA Office of Telehealth Services in monitoring more than 75,000 Veterans in their homes. The project involves developing an integrated web platform that collects and reports data from third-party home telehealth vendors in one place. It integrates Veteran data collected in-home with VA systems and patient medical records and provides tools for Care Coordination nurses to manage their patient panels.

Through telehealth modernization, VA will achieve clinically meaningful first-contact resolutions via omnichannel virtual triage, a private sector best practice and critical element of care delivery. By building on the dedication and innovation of frontline contact center staff, VHA is now working to transform hundreds of varied, fragmented, and antiquated call centers into modern, regional virtual care centers available in each Veterans Integrated Service Network (VISN). This will improve Veteran experience and access as well as system resource efficiency. Figure 7 depicts the future environment of the virtual care center model. BXXB

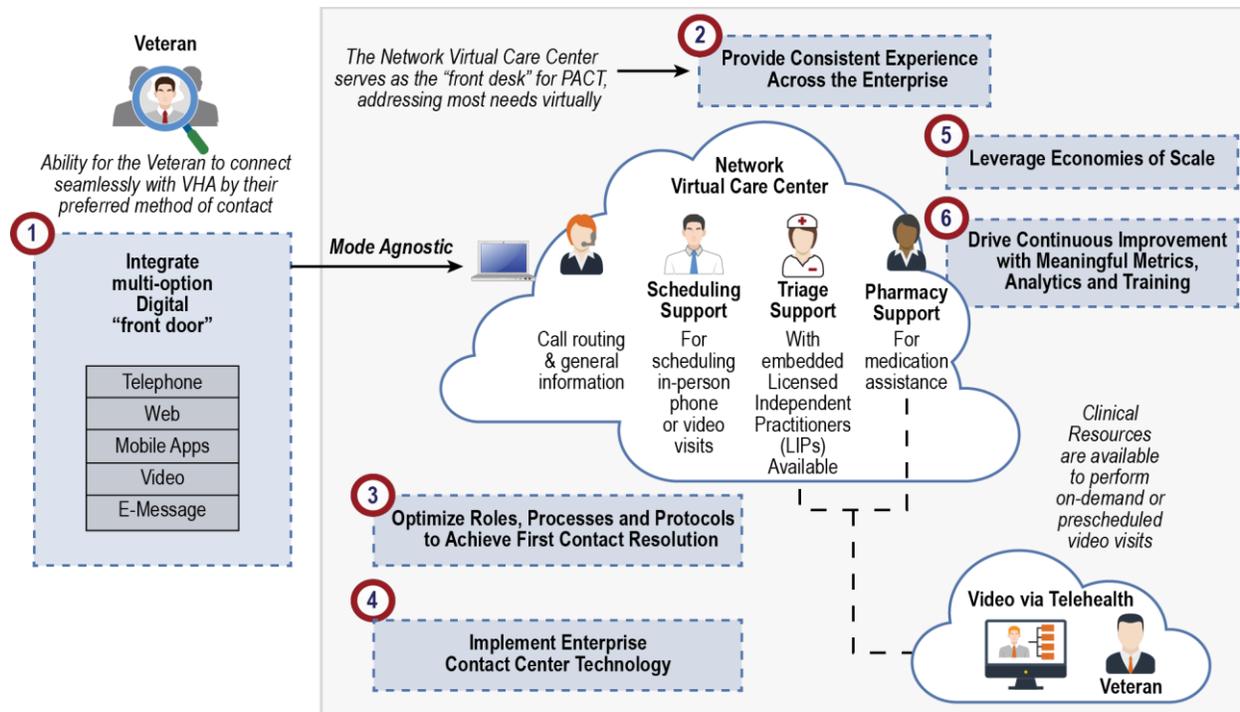


Figure 7: Future Environment of VA's Virtual Care Center Model

VA Video Connect

VA Video Connect (VVC) is a mobile application that allows Veterans to access VA healthcare services on their smartphones, tablets, and personal computers. VVC provides a secure, web-enabled video service that makes it easy for Veterans to connect with their VA providers from anywhere in the country; it functions as a video conference tool that allows VA to conduct video healthcare visits when a hands-on physical examination is not required. When a Veteran schedules an appointment through VVC, the web-based tool sends an email with a portal link to both the provider and Veteran, which directs them to a virtual medical room. VVC allows Veterans to connect with their healthcare teams via live video from the comfort of their preferred location, thereby increasing their access to VA healthcare and reducing travel times. VA has also built an enhancement to VVC that provides the contact information of patients' local emergency services when their address is entered into the application; in the case of a medical emergency during a VVC visit, this allows providers in a different location to quickly contact emergency services in the location of the patient. BXXB

VA Online Scheduling

VA Online Scheduling (VAOS) enables Veterans to self-schedule and request primary care appointments. Depending on whether a facility offers these capabilities, Veterans can also use VAOS to self-schedule or request audiology, optometry, and outpatient mental health appointments. The tool allows users to view appointment details, track the status of requests, send messages about requested appointments, receive notifications and call reminders for appointments, and cancel appointments. VA has deployed VAOS nationwide, and OIT will continue to add appointment types and functionality for direct scheduling of telehealth and community provider appointments.

Telecare Hubs and Services

VA is establishing a network of telecare hubs to support the provision of clinical, urgent, and specialty care enterprise wide. Specifically, the Department is developing Tele-Primary Care (PC) and Tele-Mental Health (MH) Clinical Resource Hubs to fill service gaps in primary care and mental health. VA's Tele-PC and Tele-MH Clinical Resource Hubs will leverage the hub and spoke model and help achieve same-day access for Veterans by relieving on-site staff from the routine workload associated with provider positions that are vacant.

VA is also creating Tele-Urgent Care Hubs for immediate access to urgent care services and clinical triage through 24/7 contact centers accessible to Veterans by telephone, online, and through mobile applications. To enable a network of virtual providers to deliver care within the framework of a contact center, VA staffs Tele-Urgent Care Hubs with integrated licensed independent practitioners (LIPs). By integrating LIPs into Tele-Urgent Care Hubs, VA is able to provide Veterans with real-time medical care and triage.

Additionally, VA is establishing Tele-Specialty Care Services to deliver urgent specialty services in VA outpatient clinics above and beyond local specialty resources. Tele-Specialty Care enables VA to leverage national expert consultation centers to close access gaps, enhance quality, and improve patient safety. Veterans will receive a standardized, enterprise-wide set of core specialty services through their preferred telehealth modality at the location of their choice.

BXXB

Telehealth Management Platform

The Telehealth Management Platform (TMP) serves as the foundational application for each VA facility's telehealth program. Additionally, TMP supports clinical care by simplifying telehealth business processes related to telehealth service agreements, credentialing and privileging, equipment and resource management, clinical and administrative staff point of contact, and scheduling. Telehealth scheduling is a complex process, often requiring significant effort to schedule a single visit. Clinic-based telehealth visits require reserving staff, space, and equipment in two or more locations, and working with medical centers and healthcare systems that have separate EHR systems further complicates scheduling these multiple resources. By simplifying such processes, TMP supports communication of important information between providers, VA staff, and Veterans.

WebVRAM

VHA is rapidly expanding its use of telehealth to enhance the accessibility of clinical services and increase its capacity for care in rural and underserved areas. The current process of requesting access to multiple instances of VistA is not standardized or consistently defined across the enterprise and often necessitates time-consuming manual intervention to obtain access for each remote provider. To eliminate delays and reduce the administrative workload caused by the current request processes, the WebVRAM application implements a solution that allows for synchronization of account credentials; this enables telehealth providers and staff to efficiently obtain and maintain access to one, multiple, or all VA instances of a medical record using an intuitive user interface.

Future Environment

VA will shape the future of healthcare through telehealth expansion, as telehealth is a critical tool to ensure that the Department delivers convenient, accessible care to Veterans. VA's goal is to provide care through a telehealth modality to 20% of Veterans. The Department's expansion of telehealth will focus on providing care in Veterans' homes or their preferred location. To enable this expansion, VA will establish a national telehealth network and leverage public-private partnerships. VA will expand the availability of telehealth services and improve telehealth modalities through innovative technology to enhance provider productivity, patient experience, and care quality with support for on-demand and resource-based scheduling. Full implementation of ATA will enable medical providers to deliver care to Veterans nationwide regardless of location, and virtual care will expand and enhance access to services to improve their timeliness. Standardized digital, clinical workflows will provide improved and consistent Veteran experience, deeper engagement with patients, and enhanced care coordination—including two-way flow of information between DoD, community care, telehealth, and virtual care modalities. Additionally, VA's bandwidth upgrade effort will accelerate the expansion of VA's telehealth services, directly supporting Veterans' access to healthcare. It will enable the provision of in-home VA healthcare services, delivering mission-critical healthcare that is particularly important for Veterans with mobility challenges and those in rural areas. BXXB

2.3 Community Care

Current Environment

VA's goal is to provide Veterans with the care they need at the right time and from the right provider. In some cases, this requires eligible participants to receive care from a local community care provider, paid for by VA. As an IT capability, Community Care allows Veterans, providers, and VA staff to access tools for care coordination, referrals and authorizations, provider portals, electronic data interchange, provider payments, and revenue operations. However, VA's patchwork of multiple separate community care programs is a bureaucratic maze that is difficult for Veterans, their families, and VA employees to navigate. VA has experienced challenges with claims processing and access to community care. Because community care programs are not organized within a regional structure, programs often overlap in terms of type of function and service. Additionally, the overall care coordination and exchange of health information consist of manual processes and workarounds that are often unreliable. Figure 8 provides an overview of community care services.

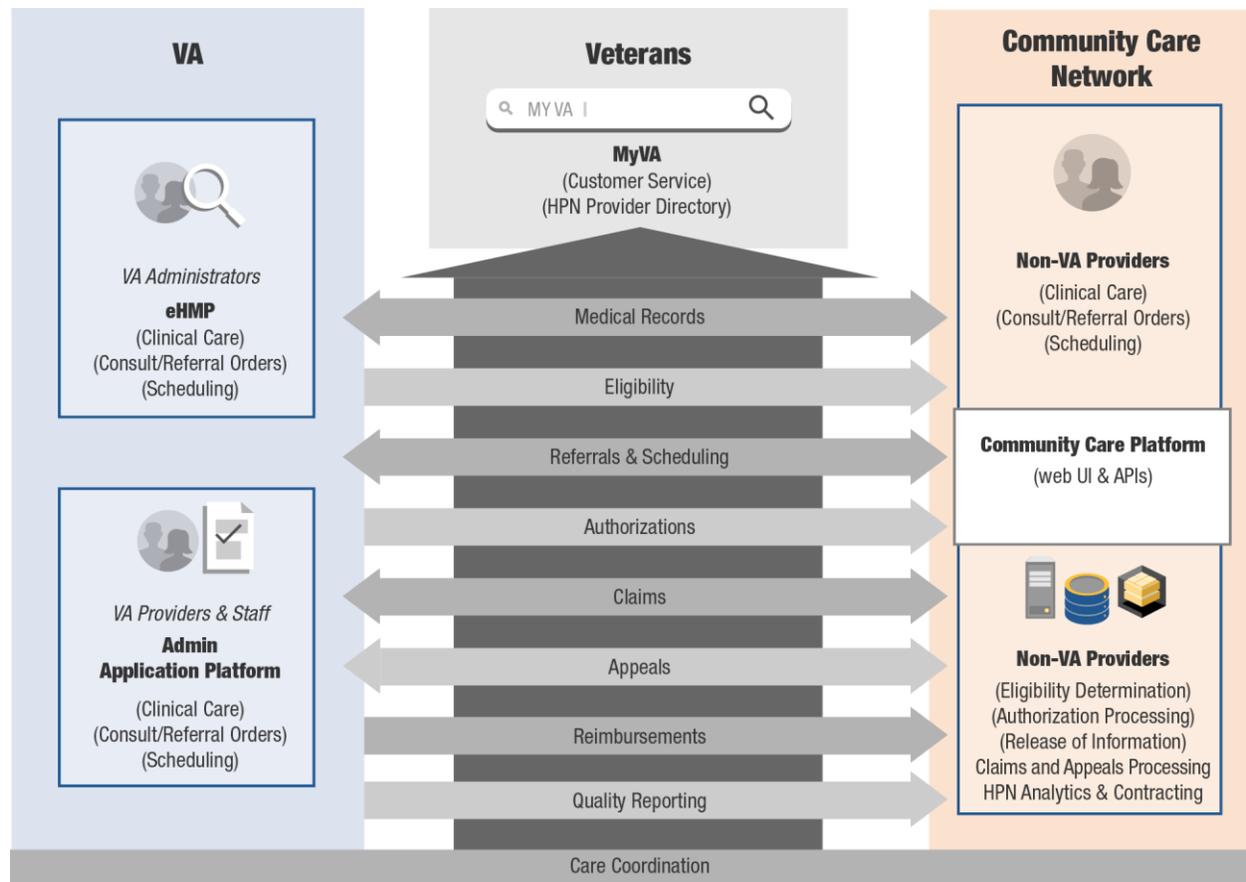


Figure 8: Overview of Community Care Services

Drivers

Demand for community care is increasing, but the numerous existing programs create unnecessary complexity. VA's fragmented claims and payment process results in untimely claims processing and incorrect payments to providers. Additionally, current community care patient accounting requires multiple systems, which results in disconnected information and inaccurate billing. In an effort to streamline VA's community care programs, the president signed the MISSION Act into law on June 6, 2018. The MISSION Act will consolidate VA's existing disparate programs into a single Community Care Program (CCP) and empowers VA to build an integrated, holistic system of care that combines the best of VA and its federal, academic, and private sector partners. MISSION Act Section 132, Improving Information Sharing with Community Providers, amends the existing statute so that—instead of Veterans opting in to share their medical records with non-VA providers—Veterans' records will be shared with the CCP unless the Veteran intentionally opts out, which will enable improved interoperability between VA and community care providers. Technology advancements—such as APIs, SMART on FHIR apps, Health Information Exchanges (HIEs), AI, big data analytics, and omnichannel customer relationship platforms—are shaping the future evolution of Community Care capabilities.

Transformative Initiatives

Community Care Modernization

On June 6, 2019, VA launched Community Care services under the MISSION Act. Under the consolidated CCP, VA will streamline the disparate systems and processes for purchasing care into an integrated system for a seamless experience for all stakeholders. The CCP will expand the availability of community care options to Veterans while simplifying processes and workflows.¹³ In effect, the program will simplify and standardize community providers' interaction with VA, providing straightforward eligibility criteria and a single set of systems and processes. Consolidation of community care services will improve community care operations, including interoperability between VHA, DoD, and community providers; reduce confusion among providers; and deliver effective coordinated care.¹⁴ Consequently, the CCP will simplify billing and co-payment requirements as well as ensure that Veterans have timely access to care and a shared understanding of their services and care options.¹⁵ BXXB

The new consolidated program will also position VA to collect critical health information with federal and community partners in order to aggregate and integrate Veteran data. This will significantly increase VA's ability to utilize data analytics in an effort to improve Veteran outcomes. As the Community Care Network (CCN) and CCP mature, the use of data and analytics will be important tools for VA to identify gaps in services, quality issues, and changes in demand. This will enable VA to more effectively and efficiently address changes in how VA delivers healthcare. GXXA

¹³ Veterans Health Administration (VHA) Health Information Strategic Plan (HISP) FY 2018–2022 Version 6.0 , Page 21

¹⁴ Veterans Health Administration (VHA) Health Information Strategic Plan (HISP) FY 2018–2022 Version 6.0 , Page 21

¹⁵ Veterans Health Administration (VHA) Health Information Strategic Plan (HISP) FY 2018–2022 Version 6.0 , Page 21

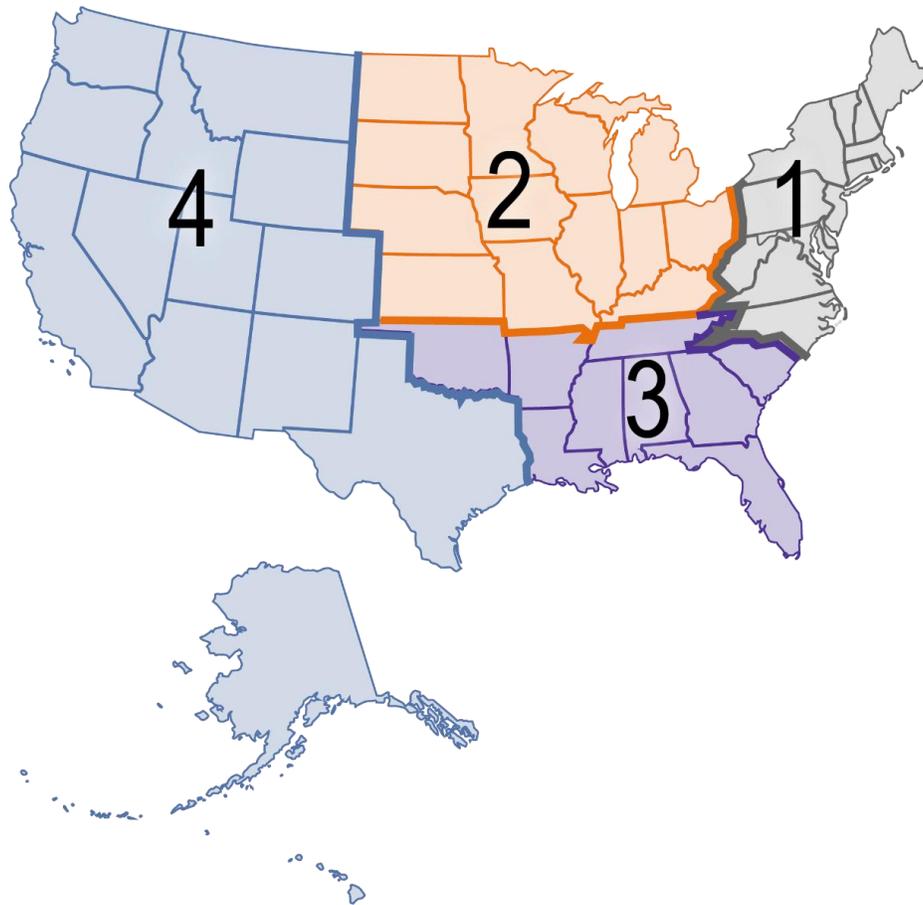


Figure 9: Community Care Network Regions

As shown in Figure 9, the Department has divided the new CCN into four regional networks, which provide local flexibility and increased access to care; unlike previous networks, these regions now align with state boundaries. The CCN will replace existing community care networks (i.e., Patient Centered Community Care and VCP), which will help VA address clinical and administrative issues. Additionally, VA will implement a standardized governance structure to support the CCN that clearly defines responsibilities, guidelines, and delegated authorities and concentrates on Veterans' needs. This governance structure for the CCN will facilitate the establishment of a high-performing CCP.

Figure 10 illustrates the high-level models of OIT systems associated with the CCP. The key components are the systems at the stated level of abstraction as well as their interfaces and capabilities. For clarity, the systems are grouped under key entities, such as VA, VA Edge Systems, Network Provider, Non-Network Provider, and VA Data Interface Layer.

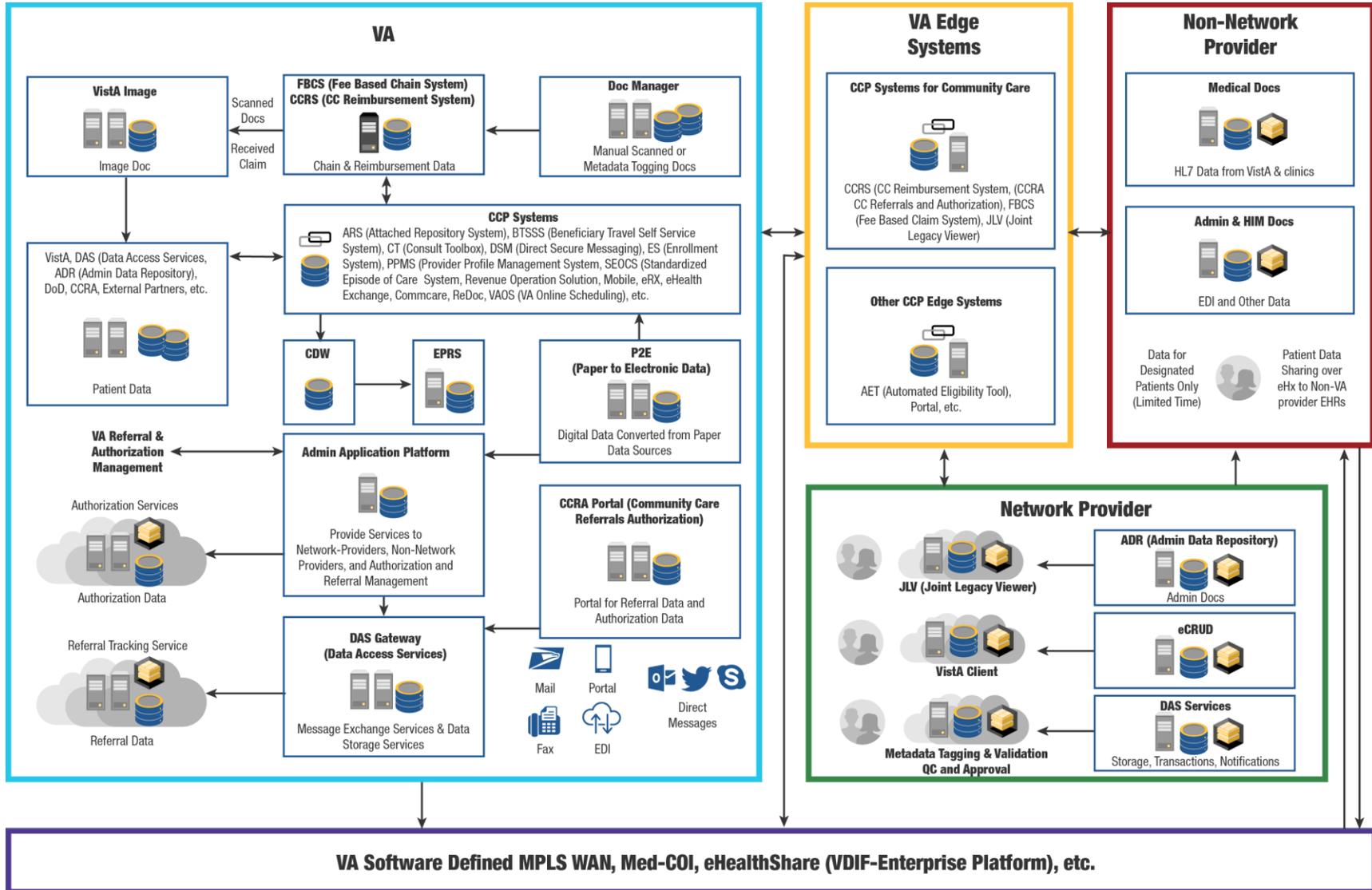


Figure 10: Community Care Future Environment Conceptual Architecture

Enrollment System Redesign

The Enrollment System Redesign (ESR) defines health benefit plans for which a Veteran is eligible and ties them to the authority for care. A Veteran’s eligibility is derived from Client enrollment applications, Military Service Information, rating decisions, financial information, and other factors. ESR supports the management of enrollment correspondence and telephone inquiries, sharing of eligibility and enrollment information with VA and non-VA organizations, and supports national reporting and analysis of VHA enrollment data. ESR provides self-service opportunities for Veterans which allows them to save, submit, and edit health benefit application information online. Additionally, ESR will enable VA to comply with MISSION Act legislation to include enhancing the enrollment system in order to comply with grandfather status eligibility requirements.¹⁶

Community Care Referral and Authorization

The Community Care Referral and Authorization (CCRA) is a modern enterprise-wide system used by community care staff to generate referrals and authorizations according to clinical and business rules. VA is utilizing HealthShare Referral Manager (HSRM)—a COTS product and Software as a Service (SaaS) application—to develop CCRA, which it will host in the VA Enterprise Cloud (VAEC). CCRA will manage medical records sharing as well as referral, authorization, and coordination of all VA care assigned to community providers. Additionally, this solution will provide an external portal for community care providers to receive referral packages that include relevant medical documentation. CCRA will yield the following benefits:

- Provide Veterans with prompt referrals to a community provider of their choice.
- Provide community providers with referrals and authorizations consistent with industry standards.
- Decrease the administrative burden on VA clinical and community provider staff.
- Facilitate communication between facility community care staff and community care providers via unified system that enables the secure exchange of medical information.
- Facilitate the complex business of VA referral management for community care staff by leveraging automated business rules and workflows.
- Increase Veteran access to care by reducing turnaround times for appointments. BXXB

Community Care Reimbursement System

In an effort to reduce administrative burdens on community providers and improve the timeliness of provider reimbursement, VA is developing the Community Care Reimbursement System (CCRS). CCRS is a COTS product that will store all CCP information related to reimbursements to community providers by the community contractor, which includes them in their network of providers. CCRS will capture applicable paid claim data and coordination of benefit information for third-party billing and first-party copayment liability determination. CCRS will simplify the reimbursement process and facilitate more effective episodes of care between Veterans and community care providers. VA will use the system to:

¹⁶ ESR helps meet MISSION Act Sections 101, 105, and 143 requirements.

- Validate claims submitted by contracted entities within the newly established CCN.
- Generate reimbursement payments to the contracted entities.
- Automate and facilitate post payment audit activities for reimbursements.
- Automate and facilitate revenue operation activities, such as identifying care that requires pre-certification with Other Health Insurance agencies.

Provider Profile Management System

The Provider Profile Management System (PPMS) is a centralized records management system repository that will be used by multiple portfolios to maintain provider agreements, contact information, credentialing and licensing data, and other non-VA provider information for each community care provider. Additionally, PPMS will store the authoritative information for all CCN providers and will include workflow and tracking capabilities. The Department will update provider information daily and host the system in VAEC as VA's searchable database with authoritative information for all community care providers.¹⁷

Community Care Provider Locator

Under the MISSION Act, it will be easier for eligible Veterans to find a community provider in VA's network, make an appointment, and get timely, high-quality care. VA is deploying new technology that improves communication and coordination between Veterans, community providers, and VA employees. Veterans can efficiently and effectively identify community providers in VA's network using the Community Care Provider Locator. The new tool pulls data from PPMS, the system of record for provider data, to locate community care providers. The Community Care Provider Locator will help Veterans identify the best suited community provider in their area. In addition to being available on VA.gov, the Community Care Provider is integrated with the VAOS application. This integration with VAOS will expedite community care scheduling and reduce appointment wait times.¹⁸ BXXB

Enterprise Program Reporting System

The Enterprise Program Reporting System (EPRS) is a clinical and business intelligence tool that enables Community Care and VHA Leadership to monitor the Veteran's journey through community care processes, supporting contractor accountability and informing program improvement efforts. Veterans may never interact with EPRS directly, but the system plays a major role in their community care experience. Network adequacy and the timeliness of care delivery are key priorities for Veterans and VHA, and the data collected and reported by EPRS are essential to ensuring that Veterans can access timely and appropriate community care. VA Community Care Leadership will use EPRS in order to successfully monitor operations of the CCP and CCN contract.¹⁹

¹⁷ PPMS helps VA meet MISSION Act Sections 102, 105, 108, 112, and 122 requirements.

¹⁸ CCPL helps VA meet MISSION Act Sections 101, 102, 105, and 143 requirements.

¹⁹ EPRS helps VA meet MISSION Act Sections 101 and 102 requirements.

Fee Basis Claims System

The Fee Basis Claims System (FBCS) is a web-based platform to host and consolidate claim data into a single system for newly received Purchased Care claims. Eligible Veterans can receive a wide range of healthcare services through Purchased Care, including Civilian Health and Medical Program of the Department of Veterans Affairs (CHAMPVA) benefits and Meds by Mail.²⁰

Claims Administration and Management System

The Claims Administration and Management System (eCAMS) is a Community Care claims processing software solution that modernizes processing of claims received from community care providers outside of VA's CCN. eCAMS is an integral component of VA's community care IT architecture that streamlines claims processing while improving efficiency and standardization. The system leverages auto-adjudication functionality and is reliant on valid data inputs to realize full automation capabilities. VA has also initiated integration of eCAMS and HSRM; this interface provides critical Veteran referral information from the HSRM system to eCAMS to ensure services billed to VA for Veteran care are in alignment with the services requested for that Veteran.²¹ However, these are appealable issues and eCAMS is currently not integrated with Caseflow.

Consult Toolbox

Referrals for care, otherwise known as “consults,” may be internal to the facility (provider to provider), inter-facility (VA to VA), or external (VA to non-VA), and they are managed through a consult management process. In an effort to improve VA's ability to oversee consults and manage the process more effectively, VA developed the Consult Toolbox. The Consult Toolbox is a single consult that staff members can forward as needed to schedule a patient for an episode of care, rather than the current system where staff members are required to re-enter data for each new consult. This enhancement to the current process makes it possible to document completed actions quickly and consistently, use consistent verbiage, and eliminate the need to take a second action or make a separate entry to track scheduling steps. Additionally, the consistent verbiage allows software analysis of records without needing to have software changes to VistA or the Computerized Patient Record System (CPRS). The Consult Toolbox will enable VA providers and community care staff to share statements for consults and track the Veteran through the community care experience.²²

Decision Support Tool

The Decision Support Tool (DST) is designed to standardize the way VA providers and staff determine the appropriate location for a Veteran to receive care. The DST can be accessed either during the consult order workflow or from a signed consult in CPRS. The DST informs VA providers and staff of the availability of services in VA and on the Veteran's eligibility for the new Veterans CCP. The DST consolidates the following information into one dashboard:

²⁰ FBCS helps VA meet MISSION Act Sections 101, 111, and 112 requirements.

²¹ eCAMS helps VA meet MISSION Act Sections 101, 102, 108, 111, 112, 113, 114, and 122 requirements

²² The Consult Toolbox helps VA meet MISSION Act Section 101 requirement.

- MISSION Act eligibility criteria for accessing care in the community.
- Veteran demographic information.
- Average drive times from the Veteran's residential address to local VA facilities that offer the requested consult service.
- Average wait times for local VA facilities that offer the requested consult service.
- Standard Episodes of Care.

This information guides the VA ordering provider's decision to refer a consult service within the local VA facility, to a nearby VA facility via Interfaculty Consult (IFC), or to a community care provider. The DST documents the outcome of the referral decision process. In addition, use of the DST generates structured data to report on system-wide compliance and utilization.²³

Referral Documentation

The Referral Documentation (REFDOC) is a web application that quickly compiles medical information from VistA and the Corporate Data Warehouse (CDW) to form a complete referral package for community care staff to send to community care providers.²⁴ It is an innovative tool that will enable future costs savings and improved care coordination. OIT has deployed REFDOC at 122 sites nationwide. When combined with Virtu Pro, VA staff eliminated the time-consuming tasks of scanning, faxing, and mailing patient records to community care providers, increasing the timeliness of Veteran access to services. REFDOC is credited with the following:

- Assisted 1,335 active users in creating over 818,837 packages.
- Avoided costs of approximately \$8.3 million.
- Improved timeliness of medical record transfers to third parties by reducing the average processing time by 10 minutes per package.

GetWellNetwork

GetWellNetwork is a platform that enables Veterans to manage their care and access resources. In 2017, OIT worked with VHA to enhance GetWellNetwork capabilities by integrating functionality with VistA. Veterans can now access important Veteran patient data—such as health education, goals, and preferences—using GetWellNetwork and VistA. Before this effort, a company like GetWellNetwork could collect Veteran health data but could not analyze it in a meaningful way. Collaboration between OIT and VHA created a way to accurately and securely integrate Veteran-generated information from GetWellNetwork into VistA. Additional functionality will potentially include expanding its use to emergency rooms, Community Living Centers, and other areas within VAMCs. BXXB

Future Environment

The MISSION Act will fundamentally transform elements of VA's healthcare system, and successful implementation of the legislation will empower VA to deliver quality care and timely service. The consolidated CCP within the CCN will strengthen VA by merging the Department's

²³ The DST helps VA meet MISSION Act Section 101 requirement.

²⁴ REFDOC helps VA meet MISSION ACT Section 101 and 131 requirements.

tangled web of community care programs into one that is simple for Veterans, VA employees, and community partners to navigate. CCN will replace existing community care networks and provide access to high-quality care both inside and outside of VA. It will be simpler for Veterans to compare access and quality across VA and community facilities, allowing them to make more informed care choices.

VA will also achieve transparency with community providers, supporting accurate and timely payments while enhancing quality of care and Veteran satisfaction. Modern community care will utilize standardized and digital clinical workflows that provide improved and consistent Veteran experience and deeper engagement with patients. Ultimately, VA will seamlessly coordinate care and exchange information with community care providers.

2.4 Other Health IT

Current Environment

Suicide is a National Public Health issue that affects all Americans. Preventing Veteran suicides is VA's highest clinical priority. On average, 20 Veterans, active-duty Servicemembers, and non-activated Guard or Reserve members die by suicide each day. Of those 20, 14 were not in VA's care. Therefore, VA is working to improve the transition from active duty to Veteran status, identification of at-risk Veterans, firearm and medication safety, and access to mental health services. Every day, more than 400 Suicide Prevention Coordinators and their teams—located at every VAMC—connect Veterans with care and educate the community about suicide prevention resources. Furthermore, VA and SoldierStrong have partnered on an initiative to use a virtual reality system to treat patients experiencing post-traumatic stress; through its StrongMind Virtual Reality System, SoldierStrong will donate virtual reality software and hardware to 10 VAMCs in the coming year with the goal to reduce the number of Veteran suicides across the country.

Additionally, VA offers a wide array of interventions designed to identify homeless Veterans, engage them in services, find pathways to permanent housing, and prevent homelessness from occurring. VA has made significant progress in ending Veteran homelessness. Since 2010, the number of Veterans experiencing homelessness in the U.S. has declined by nearly half, and over 700,000 Veterans and their families have been permanently housed or prevented from becoming homeless.

Drivers

VA's suicide prevention efforts are guided by its long-term plan published in summer 2018: the *National Strategy for Preventing Veteran Suicide*. The strategy focuses on adopting broad public health approach to prevention with emphasis on comprehensive community based engagement. Psychosocial health is a significant component of the whole health of a Veteran. Additionally, social determinants of health play a vital role in the type of care that VA provides to Veterans and their families. Consequently, mental health, suicide prevention, and homelessness prevention are issues that VA must actively address.

Veteran suicide is a national health crisis that requires coordination and collaboration between public, private, and nonprofit partners nationwide. The 2018 Executive Order *Supporting Our*

Veterans During Their Transition from Uniformed Service to Civilian Life directed DoD, VA, and the U.S. Department of Homeland Security (DHS) to develop a Joint Action Plan to provide access to mental health treatment and suicide prevention resources in the year following transition to civilian life.

Furthermore, the 2019 Executive Order *National Roadmap to Empower Veterans and End Suicide* created a task force to develop a roadmap for empowering Veterans to pursue an improved quality of life, preventing suicide, prioritizing related research activities, and strengthening collaboration across the public and private sectors. Technology advancements—such as AI, big data analytics, simulation modeling, and omnichannel customer relationship platforms—are shaping future solutions to address Veteran suicide and homelessness.

Transformative Initiatives

Status Query and Response Exchange System

The Status Query and Response Exchange System (SQUARES) is a web application that allows users to quickly confirm an individual’s Veteran status and eligibility by submitting his or her identity traits. At homeless service organizations that receive VA grants to serve Veterans, case managers use SQUARES to quickly screen the eligibility of individuals experiencing homelessness. Case managers at homeless shelters that do not receive VA grants to serve Veterans, and those on outreach teams also use SQUARES to identify Veterans among their caseloads and refer them to the richer array of services available to Veterans. Currently, VA provides a rudimentary version of SQUARES that queries the VA/DoD Identity Repository (VADIR) and only returns a likely Veteran indicator.

OIT developed a significant SQUARES enhancement on the Salesforce platform. In addition to VADIR, SQUARES 2.0 queries the Master Veteran Index (MVI) and the Enrollment System. It also provides users with identity traits of the matched individual(s) found in VA databases, which allow staff to assess whether the match is accurate; a nuanced Veteran status indicator that identifies key limits for homeless program eligibility; and VHA eligibility. The application will also allow users to submit bulk queries of Veterans rather than submitting each individual separately. Additionally, SQUARES 2.0 includes a robust user approval system to properly control the disclosure of a wider set of data fields within the enhancement.

Suicide Prevention Package

The Suicide Prevention Package (SPP) is an enhancement to the Mental Health Assistant (MHA) software application, which provides critical measures of a Veteran’s response to treatment. The project will enhance the MHA infrastructure by enabling Veterans to self-report using tablets and kiosk devices. Collected data will automatically transfer to Veterans’ EHRs and will support the field in more effectively measuring response to care and treatment effectiveness. The SPP will ultimately enable VA to provide effective, personalized treatment based on an individual’s response to specific therapies; it will help clinicians better diagnose Veterans and, in turn, strengthen the Department’s ability to manage Veterans at risk of suicide. Additionally, it will enhance VA’s mental health efforts to ensure availability of high-quality mental health services. BXXB

Suicide High-Risk Patient Enhancements

VA has worked to improve Patient Record Flags (PRFs) in VistA/CPRS. These flag assignments are a part of patients' EHRs, which are displayed to providers during the patient look-up process. VA relies on PRFs to identify patients whose current clinical status requires immediate action. This alert allows clinicians to provide critically needed care in a timely fashion, reducing the likelihood of a negative outcome.

OIT developed the PRF Ownership Enhancements and Adjudication Logic, which improves the consistency of the PRF display and the efficiency with which flags are updated, managed, and transferred between separate mental healthcare facilities. This enhancement provides significant improvements for flagging Veterans' charts when they are identified as being at high clinical risk for suicide. It allows PRFs to be reliably visible nationwide as well as improve national management of Veterans at risk of suicide and behavioral issues that require special accommodations. Facilities will be able to quickly and efficiently obtain management of Veterans' PRFs and update their high-risk flag status at the local site, which will then be updated at all care sites. Ultimately, the PRF Ownership Enhancements and Adjudication Logic will provide clinicians with the most current information, leading to informed decisions and sound treatment plans for Veterans.

Recovery Engagement and Coordination for Health – Veterans Enhanced Treatment

Recovery Engagement and Coordination for Health – Veterans Enhanced Treatment (REACH VET) is a program that uses a new predictive model to analyze existing data from EHRs and identify Veterans at a statistically elevated risk for suicide, hospitalization, illness or other adverse outcomes. To enhance the White House VA Hotline and Veteran Crisis Line, VHA and OIT partnered to provide hotline staff and VA mental health and primary care providers with access to REACH VET via their computers. Once at-risk Veterans are identified, their mental health or primary care provider contacts them to assess their well-being, review their condition and treatment plan, and determine if enhanced care is necessary. By engaging at-risk Veterans early, REACH VET reduces the frequency of adverse outcomes and allows VA to provide preemptive care and support for Veterans, in some cases before a Veteran even has suicidal thoughts.

Prescription Drug Monitoring Program Solution

The Prescription Drug Monitoring Program (PDMP) solution will enable providers to retrieve controlled substance prescription monitoring data from external sources and within patients' EHRs and electronic medical records, update patient progress notes with applicable prescription-related data, and efficiently use prescription and patient prescription history. VA clinicians will be able to use the PDMP solution to query state PDMP databases when providing patient care or performing administrative functions. The PDMP solution will link to state PDMP data resources to provide interstate PDMP data sharing and will integrate with VistA, CPRS, and EHRM.

Clozapine Modernization

The Clozapine Modernization project is a vital component of the overall effort to address Veteran suicide. Clozapine is the most effective medication for mentally ill, psychotic patients who are difficult to treat; it has demonstrated efficacy in improving quality of life and preventing suicide in this clinically-defined segment of VA patients. However, there are very rare but serious side effects that require clinicians to closely manage and monitor patients taking clozapine. The Clozapine Modernization project increases the efficiency and accuracy of VA's clozapine treatment system and ensures the ability to remain compliant with the Clozapine Risk Evaluation Management Strategy of the U.S. Food and Drug Administration (FDA). VA has developed functionality to allow for daily collection and storage of clozapine prescription and dispensing data, improving efficiency and safety of clozapine orders and dispensing for both inpatient and outpatient treatment of Veterans at high risk for suicide.

ScripTalk®

VA's new ScripTalk technology is a state-of-the-art information tool that generates prescription labels a Veteran can hear. The Department has enhanced ScripTalk memory capacity, allowing the tool to process and read lengthier information and instructions. This upgrade improves accessibility and safety for blind and visually-impaired Veterans, empowering them with the information they need to take their lifesaving medications safely and effectively. BXXB

Future Environment

VHA and VBA will significantly enhance collaboration with DoD and DHS on mental health and suicide issues through public-private partnerships. VA will reduce risk factors for Veterans at high risk of suicide and assist every eligible homeless Veteran in acquiring safe housing, healthcare services, employment opportunities, and benefits assistance. The Department will also collaborate with communities to develop practical and innovative solutions to prevent Veteran suicides and homelessness through the development of public-private partnerships. Measurement-based care systems will enable effective screening and assessment of Veteran's suicide risk and better equip healthcare providers to reduce symptoms and improve recovery through enhanced care. This will facilitate improved individual treatment plans and outcomes, as well as minimize the risk of suicide. Other IT enhancements will allow VA to provide preemptive and critically needed care to Veterans in a timely fashion by implementing Health Provider Systems like pharmacy programs (e.g., One VA Pharmacy and pharmacy automated dispensing) and updates from the VA National Center for Patient Safety, thus reducing the likelihood of a negative patient safety outcome. Finally, VA will comprehensively address opioid safety, pain management transformation, and treatment of opioid use disorder to reduce suicide risks.

2.5 Supply Chain Management

Current Environment

VA's supply chain delivers clinical care to Veterans by managing the flow of supplies and equipment. Currently, VA's supply chain system is comprised of a set of antiquated legacy and COTS systems with disjointed capabilities. The lack of integration with other VA systems

prevents the Department from achieving comprehensive financial, inventory, and supply chain management. VA has had a lasting need to replace its antiquated supply chain management system and has attempted to modernize the system in the past. However, disparate modernization efforts have led to a proliferation of enhancements, workarounds, and add-on systems. This has resulted in a fragmented supply chain environment that is difficult to maintain and accurately oversee. VA's current supply chain systems face numerous challenges. The supply chain environment is not fully interoperable with other key VA systems. Additionally, they are not equipped to address the complexity of decision making and integration required across functions, such as acquisition, logistics, and construction.

Drivers

The VHA supply chain delivers clinical care to Veterans by managing the flow of the Department's supplies and equipment, which are valued at \$161 million and \$12 billion, respectively. Accordingly, VHA supply chain costs are about \$8 billion per year.²⁵ This total includes management of both commodities and equipment throughout their lifecycles. Effective management of a supply chain is a major differentiator between high-quality and low-quality healthcare systems. Over the past decade, oversight bodies have identified ineffective performance by VHA's supply chain. This performance leads to patient safety issues and inefficient resource allocation.

In 2016, the Commission on Care reported that VHA could not modernize its supply chain to overcome cost inefficiencies because it is burdened with antiquated IT systems that inhibit automation. In 2017, GAO recommended that the Department consolidate and transform VA's medical supply chain organization, improve data standardization and IT systems, and standardize supply chain processes. The Drug Supply Chain Security Act (DSCSA) also drives supply chain modernization, as it outlines critical steps to build an electronic, interoperable system that will identify and trace certain prescription drugs as they are distributed within the U.S. Additionally, one of the VA Secretary Priorities is Business Systems Transformation, which includes VA's supply chain. Business Systems Transformation is essential to VA empowering its employees to provide world-class customer service. Technology advancements—such as AI, robotics, IoT, and blockchain—are shaping future solutions and competitive positioning in Supply Chain.

Transformative Initiatives

Supply Chain Transformation

The Supply Chain Transformation is an initiative designed to build a lean, efficient supply chain that provides timely access to meaningful data focused on improved patient care and financial outcomes. The holistic modernization effort will address people, training, processes, data, and automated systems by establishing a standardized supply chain organizational structure, a robust supply chain training and development program, an integrated data analysis capability, and a comprehensive equipment lifecycle management program. VA will achieve greater efficiencies by partnering with other Government agencies such as DoD and leveraging the

²⁵ V16-00127-002, VA Enterprise Adoption of DMLSS

expertise to modernize supply chain operations while remaining fully committed to providing quality healthcare.

Defense Medical Logistics Standard Support

Defense Medical Logistics Standard Support (DMLSS) is an integrated IT logistics system with a comprehensive range of medical material, war reserve material, and facilities management functions. The on-premise, client-server-based solution is a government off-the-shelf (GOTS) supply chain and healthcare logistics system employed throughout DoD's Defense Health Agency (DHA) that delivers an automated, integrated, and comprehensive range of medical logistics management functions. DMLSS provides an integrated supply chain system and a continuum of medical logistics support for DHA, including the full suite of medical logistics and supply chain management capabilities. Currently, DMLSS supports 54 Medical Treatment Facilities (MTFs) and 9.4 million beneficiaries.²⁶ The benefits that DoD has realized with DMLSS include:

- Reducing the time healthcare providers and professionals spend on logistics planning and management.
- Improving the effectiveness, efficiency, and quality of healthcare delivery.
- Enabling DHA to be compliant with federal standards from FDA, the Federal Information Security Management Act (FISMA), etc.

After supporting DoD for 20 years, DMLSS is undergoing a technical refresh and will fully transition to LogiCole through the conversion of all legacy, on-premise functionality to the single, Cloud-based application.

Defense Medical Logistics Standard Support Pilot

In an effort to foster collaboration with DoD and provide Servicemembers transitioning from active duty with a seamless experience, VA is implementing DMLSS as the single supply chain management system at the Captain James A. Lovell Federal Health Care Center (JALFHCC). Using DMLSS as the sole supply chain system, the pilot will deliver supply chain capabilities to the VHA and DoD staffs at JALFHCC. The DMLSS pilot will use the DMLSS environment already deployed within DoD and employ a technical solution for JALFHCC that utilizes the Inter Systems Health Connect interface between the DoD DMLSS application and VA's internal legacy systems.²⁷

Defense Medical Logistics Standard Support/LogiCole

VA has not selected a modern supply chain management solution for enterprise-wide deployment. One of the COTS and GOTS solutions that the Department is considering is DMLSS/LogiCole. LogiCole, the Cloud-based version of DMLSS, will be available as a shared service from DoD in FY 2022. Based on the success of the JALFHCC DMLSS implementation, VA will implement DMLSS as the supply chain management system at the EHRM IOC sites. DMLSS will be implemented on premise at the parent VAMCs (i.e., Mann-Grandstaff VAMC and Seattle

²⁶ <https://health.mil/I-Am-A/TRICARE-Beneficiary>

²⁷ V16-00127-002, VA Enterprise Adoption of DMLSS

VAMC), four months before the Cerner EHR IOC at each VA site. If VA chooses DMLSS for enterprise-wide deployment, VA will determine the transition timeline and process to LogiCole. Currently, DMLSS/LogiCole interfaces with MHS GENESIS, DoD’s implementation of the Cerner EHR suite. Since the Department intends to deploy the Cerner EHR, it potentially simplifies the required interfaces with the supply chain management system. Additionally, the Army is replacing their legacy financial system with CGI Momentum. Commonly known within VA as the Integrated Financial Acquisition Management System (iFAMS), it is the same COTS system that the Financial Management Business Transformation (FMBT) program is implementing to replace VA’s Financial Management System (FMS).²⁸ Partnering with other government agencies to implement a medical supply chain system with synergies to iFAMS and EHRM may enable improved resource efficiency, responsiveness, and safety when combined with data improvements.

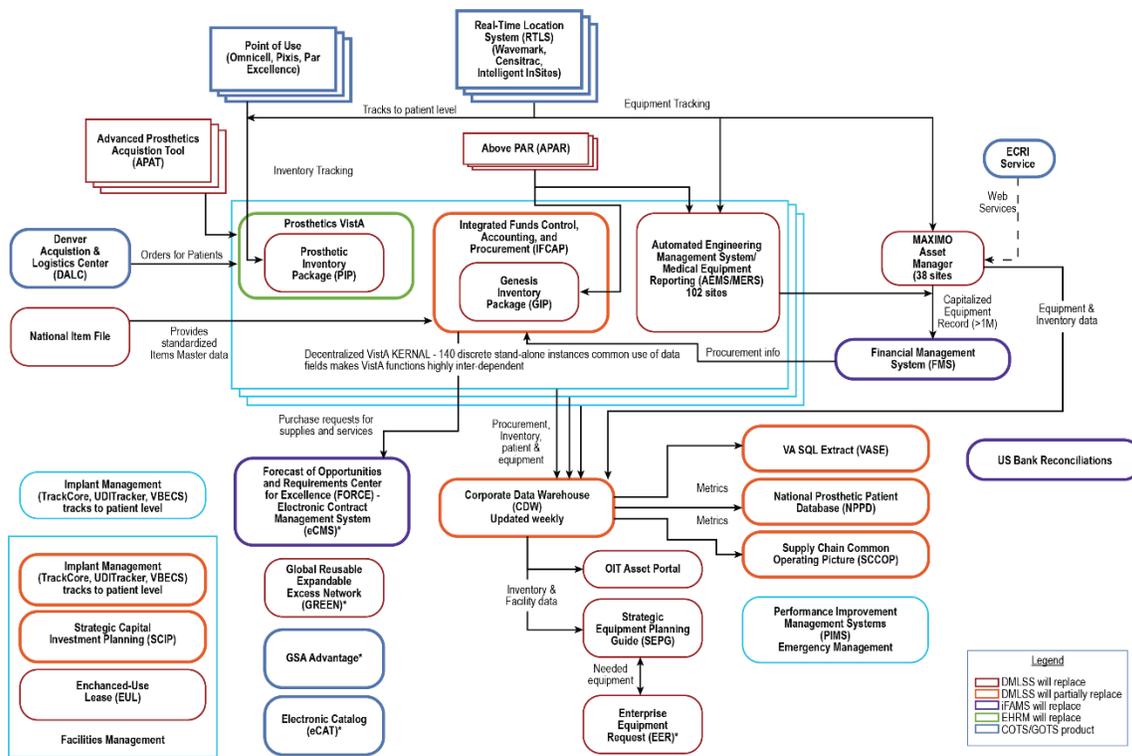


Figure 11: Current Environment of VA Supply Chain Management Systems

Figure 11 depicts the current environment of VA’s Supply Chain system, showing the supply chain systems and functions that EHRM and iFAMS will replace. Additionally, it depicts the systems that DMLSS will replace (if chosen as the enterprise-wide solution) and/or the functions that the modern solution will replace. Identifying VA’s modern supply chain solution for the future will lead to an updated version of Figure 11.

²⁸ V16-00127-002, VA Enterprise Adoption of DMLSS

Supply Chain Healthcare Master Catalog

VA lacks a Supply Chain Healthcare Master Catalog (SCHMC) that will enhance commodity total supply support with the integration of major functions/processes in a cohesive, standardized, and high-performing supply and demand management support system. This results in a lack of standardization, inconsistent ordering practices, and redundant contracts for identical products. The SCHMC will enable VA staff access to all VA and VHA medical commodity, prosthetic device, expendable equipment, non-expendable, and non-clinical products on contract at VA. Additionally, the catalog will aid in the Periodic Automatic Replenishment (PAR) process that DMLSS provides. VA's selection and implementation of will be a SaaS, Cloud-based catalog that harmonizes all contract information to become the single source of truth (SSoT) for all supply chain products available for procurement. The solution will also be fully searchable, using unique identifiers for each product in order to standardize and enrich data at over 140 VistA sites. The SCHMC is critical to the oversight of product visibility and establishing enterprise-wide best practices.

Future Environment

VA will pursue a holistic supply chain modernization effort that addresses people, training, processes, data, and automated systems, and it will leverage and strengthen its collaboration with DoD to modernize its supply chain. Based on the success of the JALFHCC Pilot implementation, VA will deploy DMLSS as the supply chain management system at EHRM IOC sites. The Department will implement DMLSS at the Mann-Grandstaff and Seattle VAMCs four months before the Cerner EHR IOC.

VA will also collaborate with DoD on an enterprise-wide adoption of DMLSS to replace VA's existing supply chain solution. Its implementation of DMLSS will ensure that the right products are delivered to the right places at the right time. This decision leverages a proven system that DoD has developed, tested, and implemented. DMLSS's synergies with the Cerner EHR and iFAMS will enable improved resource efficiency, responsiveness, regulatory compliance, access to care, quality, and safety when combined with data improvements. VA will determine the transition timeline and process from DMLSS to LogiCole. BXXB

3. Benefits and Memorial Services Portfolio

The Veterans Benefits Administration (VBA) supports Servicemembers and Veterans from the time they enter service to their final tribute when their service is memorialized. VBA provides this support by delivering benefits, which Veterans have earned, through its Lines of Business (LoBs), which include Compensation Service (CS), Pension and Fiduciary Service (P&F), Education Service (EDU), Vocational Rehabilitation and Employment (VRE), Loan Guaranty Service (LGY), Benefits Assistance Services (BAS), Office of Field Operations (OFO), Insurance Service (INS), and Office of Human Capital Management (OHCM).

The Board of Veterans' Appeals (The Board) has jurisdiction over appeals arising from various Agencies of Original Jurisdiction (AOJ), to include the VA Regional Offices (ROs), VA Medical Centers, the National Cemetery Administration (NCA), and the Office of the General Counsel (OGC). The vast majority, approximately 96 percent, of appeals considered involve Veterans' claims for disability compensation or survivor benefits. The projected appeals workload has prompted the Board, as the sponsor of the Appeals Process to work with their VA partners to seek a cohesive and unified strategy to address all aspects of appeals modernization across the Enterprise.

The National Cemetery Administration (NCA) systems and applications spearhead the support of Veterans' interment services. NCA honors Veterans and their families with final resting places in national shrines and lasting tributes that commemorate their service and sacrifice. NCA oversees 135 VA national cemeteries and 33 Soldiers' lots and monument sites in 40 states and Puerto Rico, many of which were established during the Civil War and are over 150 years old. Over four million Americans are memorialized by burial in VA's national cemeteries. NCA provides burial space for Veterans and eligible family members, maintains national cemeteries as national shrines, marks Veterans' graves with a government-furnished headstone or marker, and administers grants for establishing or expanding state and tribal government Veterans cemeteries.

This section documents the current environment, drivers, transformative initiatives, and future environment for the Benefits and Memorial Services Portfolio and contains the following the SCIF IT Capabilities:

3.1 Benefits

3.2 Memorials

See Appendix J for the FY 2018–2025 milestones associated with the Benefits and Memorial Services Portfolio and its respective capabilities. The milestones represent initiatives that VA will complete to achieve the future environment of the Benefits and Memorial Services Portfolio.

3.1 Benefits

Current Environment

VBA's mission is to serve as a leading advocate for Servicemembers, Veterans, their families, and survivors by delivering Veteran-centered, personalized benefits and services with

excellence. VBA accomplishes this by honoring their service, assisting in their readjustment, and gaining their full trust. As an IT capability, Benefits aims to provide technology solutions to support VBA's essential programs and services, delivering initiatives for digitization, modernization, automation, and interoperability of VBA's systems and processes to provide Veterans and their families the most efficient and timely service and benefits.

The Benefits technology environment is currently built on a multi-systems approach and outdated hardware and software that are becoming increasingly obsolete. Legacy systems often fail to integrate, and even where integration exists, extensive duplication of customer data and functionality leads to non-authoritative data sources and complex system interfaces. VBA must continue to utilize its legacy systems until new IT solutions are established to replace the functionality. These systems present technical difficulties with programming capabilities that result in inefficiencies and rework. For example, VBA employees currently use numerous workarounds for legacy systems, such as the Veterans Benefits Management System (VBMS), to execute operations.

There are several hundred workarounds and nearly 2,000 production defects for VBMS alone. Ongoing system maintenance and development place a substantial financial burden on VBA and contribute to technical debt. VBA's legacy systems also inhibit the consideration of COTS solutions and managed services. Additionally, VBA is dependent on external systems and agencies to complete claims processing. These dependencies perpetuate delays, prohibit timely processing, and create consistency and quality issues.

The Board's mission is to conduct hearings and decide appeals properly before the Board in a timely manner. In February 2019, OIT successfully released the final software updates necessary to implement the Veterans Appeals Improvement and Modernization Act of 2017 (AMA) functionality. The implementation of the AMA is completely altering the landscape by allowing for better and timelier processing of Veterans' Appeals. At the Board's Direction, OIT deployed the system enhancements necessary to implement the AMA across three major Benefits systems: Caseflow, Veterans Benefits Management Services (VBMS), and Benefits Gateway Services (BGS). In addition, the Board of Veterans' Appeals (the Board) continues to demonstrate its commitment to reducing legacy appeals and settled a historic number of appeals—85,288—in FY 2018, the highest number for any fiscal year. The Board is on pace to decide over 95,000 appeals in 2019.

Drivers

Legacy systems pose significant risks to VBA's and the Board's ability to provide benefits in a consistent, secure, and timely manner. Many of VBA's and the Board's legacy systems are built upon obsolete software languages and unsupported hardware. As the Board's primary IT system, Veterans Appeals Control and Locator System (VACOLS), increasing claims volume began to burden the effectiveness of the legacy system which impacted timeliness and Veteran experience. The inefficiencies required to conduct business through VACOLS and other legacy system have led to inconsistent Veteran experience, complex system interfaces, and duplication of customer data and functionality which leads to non-authoritative data sources. Legacy systems inhibit the consideration of COTS solutions and managed services. Diminishing knowledge of these legacy systems indicates an urgency for decommissioning efforts.

The VA Secretary Priorities and new legislation also drive Benefits and Board modernization. The Forever GI Bill, otherwise known as the Harry W. Colmery Veterans Educational Assistance Act, expands access to GI Bill benefits, eliminating the requirement for Veterans to use their Post-9/11 GI Bill benefits within 15 years of their last 90-day period of active duty service. Since the passage of the Forever GI Bill, VA has implemented 28 of the law's 34 provisions, 22 of which require significant changes to VA IT systems.

In addition to modernizing the Board's legacy IT system, AMA is transforming the benefit claims and appeals process by providing Veterans with new options for seeking review, requiring improved notification of VA decisions, and improving the turnaround time and quality of Appeals. VA implemented the AMA in February 2019, improving the appeals process by providing Veterans with three decision review lanes—Higher-Level Review, Supplemental Claim, and appeal to the Board. VA's goal is to complete Higher-Level Reviews and Supplemental Claims in an average of 125 days and decisions appealed to the Board for direct review in an average of 365 days. Modernization of VA's Enterprise Appeals Process is necessary to enable VA to adjudicate appeals efficiently to serve Veterans and their families with issuance of timely and quality appeal decisions. If the VA appeals process along with supporting technologies is not modernized, it will have a negative impact on Veterans, their families, dependents, and beneficiaries. BXXB

Recent legislative changes will expand and simplify access to benefits for Servicemembers and Veterans. To achieve the requirements of new legislation, VBA must significantly enhance the Benefits IT environment. To enable Benefits transformation, VA will leverage Cloud, virtual exams, Tele-counseling, AI, RPA, and API technology platforms.

Transformative Initiatives

Caseflow

The Board and OIT are streamlining the way appeals are processed by replacing the legacy system, Veterans Appeals Control and Locator System (VACOLS), with Caseflow, a web-based application. To meet the requirements of AMA, OIT built new functionality in the form of tools within Caseflow such as Caseflow Certification, Caseflow Reader, and Caseflow Hearing Prep. Caseflow Certification is a tool that automatically detects if required documentation has been added to an appeal before it moves forward in the process. This simple check will help reduce preventable errors and avoidable delays. Caseflow Reader streamlines the workloads of attorneys and judges at the Board while Caseflow Hearing Prep is a tool to improve judges' ability to prepare for and hold hearings at the Board.

Appeals modernization will enhance Veteran experience by adding self-service features via VA.gov and removing duplicative efforts. Reducing the number of manual activities will lead to fewer errors and improve the quality of service delivered to Veterans. Appeals automation will enable the retirement of the legacy system while streamlining the appeals process.

Virtual Hearings

In the past, Veterans have had few options for their appeals hearings. They could either go to a Regional Office for a video hearing using proprietary technology or travel to Washington, DC to

have their hearing at the Board. Virtual Hearings allow Veterans with the right technology to be anywhere that has strong internet access and experience their hearings in both sight and sound.

The Board and multiple OIT departments have collaborated to develop the first generation of Virtual Hearing technology. Early testing of the technology resulted in achieving the objectives of providing a remote alternative to onsite hearings. Now the teams are working toward the release of the second-generation technology which will integrate Caseflow with the VA Video Connect system. This initial operating capability will allow Veterans that are homebound or otherwise unable to travel to a Board hearing location to virtually attend a hearing with a Veterans Law Judge. Additionally, the technology provides more flexibility for Judges to preside over hearings remotely in case of inclement weather.

The first test of the first generation of Virtual Hearing capability began in July and formally ended at the beginning of October. The Virtual Hearing tests were extremely popular with the Veterans that participated in the tests. A full rollout of Virtual Hearings is expected in early 2020.

Veterans Benefits Management System

VA initially developed the Veterans Benefits Management System (VBMS) as an electronic repository for storing scanned paper documents so that VBA employees could access claims information and evidence electronically. However, VA identified opportunities for improving the claims process electronically and expanded the capabilities of VBMS. Currently, VBMS serves as the backbone of the disability claims process within CS. It facilitates faster delivery of disability benefits and consequently helps reduce the claims backlog and improve the accuracy and consistency of entitlement decisions. Since its inception, over 692 million documents have been scanned into VBMS eFolders, and VBA currently processes 98% of disability compensation claims electronically in VBMS.²⁹

In May 2019, OIT completed the migration of VBMS to the Amazon Web Services (AWS) Government Cloud. VBMS and its image repository are now hosted on a state-of-the-art, industry leading Cloud platform that vastly improves cybersecurity, scalability, resilience, and system response times. More significantly, the migration has enabled improved processes and capabilities to augment the quarterly VBMS version releases by introducing monthly interim releases, reducing the time to address defects that have significantly impacted the productivity of VBA claims examiners.

To further improve VBMS, OIT is developing Exam Management Vendor functionality within the system, which will enable VA to receive PDF documents of exam results in the VBMS eFolder. This functionality will encompass the VA Schedule for Rating Disabilities (VASRD), which is the rating schedule used as a guide in the evaluation of disability resulting from all types of diseases and injuries encountered as a result of or incident to military service. The percentage ratings represent as far as can practicably be determined the average impairment in earning capacity resulting from such diseases and injuries and their residual conditions in civil occupations.

²⁹ FY 2019 Operations Plan, EPMO

Additionally, OIT is implementing Separation Health Assessments, commonly referred to as the “Disability Exam” within VBMS. Quality Management Systems integrations such as Robotics (real-time adjudication tools) will assist Veteran Service Representatives and Raters in establishing disability connections in near real-time and perhaps even suggest appropriate legislative guidance that will improve consistency and quality among similar claims pending for similar contentions.

VBA anticipates building on the VBMS technological platform to develop the Benefits Integration Platform (BIP) as the unified Benefits platform and underpinning for automating future claims processing. VBA will leverage and enhance VBMS to ensure that BIP has the foundation necessary to consolidate all of VBA’s LoBs and provide enterprise-wide capabilities.

Benefits Delivery Network Decommissioning

The Benefits Delivery Network (BDN) is VBA’s primary database and payment system, which processes entitlements for CS, P&F, EDU, and VRE. Built on common business-oriented language (COBOL) mainframe applications, the legacy system hinders VBA’s ability to provide benefits in a secure and timely manner. The decommissioning of BDN is a VA priority and has targeted the legacy system for retirement since 2003. VBA partnered with VA OIT in 2017 to develop a decommissioning roadmap to migrate functions to more modern and advanced systems, while allowing the current system to continue processing benefits. The decommissioning roadmap decouples each BDN component from the existing network so that individual components can receive maintenance or upgrades without shutting down the entire system. Once decoupled, OIT will transition BDN functionality to modernized systems. For example, OIT will transfer compensation and burials to VBMS, pensions to the Finance and Accounting System (FAS), and payments to the Long-Term Solution (LTS).

Benefits Integration Platform

The Benefits Integration Platform (BIP) is a modern, unified claims platform for all VBA and NCA LoBs that will integrate Benefits-related capabilities. BIP will help VBA ultimately replace BDN, process Chapter 33 payments, provide timely claims processing and payments, streamline processing, and minimize manual claims work for field employees.³⁰ VA is focused on systems integration, coordination planning, IT software development, and integrated testing of all systems associated with BIP. Sections 107 and 501 of the Forever GI Bill changed the way monthly housing allowance payments are calculated, effecting nearly all Post-9/11 GI Bill Students. In December 2018, VBA announced its approach to implement the IT changes by December 1, 2019. In direct support of this initiative, VA has established a program integration office to lead integration of all business, technical and functional activities of the Colmery Act to ensure the solution meets stakeholder expectations and is deployed on time. VA has also established a program governance structure to serve as the decision authority for definition and enforcement of program activities to achieve successful implementation.

BIP will enable enhanced use of managed services and COTS solutions, as well as integration with iFAMS for all VA financial transactions. BIP will ensure that VA services are consistent

³⁰ FY 2019 Operations Plan, AMO

across LoBs, provide integrity of common information related to each Veteran, and normalize business processes for managing claims. Additionally, BIP will have enterprise-wide functionality in the form of the Corporate Database, National Work Queue (NWQ), and eFolder that will be accessible to all VA Administrations and Staff Offices. BIP will transition VBA from an application-centric model to one focused on delivering enterprise business capabilities that support common access, stakeholder integration, end-user satisfaction, and seamless Veteran-centric benefits and services. Benefits will transition VBA functionality to BIP through FY 2021, migrating major applications, such as Forever GI Bill Chapters, BDN, Veteran Service Network (VETSNET) benefits functionality, and the loan guaranty program. Additionally, Benefits will integrate the VA Loan Electronic Reporting Interface Re-Design (VALERI-R), a portal for loan servicers, and Caseflow, an application that streamlines benefit claims appeals, into BIP. As the platform continues to evolve, it may provide the opportunity to decommission other legacy systems.

Beneficiary Fiduciary Field System

The legacy Beneficiary Fiduciary Field System (BFFS) provides workload and case management abilities, generates letters, and completes VA Forms. P&F utilizes BFFS for fiduciary oversight to ensure compliance of their duties and responsibilities as required by regulatory policies and procedures. BFFS will be migrated from Microsoft Dynamics CRM to the Cloud-based Microsoft 365 to facilitate a more cost-effective and user-friendly platform that operates in a Cloud-based environment.

Tele-Counseling, Virtual Assistant, and Centralized Mail

A key driver behind VRE is the enhancement in the delivery of Veterans' earned benefits in a manner that honors their service. To accomplish this goal, VRE is working toward reducing the ratio of counselors to Veterans and providing field personnel with 3-in-1 devices and wireless hotspots. VRE will leverage the SaaS model to replace its current Corporate Case Management System with a robust, modern, and integrated Case Management Solution. This initiative will modernize the way VRE counselors are able to view and manage VRE cases through the implementation of Tele-counseling, Virtual Assistant, and Centralized Mail.

Tele-counseling, accessible on any device with a webcam and microphone, allows Veterans to meet with their Vocational Rehabilitation Counselor (VRC) virtually through VVC. Tele-counseling increases VA's responsiveness to Veterans' needs, reduces travel costs and time, and improves access to necessary VRE services. BXXB

Virtual Assistant will utilize a SaaS model and leverage AI to communicate with Veterans participating in the VRE Program. This technology will deliver routine communications, assist with appointment scheduling, and collection of digital documents from the Veterans as needed throughout their plan of service.

Centralized Mail will enable the receipt of all mail through a central portal, digitization, and storage of documents, such as the Veteran Counseling and Evaluation Records (CER), into the eFolder. This streamlines the intake and upload of documents received by the Regional Office (RO) into the eFolder and eliminates the need for a manual work around. Centralized Mail and eFolder will complete the overall transition to a paperless environment.

eFolder Enhancements

VBMS eFolder Enhancements will enable VBA to capture all Veteran non-health related information in one designated repository. This involves transitioning from an application-centric model to one focused on delivering enterprise business capabilities across VBA's LoBs, while capitalizing on investments-to-date to achieve interoperability goals and improve service delivery to Veterans and their beneficiaries. These enhancements will support VBA's desired integrated electronic operating environment and provide the ability to empower Veterans, engage business partners, and enhance VA operations across the enterprise by providing more immediate access and transparency to Veteran documents. Reducing the number of Freedom of Information Act (FOIA) and document requests across VA and ultimately decreasing the strain on personnel resources will positively affect productivity. Additionally, eFolder Enhancements will enable the retirement of multiple legacy systems (e.g., Virtual VA [VVA]) and reduce Veteran information security risks. GXXA

VA Loan Electronic Reporting Interface Re-Design and Enhancements

VA helps Veterans become homeowners through a home loan guaranty benefit and other housing-related programs. Private lenders provide VA Home Loans, and the Department guarantees a portion of the loan, enabling the lender to provide Veterans with more favorable terms. In an effort to improve VA's loan guaranty capabilities, OIT is implementing a VA Loan Electronic Reporting Interface Re-Design (VALERI-R). VALERI-R will be a web, rules-based solution that will enable loan servicers to monitor their VA loan portfolios and to report loan events to VA. In May 2019, OIT successfully deployed the first phase of a greatly improved VALERI-R portal, replacing an older legacy VALERI system, for both VA case managers and 43 VA loan servicing companies within the mortgage industry. The new Cloud-hosted VALERI-R system is not only more cost effective but additionally provides a more modernized and flexible technology stack, positioning VA to improve the electronic interface, more quickly introduce new capabilities, and adapt to industry, regulatory, and Veteran needs. The improvements will decrease turn-around time for changes and ultimately improve VA's effectiveness to intervene on the Veteran's behalf in situations of impending foreclosure and bankruptcy.

VALERI-R will improve oversight capability over VA's loan systems, increase security, and reduce the costs to service and liquidate VA-guaranteed loans at VBA. Once fully implemented, VALERI-R will integrate with FMS and iFAMS. VA will be able to use VALERI-R as a loan management, case management, and customer relationship management (CRM) application to address delinquent loans and monitor the activities of loan servicers. VALERI-R enhancements include the development of CRM capabilities within the solution and integration with a vendor loan origination system to enable self-service. VALERI-R will automate electronic requests to credit/payment organizations as well as modernize the Funding Fee Payment System (FFPS), Web-Based Loan Guaranty (Web LGY), Loan Underwriting, and Veterans Information Portal systems. VALERI-R and enhancements will enable VA to innovate on how the Department interfaces with its loan servicers.

Transformation of SAHSHA

VA administers two types of grants to assist seriously disabled Veterans and servicepersons in adapting housing to their special needs: Specially Adapted Housing (SAH) grants and Special Housing Adaptation (SHA) grants. SAH provides grants of not more than 50% of the cost of a specially adapted house, up to the total maximum allowable by law to eligible/qualified Veterans. SHA provides grants for the actual cost to adapt a house or for the appraised market value of necessary adapted features already in a house when it was purchased, up to the total maximum allowable by law to eligible/qualified Veterans. A fully customized platform that integrates SAHSHA with CS, VHA, and VRE systems to perform all necessary LGY functions will provide advanced technology solutions positioned to improve loan processing and benefits and service delivery through adopting modernized, fully-integrated systems on the BIP.

National Work Queue Enhancement

The National Work Queue (NWQ) is a paperless workload management initiative designed to improve VBA's overall productive capacity and assist with eliminating the claims backlog by processing all claims within 125 days with improved accuracy. The NWQ is designed to serve as an efficient method to process, develop, and adjudicate veterans' claims. Enhancements to the NWQ include the distribution of workload items, when appropriate, to the employee that initiated the previous action on the claim. The purpose is to improve the quality of benefits claims processing and to improve the employee experience. VBA is also working toward implementation of a singular, unified, dynamic system that will adjust with changes in business drivers.

National Call Center Consolidation

The VBA LoBs will consolidate VBA's contact center activities under the BAS umbrella into the National Call Centers (NCC). The VBA LoBs are experiencing technical difficulties and inefficiencies with their CRM tool and require enhancements that focus on increasing efficiency and enable call center employees to perform simple, non-rating tasks. The VBA LoBs will also enhance capabilities for RO public contact teams to enable the call centers to operate more efficiently and increase the quality of every customer interaction. Additionally, arrangements will be made to route Tier 1 calls from LGY Call Centers to the NCC. Simple inquiries, such as LGY claim status updates, can be fielded by NCC employees so that LGY Call Centers can focus on more complex issues. For more information on Enterprise Contact Center Modernization (ECCM), refer to Section 5.2.

Life Insurance Policy Administration Solution

The Life Insurance Policy Administration Solution (LIPAS) will replace the Veterans Insurance Claims Tracking and Response System (VICTARS) and Insurance Payment System (IPS), which are aging mainframe and client server applications, and will modernize business processes, and integrate Veterans' insurance records with the VBMS eFolder and VBA Corporate database. A modernized insurance system is needed to provide a sustainable solution that improves operations through a modern, Cloud-based/web-based, real-time commercial insurance product to be managed by a contractor and hosted in VAEC. The system will provide instant

feedback to employees when account changes are made instead of requiring an overnight processing period as currently implemented with VICTARS and IPS.

Disability Compensation Claim Tool

VA has developed and implemented a user-friendly online Disability Compensation Claim Tool to make it easier and more efficient for Veterans to submit disability claims. Rolled out in March 2019, the tool features new interactive questions to automatically populate the claims form and allows users to review their responses before submitting the form online. In the first month alone, Veterans submitted 3,000 benefits compensation claims using this new tool. As a part of this tool, VA also released an enhanced Benefits Appeals Status Tool that is relieving the burden of VA's legacy appeals process for over 24 million Veterans. It improves the Veteran experience by modernizing the claims process, allowing Veterans to see the status of their claim decision, make updates, and request additional review from a user-friendly website.

Legacy System Decommissioning

VBA and the Board's legacy systems are becoming increasingly outdated, with many being dependent upon obsolete software languages and unsupported hardware. Legacy systems have led to an inconsistent Veteran experience and inhibit the consideration of COTS solutions and managed services. Legacy systems also duplicate customer data and functionality, which leads to non-authoritative data sources and complex system interfaces, and pose significant risks to VBA's ability to provide benefits in a consistent, secure, and timely manner. Therefore, Benefits will transition functionality from legacy systems such as VETSNET, Search and Participant Profile, VACOLS, Control of Veterans Records System (COVERS), FFPS, the Personal Computer Generated Letters (PCGL) system, and VVA.

Future Environment

Benefits aims to provide advanced technology solutions positioned to improve benefit claims processing, appeals processing, case management, and benefits and service delivery. VBA will orient the future environment around a uniform, Veteran-centric approach known as BIP. Built on the technological foundation of VBMS, BIP will consolidate common services and capabilities and operate as VA's unified benefits and services platform, expanding the framework for web application development and a graphical user interface. BIP will support VA's buy-first strategy for services that can be delivered most effectively through managed services or COTS solutions. Additionally, VBA will leverage human-centered design to develop functionality, interfaces, and modernize systems to improve the Veteran experience in terms of accessing benefits and services. BXXB

VBA will drive toward application modernization resulting in greater availability of standard platforms, common data sharing, and a standardized approach to software delivery. A suite of strategies will drive VBA's core modernization efforts: leveraging integration of more functionalities into VBMS, increasing utilization of Cloud-based commercial products, enhancing currently-integrated systems, standardizing record sharing between federal agencies, and replacing or retiring as many legacy systems as possible. Additionally, the Board intends to deliver appeals processing and management capabilities that support configuring and implementing a Veterans-centric appeals processing and management solution.

The Board will drive toward application enhancements to Caseflow in order to intake decision reviews and to process appeals from VBA, VHA and NCA. These enhancements will also serve to improve the timeliness of decisions. Virtual Hearing capabilities will also be augmented to take advantage of strategic partnerships that improve availability of video conferencing equipment to Veterans near their homes.

3.2 Memorials

Current Environment

The National Cemetery Administration (NCA) oversees the largest cemetery system in the country with over four million Americans memorialized by burial in VA's national cemeteries. VA developed the Burial Operations Support System (BOSS) as NCA's main IT system to ensure that all aspects of the interment process are completed efficiently and effectively. BOSS supports cemeteries nationwide with 3.5 million occupied gravesites and processes over 100,000 new interments annually. The legacy system consists of 14 custom-developed modules that are complex and difficult to update. Collectively, these applications are referred as BOSS Enterprise, or BOSS-E.

Implemented in 1994, the system is no longer compatible with VA's needs, and NCA's continued reliance on BOSS-E is a major risk. The legacy IT system fails to comply with security and accessibility requirements, lacks integration with other Benefits systems, and relies on manual processes. To transition to a modern solution and decommission BOSS, NCA is developing the Memorial Benefits Management System (MBMS).

Drivers

NCA's legacy IT systems cause operational inefficiencies and present security risks. Specifically, its legacy case management system, BOSS-E, lacks the functionality of a modern software application. It requires NCA personnel to manually perform scheduling via a text file that can be interpreted multiple ways. Manual processes can lead to high hold times and present opportunities for improper scheduling. NCA must implement robust IT systems to address current risks, adapt to increasing Veteran interments, and ultimately enable efficient delivery of memorial benefits to Veterans. Modernizing legacy systems and processes is one of VA's strategies in its FY 2018–2024 Strategic Plan. It also aligns with VA's objective of IT Modernization and PMA Cap Goal (Goal 1) related to IT modernization.

Modern solutions are required to improve access to memorial benefits tracking and delivery as well as end-user functionality. These solutions will enable NCA to continue to provide excellent customer service that is consistently positive for Veterans and their families in terms of ease, effectiveness, and emotional resonance. Furthermore, in his 2018 Memorial Day Proclamation, the president announced the development of a single-source tool to memorialize Veterans and safeguard their legacy. Cloud technology and APIs are also driving the development of the Veterans Legacy Memorial (VLM).

Transformative Initiatives

Memorial Benefits Management System

VA is implementing a modern solution for Memorials, Memorial Benefits Management System (MBMS), that will automate manual NCA business processes and enable the Department to decommission legacy Memorials systems, platforms, and processes. VA has migrated MBMS to the Cloud and will leverage and expand BIP functionality to incorporate NCA requirements and develop MBMS, increasing standardization and access to authoritative data across LoBs. The system will automate all business processes associated with monument ordering, delivering, and tracking; provide a complete historical record for each monument application; and automate all manual, paper-intensive record keeping as well as information and forms processing associated with over 100,000 yearly interments. MBMS will also enable NCA end-users to perform eligibility, benefits, and cemetery management functions using one system.³¹ Figure 12 depicts the MBMS future environment through conceptual infrastructure.

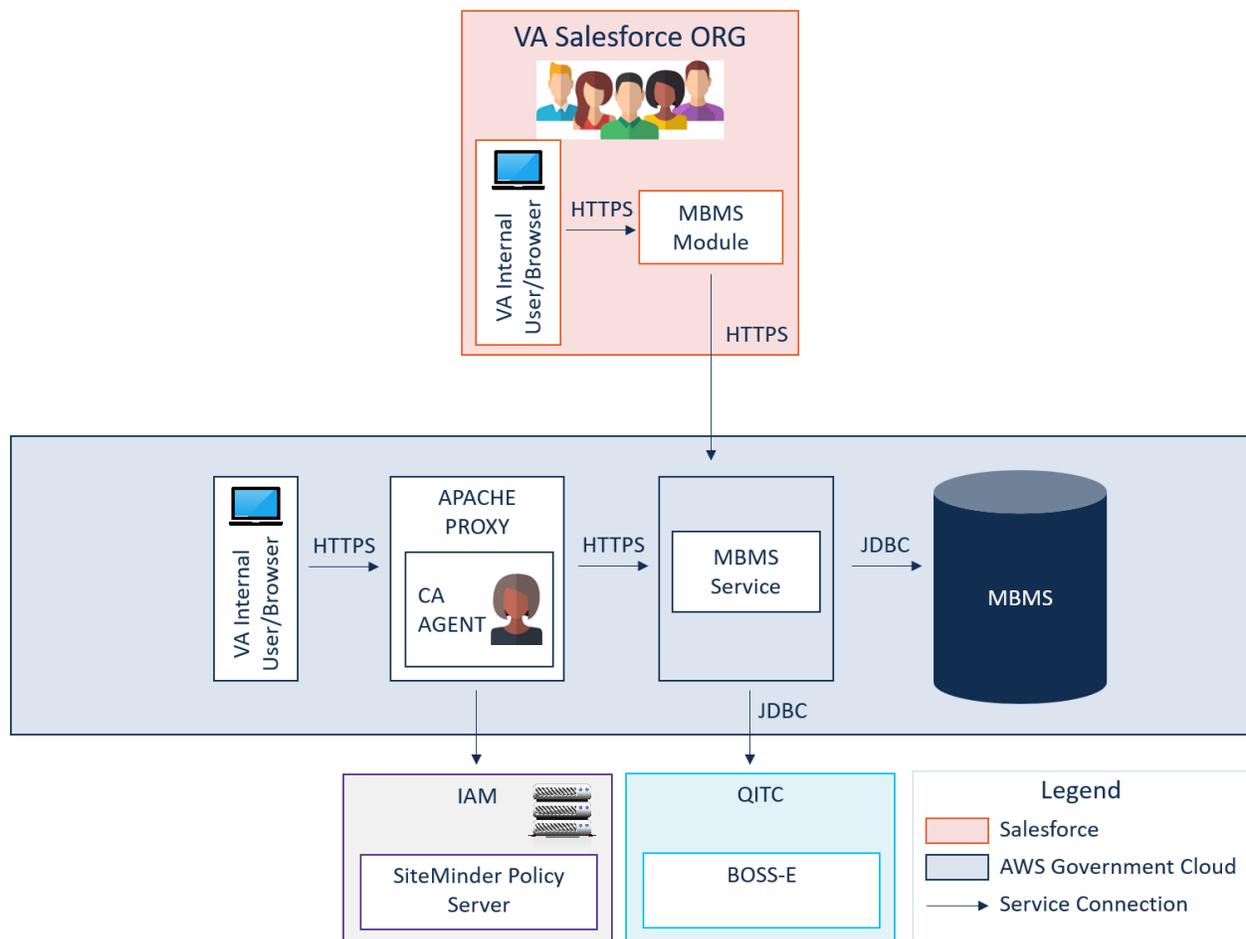


Figure 12: Conceptual Interim MBMS Infrastructure Design

³¹ FY 2019 Operations Plan, Account Management Office (AMO)

Burial Operations Support System Enterprise Decommissioning

VA will decommission the 14 custom-built legacy systems within the Burial Operations Support System – Enterprise (BOSS-E) and transition users from these legacy Memorials systems by leveraging BIP capabilities, VA systems, and COTS solutions. It will migrate the functionality of the following mission-critical IT systems into MBMS and then decommission these systems as part of BOSS-E:

- Burial Operations Support System (BOSS)
- Automated Monument Application System (AMAS)
- Eligibility Office Automation System
- National Gravesite Locator (NGL)
- Presidential Memorial Certification

Veterans Legacy Memorial

The Veterans Legacy Memorial (VLM) is an interactive online memorialization solution designed to honor the service and sacrifice of the nation's Veterans. The digital memorial space will allow visitors to honor and pay their respects to Veterans interred at VA national cemeteries by allowing public contributions to Veterans' pages. VLM online portal will also have digital pictures of headstones and markers as well as burial records that family members, survivors, and friends can view. Figure 13 depicts VLM's target architecture with user interfaces and data feeds.

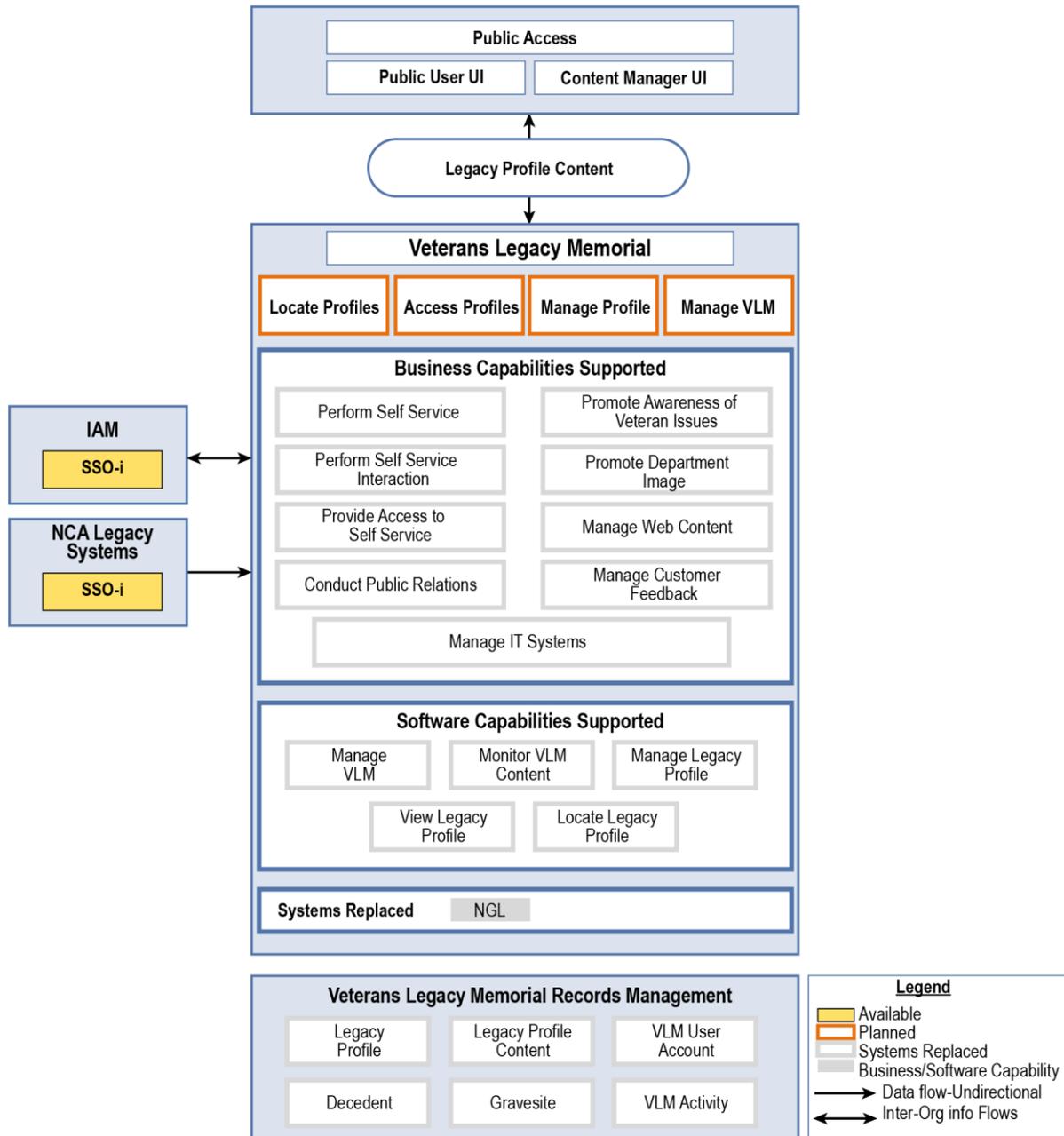


Figure 13: VLM High-Level Target Architecture

Future Environment

NCA will implement MBMS to replace BOSS-E and its legacy applications with a more cohesive, compliant, and functional enterprise platform that seamlessly integrates with VA's systems. MBMS will streamline VA's management and operation of the cemeteries that NCA oversees. It will serve as NCA's system of record once VA migrates all BOSS-E applications to the modern platform. Furthermore, VA will leverage shared services in order to meet the needs of NCA and realize cost savings by reducing duplicative and antiquated systems. NCA will use VA enterprise-wide solutions where available and purchase COTS solutions for services that are integral to NCA's mission but do not currently exist within VA. For these reasons, ensuring that Memorials functionalities connect effectively with systems in other Portfolios will be key to the success of Memorials modernization.

Memorials' initiatives will lead to new features that benefit Veterans and NCA employees. These features include seamlessly referenced authoritative data from appropriate sources, automated approvals, and GIS digital mapping that allows cemetery visitors to obtain walking directions to gravesites via their cell phones. Additionally, Veterans and their families will be able to submit self-service Pre-Need or Time of Need applications for burial services. The implementation of a digital online memorialization platform such as VLM will preserve, commemorate, and share the stories of Veterans and will provide a digital memorial page (e.g., Veteran data, pictures, and videos) for each Veteran interred at VA national cemeteries. MBMS will enable users to perform Eligibility, Benefits, and Cemetery management seamlessly. It will improve CX and reduce processing time dramatically.

4. Corporate Services Portfolio

This section will provide an overview of the initiatives within the Corporate Services Portfolio, which will contribute to increased efficiency of VA's back-office operations, enterprise resource planning, improved access to services, and enhanced CX for Veterans.

This section documents the current environment, drivers, transformative initiatives, and future environment for the Corporate Services Portfolio and contains the following SCIF Capabilities:

- 4.1 Customer Relationship Management
- 4.2 Finance and Acquisition
- 4.3 Human Resources

Current Environment

The Corporate Services Portfolio provides IT support to VA's Administrations, Staff Offices, and boards—including the Office of Management, Financial Services Center (FSC), Office of General Counsel, and HR&A—and consists of customer service and back-office operations that are integral to running the business at VA. Currently, the Corporate Services Portfolio relies on multiple outdated and interconnected systems that have outlived their effectiveness. VA's use of obsolete legacy systems and different platforms has created a fragmented environment with unstandardized processes and, as a result, inconsistent CX. However, through Corporate transformative initiatives, VA is taking steps to transform its Customer Relationship Management (CRM), Finance and Acquisition, and Human Resources (HR) technology to improve the Department's service to Veterans.

Drivers

Both internal business imperatives from across VA and external guidance drive Corporate modernization efforts. The current Corporate technology environment leads to significant costs, operational risks, decreased efficiency, and unpredictable CX. Key legacy systems are extremely outdated, with VA's legacy financial and HR systems being over 30 and 50 years old, respectively. These legacy systems also fail to comply with federal regulations and mandates. VA's modernization strategy within the Corporate Services Portfolio is further guided by the PMA, OMB's mandate regarding financial shared services, and a government-wide Center of Excellence (COE) for call centers.

Transformative Initiatives

The Corporate Services Portfolio includes the following key transformative initiatives:

- VA Integrated Enterprise Workflow Solution (VIEWS)
- White House VA Hotline
- Financial Management Business Transformation (FMBT)
- Personnel and Account Integrated Data (PAID) System Decommissioning
- HR Shared Services
- Human Capital Business Reference Model (HCBRM) Alignment

See Appendix K for the FY 2018–2025 milestones associated with the Corporate Services Portfolio and its respective capabilities. The milestones represent initiatives that VA will complete to achieve the future environment of the Corporate Services Portfolio.

Future Environment

VA envisions the Corporate Services Portfolio as an integrated service delivery platform that places the Veteran at the center. Integrated systems will enable cost savings, operational efficiency, and improved access to benefits and services. This will ultimately strengthen the Department's ability to provide care and services to Veterans and enhance CX. VA will employ, and promote further adoption of, shared services within the Corporate Services Portfolio. In addition to shared services, the Department will use COTS and GOTS solutions to provide a modernized experience across functional areas. These solutions will allow VA to replace outdated legacy systems and comply with federal requirements. HXXA

4.1 Customer Relationship Management

Current Environment

In an effort to effectively communicate with the population that it serves, VA uses various Customer Relationship Management (CRM) technologies. These channels of communication are especially important for Veterans and their families, as they typically engage with VA during times of need. However, VAMCs and other VA facilities use differing CRM technologies, which has led to a proliferation of non-standardized tools and inconsistent experiences for customers. VA currently utilizes legacy and commercial tools (e.g., Salesforce, Microsoft Dynamics 365, and ServiceNow) for both internal and external engagement purposes.

The Department is committed to creating an interactive experience with the Veteran that is consistent, easy, intuitive, and personalized. Therefore, VA is planning to transition all of its contact centers and associated CRM and knowledge management (KM) tools to a single enterprise application. Currently, VEO is engaging key stakeholders and using human-centered design techniques to elicit and document business requirements for an enterprise CRM platform. Additionally, the Department has replaced the VA Intranet Quorum (VAIQ) with VIEWS—a modern, Cloud-based document and workflow case management system. VEO has also leveraged Salesforce to develop the White House VA Hotline for at-risk Veterans.

Drivers

VA's use of disparate CRM technology results in inconsistent Veteran experience and inhibits its ability to track a single engagement record. The Department must develop a CRM strategy and implement a unified platform in order to address these issues and provide excellent customer service. One of VA's goals is to unify its CRM technology using best practices from the public and commercial industry. VA is currently working with the White House, OMB, and the U.S. General Services Administration (GSA) to support a government-wide COE that is dedicated to call centers, initially focusing on Tier 1 help desks. This COE will assist VA in considering a unified CRM strategy for enterprise-wide deployment.

Furthermore, as a part of VA's CRM strategy, an enterprise CRM platform would enable cost efficiencies; improve Veteran engagement, trust, and access to services and benefits; and support data-driven, Veteran-focused organizational improvements. CX is a key component of the FY 2018–2024 VA Strategic Plan, and the Department has a CX Policy that includes three pillars: CX capabilities, CX governance, and CX accountability. PMA CAP Goal 1 (IT Modernization) and CAP Goal 4 (Improving Customer Experience) also drive CRM transformation. Technology drivers for this transformation include advanced analytics, AI (e.g., ML and natural language processing), Cloud, and standard APIs. The Digital Transformation Center will support VA's pursuit of improved CRM capabilities through innovative technology.

Transformative Initiatives

VA Integrated Enterprise Workflow Solution

After multiple attempts to deploy a separate VAIQ correspondence management system, VA charted a path toward a modern enterprise correspondence and case management solution. Consolidation of current capabilities into a single product provides a more efficient and effective way of collecting, managing, and tracking documentation, and the VA Integrated Enterprise Workflow Solution (VIEWS) is the first step toward eliminating one-off disparate systems and reducing VA's IT footprint. Built on the Salesforce platform, the solution integrates correspondence and case management functionalities into one system and enables VA to better coordinate requests and correspondence from internal and external stakeholders. VA's primary correspondence customers include Veterans and their families, Congress, state and local officials, Veterans Service Organizations (VSOs), the White House, and government agencies. VIEWS provides integrated visibility, resulting in a more comprehensive and timely response, and increases productivity through shared resources and a standardized process for intake, delegation, and tracking of documentation.³²

White House VA Hotline

More than 60 agents who have extensive training on VA programs and services staff the White House VA Hotline, which began under the direction of VEO in 2017. Live agents answer calls 24 hours a day, seven days a week, and 365 days a year and conduct immediate warm handoffs for at-risk Veterans in need of Veterans Crisis Line services. Of these agents, 93% are a Veteran, military family member, caregiver, or survivor. The hotline also interfaces with the MVI, enabling agents to identify and support callers efficiently. Trends identified by the hotline are used to rapidly respond to systemic inefficiencies and empower VA employees to resolve Veterans' concerns quickly. VA is planning key enhancements to the White House VA Hotline including incorporating additional reporting capabilities, self-service for Veterans, and enhanced call center capabilities.³³

³² FY 2019 Operations Plan, Account Management Office (AMO)

³³ White House VA Hotline Website

VA Enterprise Case Management Solution

VA offers case management services to Veterans and families to meet their comprehensive health needs through communication and available resources and to promote patient safety, quality of care, and cost-effective outcomes. In order to better serve Veterans, VA is implementing a modern VA Enterprise Case Management Solution (VECMS) that will be available to all VA Administrations and Staff Offices. VECMS will leverage Salesforce to provide VA with a modern platform to support all of the Department’s case management efforts, including outreach, intake, mission execution, relationship management, and analytics. As part of VECMS, VA will also develop modules to modernize mission-specific case management solutions across the enterprise. VECMS will help deliver a comprehensive view of case management and improve real-time reporting, collaboration, and CX. Additionally, the solution will enable VA to decommission legacy case management tools in the future.

Future Environment

VA will create a “post channel” world in which multiple forms of interaction or omnichannel engagement (e.g., hub, chat, and secure messaging) blend to create the best CX. Accordingly, VEO is pursuing an enterprise-wide, Veteran-centric technology customer service environment, which will provide VA with an integrated customer service delivery platform. The Department will define and implement a unified CRM strategy built on this integrated commercial platform in order to improve Veteran, beneficiary, and partner access to VA through state-of-the-art CRM and self-service tools, such as VA.gov. Such self-service will create a customer care feedback loop and customized self-service interactions.

Using an enterprise CRM platform, VA will gather data and communicate with Veterans through the channel of their preference, and VEO will become the sole supplier of authoritative customer information for new and legacy systems. This platform will provide a consolidated interface and means of answering, tracking, and reporting contact points to improve CX and service delivery. Overall, it will more effectively serve Veterans through consistent engagement and access to VA care, benefits, and services. The enterprise-wide CRM solution will ultimately allow VA to proactively deliver the right care to the right Veterans at the right time. The Department will be able to build long-term relationships as part of a holistic approach that treats Veterans—not just their conditions. BXXB

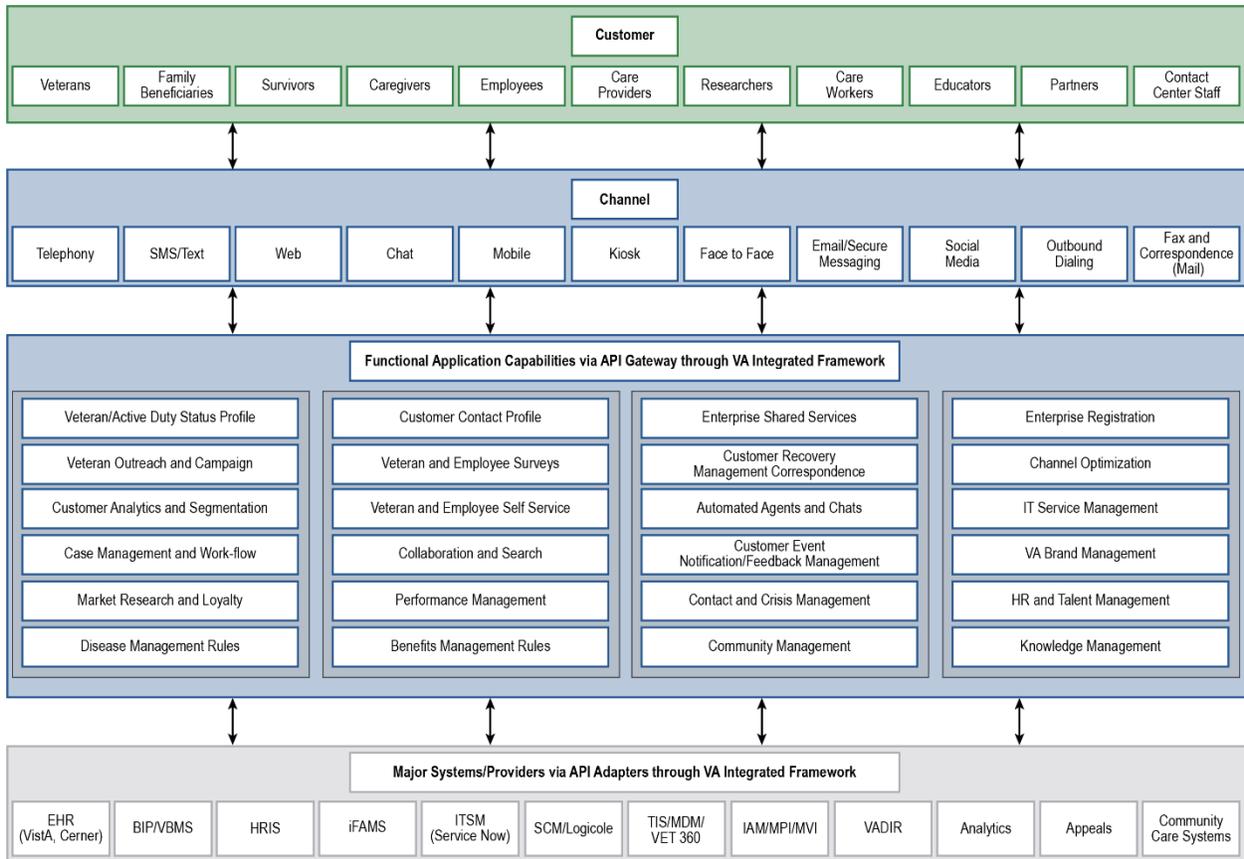


Figure 14: CRM Future Environment Reference Architecture

Additionally, to support the development of future CRM architecture, VA has created the CRM reference architecture depicted in Figure 14. The Department will be able to use this reference architecture to select the best delivery method for particular CRM-related technologies. There are four layers of logical components that are critical to support key CRM functions: customer, channel, application, and system. Between layers, interrelationships and interfaces emphasize the importance of integrating these layers and their logical components.

4.2 Finance and Acquisition

Current Environment

Like other systems in the Corporate Services Portfolio, VA's current financial system, the Financial Management System (FMS), is outdated and ineffective. FMS is also non-compliant with several federal regulations, including U.S. Government Standard General Ledger requirements. FMS has over 100 primary interfaces with legacy systems, and its hardware and software are no longer updatable. This legacy software prevents the Department from fixing audit issues, including security and privacy concerns.

VA has cancelled two major efforts to replace FMS since 1999. Prior to the FMBT program, VA's last attempt to implement a new financial system ended in 2010. This has led to a proliferation of FMS enhancements and workarounds and the development of add-on systems, resulting in a fragmented financial system environment. To replace FMS, the FMBT program is implementing

iFAMS as VA’s modern financial management and acquisition system. Commonly known as VA’s “three-legged stool,” the Department is carefully coordinating the implementation activities of iFAMS, the Cerner EHR, and DMLSS through enhanced governance and oversight, thereby improving accountability and transparency. Specifically, the VA Modernization Board has initiated a Leadership Integration forum to synchronize the development schedules of the three major enterprise initiatives.

Drivers

VA’s legacy financial and acquisition management systems are over 30 years old. This poses operational risk, as it becomes more challenging to technically and functionally support these legacy applications each year. VA is unable to meet federal financial regulations and mandates, including the Digital Accountability and Transparency Act of 2014 (DATA Act), due to its inability to update legacy code and the lack of integration between the legacy finance and acquisition systems. PMA CAP Goals 1 (Improving Customer Experience), 9 (Getting Payments Right), and 11 (Improve Management of Major Acquisitions) also drive VA’s financial modernization. Cloud, AI, and RPA technology will be key technology drivers for this modernization.

Additionally, OMB Memorandum 13-08, *Improving Financial Systems through Shared Services*, directs all executive agencies to use a shared services solution for future modernizations of core accounting or mixed systems. In accordance with OMB’s mandate, VA chose the U.S. Department of Agriculture (USDA) as its Federal Shared Service Provider (FSSP) in September 2016 to guide its migration to an integrated financial and acquisition management solution. However, in December 2017, USDA officially notified VA that it would no longer serve as an FSSP in support of FMBT. As a result, the Department phased out USDA as its FSSP and has solely managed the FMBT program since January 2018.³⁴

Transformative Initiatives

Financial Management Business Transformation

The Financial Management Business Transformation (FMBT) program is implementing iFAMS to replace the legacy financial management system, FMS. FMBT is using industry best practices and an Agile Framework for project management in order to improve cross-workstream collaboration and focus on delivering business value sooner. The Agile Framework focuses on implementing the highest priority requirements first and is specifically tailored to FMBT to help deliver iFAMS in small increments. Therefore, FMBT will deliver the iFAMS solution in multiple iterative and concurrent waves while maintaining strategic oversight and management.³⁵

The FMBT IT Division leads VA’s transition to iFAMS. They must analyze nearly 200 interfaces involved in VA’s financial management data transmission and over 100 legacy systems to

³⁴ United States Senate Committee on Appropriations Request for Information (RFI) Financial Management Business Transformation (FMBT) Status Update May 2018, Page 2

³⁵ United States Senate Committee on Appropriations Request for Information (RFI) Financial Management Business Transformation (FMBT) Status Update May 2018, Page 4

support the design of iFAMS and prepare for data migration and security requirements. Throughout implementation, the program has engaged over 300 SMEs and Program Advisors across all VA Administrations and Staff Offices.³⁶ These personnel have been involved in the business process reengineering effort and have driven the base configuration of the system, which FMBT will leverage for each subsequent wave implementation.

The iFAMS modules will subsume many of the functions currently performed across multiple VA legacy systems (e.g., acquisitions, budget execution, general ledger, and performance budgeting). iFAMS will also offer new features and capabilities that help users and stakeholders analyze data and ultimately improve the efficiency and effectiveness of financial and acquisition management. VA will benefit from real-time integration of financials through a single, consolidated system, gaining the following inherent functionality:

- A consolidated view of all acquisitions and financial transactions.
- Real-time funds validation when processing commitments and obligations.
- Undelivered orders tracking (e.g., unliquidated obligations).
- Expenditures tracking on obligations (e.g., invoices, payments, and collections).
- A consolidated financial and contract closeout process.
- Copy forward functionality for all acquisition lifecycle transactions.

Future Environment

FMBT will deploy iFAMS—a streamlined, federally compliant, and Cloud-hosted financial and acquisition solution with transformative business processes and capabilities. Through the iFAMS implementation, FMBT will increase the transparency, accuracy, timeliness, and reliability of financial information across VA. FMBT will fully implement iFAMS by FY 2027. The iFAMS deployment schedule is depicted in Figure 48 of Appendix K. This will result in improved fiscal accountability to American taxpayers and strengthen the Department’s ability to provide care and services to Veterans. Additionally, iFAMS will enable VA to resolve a material weakness on its annual financial statements and increase the Department’s operational efficiency, productivity, agility, and flexibility. The system will also integrate with the Cerner EHR and DMLSS as well as provide additional security, storage, and scalability. Ultimately, iFAMS will modernize VA’s financial and acquisition management and reporting to comply with federal requirements.³⁷

As shown in Figure 15, the future FMBT operating model is based on VA Administrations as business lines and VA Staff Offices as business areas that enable operations and deliver optimized services to Veterans. With their focus on core mission functions, VA Administrations and Staff Offices will coordinate with OEI on budgeting and financial management. OEI will optimize budgeting and financial management through nine end-to-end common processes, in which Administrations and Staff Offices play a key role. Furthermore, iFAMS will integrate with

³⁶ United States Senate Committee on Appropriations Request for Information (RFI) Financial Management Business Transformation (FMBT) Status Update May 2018, Page 8

³⁷ FY 2019 Operations Plan, Account Management Office (AMO)

modern IT solutions and legacy systems as required. The future FMBT operating model is also predicated on the following concepts:

- Financial management is systemic, spanning the entire Department.
- VA can automate aspects of financial management and acquisition management through standardized business processes.
- Computing technology today enables VA to reduce the number of systems required to automate those processes.

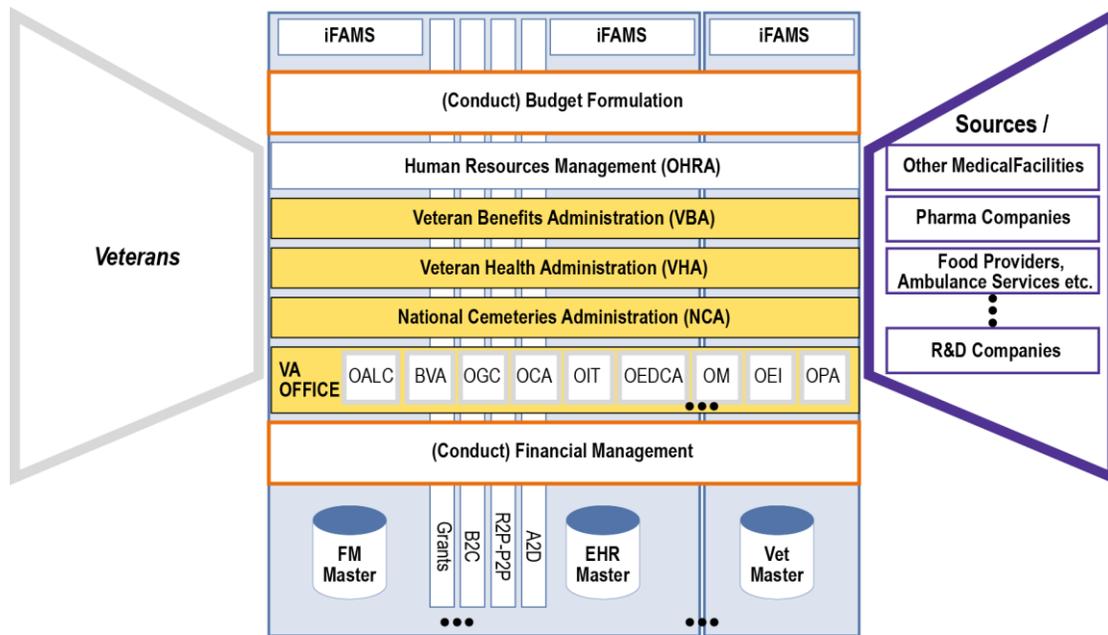


Figure 15: FMBT Future Environment Operational View

Additionally, iFAMS will encompass a number of specialized modules. Each specialized module will have its own unique function and purpose and will integrate to operate seamlessly—from planning an investment; to acquiring, using, and disposing assets; to the final retirement reporting and beyond. Each functional group will see a different aspect of the iFAMS performance. Figure 16 depicts iFAMS’ high-level application and data view. It also shows the end-to-end data flow and application relationships related to transaction processing, storage, and analytics.

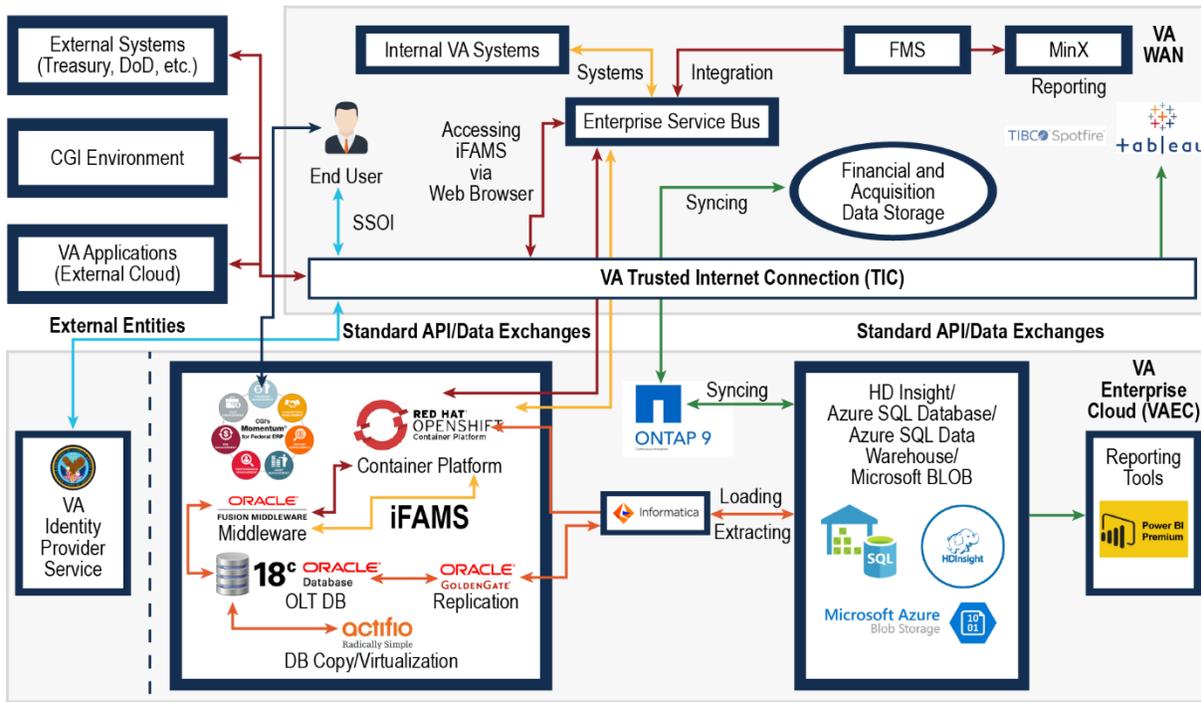


Figure 16: iFAMS High-Level Application and Data View

4.3 Human Resources

Current Environment

VA’s Human Resources (HR) IT environment consists of a set of applications that support the Department’s human capital business functions for approximately 388,000 employees plus 120,000 uncompensated personnel (e.g., trainees and students). These applications exist on disparate platforms and vary in scope, size, complexity, and support mechanisms. Additionally, many of these business functions are supported by redundant systems across VA Administrations and Staff Offices. The current HR environment presents several challenges:

- The significant cost associated with sustaining outdated functionality that uses different workflows and business processes.
- Inconsistent and often unreliable data standards and reporting methods.
- Increased workload and decreased efficiency of VA’s HR practitioners due to manual processes that require remediating data errors.

In order to address these challenges, VA Human Resources Information Technology (HRIT) has numerous efforts underway including the decommission of PAID, the transition to shared services with HR-Smart, and additional efforts to modernize HR capabilities that align to the Office of Personnel Management’s (OPM) HCBRM.

Drivers

VA’s HR modernization efforts are driven by business imperatives from across the Department and from external sources, such as GAO and OMB. Per the FY 2018–2024 VA Strategic Plan, VA

is modernizing its human capital management capabilities to empower and enable a diverse, fully staffed, and highly skilled workforce that consistently delivers world-class services to Veterans and their families. It is focused on enabling cost avoidance associated with incorrect personnel and pay data, reducing disparate systems, and improving HR system capabilities to reduce manual entry and data errors and increase the accuracy of personnel records.

In 2016, GAO identified PAID as one of the 10 oldest IT systems in use in the Federal Government. PAID has supported many core HR functions for more than 50 years and is antiquated, expensive to maintain, and no longer compliant with federal security requirements and mandates due to its outdated programming language. Additionally, PMA CAP Goal 3 (Workforce of the Future) guides VA's transformation of its HR capabilities. Digital self-service tools, Cloud technology, and AI (e.g., ML, virtual reality, RPA, chat bots, and augmented analytics) will enable this modernization by streamlining and improving HR processes.

Transformative Initiatives

Personnel and Accounting Integrated Data System Decommissioning

VA is among a handful of federal agencies with one or more archaic legacy systems; the Personnel and Account Integrated Data (PAID) system—VA's legacy HR solution that automates time and attendance for employees, timekeepers, payroll, and supervisors—is one of these systems. Ongoing use of PAID contributes to VA's increasing IT expenditure on sustainment and maintenance of legacy systems that have outlived their effectiveness and are consuming resources that outweigh their benefits.³⁸ Therefore, PAID is simply unable to meet VA's 21st-century needs, and the Department requires a modern HR environment. Accordingly, VA began decommissioning PAID during the first quarter of FY 2019 and, by leveraging the Human Resources Information System (HRIS) Shared Service Center to replace PAID with HR-Smart, expects to fully decommission the legacy HR system by June 2019.

HR Shared Services

By adopting and expanding shared services for HR functions, VA will realize cost savings and achieve greater strategic alignment with the VA Administrations and Staff Offices as well as other government agencies. Additionally, adoption of shared services will improve internal HR operations and data governance through greater standardization. This will directly impact the level of customer service provided to VA employees, Veterans, and their families, as Veterans can expect better customer service from employees who have the necessary tools to perform their duties. In FY 2016, The Department fully deployed HR-Smart—an Oracle PeopleSoft, COTS HR solution—and now utilizes the shared service solution for most HR activities in the areas of personnel action processing, benefits management, and compensation management.

As VA expands HR-Smart's integrations to achieve greater interoperability, it will deploy self-service capabilities for managers and employees in HR-Smart as well as integrate the USA Staffing talent acquisition system. The link between HR-Smart and USA Staffing will allow HR and related staff to follow a vacancy from recruitment to the onboarding of a new hire. VA will

³⁸ GAO-17-408T, Veterans Affairs Information Technology: Management Attention Needed to Improve Critical System Modernizations, Consolidate Data Centers, and Retire Legacy Systems, February 7, 2017

also adopt shared services through the Performance Management System, which will eliminate the intensive manual business processes related to employee performance goals. Its functionality will include performance goal setting and planning, ongoing performance feedback, and rewards for achievements. The system will communicate organizational goals and objectives, reinforce individual accountability for meeting those goals, and track and evaluate individual and organizational performance results. GXXA

HR·Smart Data Cleanse Initiative

During the transition from PAID, invalid data was transferred from the legacy system into HR·Smart. To address this issue, VA launched an enterprise-wide HR·Smart data cleanse initiative to correct the invalid data extracted from PAID and enable sustained data integrity following the cleanup. This initiative allows VA to identify and replace invalid and inaccurate information that does not support existing business processes. As a result, it will create efficient processing, reduce issues that impact employees' pay, drive effective position management, and provide more accurate reporting functions within HR·Smart and downstream systems.

HR·Smart Help Desk Ticketing System

HRIT is enhancing the HR·Smart Help Desk Ticketing System, which is a consolidated ticketing tracking system with the ability to access issues and provide customer service support for end users. The information and data in the ticketing system help HRIT identify current HR·Smart defects, manage reporting needs, and plan future enhancements. The HR·Smart Help Desk supports around 5,000 end users with system access and day-to-day, system-related operational activities. The ticketing initiative will assist help desk staff in providing a seamless user experience and eliminate submission of duplicate tickets in separate help desk systems.

Human Capital Business Reference Model Alignment

In conjunction with HR&A and OIT's AMO, HRIT is realigning VA's HR service delivery model to the core and non-core functions of OPM's Human Capital Business Reference Model (HCBRM). The HCBRM is the authoritative model that incorporates all HR business mission areas, capabilities, service lines, and business functions. VA intends to use this model for its Administrations and Staff Offices to define and provide a holistic view of its business operations and align them with business operations used by agencies across the government. HCBRM core functions, tools, and enhancements that VA will implement are categorized under the following capabilities:

- Human Capital Strategy, Policies, and Operation Plan
- Labor Relations
- Performance Management
- Talent Development
- Employee Relations and Continuous Vetting
- Separation and Retirement
- Talent Acquisition
- Compensation and Benefits
- Workforce Analytics and Employee Records
- Agency Human Capital Evaluation

VA is in the process of implementing the HCBRM functions related to Human Capital Strategy, Policies, and Operation Plan; Performance Management; Position Classification; and Employee Relations. Implementing HCBRM functions will enable VA to achieve a more effective decision-making process aligned to agency missions, reduce cycle times, and improve CX. The initiative will also reduce costs by automating manual tasks; reducing duplicate spending on software, hardware, and labor resources; and increasing competition among potential shared service providers. The HCBRM alignment will result in an enterprise solution with institutionalized, standard practices that are used by all Administrations within VA. FXXA

Workforce Accessibility

VA benefits from sustaining a diverse workforce through employees' varying perspectives and approaches to their work. Therefore, it encourages workforce diversity by identifying competencies and recommending level-specific training programs for all staff. Additionally, human capital management uses recruitment, outreach, and training opportunities to promote a diverse workforce. VA is also achieving diversity and accessibility across the Department through Section 508 compliance, addressing all facets of IT from development to implementation. The Department now includes Section 508 language in acquisition packages to ensure contractors and vendors understand accessibility requirements. Furthermore, VA facilitates accessibility learning events at various proficiency levels to allow its employees to customize their learning plans based on their current project work and career goals.

The VA IT Strategic Plan includes additional detail regarding the Department's approach to creating a diverse environment where individuals of all abilities can work, interact, and develop into leaders as well as its approach to integrating accessibility considerations into the development, production, maintenance, and use of IT. FXXA IXXA IXXB IXXC

Future Environment

To adequately support the Department's 500,000+ personnel, HRIT will modernize VA's HR systems according to the following high-level objectives:

- Provide cost-effective, standardized, and interoperable HR solutions to support the strategic management of human capital.
- Develop HR data standards for efficient and reliable data exchange.
- Leverage existing HR system capabilities to supply innovative core and non-core solutions between shared service resources.
- Implement a modern end-to-end system (i.e., a system comprised of one or more interconnected applications) designed to enter HR data one time and move that data in concert with employees throughout the HR lifecycle.
- Encourage VA Administrations and Staff Offices to transition from localized and siloed HR resources to shared services and modernized, innovative solutions.
- Acquire and implement systems that meet the functional needs of stakeholders.

The HR transformative initiatives will enable VA to achieve a future environment in which HRIT operates seamlessly and efficiently to address the business needs of VA Administrations and

Staff Offices. They will also enable cost savings, operational efficiency, enhanced customer service, and improved ability to manage the HCBRM functions. In addition to addressing VA’s challenges with applications supporting HR functions, HRIT envisions a future with a renewed focus on strong governance to accomplish its strategic objectives. Well-defined and executed governance will help VA eliminate duplicate systems, achieve end-to-end interoperability, and align systems to the HCBRM.

Human Resources Payroll Accounting Services (HR-PAS), the organization providing HR and payroll services to VA—including the maintenance of PAID, will transition services from legacy HR systems to modern VA applications as necessary. Once VA has decommissioned PAID, HR-PAS will provide middleware, supporting more than 50 interface data exchanges; facilitate payroll adjustment processing for VA’s FSC; and act as a central repository to aggregate HR and payroll data and reports. Figure 17 depicts the future operational environment of HR-PAS.

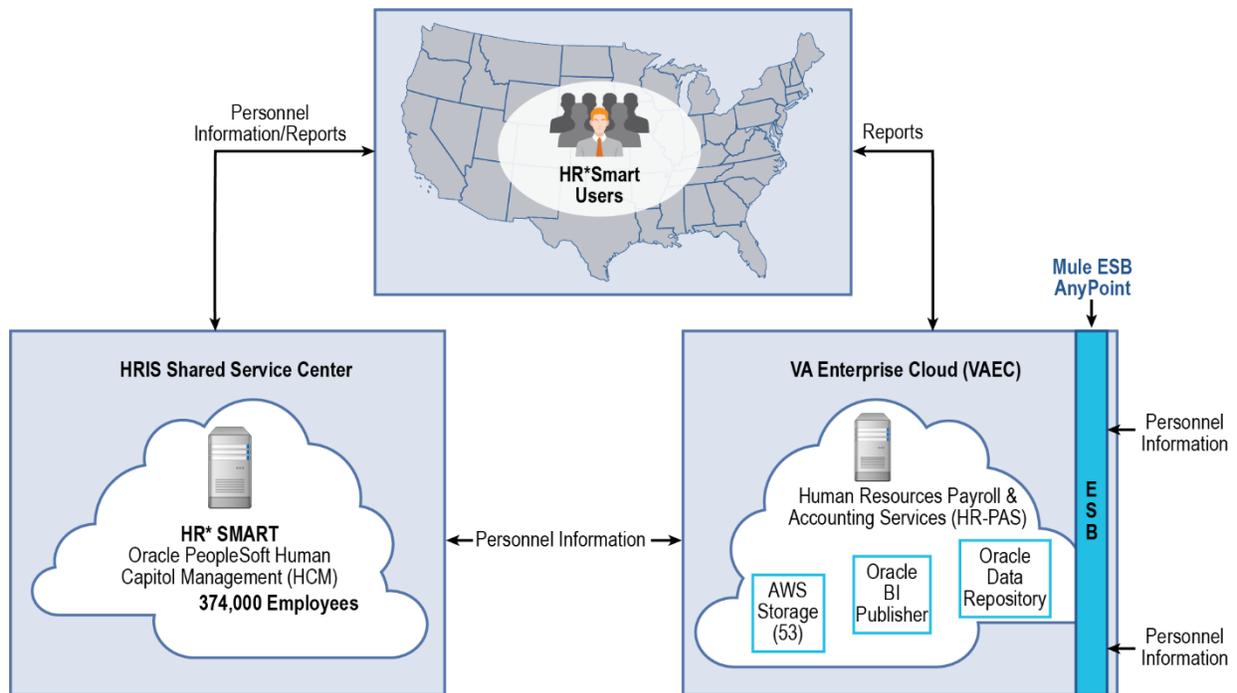


Figure 17: HR-PAS Future Operational Environment

5. Technology and Platform Services Portfolio

This section will provide an overview of the initiatives within the Technology and Platform Services Portfolio, such as IT modernization efforts to enhance infrastructure, which will contribute to the success of shared services, mobility, and seamless interoperability.

This section documents the current environment, drivers, transformative initiatives, and future environment for the Technology and Platform Services Portfolio and contains the following SCIF Capabilities:

- 5.1 Digital Modernization
- 5.2 Contact Center Modernization
- 5.3 IT Infrastructure
- 5.4 Migration of Applications to the Cloud
- 5.5 Data Center Optimization and Consolidation
- 5.6 Trusted Information Sharing
- 5.7 Analytics

Current Environment

The Technology and Platform Services Portfolio maintains a robust technology infrastructure for the Department to enable the business Portfolios to deliver care and other services to Veterans. VA's technology environment consists of applications with a dedicated infrastructure and a project-centric IT service delivery model. Although the current IT environment is characterized by the need for infrastructure improvements coupled with a collection of legacy and modern technologies, VA has made progress in the direction of its future technology environment.

Drivers

VA's complex and fragmented technology environment affects the CX of 10 million users. The PMA and 21st Century Integrated Digital Experience Act (IDEA) further call for a world-class, Veteran-centric CX. The MISSION Act is also driving modernization within the Technology and Platform Services Portfolio.³⁹ VA must modernize legacy infrastructure and transition to the Cloud to alleviate technical debt, enable interoperability, and ultimately improve customer service and delivery of care. The Federal Information Technology Acquisition Reform Act (FITARA), Data Center Optimization Initiative (DCOI), and federal Cloud policies guide VA in areas of this effort. Such transformation presents additional opportunities to improve quality of care through collaboration and enhanced analytics capabilities.

³⁹ Systems within the Technology and Platform Services Portfolio are helping VA meet MISSION Act Sections 101, 131, and 132 requirements.

Transformative Initiatives

The Technology and Platform Services Portfolio includes the following key transformative initiatives:

- VA.gov Relaunch
- Enterprise Contact Center Modernization (ECCM)
- Virtual Care in VHA Clinical Contact Centers
- Networx Transition Project
- VA Enterprise Cloud (VAEC)
- Identity Access Management (IAM)
- Data Center Optimization and Consolidation
- Vet360
- HealthShare Enterprise Platform (HSEP)
- Data Access Services (DAS)
- Lighthouse: VA's API Management Platform
- Multi-Cloud Research Environment

See Appendix L for the FY 2018–2025 milestones associated with the Technology and Platform Services Portfolio and its respective capabilities. The milestones represent initiatives that VA will complete to achieve the future environment of the Technology and Platform Services Portfolio.

Future Environment

Through the initiatives in the Technology and Platform Services Portfolio, VA will deliver seamless and personalized experiences for Veterans and customers across all digital services and communication channels. Efficient and modern telecommunications and infrastructure technologies will be capable of integrating with newly adopted solutions, and VA will achieve a hybrid Cloud environment that is efficient and dynamic. Data standardization and synchronization will enable seamless information sharing and reuse for collaboration and research. It will position VA to become a high-reliability, learning health system with the ability to make precise diagnostics and deliver precise care reliably and consistently. The Department will also aggressively implement APIs, PLM, and Development Operations (DevOps) to drive Digital Transformation.

5.1 Digital Modernization

Current Environment

Whether it is shopping for car insurance, changing a mobile phone plan, or scheduling a dentist appointment, Americans increasingly expect the places where they do business to offer easy-to-use digital tools for routine transactions. Veterans, caregivers, Servicemembers, VSOs, and VA's other users are no different; they expect VA to offer an online experience on par with the private sector companies they interact with in their day-to-day lives. Through user research sessions, VA learned that Veterans think about the Department as a single entity and are confused when VA services are presented under different brands or organizations. VA ingested this customer feedback and is putting Veterans first by integrating disparate content, tools, and brands into one experience and delivering a single, digital experience that is customized to each

individual user. VA will leverage its Digital Modernization Principles, shown in Figure 18, to continue identifying ways to improve Veteran and employee experience.⁴⁰

VA Digital Modernization Principles
Every VA service will have a single, high-quality digital version designed with direct input from users. All VA digital services will have a consistent look and feel.
Top services will be accessible from a single customer-focused homepage on VA.gov. This homepage will be organized around the primary actions people are trying to take when they visit VA. The homepage will be optimized for quickly connecting users with the tool or information they are seeking. VA’s internal organizational chart will be invisible to customers.
Whenever possible, services will be personalized for the individual using the tool.
All existing VA account holders, regardless of which account they have, will be able to use that account to access all of VA’s digital tools.
VA’s customer support channels will be equipped to assist Veterans with digital tools, and Veterans will be provided the same information about their situation regardless of whether they use a digital tool or a different customer support channel.
Every service will be equally available in desktop and mobile environments.
Customer information will be protected with best-in-class security.

Figure 18: Digital Modernization Principles

Drivers

Over 10 million people access VA’s digital tools and content each month. These users have a difficult experience when navigating VA websites, logins, and outdated tools that are a reflection of the Department’s stove-piped nature. Historically, VA has given users reasons to not “Choose VA.” Users of VA’s digital footprint believe it is challenging to find tools and services online and believe that VA designs its websites for the Administrations—not customers. They are also confused by the disjointed navigation between sites. In order to improve CX, VA will leverage APIs and Cloud technology to enable Digital Modernization.

The 21st Century IDEA further solidifies the goal of creating citizen-friendly digital services. The legislation requires agencies to digitize their services and sets minimum criteria for accessibility, ease of use, and security of their public-facing websites and digital services. These criteria require public-facing agency websites to have a consistent look and to be compliant with web standards developed by GSA.⁴¹ Additionally, the Foundations for Evidence-Based Policymaking (FEBP) Act of 2018 requires all federal agencies to designate a chief data officer, maintain comprehensive data catalogs, and ensure that all non-sensitive government data is available in

⁴⁰ These principles were developed and agreed to by the Digital Modernization Working Group, including SMEs from VHA, VBA, VEO, OEI, DSVA and OIT, and are based on a human-centered design analysis of customer needs.

⁴¹ 21st Century Integrated Digital Experience Act (IDEA), 2018

machine-readable formats by default. PMA CAP Goal 4 (Improving Customer Experience) and the VA Secretary’s focus on CX also drive Digital Modernization.

Transformative Initiatives

VA.gov Relaunch

By dramatically upgrading VA’s online front door, VA.gov, the Department is providing customers with exceptional service from the minute they encounter VA and is delivering a digital experience on par with the private sector. As VA modernizes, it has Innovation Fellows who are studying behavior and reaching out to ask about the user experience; in the case of VA.gov, this included pre-testing the relaunch with a Veterans organization that engaged their members to test the website and give feedback. Through the relaunch of VA.gov in November 2018, Veterans received:

- Homepage content that focuses on the top 20 tasks that 80% of them need.
- Single sign-on, allowing all logged-in VA.gov users to access tools.
- Action-oriented content that is easy to understand along with a simple and standard design across tools.
- A personalized dashboard that allows customers to view the items they have outstanding with VA.

Veteran engagement tripled when VA relaunched the new VA.gov—and then again when the Department added the ability to check and manage benefits. Since the relaunch of the website, VA has seen double-digit increases in key transactions on the overhauled website. Year-over-year, the application for healthcare on VA.gov has also had a 30% increase in traffic following the site’s relaunch. BXXB

Future Environment

Through the relaunch of VA.gov, the Department is demonstrating that it is possible to transform its online experience in accordance with the Digital Modernization Principles. However, this is just the first step. With over 100,000 pages of content on VA.gov, the Digital Modernization Council and Web Brand Consolidation group will continue to streamline VA’s digital experience so it is more user-friendly for customers and more efficient for VA. The Department will consider using AI to suggest possible areas of interest to users based on personal preferences.

By working together across the Department through the efforts of the Digital Modernization Council and Web Brand Consolidation group, VA will develop a modern experience for Veterans—one that will put the organization at the leading edge of digital modernization across government. As defined by the Digital Modernization Council, VA will deliver self-service tools on par with top private sector companies and have the best online experience in the Federal Government. VA’s Digital Modernization Vision will ensure that the Department will customize every digital service to the individual using it.⁴² HXXA

⁴² Defined by Digital Modernization Council, July 2017

5.2 Contact Center Modernization

Current Environment

VA provides a wide range of services to 10 million Veterans, survivors, family members, caregivers, and personal representatives. During the delivery of these services, the Department receives 140 million calls annually, which are serviced by over 9,300 call agents spread throughout VA's 1,800 contact centers. Veterans expect VA to offer intuitive CX, self-service options for routine transactions, and exemplary customer service.⁴³ Accordingly, OIT strives to provide Veterans and business partners with services effectively and efficiently. However, VA currently lacks an omnichannel operating model that is coordinated across the enterprise. This prevents the Department from providing a seamless Veteran experience that meets industry standards. Therefore, Veterans attempting to access VA services through contact centers often have fragmented and variable encounters that include unanswered phone calls, long wait times, and overwhelming written materials.

Drivers

VA's contact centers are the door to a complex environment that Veterans must navigate when contacting the Department.⁴⁴ They are implemented by each Administration and regionally through VAMCs. This results in over 1,800 VA contact centers that have varying levels of maturity based on their primary mission, funding, and leadership. Each one operates in an independent, unstandardized manner with fragmented equipment, technologies, and processes. This creates multiple redundancies, inefficient operations, and an inconsistent CX. Contact management in these VHA facilities range from contact centers with dedicated staff to staff that answers phones while simultaneously managing in-person interactions.

The PMA and 21st Century IDEA are also driving the Department's contact center modernization. VA is serving as the lead agency for PMA CAP Goal 4, advising 14 other federal agencies in achieving improved CX. Furthermore, the 21st Century IDEA is placing the focus on agency CIOs to more broadly assume the leadership role for CX. Additionally, advances in AI (e.g., ML, chat bots, and voice assistants), advanced data analytics, virtual care platforms, and APIs will shape the future direction of enterprise contact centers.

Transformative Initiatives

Enterprise Contact Center Modernization

VEO launched the Enterprise Contact Center Modernization (ECCM) initiative to design and deliver an easy and more effective CX as Veterans interact with VA through all communication channels (voice, chat, text, video, etc.). ECCM involves consolidating the existing network of contact centers and agents into an enterprise-wide Veteran Contact Center through a unified CRM and KM platform and technology. VA is developing an enterprise model that is consistent with industry best practices and optimizes existing contact center technology and workforce

⁴³ VA Contact Center & Digital Modernization Shared Strategy, August 7, 2018

⁴⁴ VA Contact Center & Digital Modernization Shared Strategy, August 7, 2018

investments. Figure 19 identifies the logical structure of VA’s Enterprise Contact Center in the future environment.

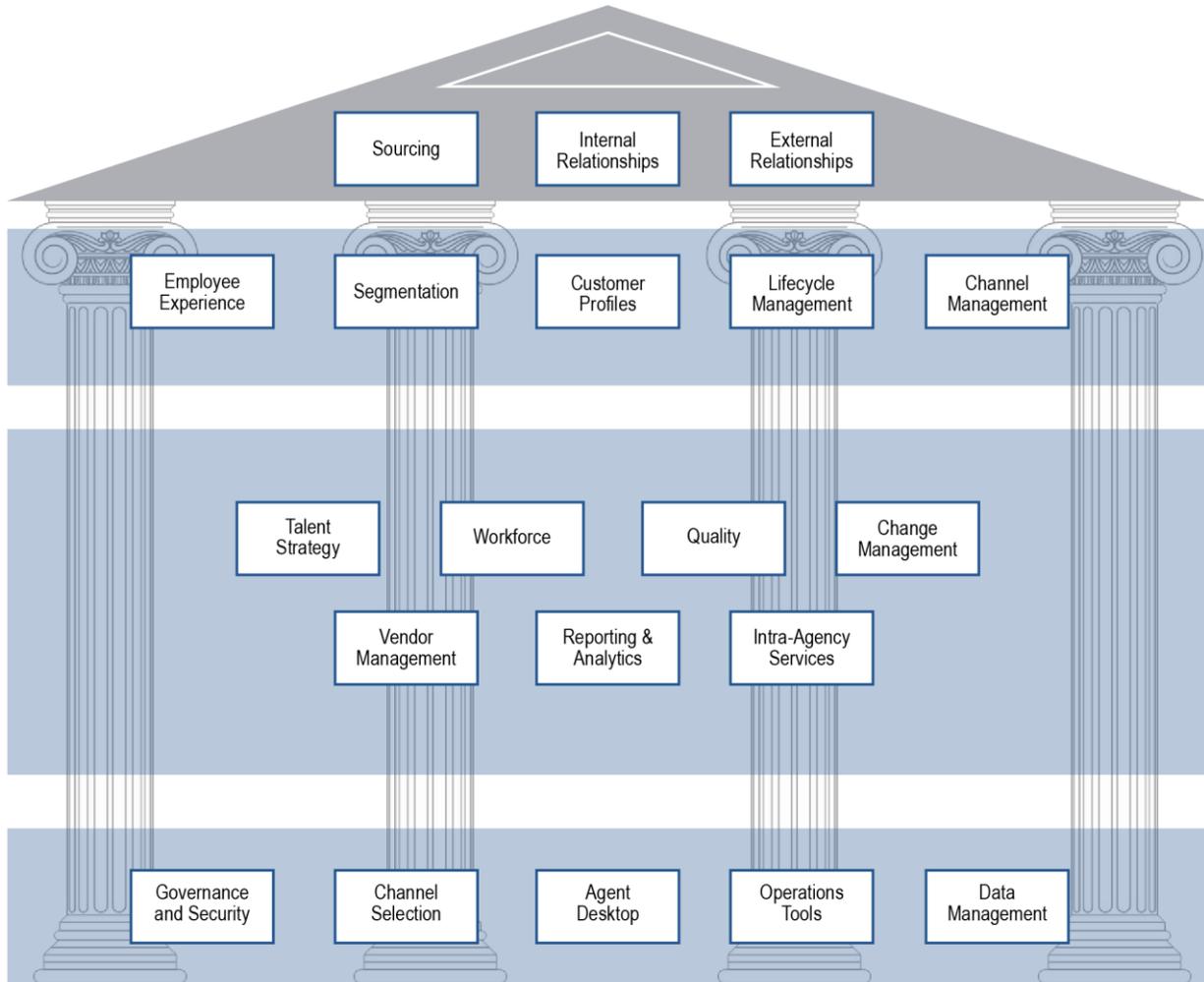


Figure 19: Enterprise Contact Center Logical Structure

Additionally, the Department is implementing emerging technologies, including ML, APIs, and common user interfaces, to handle low-complexity contacts. ECCM will align digital and contact center strategies in order to unite all VA services and provide Veterans with a seamless CX. As a result of ECCM, VA will be able to personalize experience and anticipate Veterans’ needs based on their individual data and history. ECCM will decrease the cost of ownership by reducing the number of disparate technology stacks that VA manages. It will also enhance service quality and CX by leveraging new technologies to improve response times, coordinate across channels, provide transparency, and build customer value. VA is working to establish a consistent experience across digital and contact center touchpoints through ECCM by 2025.

Data Management

The Data Management Initiative will migrate, centralize, and deliver accurate Veteran engagement data from multiple contact center touchpoints. VEO is leveraging ECCM

transformational technology to capture Veteran data in a contact center environment as the customer journeys from issue to resolution. VA will implement mechanisms to link all interactions to a single journey and apply AI and ML technology to discover customer patterns and anticipate customer needs. The Data Management Initiative is predicated on the development of an enterprise-wide data management strategy to capture and rationalize the vast amount of data that is generated from multiple contact center interactions. Centralizing VA's data management will allow VA to standardize digital and contact center technical requirements and implement a unified CRM/KM platform through ECCM. For more information on Enterprise Data Management (EDM), refer to Section 6.8.

Telecommunications

VA is developing an enterprise-wide telephony solution that will modernize telephony technology and set consistent standards across the Department. As part of this initiative, VA is transitioning all of its contact centers and associated toll-free services to a managed infrastructure service. Its goal is to centralize and consolidate its contact center infrastructure, using best practices from both public and commercial industry. This initiative will simplify the process of acquiring enterprise telecommunications and IT infrastructure services and enable cost-effective IT capabilities to improve Veteran access to services and benefits. This initiative will enhance functionality and standardization as well as improve first-contact resolution for Veterans.⁴⁵ For more information related to telecommunications, refer to Section 5.3.

Virtual Care in VHA Clinical Contact Centers

VHA is striving to achieve clinically meaningful first-contact resolution via omnichannel virtual triage, which is a private sector best practice and critical element of care delivery. To fulfill this goal, OIT and VHA are transforming hundreds of fragmented and antiquated call centers into modern, VISN/regional virtual care centers. VA will ensure there is a robust clinical contact center in each VISN and will enhance these centers to improve Veteran and employee experience by further integrating LIPs and telehealth into virtual urgent care. Lastly, in collaboration with telehealth hubs, VA will establish a pool of virtual urgent care providers to improve Veteran access to virtual care. Clinical Contact Center Modernization will ensure there is meaningful collaboration and integration with EHRM and Community Care. For more information on the Future Environment of VA's Virtual Care Center Model, refer to Figure 7 in Section 2.2. BXXB

Future Environment

By breaking down institutionalized silos and transforming the Department's current approach to customer service, VA will deliver seamless and personalized experiences for all Veterans and customers across every touchpoint and channel. Contact Center Modernization will deliver a unified experience that is consistent and benefits Veterans regardless of how they choose to interact with VA.⁴⁶ Specifically, Contact Center Modernization will leverage intra-agency services

⁴⁵ VA Contact Center & Digital Modernization Shared Strategy, August 7, 2018

⁴⁶ VA Contact Center & Digital Modernization Shared Strategy, August 7, 2018

that will provide the capabilities and processes necessary to coordinate sharing best practices, information, and data to positively impact Veterans.

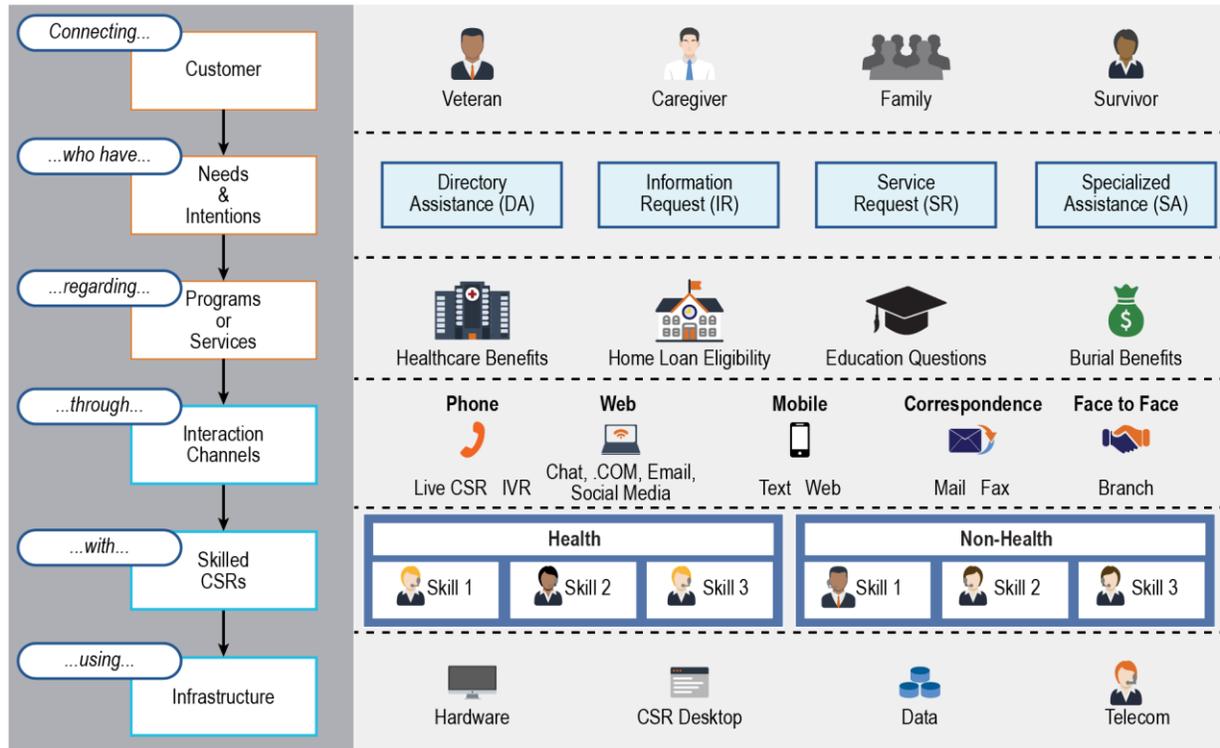


Figure 20: ECCM Veteran-Centric Operating Model

Contact Center Modernization will use a Veteran-centric omnichannel operating model, as shown in Figure 20, in order to decrease complexity and provide ease of access for Veterans. This model will support consistent and accessible customer interaction channels to enhance CX and quality of customer service. The Department will provide a modern, streamlined, and responsive CX for those who contact VA contact centers. It will improve the level of care available to Veterans by eliminating and unifying facilities and technology stacks, standardizing processes, and reducing the cost per transaction associated with lifetime Veteran benefits. For information related to VA’s CRM reference architecture, refer to Section 4.1. **BXXB**

5.3 IT Infrastructure

Current Environment

The cost of enhancing and maintaining VA’s operational systems hosted on large and complex on-premise infrastructure is growing exponentially. Sustainment, operations, and maintenance costs comprise more than 80% of VA’s IT spend and are increasing, leaving little funding for new investment in development, modernization, and enhancement. After conducting an analysis of the existing hardware and software, OIT determined that portions of the infrastructure are more than five years past end-of-life. Outdated desktops and laptops, under-strength network infrastructure, exponential storage growth, out-of-warranty phone systems, and under-capacity

bandwidth contribute to an unbalanced state of technical debt.⁴⁷ VA built its current infrastructure to support a less intensive need for bandwidth, speed, storage, and reliability and must modernize in a much more significant way than a traditional equipment refresh. Accordingly, the infrastructure currently hinders VA's ability to leverage new innovative solutions. VA requires infrastructure elasticity in order to take advantage of new capabilities and innovative technologies. The existing infrastructure is not architected to scale cost effectively; thus, the Department must replace and update hardware and software in many cases in a wall-to-wall fashion.

The Infrastructure Readiness Program is guiding the ongoing refresh and replacement of the infrastructure that sustains VA's IT operations, identifying the current environment of IT infrastructure and providing an analysis for the lifecycle replacement strategy. VA is taking steps to refresh and update hardware and software at VA facilities, including routers, servers, and telephony systems, with enhanced functions and compatibility options. The Department is initiating procedures to migrate legacy solutions to modern, unmodified COTS solutions and conducting technical refreshes of wireless routers across all VAMCs as a result of integrating new solutions into enterprise operations. HXXA

Drivers

As the integrated framework upon which its digital services operate, IT infrastructure is critical to VA's foundation. Accordingly, its IT infrastructure program provides a platform for supporting all VA information systems, including hardware, software, operating system platforms, data management, and network and telecommunication technology. As VA integrates new solutions and services into enterprise operations, such as EHRM, it must enhance and modernize its infrastructure to meet the standards for additional resources. Modernization of VA's IT systems is important to security, cost, and mission. However, technical debt inhibits the Department's ability to optimize and transform, as legacy infrastructure, systems, and processes are a barrier to IT and digital transformation. Consequences of technical debt include increased risk of critical system failure, inhibited performance of new software applications, increased maintenance support costs, and legacy technology that is unable to respond to new and ever-changing business requirements.⁴⁸ Technical debt will impede innovation and agility and hinder VA's ability to deliver improved experience and Veteran-centric services in a timely, reliable, and consistent manner. In addition to technical debt, new IT systems (e.g., Cerner EHR) and bandwidth needs (e.g., telehealth) are driving infrastructure upgrades. Similarly, utilization of Cloud technologies, 3D printing, 5G, and managed services will shape future IT infrastructure modernization.

⁴⁷ Information Technology Operations and Services (ITOPS), Paying Down the Technical Debt, February 2019

⁴⁸ Information Technology Operations and Services (ITOPS) Infrastructure Readiness Program, Targets for FY19 & FY20

Transformative Initiatives

Networkx Transition Project⁴⁹

To implement the services model, VA requires successful, timely, and orderly transition of the Department's telecommunications and IT services from expiring GSA Networkx Universal, Washington Interagency Telecommunications System (WITS) 3, and Regional Local Service (RLS) contracts. Collectively, these contracts are referred to as Networkx. With the contracts expiring in 2023, this transition provides a flexible platform to support agency migrations to modern telecommunications and IT service offerings.⁵⁰

As a part of this initiative, the Department has consolidated five independent district and national business offices that are responsible for supplying and decommissioning telecommunication services into a single, enterprise business unit within OIT. VA is transforming the offices' previously disparate business processes, which were directly linked to approximately \$221 million of annual telecommunication expenditures, to conform to consolidated and consistent methods.⁵¹ Further improving efficiencies, the Department is procuring an enterprise Telecommunications Expense Management System (eTEMS) service. This will ensure that VA conducts all transition ordering, inventory, tracking, and billing reconciliation in a single, uniform manner on a single system for the entire Department. eTEMS will interface with major telecommunications providers for electronic order processing and internally with customers through ServiceNow.

The transition to the new telecommunications contracts will result in an extensive analysis and inventory of all the Department's telecommunications. Coupled with the implementation of eTEMS, this will create a single, accurate repository of telecommunications services for the new contracts, providing visibility through business analytics and intelligence. In addition, VA will be able to discontinue contracted services at any time as modernized or managed services are funded and available to replace them.⁵²

Telephony Modernization

More than 50% of VA's telephony systems are using outdated private branch exchange technology and, as a result, operate in isolation and impede the implementation of modern capabilities. Many of these platforms are past or near their lifecycle dates and cost VA approximately \$35 million to maintain. In alignment with OIT's priorities of decommissioning legacy systems and migrating to the Cloud, VA is modernizing telephony systems to dramatically improve its ability to provision new services, encourage business process transformation for its customers, and reduce maintenance contract costs. Benefits of VA's telephony modernization include shifting budget expenditure from support of legacy systems to

⁴⁹ Enterprise Infrastructure Solutions Office (EISO) Telecommunications Managed Services Strategic Roadmap, December 2018

⁵⁰ <https://www.gsa.gov/technology/technology-purchasing-programs/telecommunications-and-network-services/enterprise-infrastructure-solutions/eis-transition/about-transition>

⁵¹ FY 2019 Operations Plan, Information Technology Operations and Services (ITOPS)

⁵² FY 2019 Operations Plan, Information Technology Operations and Services (ITOPS)

further modernization; reducing the number of staff required to support CX; eliminating end-of-life and end-of-support vulnerabilities; easing the transition to operational services or Voice as a Service; and centralizing inventory, firmware, patch management, and parts replacement.⁵³

Currently, 30% of VAMCs and remote sites have already modernized with Cisco Voice over Internet Protocol (VoIP) and are poised to take advantage of the fully unified communications technology stack.⁵⁴ An additional 15% will complete modernization projects in 2019. Further, VA is focusing on upgrading the remaining 92 VAMCs as well as VBA and NCA sites, with a DevOps continuous delivery approach focused on delivering the most urgent modernization capabilities to the customer first. During these phases, VA will begin moving from an exclusively capital expenditure model to an increasingly operating expenditure model, using services such as Infrastructure as a Service (IaaS) or managed services.

Enterprise Service Desk Managed Service Provider

The Enterprise Service Desk (ESD) provides around-the-clock technical support to all end users of VA technology. Shifting to a managed service approach for ESD, a managed service provider (MSP) will serve as the single point of contact for all Veterans, VA employees, and VA-designated third parties that use or have access to VA-approved applications, hardware, software, data, and services that enable them to conduct daily business. The MSP will create and maintain an effective IT service delivery environment where all incidents, problems, service requests, and access to VA applications and related infrastructure services by end users are received, monitored, tracked, and dealt with to resolution or handed over to other resolving groups and agencies. These services will include providing end-to-end incident lifecycle management and ownership, introducing increased workflow of self-service capabilities, and providing automated service request fulfillment services. With an MSP managing the customers' end-to-end services, VA will be able to reduce costs and ultimately improve the quality of IT services to the end user.⁵⁵

Server and Storage Farm

OIT has focused on utilizing SaaS, IaaS, and Platform as a Service (PaaS) Cloud capabilities for all new applications. Additionally, VA is migrating existing applications hosted in on-premise infrastructure to VAEC, which will substantially decrease the need for on-premise infrastructure over the next several years. However, on-premise infrastructure will still be required; therefore, OIT is transitioning to on-demand managed service capabilities to provide efficient and dynamic scalability. Accordingly, OIT is working toward the creation of managed service contract vehicles for on-premise server and storage requirements. The associated managed service contracts will provide rapid delivery of infrastructure, operational support, and lifecycle management and allow VA to only pay for what it uses. VA will use these contracts to resolve existing technical debt and avoid further technical debt through lifecycle management services.

⁵³ FY 2019 Operations Plan, Information Technology Operations and Services (ITOPS)

⁵⁴ FY 2019 Operations Plan, Information Technology Operations and Services (ITOPS)

⁵⁵ FY 2019 Operations Plan, Information Technology Operations and Services (ITOPS)

Mobile Device Services

In order to reduce its IT footprint, VA has moved the Enterprise Mobile Manager to VAEC and is working to leverage Cloud services to provide full functionality on its mobile devices. For example, the Department will shift from on-premise email for mobile devices to Cloud-hosted email. In addition to drastically reducing VA's footprint, this will improve customer satisfaction by increasing the speed of email delivery and reduce downtime by leveraging the redundancy of the Cloud systems. VA's ability to leverage more Cloud-based applications will expand as OMB finalizes its Trusted Internet Connections (TIC) 3.0 policy, which will provide an updated approach to enhance network security across the Federal Government.

End User Computing as a Service

VA is taking steps to modernize end user computing infrastructure by moving to a capably efficient managed services approach. Modernization of end user computing devices has been traditionally underfunded, leading to devices being utilized beyond their useful life. For example, 52% of VA's desktop computers are currently over the four-year useful life as defined by Directive 6401. The Department's transition to End User Computing as a Service involves developing a FY 2019 pilot for an agile Device as a Service vehicle that allows ITOPS staff to meet three key organization needs:

- Just-in-time contractor and full-time equivalent onboarding.
- New space activation.
- Lifecycle refresh of aged devices that are no longer suitable for their purpose (e.g., devices not capable of running Windows 10).

Moving to a Managed Services approach will help OIT modernize VA's end user computing device fleet and keep the devices modernized into the future. This transition will also eliminate the need for at VA facility imaging of most of the Department's end user devices, reduce the need to stock spare components, and adapt to new federal end user device standards.⁵⁶

Wireless Infrastructure Upgrade

The Wireless (Wi-Fi) Infrastructure Upgrade project is an enterprise-level project to modernize the aging Wi-Fi infrastructure currently in place as well as expand coverage areas and capabilities. The Next Generation Wi-Fi Infrastructure builds upon the success of legacy Wi-Fi infrastructure to move VA into the future of high-density, high-availability, and IoT support. High-density coverage aims to provide coverage for high throughput data devices, such as VA Laptops; VA Apple devices; voice applications (e.g., Nurse Call and Voice over Wireless Local Area Network [WLAN] systems) and video applications (e.g., telehealth, multicast streams, and point-to-point video conference). Location-based services (LBS) coverage is a design intended to support Radio Frequency Identification (RFID) technologies (e.g., real-time location systems). The Next Generation Wi-Fi Infrastructure increases Wi-Fi client capacity by nearly 10 times while also increasing average throughput and performance. It lays the groundwork for a mobile VA workforce with demanding mobile applications.

⁵⁶ FY 2019 Operations Plan, Information Technology Operations and Services (ITOPS)

Future Environment

IT Infrastructure modernization will increase capabilities to better respond to the needs of Veterans, business partners, employees, rapidly changing technology, and new modes of business delivery. VA will provide efficient and modern telecommunications and infrastructure technologies with enhanced hardware and software capable of integrating with newly adopted solutions. The Department will also achieve greater IT infrastructure cost transparency through its Technology Business Management (TBM) implementation (For more information related to TBM, refer to Section 6.6.). Figure 21 depicts the high-level framework of VA’s network and infrastructure landscape. The key future capabilities addressed in this diagram are data center, Cloud-based services, wide area network (WAN)/local area network (LAN), network management, security, wireless and mobility, and unified communications. These capabilities will be keystones in IT operations to support VA’s overarching business strategy.

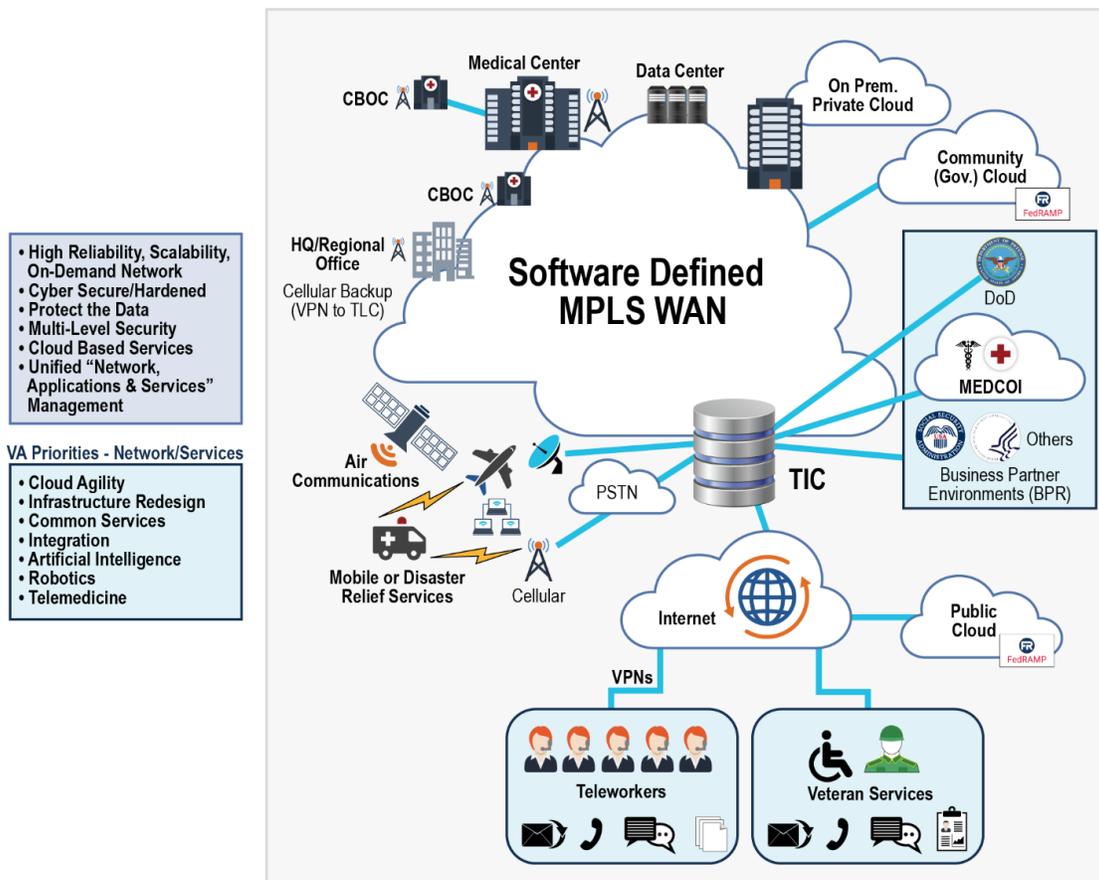


Figure 21: Proposed Future Enterprise Network and Infrastructure

OIT will transition from a capital expenditure model, which is government-owned and operated, to an operating expenditure model, which is contractor-owned and operated (e.g., Anything as a Service [XaaS] or managed services). This model will expedite modernized infrastructure, provide greater scalability, reduce service and technical debt, and improve IT service delivery.

The XaaS model, specifically, offers a path to reduced costs and streamlined workflows; rather than struggling to provide everything in-house, which requires significant resources for hardware and maintenance, buying services through third parties allows VA to pay for services as it needs them. The transition to a capital expenditure model will enable VA staff to shift from maintenance of legacy infrastructure to processes that focus on creating an excellent CX for Veterans. An IT services model will also allow VA to focus on improving Veteran experience by concentrating on new services, core projects, and strategic initiatives instead of day-to-day break-fix operations.⁵⁷

Furthermore, VA will have a fully deployed hybrid Cloud environment that is efficient and dynamic with improved wireless and mobile connectivity. Accordingly, its digitally transformed IT infrastructure will expand the opportunities to capitalize on Cloud computing and reduced cost of operations. To support this future environment, VA will redesign its infrastructure posture, policies, and processes in accordance with its API Management Platform and HSEP architecture to address IoT, mobile devices, Cloud, and distributed computing strategy. As OIT accomplishes its main Cloud computing objectives, VA architecture will become readily capable of leveraging managed services, allowing VA to reduce and control costs, increase efficiency, and provide scalability.⁵⁸ HXXA

5.4 Migration of Applications to the Cloud

Current Environment

The current environment of VA's IT enterprise is a significant factor in the need to migrate to the Cloud. For example, VA currently owns over 365 data centers that depend on legacy technology and create unnecessary and unsustainable pressures on the Department's IT budget partly due to increasing sustainment costs. VA's large and complex IT infrastructure, with an exponentially growing volume of hardware and storage, is inconsistent with a modern Cloud computing strategy. Additionally, the current process for VA customers to adopt SaaS is time consuming and expensive. To improve its delivery of Cloud services, OIT has begun to refine its Cloud strategy to incorporate recent realignments and reassignments within its organization.

In April 2018, VA established VAEC IOC as well as the Enterprise Cloud Solutions Office (ECSO) to implement and improve OIT Cloud Governance structures and processes. VAEC is implemented and operated by ECSO and the Information Operations Cloud Service Line within ITOPS. In its implementation and operation of VAEC, ECSO also partners and collaborates with OIS to ensure adherence to VA and FISMA security standards and to adapt and streamline Cloud security assurance processes. In addition to its efforts to migrate IAM and Office 365, VA has successfully migrated VA.gov to the Cloud with an implementation cost that is 85% less than traditionally hosted service.

⁵⁷ Enterprise Infrastructure Solutions Office (EISO) Telecommunications Managed Services Strategic Roadmap, December 2018

⁵⁸ Enterprise Infrastructure Solutions Office (EISO) Telecommunications Managed Services Strategic Roadmap, December 2018

Drivers

Cloud technology is a key enabler for IT modernization and is one of the cornerstones of the PMA, as Cloud-based capabilities can support faster development and provide modern, cost-effective IT solutions. It will promote innovation and increase flexibility and operational efficiency. Accordingly, the Report to the President on IT Modernization recommends bringing government to the Cloud and bringing the Cloud to the government.⁵⁹ VA's migration to the Cloud responds to this report's recommendations as well as the federal Cloud strategy. In 2010, OMB established a Cloud First policy as part of the Federal Cloud Computing Strategy, which the Department has adopted through VA Directive 6517. In accordance with recent updates to this strategy, VA's ECSO will supplement its Cloud First efforts with the Cloud Smart policy. VA's Cloud First policy further supports the Department's buy-first strategy for acquisitions, focusing primarily on the procurement of managed services through Cloud vendors.⁶⁰ Other Cloud First directives include the following memorandums: *Use of VAEC to Host Applications*; *Use of Software-as-a-Service (SaaS), Managed Service and Cloud-based Native Technologies and Approaches*; and *Use of VAEC for New Development*.

Transformative Initiatives

VA Enterprise Cloud

VA is implementing the VA Enterprise Cloud (VAEC), a multi-vendor Cloud solution for the development and deployment of VA Cloud applications that provides a set of common general support services (e.g., authentication and performance monitoring) for each application. VAEC simplifies the development of new applications in the Cloud and accelerates VA's migration of existing applications to the Cloud. VAEC also implements many of the security controls required by the National Institute of Standards and Technology (NIST), the Federal Risk and Authorization Management Program (FedRAMP), and VA, reducing the time each application should take to obtain a VA Authority to Operate (ATO). HXXA

VAEC currently utilizes the two leading commercial Cloud platforms: Amazon Web Services (AWS) Government Cloud and Microsoft Azure Government (Azure). Both have met stringent federal security requirements, including a FedRAMP High authorization. VAEC will also include a possible on-premise extension for applications with data sensitivity, technical architecture, or performance conditions that require VA to host them in an on-premise extension to VAEC. In addition, ECSO has secured Cloud capacity contract vehicles for both VAEC-AWS and VAEC-Azure, reducing the time and effort for projects to procure their capacity, or hosting, in the Cloud.

⁵⁹ Report to the President on IT Modernization

⁶⁰ U.S. Department of Veterans Affairs FY 2018–2024 Strategic Plan, Refreshed May 31, 2019

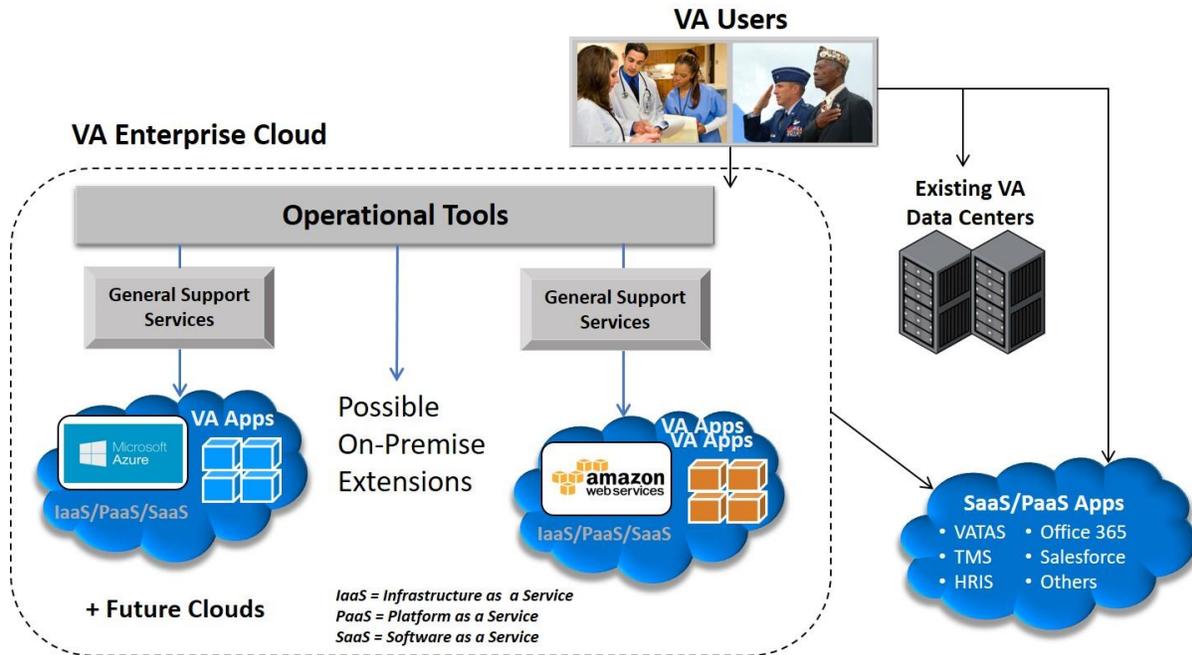


Figure 22: VAEC Architecture Future Environment

Figure 22 presents the VAEC architecture, which includes VAEC-Azure, VAEC-AWS, and a possible on-premise extension to VAEC for specific applications. VAEC provides several capabilities to support rapid development and rollout of Cloud applications: a set of operational tools; inheritance of the FedRAMP High Controls, which will accelerate the ATO approval process; and access to existing, high-bandwidth, redundant connectivity to the VA network that is compliant with the TIC Initiative.

Enhancements and Strategy

While Cloud technology is key to IT modernization, it in turns depends on IT infrastructure modernization, which must precede migrating applications to the Cloud. For example, moving an existing application from a data center to the Cloud or implementing a new application in the Cloud can increase both network traffic and latency, causing performance degradation of the application or network. Therefore, as part of its Cloud strategy, VA must closely monitor and coordinate network modernization with Cloud migration to ensure optimal performance of applications hosted in the Cloud.

VA is implementing its enterprise Cloud strategy to realize the greatest benefits of Cloud computing across VA and mitigate the risk of diverging or overlapping efforts. This strategy aligns with the CIO’s vision and VA policies, and its purpose is to deliver more responsive, cost-effective IT services and promote adoption of the following concepts: Cloud First and Cloud Smart policies; high-capacity Cloud contracts to support governance and overall migration to Cloud service; public/community/private Cloud criteria; early adopters of VAEC to capture and apply early lessons learned; and VAEC-specific Cloud computing Enterprise Design Patterns (EDPs). Figure 23 presents VA’s Cloud strategy and the goals, objectives, and actions required to

implement and operate VAEC.⁶¹ Together, they will develop the foundation for VAEC and help build future standard operating procedures, roadmaps, and concepts of operations.

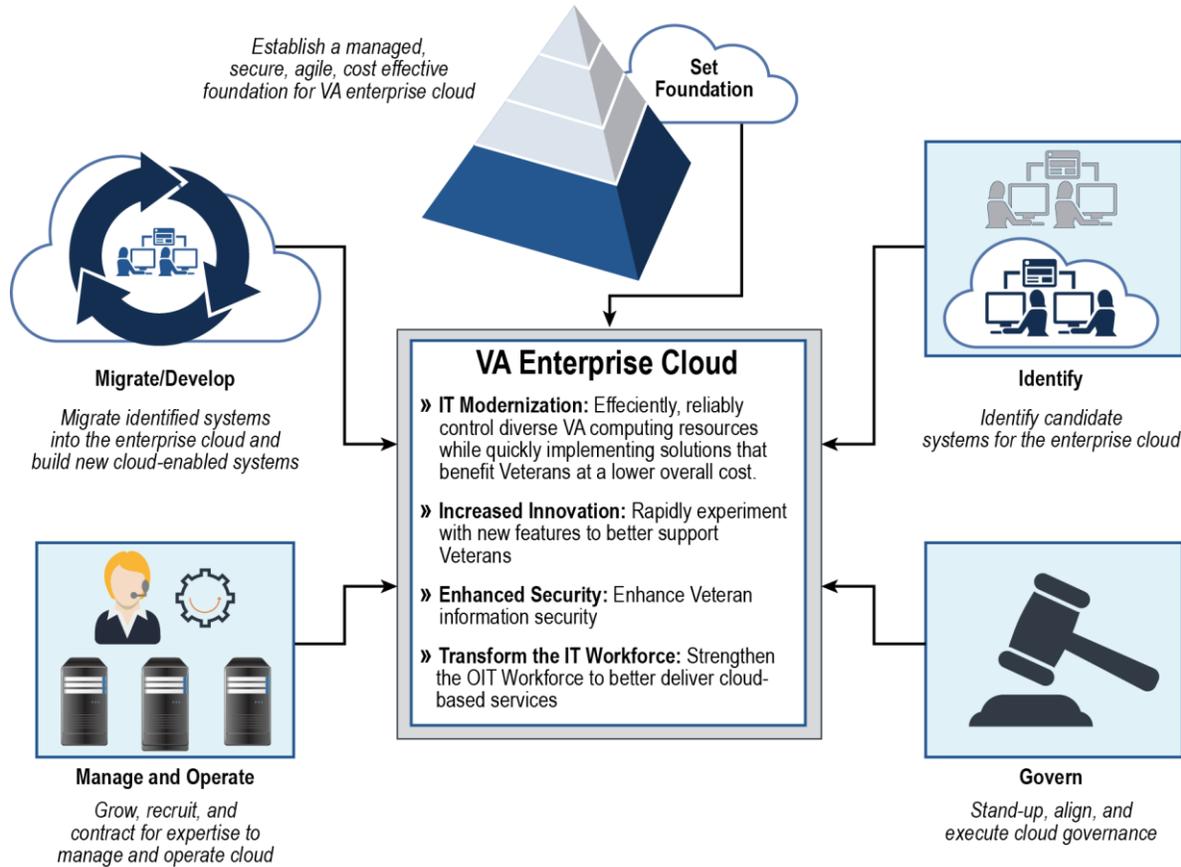


Figure 23: VAEC Strategy

Identity Access Management

Enterprise Identity Access Management (IAM) is VA’s Enterprise Shared Service (ESS) for user authentication that coordinates secure access to VA resources for both internal and external users. IAM consists of Identity Services—which provide the foundation for a single, strategic view of a Veteran, beneficiary, or internal user for business purposes—and Access Services—which provide authenticated and authorized access to VA applications. Together, they produce a standard set of enterprise security services, making project-specific solutions unnecessary. IAM also provides the MVI, which is VA’s authoritative source of enterprise user identity. The program’s combined set of capabilities work together throughout the IAM lifecycle from granting to removing authorized access. To integrate IAM with other priority initiatives, VA is migrating the system to a Cloud service provider, providing enterprise-level authentication and authorization services. For more information related to ESS, refer to Section 6.12. BXXB HXXA

⁶¹ U.S. Department of Veterans Affairs Cloud Strategy, FY18 and FY19

Office 365

Moving applications to the Cloud facilitates collaboration and saves VA equipment, space, and operations expenses. Upgrading to Office 365 accomplishes all of this while bringing VA the latest versions of productivity applications, such as Word, Excel, PowerPoint, Access, and Skype for Business. It also provides VA with additional levels of security; greater ability to update and deploy these applications; and extra tools and features that will better enable IT technicians to deliver more efficient, reliable service and resolve performance issues. Accordingly, the project team has successfully migrated all VA mailboxes to the Cloud via Office 365. HXXA

Future Environment

VA will migrate to VAEC, a Cloud computing environment that will allow OIT to better leverage the latest technologies to more rapidly deliver improved services to Veterans, aiming to move 350 applications (about 50% of its portfolio) to the Cloud by FY 2024. The migration will significantly reduce IT operating costs and enable VA to shift from a capital expenditure model to an operating expenditure model. VAEC will be a business enabler that provides Veterans, VA employees, and business partners with on-demand services and applications that are accessible on user-preferred devices. VAEC will form the foundation of an interoperable, scalable, and secure Cloud computing environment that can adapt to evolving business needs. It will offer elastic data storage and computing capability to support innovative approaches for the delivery of integrated services to Veterans. BXXB

VAEC's future environment will include a fully implemented and operational enterprise Cloud Management Platform. VA will achieve highly reliable and available infrastructure to develop and host Cloud services and applications across the Department; with its standardized Cloud environments, VAEC will provide common services to all tenant projects across VA, except for a minority that are assessed as unsuitable for Cloud hosting. All project managers and business owners will use VAEC to host new software applications and migrate existing applications to the Cloud. This integration of Cloud will shorten the DevOps lifecycle and provide OIT and partners more flexibility to innovate and collaborate. The benefits of an enterprise Cloud infrastructure and platform will enable VA to target its efforts toward key mission areas focused on the Veteran, resulting in more efficient and responsible stewardship of taxpayer dollars.⁶²

5.5 Data Center Optimization and Consolidation

Current Environment

The federal Cloud First and Cloud Smart policies and VA's Virtualization First policy are significantly reducing the number of physical servers in data centers, positioning VA to eliminate legacy hardware. The effort to migrate applications to the Cloud is well underway; VA's ECSO has moved beyond IOC and is moving applications to the off-premise Cloud. However, VA has several types of data centers that have evolved over the years and are based on mission requirements:

⁶² FY 2019 Operations Plan, Enterprise Program Management Office (EPMO)

- Core Data Centers that are centralized and provide enterprise-level services to geographically-distributed VA organizations and business functions (e.g., Information Technology Centers and Regional Data Centers).
- Cloud Services, such as Microsoft Azure and AWS.
- Campus Support Centers that provide geographically-specific, operational IT functionality to individual VA facilities, Mail Order Pharmacies, and Outpatient Clinics that require server rooms for localized patient care.
- Business Specialty Data Centers, such as research labs.
- Network Support Centers, which are smaller computer rooms associated with administrative offices, such as VBA ROs.

Many VA data centers contain aging, VA-owned equipment that is largely dependent on legacy technology. Some of these legacy systems have no record of service or identified system owner. This creates an issue when OIT needs to decommission or migrate data; without knowledge of service or application owners, progress may be halted or cause an interruption in services being used to assist Veterans.

Drivers

In 2010, OMB established the Federal Data Center Consolidation Initiative (FDCCI) to reduce the overall energy and real estate footprint of government data centers as well as the cost of data center hardware, software, and operations. FDCCI increased the Federal Government’s overall IT security posture and shifted IT investments to more efficient computing platforms and technologies. FITARA enacts and builds upon FDCCI by requiring agencies to submit annual reports that include comprehensive data center inventories, multi-year strategies to consolidate and optimize data centers, performance metrics and a timeline for agency activities, and yearly calculations of investment and cost savings. FITARA also provided updates to the guidelines and processes for how the Federal Government procures and sustains computing technology. The consolidation will optimize computing centers and establish core data centers to support critical enterprise services.

In 2016, DCOI refreshed the strategy and standards for management of data centers across federal Chief Financial Officers (CFO) Act agencies. DCOI required agencies to develop and report on data center strategies to consolidate inefficient infrastructure; optimize existing facilities; improve security posture; achieve cost savings; and transition to more efficient infrastructure, including the Cloud.⁶³ The initiative also established closure goals for Tiered and Non-Tiered data centers. Under DCOI, federal agencies were required to close data centers while simultaneously meeting certain performance standards for those that were retained to reduce both costs and resources. The FITARA Enhancement Act of 2017 extended the data center requirements of FITARA until October 1, 2020, and as a result, OMB is updating and extending DCOI for another two years. In 2018, OMB indicated that there would be new guidance published in FY 2019 that would better define data centers, which would drive better

⁶³ Memorandum 16-19, Data Center Optimization Initiative, Page 2

metrics. Additionally, the new guidance will require agencies to define their own closure targets based on mission requirements.

Transformative Initiatives

Data Center Optimization and Consolidation

Data Center Optimization and Consolidation entails identifying the services, tools, applications, and systems that are hosted in a data center and coordinating their transition to the Cloud with their respective owners. Some VA services, tools, applications, and systems cannot be shut down and migrated due to the services they provide to customers; therefore, coordination between VA organizations and services is vital to ensure that the services transition to the Cloud without interruption. VA must monitor services and applications affected by the initiative and ensure that there are adequate resources (network resources, exponential storage growth, etc.) to support the migrated applications.

VA will execute this initiative utilizing the following objectives:

- Categorize and classify data center functions by mission requirements and availability needs.
- Manage correct, timely, and appropriate information about the data center enterprise to enable good decision making.
- Understand and document the VA data center environment.
- Recommend and execute transformative data center consolidations to enhance operational efficiency.
- Align physical data center facility operations with OIT organizational mission functions.
- Focus IT resources on the provision of IT services to critical end-user customers.
- Provide appropriate process and information management interfaces. HXXA

Future Environment

OIT will continue to invest in organizational change management and strengthen its staff through Cloud-focused training and OIT community engagement to understand the issues and concerns regarding this transition. Existing applications will be evaluated for Cloud compatibility and may require application reengineering or refactoring as part of the migration process. Assessment for migration will be based on several Cloud readiness factors including cost, available services, application technology, sensitivity of information, and business requirements. This future environment will help reduce VA-owned data centers and the cost of sustaining on-premise infrastructure. The benefits of a reduced and optimized infrastructure will include a highly reliable and available infrastructure as well as the use of effective and efficient data centers. This will enable VA to maximize functions and capabilities while reducing cost.

5.6 Trusted Information Sharing

Current Environment

Trusted Information Sharing (TIS) provides VA with an essential capability to establish data interoperability and integration as it pursues modernization. TIS includes the enterprise service bus (ESB), business process management, master data management, API management, authoritative data sources (ADSs), and future integration components. Since the establishment of the Department, VA has experienced challenges in achieving interoperability. Disparate modernization initiatives and lack of an enterprise interoperability strategy have led to non-standard user interfaces, data exchanges, performance monitoring, and security challenges. VA collects and stores information from multiple channels, LoBs, systems, and applications. Due to the numerous sources of information, the Department has not established a standard or common understanding of maintaining information for uniformity. Additionally, information sharing and reuse is limited at VA.

Because interoperability is at the core of its modernization plan, VA has invested significant resources to improve interoperability and data standardization. Along with other modernization efforts, the Veterans Health Information Exchange (VHIE) and Joint Legacy Viewer (JLV) have improved VA's interoperability capabilities. Supporting MISSION Act and EHRM, VHIE is currently modernizing information systems and incorporating new policies for information sharing. JLV and other stop-gap technical solutions have enabled partial interoperability between VA and DoD, but seamless data exchange is still a goal. Additionally, the establishment of the IPO provides foundational oversight for the standards and exchange of health data between VA and DoD. The Department's API Management Platform, Lighthouse, is also improving interoperability. VA's venture into public-facing apps is powered by Lighthouse, which enables vendors to directly link new technologies to internal VA data. The Department expects Lighthouse to be a pivotal step in its digital transformation. GXXA

Drivers

Healthcare data interoperability plays a key role in all four of VA's top priorities—from implementing the MISSION Act and EHRM to transforming VA's business systems and delivering better customer service. Interoperability between VA and DoD specifically is the lynchpin for EHRM, the Department's highest-profile IT modernization initiative in its history. Interoperability is necessary to ensure a patient-centric healthcare experience, improved delivery of services, and a seamless care transition. However, interoperability among IT systems is a recurring challenge that has proved difficult to resolve despite the development of data exchange protocols, standards, and platforms. In healthcare, such standards and protocols form the foundation for all interoperability and HIE initiatives. The lack of a single VA environment for data interoperability and exchange limits the ability to share and understand information in a common manner. Figure 24 details standards, initiatives, and networks used across healthcare systems to help illustrate the complexity involved in health system interoperability.

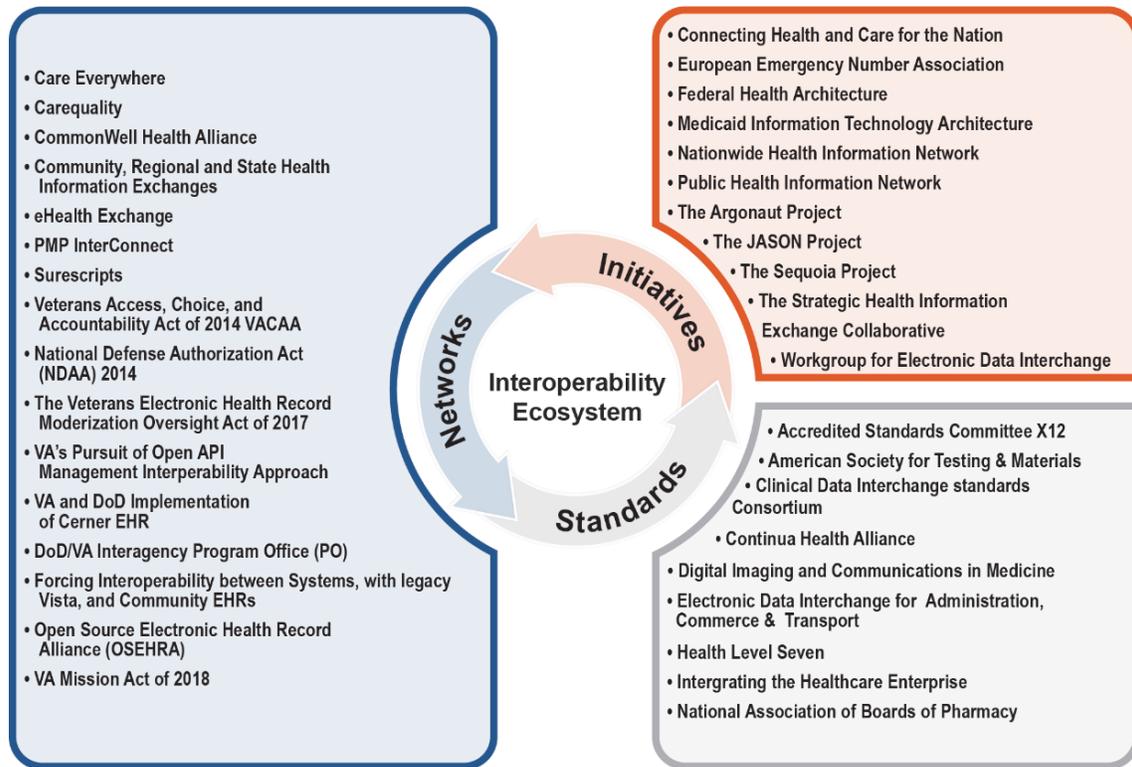


Figure 24: Health Interoperability Networks, Initiatives, and Standards

Furthermore, the 21st Century Cures Act aims to achieve improved interoperability. Relatedly, the Office of the National Coordinator for Health Information Technology (ONC) and the Centers for Medicare & Medicaid Services (CMS) have outlined their approach to information blocking, APIs, and Fast Healthcare Interoperability Resources (FHIR) standards for interoperability. In addition, ONC's Trusted Exchange Framework and Common Agreement rule is intended to establish baseline technical and legal requirements for sharing electronic health information nationwide across disparate networks.

Transformative Initiatives

Vet360

Due to a lack of standardization and synchronization of Veteran information, VA began developing Vet360 as the platform for synchronizing and maintaining Veteran data enterprise wide. Accordingly, Vet360 is a newly developed data source platform that integrates and stores common data across VA systems and applications. Working with this platform, an enterprise master data management solution will support the storage and interface of information provided to Veterans. Vet360 will create a common, consolidated connection among all VA data sources; resolve the lack of uniformity; and become the ADS for shared and common VA data across the Administrations and Staff Offices. The implementation and deployment of this solution will help VA reduce costs and improve the quality of information and governance. Figure 25 provides insight into Vet360's ecosystem design and details the data types, sources, and customer profiles that its master data management will integrate. Appendix H provides additional insight, depicting the logical architecture of Vet360.

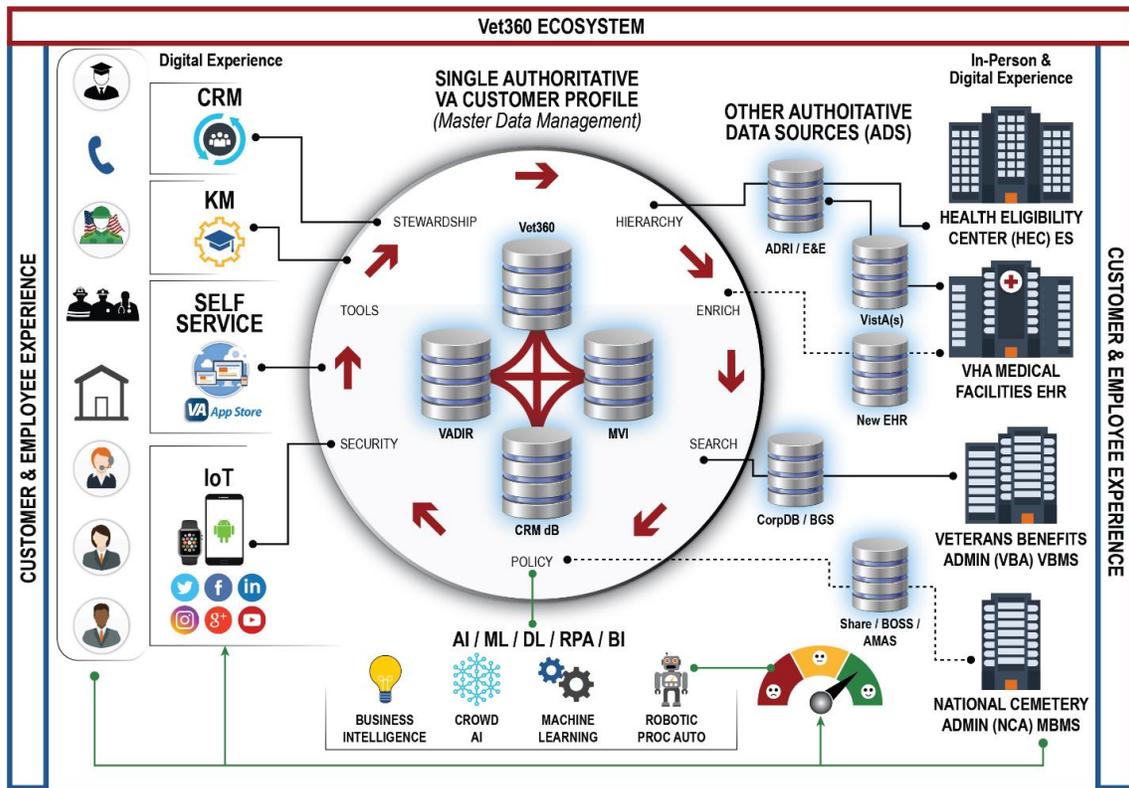


Figure 25: Vet360 Ecosystem

HealthShare Enterprise Platform

The HealthShare Enterprise Platform (HSEP) will unify and modernize access to all VistA-based health and non-health data currently maintained in the 130+ VistA instances and is therefore a vital component of the overall EHRM effort. HSEP will enable VA to transition from legacy, non-standard VistA-integration methods to a single VistA integration platform that will support key functionality. VA will replace Vitria Interface Engine (VIE) with HSEP, migrating 13 VIE applications to the new enterprise middleware platform. The platform will provide Health Level 7 (HL7) messaging services and integration between VistA and the devices it supports at VAMCs, HL7 messaging between each VistA instance, and HSEP VistA data feeds between the national HSEP instances and the regional HealthConnect instances. HSEP will also provide medical ESB capabilities to VistA and other applications as well as eliminate the need to develop custom interfaces.

To support the migration of patient data from VistA to the Cerner EHR and facilitate HIE within VA and with external partners, VA has also established the Veterans Data Integration and Federation (VDIF) Enterprise Platform as a part of HSEP. VDIF serves as middleware (an HIE) for federating VA patient data and will provide the entire enterprise with secure, governed access to Cerner EHR data and VistA legacy data. It will also help VA meet MISSION Act Section 132 requirements. Federated data allows interoperability and information sharing between organizations with the ability to aggregate data from disparate sources into a virtual database so that it can be used for business intelligence or other analysis. Figure 26 highlights the current

environment, transitional environment, and future environment of HIE between DoD and VA, with HSEP as the interim solution. GXXA

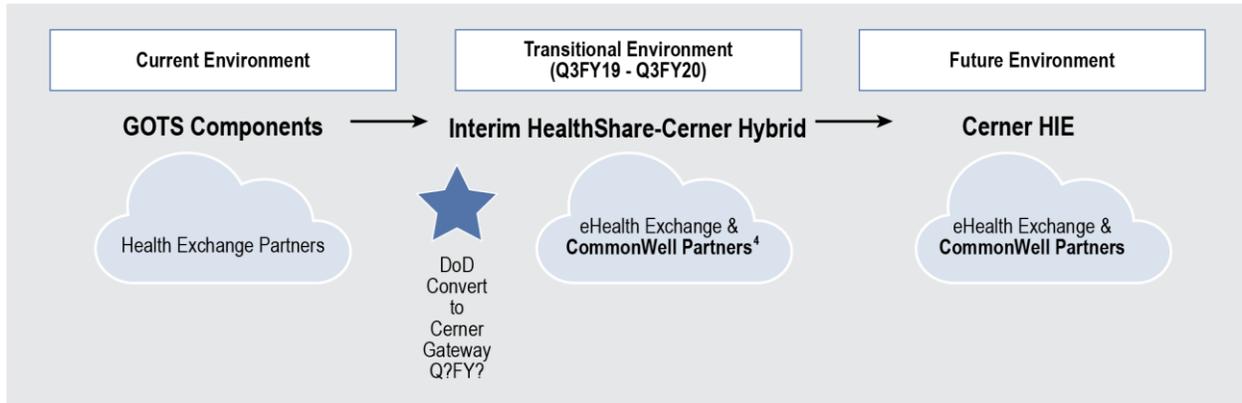


Figure 26: DoD/VA HIE Transition Course of Action

Data Access Services

Data Access Services (DAS) is a system of Enterprise Middleware Services that enables the intra- and inter-agency transport, transformation, and storage of Veterans health, benefits, or administrative data between data producers and data consumers. DAS provides a common access mechanism for Veterans’ electronic record information stored in and outside of VA. It can validate data against a schema, store data for future reuse, provide delivery confirmation, and report on performance metrics. DAS enhancements to support the Get the Data Back MISSION Act requirements include streamlining the external medical data collection process.⁶⁴

Lighthouse: VA’s Application Programming Interface Management Platform

VA is committed to leveraging APIs to accelerate the creation of transformational digital tools that support Veterans as they engage with VA’s core Health Services and Benefits and Memorial Services Portfolios. Lighthouse is VA’s API Management Platform that employs an open-source API gateway platform on a private VA Cloud to connect data from many sources and enables third-party developers to build better patient experiences for Veterans and their families. Once fully implemented, Lighthouse will allow critical health data to flow securely between patients and their healthcare providers. The overall vision for Lighthouse is to develop an API program that is on par with those of private sector companies and achieve the most robust, secure, and easy-to-use API program in government. This vision aligns with VA’s overarching modernization strategy, and to accomplish it, Lighthouse intends to make every online transaction and service delivered by VA available as a public and documented API that is fully accessible by third parties. Once third-party developers have completed the requisite verification and security requirements, they can rapidly innovate and contribute to VA functions by developing innovative solutions. This allows VA to make changes to its underlying systems, retire legacy databases, and make necessary upgrades without disrupting the user experience.

⁶⁴ DAS is helping VA meet MISSION Act Sections 101 and 131 requirements.

Since launching Lighthouse, VA has launched a Benefits API, Facilities API, Health API, and Veteran Verification API. These APIs are facilitating benefits claims submissions, facility inquiries (e.g., available services and appointment wait times), secure transfer of Veterans’ health data, and electronic verification of Veteran status. Consistent with VA’s Open API Pledge, the Health API conforms to the Argonaut FHIR API standards and will power the next generation of Blue Button features by enabling Veterans to interact with their personal health data within innovative mobile and web-based applications. VA will also release new capabilities through the Health API that will allow Veterans to access an aggregated view of their VA and non-VA health data through the Health app on Apple iPhones. After visiting a VA healthcare facility, the Veteran’s iPhone will automatically receive updated health record information within 24 hours.⁶⁵ Furthermore, VA is using FHIR-based APIs to collaborate with the Centers for Disease Control and Prevention (CDC) in order to improve public health surveillance data. The Department will ultimately use its Health APIs to establish an innovation ecosystem; Figure 27 shows the ESB, business process management, master data management, API management, ADSs, and future integration components that will improve VA’s ability to exchange data internally and externally with business partners and foster innovation. BXXB

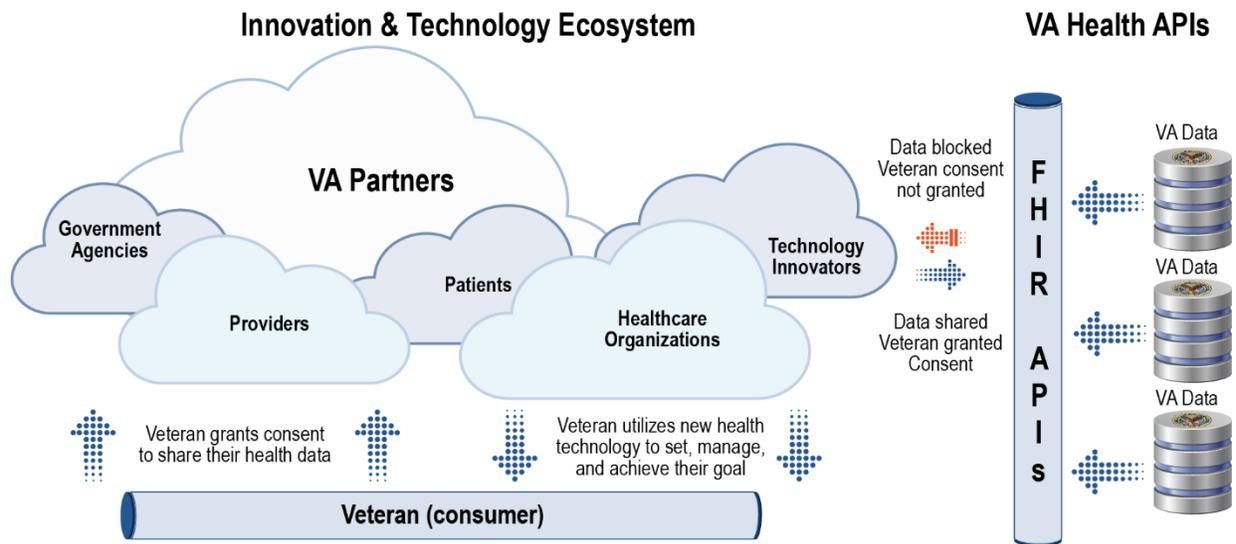


Figure 27: Innovation Ecosystem Powered by VA Health APIs

VA is advancing its API strategy in 2019 and beyond by treating APIs as products and employing Cloud-native technologies, agile development, and a DevOps release process. It will leverage Lighthouse APIs as ADSs to accelerate the delivery of other VA products and provide the same source of truth to VA and Veterans. VA’s future API architecture, shown in Figure 28, will allow Veterans to share their data with whom they want, when they want; increase their awareness of and access to entitled services and benefits; ensure consistent experience with all VA touchpoints; and provide access to a more diverse and feature-rich application ecosystem. In addition, the API architecture will allow developers to provide services to a huge customer

⁶⁵ <https://www.oit.va.gov/news/article/?read=va-provide-capability-for-veterans-to-access-health-data-on-apple-iphones>

base, facilitate self-service APIs to accelerate product development cycle times, enable a new Veteran empowered marketplace, and create a new and growing technology ecosystem. BXXB

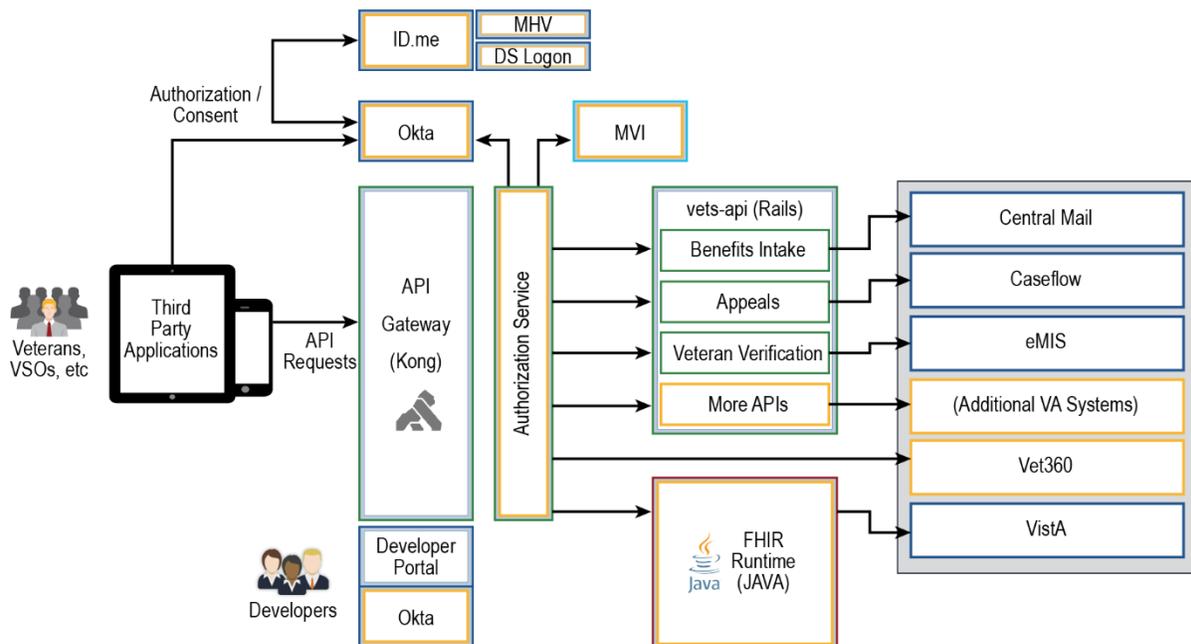


Figure 28: VA's Future Environment of API Architecture

Future Environment

VA will establish a TIS framework with information standardization and interoperability capabilities, fostering innovation and improving its ability to exchange data internally and externally with business partners. Communication with interoperability platforms, such as Vet360, HealthShare, and Lighthouse, is crucial to ensuring that compatibility and integration is possible. Therefore, as Vet360 integrates different data types from data sources, the Department will develop links and interfaces to connect the interoperability platforms. Additionally, as applications migrate from legacy systems, VA will establish a standardized process to successfully integrate modern IT solutions into the interoperability platforms and potentially automate the migration.

These interoperability platforms will largely shape the future environment of TIS. Vet360 will build the foundation for VA's enterprise master data management solution and streamline data collection and dissemination to ensure that there is accurate and consistent information in a central repository. As a result of the initiative, Veterans will have the ability to update information and a comprehensive view of their Master Records. Additionally, HSEP will improve enterprise access to all VistA-based health and non-health data and enable seamless communication between all points of care. Synchronized data will support EHRM and enable healthcare research and quality and performance management and reporting.

Lighthouse will establish a universal health language with external partner systems that will use APIs and ESS to exchange, process, and present information. The fully established environment will allow VA to consume and reuse APIs across the ecosystem, significantly reducing development efforts and costs. Consequently, Lighthouse will allow OIT to more rapidly deliver

new technology and services. Veterans will be able to manage their own health experience (e.g., schedule appointments, view medical records, manage medications, and connect to community healthcare providers in real time) within a secure and interoperable environment. VA will also partner with the third-party developer community to enable Veterans to seamlessly access their data. For example, the Department will implement its first public record-sharing platform available to all Veterans, which will allow them to access their personal medical records via the iPhone's Health app in near real time. Lastly, APIs will enable MISSION Act use cases, such as helping Veterans assess their eligibility and receive community care efficiently.

BXXB GXXA

5.7 Analytics

Current Environment

Across the enterprise, VA uses analytics as one of its tools to improve healthcare for Veterans. The Department has one of the largest healthcare-related data repositories in the world, and its CDW enables access to this data for analytics supporting population health, health research, and precision medicine. However, VA's analytical capabilities have long lagged behind other federal agencies and industry counterparts. Although VA collects patient data from tens of millions of individuals on a variety of health conditions, it has had difficulty sharing this information with researchers tasked with developing advance medical treatments. Overall, the current Analytics environment is fragmented and constrained by infrastructure and resource limitations.

VA is exploring ways to improve how it uses data to make real-time, fact-based decisions. It has specifically focused on how its healthcare system utilizes data to reduce statistical variations in levels of care. Additionally, as part of its suicide prevention efforts, VA is collaborating with the U.S. Department of Energy (DOE) and Lawrence Berkeley National Laboratory to use its EHR and Million Veteran Program (MVP) genomic data to identify Veteran suicide risks. The initiative aims to leverage this data along with DOE's experience with AI to apply deep learning strategies to the challenge of addressing these risks. **BXXA**

Drivers

Analytics enables organizations to standardize and improve the quality of healthcare processes. As the largest integrated healthcare system in the U.S., VA requires innovative ways to collect, manage, and report data throughout the system. The Department's historically limited capabilities in comparison to other federal agencies and commercial healthcare systems restrict its ability to utilize its data to improve care and outcomes. For this reason, VA must invest in analytical tools and train their workforce to better analyze and interpret data, utilizing analytics to improve quality of care. Key analytic use cases include predictive outcomes modeling; risk modeling; population health; chronic disease management; utilization management; health economics and cost of care; quality and safety insights; precision medicine; claims and appeals intelligence; and fraud, waste, and abuse management.

Big data analytics, the complex process of examining large and diverse data sets to uncover insights, plays a crucial role in organizational competency by harnessing data-driven diligence to

identify new opportunities. Effectively utilizing big and smart data technologies results in better knowledge, cost reduction, and achieving organizational efficiency. Key drivers of VA's big data research include EHRM, the public Cloud and IT transformation, and network bandwidth and multi-Cloud interconnect. Also guiding Analytics modernization, the Executive Order on Maintaining American Leadership in Artificial Intelligence was signed in February 2019 and will drive AI research and development activity within government agencies.

Transformative Initiatives

Department of Energy Partnership

In an effort to improve big data analytics, VA and the U.S. Department of Energy (DOE) formed a partnership that aims to advance medical treatment for Veterans and the greater population through the Million Veteran Program (MVP) – Computational Health Analytics for Medical Precision to Improve Outcomes Now (CHAMPION) and Advanced Computational and Translational Initiatives for Veterans (ACTIV). The partnership will utilize large sets of VA digital health and genomic data and other federal sources to identify trends that support the development of new treatments and preventative strategies in various areas, including suicide prevention, cancer, and heart disease. The initiative allows researchers to have secure access to key information on approximately 24 million Veterans who have received care from VA over the past two decades.

Both agencies will establish a DOE-VA data exchange with the required ability to securely send and receive large volumes of data to DOE secure sites without impacting the delivery of healthcare within the VA-wide area network. This will include mirror sites at DOE National Laboratories that can take advantage of specific scientific expertise, data sets that are suitable for large-scale computation, and resident supercomputer capabilities. As part of their collaboration, VA and DOE started an MVP compute enclave at Oak Ridge National Laboratory and are expanding their partnership with two new compute clusters at the Argonne and Lawrence Livermore National Laboratories becoming operational in 2019. Argonne is dedicated to genomic research while Lawrence Livermore is dedicated to imaging research.

Data Commons

Data commons have emerged as a model of collaborative research between public, academic, and private institutions. VA research is uniquely positioned to use real data generated from operational systems and would benefit from such collaboration; however, this data often contains personally identifiable information (PII) and protected health information (PHI) that must comply with FISMA-Moderate standards and the Health Insurance Portability and Accountability Act (HIPAA). Consequently, PII or PHI data that enters a new environment beyond the VA firewall must satisfy the same set of operational requirements, which may stifle research. For this reason, the Department is de-identifying VA data for data commons and collaborative research with DoD, industry, and community and academic partners (e.g., the University of Chicago [UoC] Open Data Commons).

Multi-Cloud Research Environment

In order to fulfill and coordinate its mission, VA will leverage a hybrid, multi-Cloud research environment, consisting of FISMA-Moderate with HIPAA extensions phenomics and imaging data (e.g., Cerner, VAEC, and DOE); FISMA-Moderate genomic data (e.g., Public Cloud Services infrastructure and platforms); and FISMA-Low de-identified data (e.g., the UoC Open Data Commons). VA will need a system orchestrator in order to coordinate such a wide array of compute, storage, and software resources; keep track of data, access rights, and proper authorization; audit usage; and guide users. Figure 29 displays the multi-Cloud research environment and its elements.

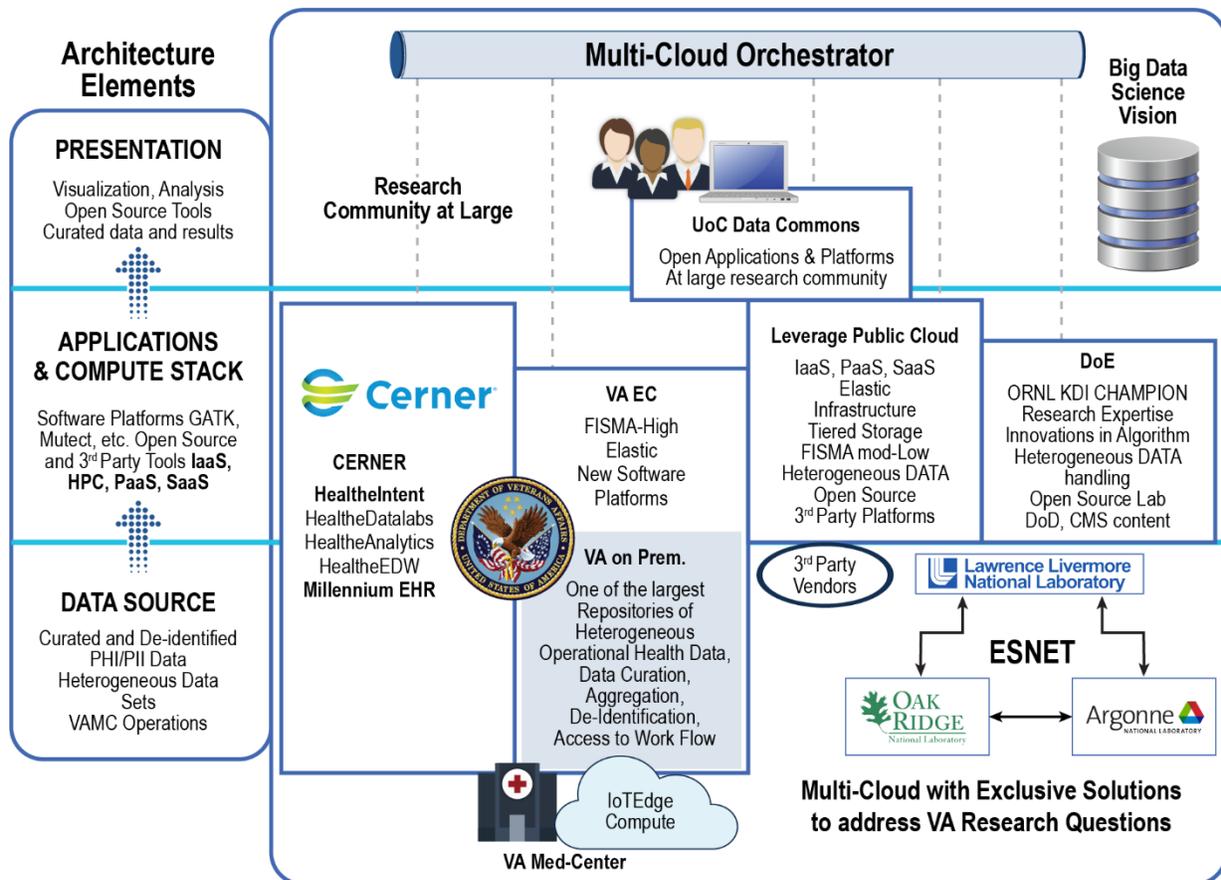


Figure 29: VA’s Multi-Cloud Research Environment

VA’s IT infrastructure will consist of on-premise data centers around the country, Cerner data centers, and VAEC. While Cerner is focused on EHR modernization over a 10-year horizon, VAEC will provide unlimited immediate access to infrastructure and software platforms to serve current and future enterprise applications as well as big data science research and applications. Additionally, where legislation mandates FISMA-Moderate with HIPAA extensions security posture, VA can leverage the public Cloud at a lower cost to handle high-volume workloads, such as MVP genomic pipelines, which are planned for 2019. Due to their extensive reach, the public Cloud storage buckets will also act as a highway for returning large volumes of genomic sequencing results from third-party vendors.

The research environment will also include the DOE-VA MVP compute enclave at DOE's Oak Ridge National Laboratory as well as the new compute clusters at the Argonne and Lawrence Livermore National Laboratories dedicated to genomic and imaging research. While these enclaves are secured as FISMA-Moderate, VA can analyze de-identified data sets using the Exascale supercomputer infrastructure within DOE. Lastly, validation of research results often requires calibration and corroboration via a series of related studies. Therefore, the UoC Open Data Commons and other initiatives will enable the research community at large to gain access to de-identified VA data.

VA Informatics and Computing Infrastructure

VA Informatics and Computing Infrastructure (VINCI) is an initiative to improve researchers' access to VA data and to facilitate the analysis of that data while ensuring Veterans' privacy and data security. VINCI provides storage and server technologies to securely host national data and provides the necessary systems to allow access to the data along with the tools for reporting and analysis in a secure, virtual working environment. The initiative is constantly obtaining and integrating select national data into its database and is expected to continue to acquire trillions of rows of data annually and preserve system performance. New types of data will become available as technologies and tools are developed by the Consortium for Health Informatics Research and other groups. VINCI will integrate this data into a suite of databases and provide health services data and research tools to 1,200+ VA investigators in support of its research mission.⁶⁶

Research Administrative Management System

OIT is developing and implementing SharePoint architecture for the Research Administrative Management System (RAMS) to provide new services for end users with integrated services across the VA Office of Research and Development (ORD). RAMS centralizes information and reporting and replaces or integrates legacy systems, such as the electronic Project Management and Information System (ePROMISE) and the Research Compliance Management System. The system will be a multipurpose tool for the ORD Central Office and VAMC field research offices that improves the efficiency of research administration. It will be capable of creating and tracking administrative data for each project assigned to a local research office; managing research oversight committees and subcommittees; tracking research personnel assignments, training requirements, and certifications; managing laboratory data including space allocations and equipment; and supporting required reporting to ORD. Overall, RAMS will lower overhead costs and the administrative burden on VA investigators as well as streamline compliance and research oversight regulations.⁶⁷

Genomic Information System for Integrative Science

The Genomic Information System for Integrative Science (GenISIS) is a data storage and research analytics platform built for MVP that the Department maintains within access-controlled data centers. The primary purpose of GenISIS is to securely gather and store all MVP

⁶⁶ Office of Information and Technology (OIT) Program Operational Memorandum (POM) Fiscal Year 2020–2024, July 13, 2018

⁶⁷ Office of Information and Technology (OIT) Program Operational Memorandum (POM) Fiscal Year 2020–2024, July 13, 2018

data for biomedical research and analysis in accordance with MVP data governance policies. The system holds the MVP research repository and receives subsets of EHR data from CDW and VINCI, and it allows data analyses to occur within the system behind the VA firewall, preventing the need for any data to be removed from the secure environment. GenSIS leads the way in precision medicine in important areas, such as cancer care, pharmacogenomics, population screening, and chronic disability. Its long-term vision is to allow for secure integration of clinical, self-reported, and molecular data to make biomedical discoveries and provide input for better clinical care within VA while following applicable privacy regulations and policies.⁶⁸

Predictive Analytics

VA is working to provide more real-time analytics and strives to be able to review nationwide outcomes and patient safety issues in real time. Organizations leverage predictive analytics to interpret findings and draw logical inferences to facilitate enterprise-wide change. VA can leverage similar methods to detect deviations in care, processes, and support to ensure the Department provides safe, effective, efficient, and sustainable high-level care. Predictive analytics will likely play a larger role in the Department's efforts to expand mental healthcare offerings to Veterans transitioning from military service. Additionally, preventing Veteran suicides and homelessness are two of VA's top clinical priorities, and as its analytics capabilities and systems improve, the Department will be better equipped to prevent both.

For example, REACH VET draws on VA's vast trove of EHRs and uses predictive analytics to identify patients who might be at risk for adverse outcomes. VA is learning that Veterans who engage with REACH VET are admitted to mental health inpatient units less often, attend more mental health and primary care appointments, and visit VA more frequently, compared to Veterans who are not part of the program. For more information regarding REACH VET, refer to Section 2.4. BXXA

Future Environment

The Department will add data scientists to all research VAMCs and implement predictive and personalized medical practices with robust integration of big data to improve care and deliver meaningful outcomes. The future Analytics environment also includes a seamless integration with Cerner EHR and cognitive tools. This will help VA become a learning health system with the ability to make precise diagnostics and deliver precise care. To support this effort, VA will develop a solution architecture for an analytical system that will allow data scientists and researchers to develop and manage research cases. Throughout the development and implementation of the analytical system, VA will establish study data marts—subsets of a data warehouse organized for a specific analysis—that will be designed with the tables and tools required for analysts to do their jobs. The data within the data marts will be pulled from multiple sources, processed in a uniformed manner, documented, and optimized. Additionally, the scope of the VA-DOE partnership will expand to focus on other areas of care that are critical to Veteran health (e.g., prostate cancer and heart disease). Through this initiative, AI will enable

⁶⁸ Office of Information and Technology (OIT) Program Operational Memorandum (POM) Fiscal Year 2020–2024, July 13, 2018

VA to identify risks and provide preventative care for illnesses that significantly impact the Veteran population.

6. OIT Transformation

OIT has recognized the compelling need to transition into an organization that fundamentally changes the way Veterans interact with VA. Furthermore, OIT understands the need to enable its business partners to provide timely access to care, benefits, and services promised and urgently needed by Veterans. VA’s launch of the VA.gov platform and redesign of the MyHealthVet portal are noteworthy and strategic developments. The FY 2018–2024 VA Strategic Plan includes the 2024 Strategic Imperatives, as shown in Figure 30.⁶⁹

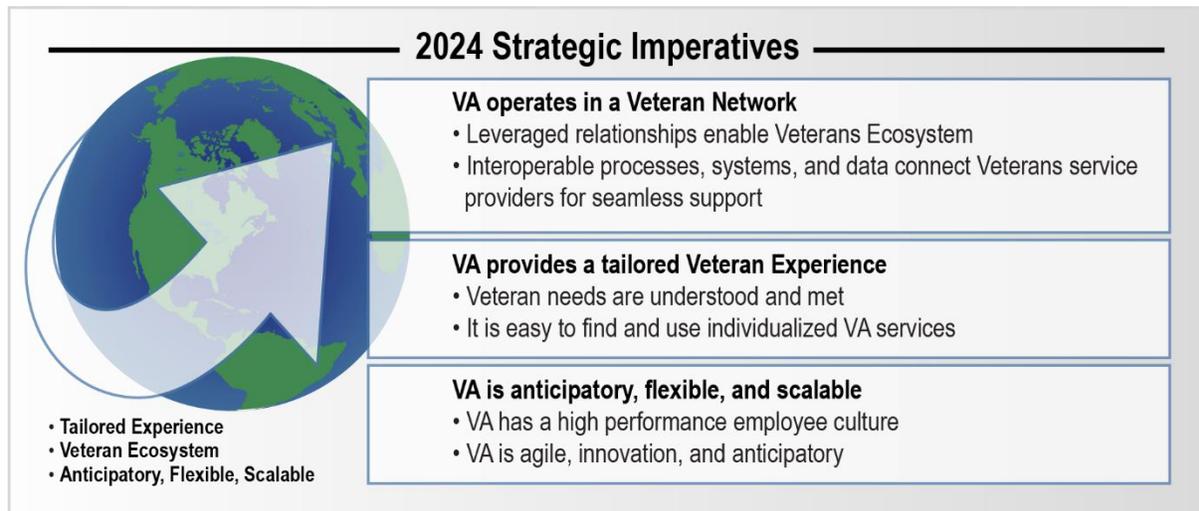


Figure 30: VA FY 2024 Strategic Imperatives

The FY 2024 Strategic Imperatives drive the IT Modernization Principles in Figure 31 below. Each of the principles enable VA to operate in a Veteran Ecosystem; provide a tailored Veteran experience; and be anticipatory, flexible, and scalable. The following principles are enduring and used to guide IT investment decisions and enable OIT Transformation.

⁶⁹ U.S. Department of Veterans Affairs FY 2018–2024 Strategic Plan, Refreshed May 31, 2019

IT Modernization Principles
Promote EHR Interoperability – EHR systems should promote open architecture and standards.
Modernize EHR and Other Legacy Systems – VistA and other VA legacy systems and applications will be replaced by modern commercial systems, state-of-art platforms, and innovative technologies.
Manage Data as a Strategic Asset (Ref: PMA CAP Goal 2) – Appropriate data management policies and governance are established to enforce data quality (e.g., consuming data from authoritative data sources), data privacy, data security, consistent data access (including secondary uses of data for analytics and open data innovation), and seamless data interoperability.
Promote Seamless Data Sharing – Each authoritative data source must have a standard, well-documented API that integrating systems from across VA’s business units can access. Where appropriate, these same APIs can be exposed to third parties.
Migrate to the VA Enterprise Cloud (VAEC) – VA will default to VAEC for all new development efforts and migrate applications to the VAEC over time.
Improve Infrastructure by Introducing Common Platforms – VA will seek to deliver new capabilities using common platforms in favor of creating new systems and projects to address new sets of requirements.
Buy First – VA will evaluate IT investments against business requirements and service needs with a philosophy of buy first, then build, and reuse.
Protect Veteran Information and Other VA Data Assets – Protecting VA’s infrastructure, assets, networks, systems, and data is one of the most significant challenges our country faces in today’s internet-based IT environment. VA must adopt modern best practices in information security to counter increasingly sophisticated threats.
Provide an Excellent Digital Experience (Ref: PMA CAP Goal 4) – The Department will ensure every VA service has a high-quality digital self-service equivalent.

Figure 31: IT Modernization Principles

Key foundational elements of OIT Transformation in this section include:

- | | |
|---|-----------------------------------|
| 6.1 Veteran-focused Integration Process | 6.8 Enterprise Data Management |
| 6.2 Investment Review Process | 6.9 Strategic Sourcing |
| 6.3 Scaled Agile Framework | 6.10 IT Service Management Tool |
| 6.4 DevOps Integration | 6.11 Enterprise Cybersecurity |
| 6.5 Product Line Management | 6.12 Enterprise Shared Services |
| 6.6 Technology Business Management | 6.13 Enterprise Mobility Strategy |
| 6.7 IT Governance Transformation | 6.14 Risk Profile |

6.1 Veteran-focused Integration Process

The Veteran-focused Integration Process (VIP) is a significant step forward for VA, allowing more frequent delivery of essential IT services benefitting the Veteran by utilizing a minimal

oversight process. VIP also enhances the ability to track and monitor IT performance and strengthens management oversight and accountability. VIP incorporates portfolio-centered strategic planning, agile development methodology, a three-month cadence, two Critical Decisions, and a single integration release cycle. VA is evolving development practices to institute the Scaled Agile Framework (SAFe), DevOps, Product Life Cycle Management, and IT Infrastructure Library (ITIL). These proven practices are integrated into VA's Product Line foundations. BXXC

6.2 Investment Review Process

Under the direction of the IT Account Managers (ITAMs), AMO drives VA OIT's investment review process. The mission of OIT's AMO is to collaborate with VA business partners to create the best experience for all Veterans. AMO balances and reconciles the IT Portfolio with the business, ensuring OIT functions as a business enabler. ITAMs ensure business context is maintained from point of ideation to point of delivery and that the value chain is maintained throughout the delivery process.⁷⁰

ITAMs manage five distinct Portfolios—Health, Benefits, Memorials, Corporate, and Enterprise. The ITAMs provide the critical link between OIT and VA business partners, while maintaining fluidity and flexibility to change with the future needs of Veterans.⁷¹ AMO follows the Business Relationship Maturity Model approach, displayed in Figure 32 below, for improving the relationship between OIT and VA business customers. The overall goal is to establish a level 5 Strategic Partner relationship between OIT and VA business customers focused on shared goals for maximizing value along with shared risk and reward, as displayed in Figure 32 below. These overall processes allow AMO to work with the VA organization to shape business demand for OIT products and services.⁷²

⁷⁰ FY 2019 Operations Plan, Account Management Office (AMO)

⁷¹ FY 2019 Operations Plan, Account Management Office (AMO)

⁷² FY 2019 Operations Plan, Account Management Office (AMO)

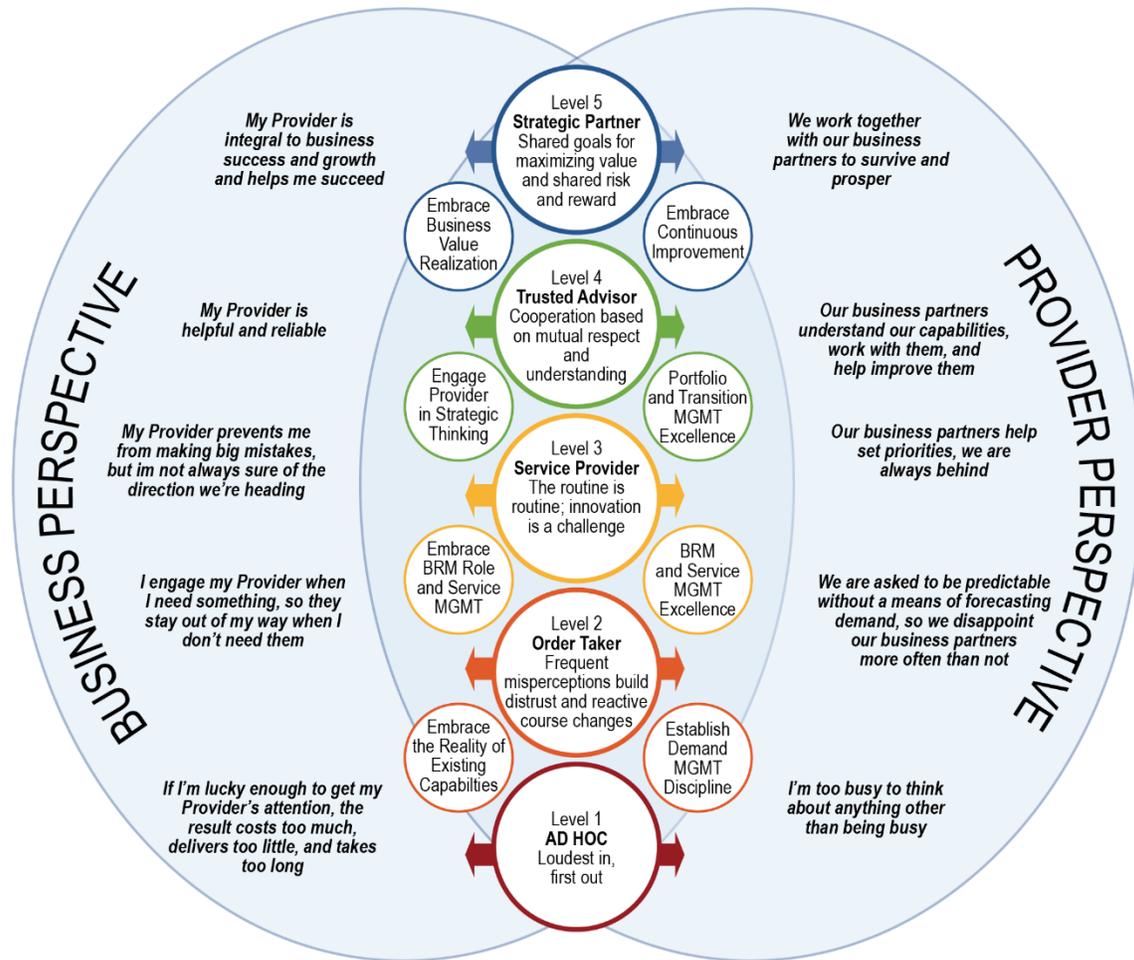


Figure 32: Business Relationship Maturity Model

ITAMs collaborate with the CIO and other OIT leaders to prioritize IT Portfolio relevant projects and efficiently allocate resources to improve existing services and builds products that are driven by VA business partners’ needs.⁷³ The intake and demand management process, facilitated via IT Account Management, is critical to VA IT Portfolio Management. The process has defined criteria to prioritize and aid decision making to fund or retire IT systems. [CXXB]

The Intake Process serves as an entry point for IT capability requests submitted to OIT for evaluation to support investment management. The standardized process will:

- Evaluate and process requests from a Portfolio perspective.
- Reduce redundant and outdated capabilities.
- Inform strategic investments.
- Ensure alignment to VA’s strategic priorities.
- Establish performance, success, and user experience expectations.

⁷³ Office of Information and Technology (OIT) Transformation in Action, Year End Review, 2016

- Provide necessary high-level architecture and related work products to better inform development in VIP. BXXC CXXD CXXF

ITRM will define and develop a strategy for reinvestment opportunities. The Technology and Platform Services Portfolio's initiatives, such as Data Center Optimization and Consolidation and Migration of Applications to the Cloud, will increase capacity, improve features and capabilities, reduce the agency's footprint, and save costs on hardware and other commodity IT products.

During funding execution in a fiscal year, program requirements can change, new missions can be mandated, emergency requirements can surface, and other emerging requirements can develop. OIT is working towards an Unfunded Requirements (UFR) Process that will capture, prioritize, approve, and track UFR.

6.3 Scaled Agile Framework

OIT has determined a new way of organizing and working is required to efficiently and effectively deliver IT solutions. Current IT development and deployment challenges include the following:

- OIT's one-team structure does not adequately address the complexity of its system-of-system architecture, requiring a transition to a team-of-teams structure.
- OIT is organized in silos, which makes team interaction complex and inefficient.
- Teams are required by VIP policy to release at least every 90 days. OIT needs to release much faster but lacks the processes, tools, and technical acumen to achieve true continuous integration and continuous delivery.
- Enterprise Program Management Division (EPMD) teams are project-based with begin and end dates. ITOPS resources address issues on one system and then move on to resolving an issue on another system. This conflicts with VA products, which are long-lasting and require resources who create and maintain the system and retain requirements and architectural context.

The Scaled Agile Framework (SAFe) provides the team structure, roles and responsibilities, and processes that enable VA to aggregate teams into an agile team-of-teams structure, or Agile Release Trains (ARTs).⁷⁴ This larger team structure requires additional roles, management, and leadership than a single stand-alone agile team. SAFe eliminates OIT silos and relies on integrated and persistent teams from EPMD, DMO, AMO, ITOPS, and the business.

SAFe PLM combines the SAFe operating model with the PLM framework. SAFe integrates the development, security, testing, production, sustainment, and infrastructure teams to form ARTs that automate activities and executes them continually to avoid waste and cost of delays. Benefits of SAFe PLM include integration with other platform teams, integrated intake process, DevOps framework, and improved product management.

The Digital Experience SAFe PLM pilot will provide OIT with an opportunity to collect lessons learned and best practices. OIT will launch a second SAFe PLM Pilot within VBA and will

⁷⁴ Connecting the Dots on the Office of Information and Technology (OIT) Modernization Strategy v1.0

continue to launch successive SAFe PLM pilots until all VBA projects are transitioned to SAFe PLM. Once SAFe PLM is fully implemented within VBA, VA will expand to other business units within the Department.

6.4 DevOps Integration

Development Operations (DevOps) identifies the interdependence between the programming activities of software development and the IT operational environment that supports software deployment. DevOps is the continuation of agile for improving software deployment performance; it improves collaboration between developers and IT operations professionals through communication and a strong understanding of business goals. VA will integrate development and operations to enable frequent delivery of incremental releases with high reliability. In VA's DevOps model, OIT will run projects as a single team that is responsible for developing capabilities within a Product Line, managing releases, and operating capabilities in production. BXXC

Because they are complementary strategic concepts, OIT is adopting PLM, SAFe, ITSM, and DevOps as part of a comprehensive modernization effort. Adopting these strategic concepts under the umbrella of "DevOps Integration," facilitates the following:

- OIT organizes systems into Product Lines based on the business capability being provided (e.g., education or memorial benefits). Each Product Line is grouped into one of five Product Portfolios (e.g., Health Services) and managed strategically as a Portfolio.
- Each Product Portfolio has a technical architecture that consolidates delivery into a small number of core Target Systems to support products within that Portfolio.
- These Target Systems are developed using agile practices and coordinated at the Product Portfolio level using a framework such as SAFe.
- Each team within a Product Portfolio is responsible both for developing and operating the systems in their Portfolio, controlling the hosting infrastructure and release process internal to the Product Portfolio.
- OIT has reformed key processes to become more service-oriented, especially in the areas of problem identification, incident management, and post-mortems.

Instead of developing new requirements through a process in which the project is handed from DMO to AMO to EPMD and on to ITOPS, an enduring Product Line team will be responsible for delivering and managing capabilities from cradle to grave. Instead of developing new systems to support each requirement, the Product Portfolio's solution engineers will analyze new requirements and incorporate the feature requests into the Portfolio's existing Target Systems. A single Product Line owner will be accountable for ensuring the capabilities work in production and will be equipped with the people, processes, and tools to be successful. OIT has established nine change teams to implement DevOps (Culture/Workforce, Platforms, Tools, etc.), and VA has invested in training 500 VA IT project managers in modern digital product management competency this year. CXXF

6.5 Product Line Management

OIT currently oversees IT product development in a project-based plan, design, and build model where each phase occurs in a silo and multiple organizations transition responsibility during the process. This approach has resulted in a lack of transparency and ownership throughout the product lifecycle and limits OIT’s insight into the business value delivered by each product.

In May 2018, OIT leadership established the Product Line Management (PLM) Working Group to evaluate the benefits and impacts of adopting a PLM methodology and oversee a pilot effort based on Digital Experience. PLM is an operating construct that aligns IT resources and funding to the enterprise’s most critical business capabilities; it packages all of the IT technologies, processes, and resources necessary to deliver specific business outcomes, aligning the work of IT by how it is consumed rather than how it is produced. The PLM Working Group has developed an initial Portfolio and Product Line construct and has evaluated roles and responsibilities, processes, and investment and acquisition implications.

Based on the success of the PLM pilot, OIT has committed to adopting PLM across the organization. OIT has begun implementing PLM within DevOps construct with goals to finalize the PLM structure, assign ownership for each Product Line, conduct initial Product Line analyses, and formalize Product Lines in the FY 2022–2026 Program Operational Memorandum. OIT is working to integrate PLM with a number of complementary initiatives, such as SAFe, DevOps, TBM, and ServiceNow. Figure 33 depicts the current draft of the Product Line organizing construct: there are five Portfolios, 27 Product Lines, and 700+ products or systems.

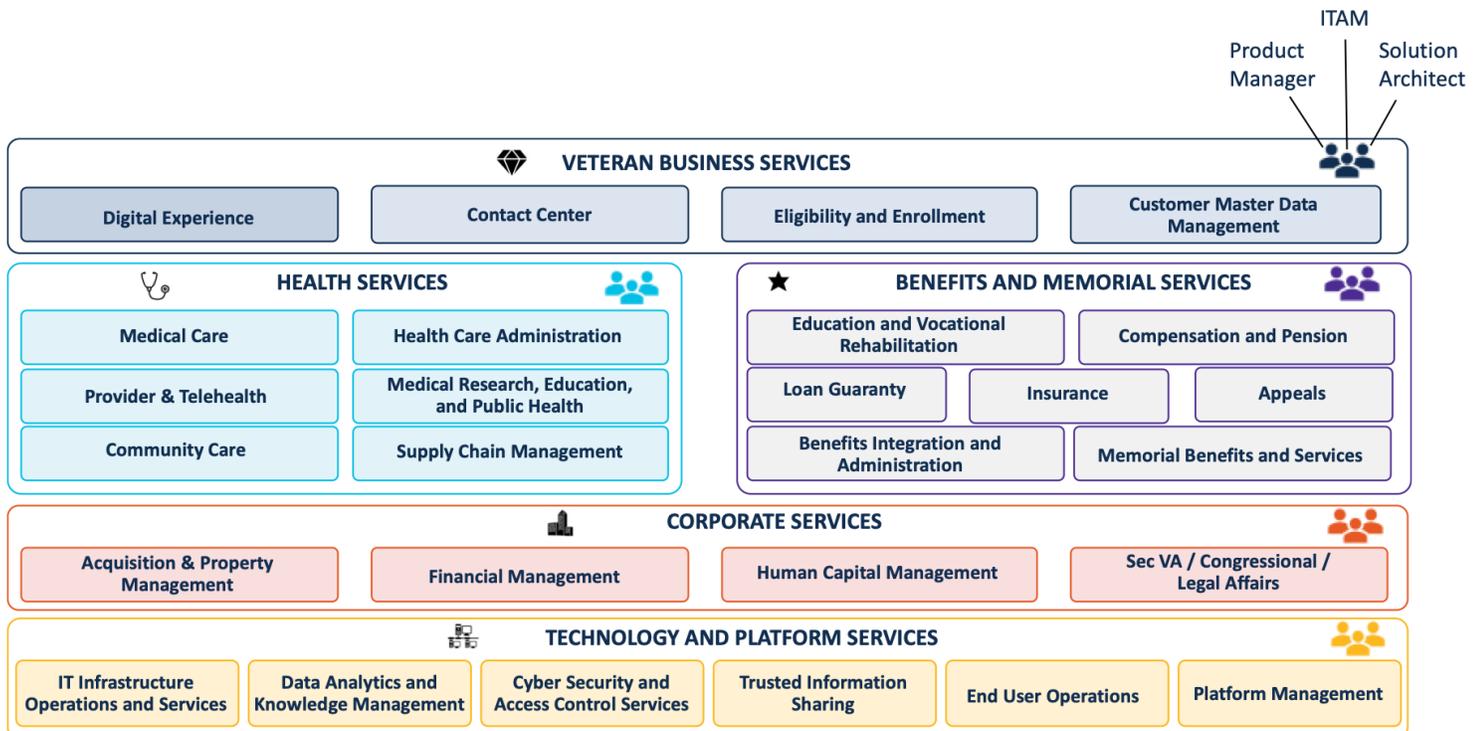


Figure 33: VA PLM Organizing Construct

6.6 Technology Business Management

Technology Business Management (TBM) is a value-management framework for IT organizations predicated on transparency of cost, consumption, and performance. Executives (e.g., CIOs, Chief Technology Officers [CTOs], and CFOs) within the commercial sector began instituting TBM in 2010. Following its success in the commercial space, OMB mandated that the public sector adopt the TBM framework across the Federal Government. In 2017, OMB called on agencies to begin adopting elements of the TBM framework. Within the PMA, CAP Goal 10 outlines key characteristics for successfully enabling IT spending. CAP Goal 10 states that the federal goal is to adopt TBM government-wide by FY 2022.⁷⁵ BXXC

The TBM framework characteristics reside at the top and bottom of the framework depicted in Figure 34 below.

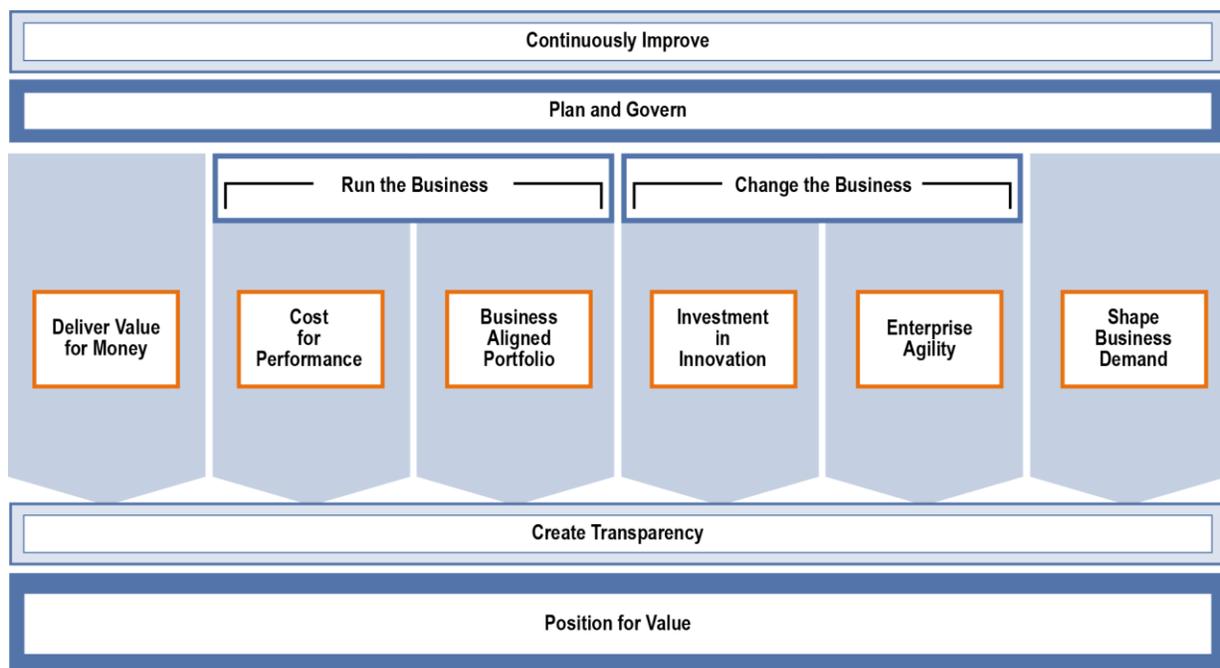


Figure 34: TBM Framework

Within these two key characteristics, the TBM framework defines four disciplines. The four key disciplines of TBM include:

- **Create Transparency:** Translate your spending, consumption, and capacity into meaningful perspectives for technology and businesses decision-makers.
- **Shape Business Demand:** Communicate costs and consumption to business units to drive informed trade-off decisions and better consumption behavior.
- **Deliver Value for Money:** Maximize value and demonstrate industry-comparable cost-effectiveness for services and innovation provided by IT.

⁷⁵ U.S. Department of Veterans Affairs Office of Information and Technology (OIT) Technology Business Management (TBM) Roadmap, October 2018

- **Plan and Govern:** Collaborate to align annual budgets and resource plans to strategic business priorities.

TBM Taxonomy

As shown in Figure 35, the TBM taxonomy provides a finance view of the organization (Cost Pools), a corresponding IT view of the organization (IT Towers and Services), and a business view (Business Units or Business Capabilities). The taxonomy is the foundation of a TBM model as it provides a common nomenclature within and between organizations.

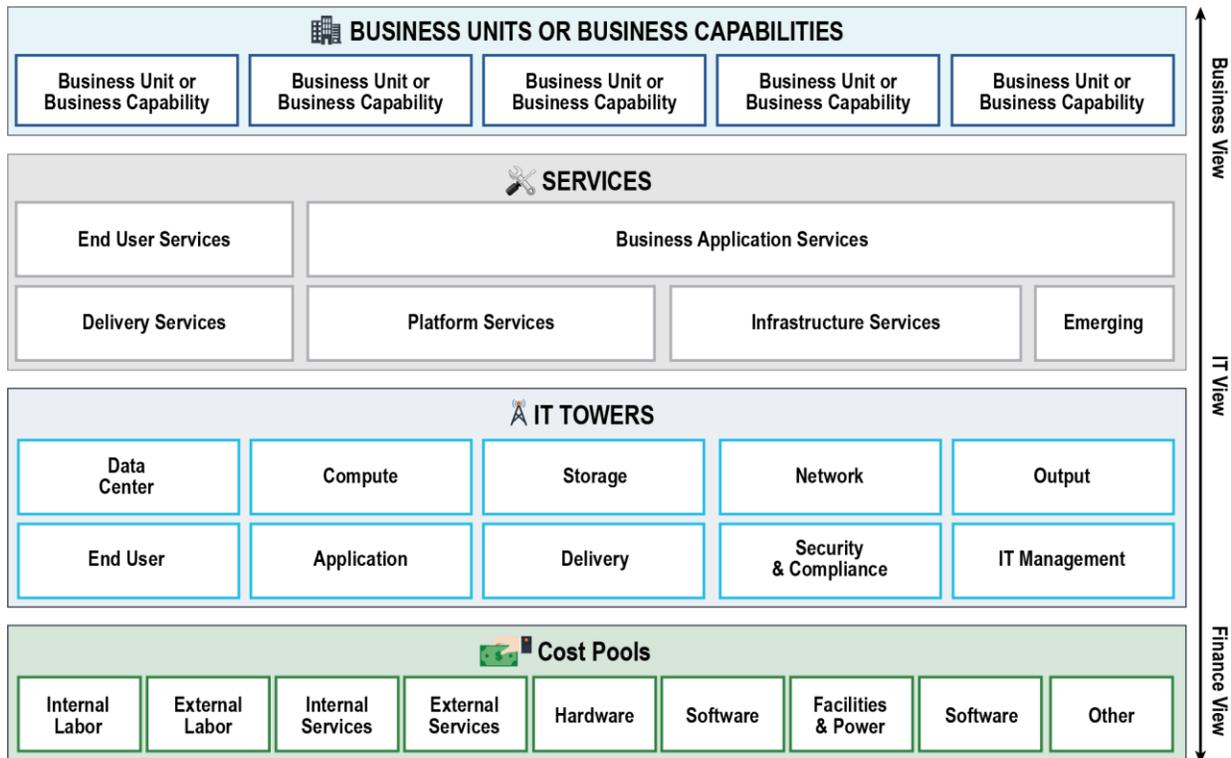


Figure 35: TBM Taxonomy

VA Environment

OIT is currently operating at Level 3 – Service Provider of TBM maturity (See Figure 36 below for TBM Maturity Details). VA OIT is building the TBM Model using Aptio software. The TBM model will be a decision engine for OIT that will provide dashboards and reporting tailored to multiple user communities—including OIT leadership, Budget Analysts, Service Providers, and Business Relationship Managers. VA will launch the first version of the TBM Model in 2019. By FY 2022, VA will meet the OMB mandate to fully report all IT Towers and Cost Pools in the TBM taxonomy.

	Decentralized Level 1	Cost Center Level 2	Service Provider Level 3	Value Partner Level 4	Business Driver Level 5
					
Dimension	No TBM Costs	TBM costs by Cost Pools and Towers	TBM costs by Service Volumes	Budgeting by Tower and Service Demand	Budgeting by Strategic (Run vs Grow) Capability
Technology	Spreadsheets	Software Costing Tool	Software Costing and Benchmarking Tool	Software Budget Forecasting Tool	Software Strategic Planning Tool
Data	Standard costs data	Manual collection and mapping of cost data	Automated collection of cost data; manual collection of operation data	Budget data integrated into TBM framework; some automation of operational data collection	Financial coding structure integrated into TBM framework; most/all data collected automatically
Process	No TBM cost reporting	Costs reported by Cost Pool and Towers	Costs reported by Services and Business Units; Tower unit costs and benchmarking	Finance/Program use TBM cost and volume data for Service budgeting and planning	TBM integrated into Strategic Planning Process to determine IT requirements
People	Little to no awareness of TBM	TBM awareness by Finance	TBM awareness by Program staff; Finance reporting on TBM costs	Finance/Program staff use TBM information for planning and managing operations	Finance/Program staff use TBM information to formulate the budget

Figure 36: TBM Maturity Model

6.7 IT Governance Transformation

OIT continually supports VA through IT governance—a subset of overall VA governance. IT governance enables efficient investment and portfolio management, sensible solutions, and technical capabilities necessary for transformation and continuous process improvement across VA. IT governance also supports related implementation regulations and guidance from internal and external government-wide advisory bodies. IT governance collaborates with VHA, OEHRM, the FEHRM, and OEI governance structures. The IT Governance Framework is established under the authority provided by FITARA. CXXF

Specific to IT governance, the VA Executive Board (VAEB) is the Department’s senior most management decision-making forum. It provides direction on Departmental policy, strategic direction, resource allocation, and performance in key areas. The IT Investment Board, IT/Non-IT Committee, and Data Governance Council (DGC) are subordinate to the VAEB and provide decision support. OIT’s IT Governance Board (ITGB) serves as an overarching governance body to the Program and Acquisition Review Council, Standards and Architecture Council, and Organization and Workforce Council. Figure 37 depicts the IT Governance Framework that facilitates decision making and drives continuous improvement through:

- Synchronizing expectations with respect to customer requirements for each investment and alignment to VA strategic goals, objectives, and outcomes including critical success factors.
- Ensuring positive return on IT investments.

- Achieving targeted outcomes for VA.
- Facilitating collaboration among leadership in prioritizing, funding, designing, and implementing IT technologies.
- Complying with FITARA.
- Providing sustainable support for VA’s transformation priorities. BXXC CXXA CXXD



Figure 37: IT Governance Framework

Governance functions best when it focuses on a higher-level IT strategic vision for producing better results. Therefore, OIT is transitioning from “informational” governance to focused, “decisional” governance, allowing executive-level members to concentrate on strategic-level decision making. IT governance focuses on effective and efficient decision making and will help support the following:

- True future planning as a part of the PPBE process.
- Improvement in FITARA scores.
- Requirements validation for UFR.
- Decisional governance framework with 90% attendance and participation.
- Insights from VA’s implementation of TBM.

6.8 Enterprise Data Management

The PMA and the Open, Public, Electronic, and Necessary (OPEN) Government Data Act are fueling enterprise data management (EDM) activities. EDM is the holistic development and execution of data management plans that deliver the value of VA data assets. EDM embodies VA’s Data Strategy Goals, and are expressed through the following guiding principles:

- Discoverable – Data consumers can identify, locate, and understand the data.

- Accessible – Data consumers can request, access, and consume the data, while securing the data from unauthorized access.
- Trusted – Data consumers understand the data resource’s quality, format, restrictions, and semantics to determine its usability.
- Accountable – Data providers, consumers, and stewards govern the data with transparency.

As described in VA Directive 6518, *Enterprise Information Management*, VA’s data and information assets are fundamental resources of the Department. The effective management of VA’s information assets is integral to the delivery of services to Veterans.⁷⁶ Figure 38 displays the framework to transform VA healthcare data into a national resource, enabling EDM capabilities to benefit the Veteran population at large. The core EDM architecture will provide key data management and analytics services by integrating and delivering high-quality data.

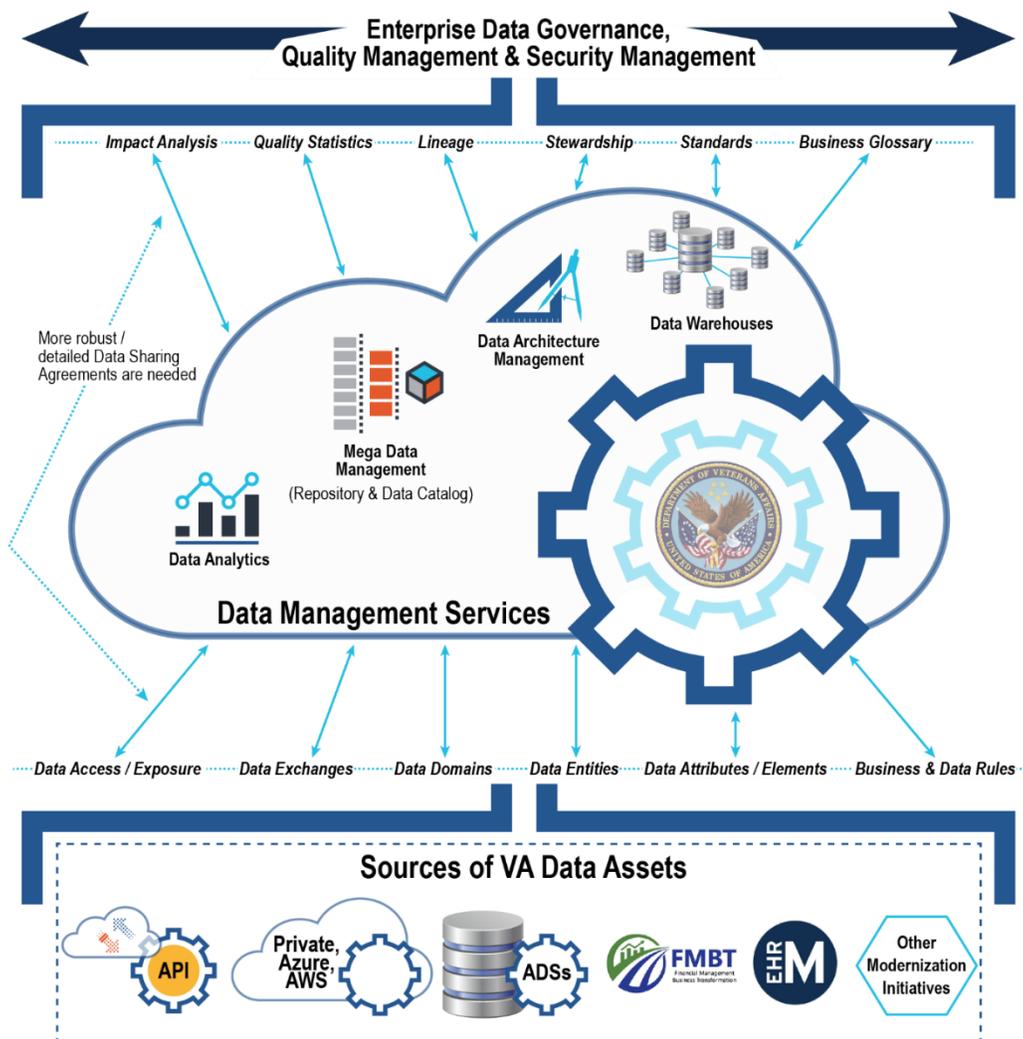


Figure 38: EDM Framework

⁷⁶ VA Directive 6518, Enterprise Information Management

Data Discoverability

Discoverability applies to all data assets (e.g., databases, documents, images, and engineering resources). To enable discoverability, sufficient metadata about the information asset is required to assess its suitability for a given need. Additionally, VA should catalog its information assets using one or more taxonomies in order to facilitate the discovery process. VA's information assets should be discoverable even if the referenced content is not accessible. The Department's structured information assets are discoverable via the VA Enterprise Architecture Repository (VEAR).

Data Accessibility

VA is utilizing APIs to facilitate data integration and data interoperability to improve accessibility. APIs can significantly improve VA's ability to integrate data across multiple systems. However, this can be hindered if there are multiple security standards or attributes that must be harmonized to access the content. By developing an approach to identify a common set of data attributes, VA can implement a common attribute-based access control architecture to ensure that manual data harmonization efforts are limited.

Trusted Data

Data is trusted if the consumer trusts the data source. While zero-defect VA data assets are not currently present, OIT must establish an appropriate balance between data needs and the associated cost of high data quality needs. VA's DGC is responsible for identifying and approving an ADS. The Department must ensure that all VA systems and services access VA data solely through ADSs where available to ensure data quality, interoperability, and reuse.⁷⁷ Metadata is essential for managing the ever-growing volume of information that the Department produces and stores in VA systems. VA must update trusted metadata to accurately represent the current environment of all data assets. GXXA

Data Management Accountability

Data management requires full accountability realized through collaborative and transparent data management processes. VIP is VA's solution development lifecycle for ensuring accountability and consistency across all project releases. VIP checkpoints ensure that artifacts incorporate data management processes and that the Department collects information asset metadata. OIT governance evaluates project compliance with EA, data, and security. By incorporating EDM into the Department's governance processes, it ensures that data assets are considered throughout the project lifecycle.

VA must institutionalize EDM as part of governance through the provision of the Enterprise Logical Data Model and DGC-approved data standards. VA is collaborating with users to define and implement metadata requirements necessary to ease full integration of ADSs and APIs into every project that requires data. VA will accelerate adoption of APIs by identifying the ADSs

⁷⁷ VA Directive 6518, Enterprise Information Management

required by VA’s modernization initiatives and working with stakeholders to proactively ensure their incorporated into solution designs.

6.9 Strategic Sourcing

FITARA mandates that public agencies procure through efficient and effective strategic sourcing solutions to deliver the latest technology at the best value. As a result of FITARA, OIT established the Office of Strategic Sourcing (OSS) to provide more accountable IT product and service procurement for VA. In 2017, OIT launched this office to:

- Examine OIT practices that will improve speed to market.
- Improve compliance and quality for IT solutions.
- Ensure CIO visibility on all IT requirements.
- Provide VA with access to industry innovation.
- Empower employees to deliver the best solution at the best value. CXXG

OSS encompasses the entire sourcing lifecycle. OSS is transforming OIT to be a customer of choice to suppliers, thereby attracting the best talent and price and delivering savings to OIT. Strategic sourcing is necessary to optimize spending while simultaneously improving the quality of supplier-delivered products and services. Strategic sourcing centralizes accountability of IT acquisition decisions under the CIO in conjunction with the Chief Acquisition Officer.

Establishment of OSS enables OIT to maximize value by optimizing the stewardship of tax dollars. Strategic sourcing changes how OIT does business with its vendors by ensuring that OIT selects the right suppliers to deliver value to Veterans. As a result, VA's suppliers will focus on providing offerings that drive outcomes that improve Veteran experience. OSS processes are aimed at decreasing the cost, improving quality, and reducing the quantity of IT acquisitions through acquisition research, and planning for future VA IT needs.⁷⁸ BXXC

OSS plans to implement a category management capability, enabling VA to deliver more value and savings from its IT acquisitions. Furthermore, the OSS COE is applying innovative strategies in order to procure cutting-edge IT goods and services for customers in the areas of hardware, software, IT services, and professional services. HXXB

6.10 IT Service Management Tool

OIT identified IT Service Management (ITSM), or the alignment between services offered and business needs, as a key gap of VA IT modernization. VA began leveraging ITIL to implement key aspects of ITSM. ITIL is a framework designed to standardize the selection, planning, delivery and maintenance of IT services within an organization. Leveraging industry standards (e.g., ISO 20000) will improve interoperability, minimize costs associated with security and risk, normalize configurations, and reduce organizational complexity throughout the enterprise.

In FY 2017, VA purchased ServiceNow, a Cloud-based ITSM tool to modernize the way customer’s access VA IT support. VA established the Service Management Office (SMO) to

⁷⁸ FY 2019 Operations Plan, Office of Strategic Sourcing (OSS)

provide OIT with a common set of validated best practices and principles around the five stages of the ITIL framework. In FY 2018, OIT implemented the first wave of ITSM Tool functionality which included incident management, service request management, KM, and an interactive self-help portal. In FY 2019, OIT will manage the implementation of ITSM Tool capabilities including change management, problem management, major incident management, and expanding service request offering to end users.

The ITSM Tool will enhance OIT employees' ability to prioritize incidents, analyze issues, and capture service management metrics. It will also offer an advanced self-service portal through which all VA users can submit requests, report issues, and talk to technicians via an online chat. VA will document and track its ITSM framework enhancement progress across the five core stages of maturity—initial, repeatable, defined, capable, and efficient. Additionally, VA will baseline and continually re-evaluate its ITSM maturity.

6.11 Enterprise Cybersecurity

VA, its core constituents, and external partners are subject to a wide variety of constantly evolving cyber threats. VA has a critical mission that includes acting as an effective steward of Veteran and VA data, protecting VHA biomedical equipment, and safeguarding VA's information systems and infrastructure from continuously evolving cybersecurity threats.

The Office of Information Security (OIS) oversees cybersecurity across VA. OIS, founded in 2012, establishes as the VA cybersecurity vanguard to protect Veterans' data, VA information systems and networks, and mission-critical data against current and emerging threats.⁷⁹

OIS developed the Enterprise Cybersecurity Strategy (ECSS) in alignment with the NIST Cybersecurity Framework (CSF) as the approach for achieving its mission. ECSS is the foundation of the OIS Enterprise Cybersecurity Roadmap and guides its supporting activities as illustrated in Figure 39. The ECSS aligns with VA's mission, core values, modernization initiatives, and efforts to implement the NIST Risk Management Framework and the NIST CSF. Additionally, the ECSS will drive the implementation of EHRM, Continuous Diagnostics and Mitigation (CDM), and Information Security Continuous Monitoring.

Since the creation of the Enterprise Cybersecurity Strategy Team (ECST) in 2015, VA has made great strides in achieving the five strategic cybersecurity goals via a prioritized set of cross-functional projects. VA has built on the ECST's momentum by evolving VA's Cybersecurity Program into the Enterprise Cybersecurity Strategy Program (ECSP). Through the ECSP alignment to the ECSS, VA will establish an integrated approach to managing cybersecurity risk, which includes the following strategic elements:



Figure 39: NIST Cybersecurity Framework

⁷⁹ FY 2019 Operations Plan, Office of Information Security (OIS)

- Conforming to VA policies and Directives such as VA Directive 6500.
- Using a risk-informed approach in managing VA’s Enterprise Security Architecture (ESA) to best enable VA’s business and mission processes.
- Proactively driving alignment with federal priorities and requirements, such as Executive Order 13800, *Strengthening the Cybersecurity of Federal Networks and Critical Infrastructure*.
- Aligning systems and enterprise-level perspectives on cybersecurity risk.
- Adapting to the evolving cyber threat landscape by continually centralizing, normalizing, and refreshing VA privacy and cybersecurity policy and guidance available to employees in the field.
- Leveraging industry best practices, innovation, and automation wherever possible to aid in cybersecurity capability implementation, continuous monitoring, and incident response.
- Fostering a culture of cybersecurity, privacy, and transparency to protect the sensitive data of U.S. Military Veterans and their families through improved privacy policy and compliance efforts.

OIS established the ECSP, which aligns with the Presidential Executive Order 13800, *Strengthening the Cybersecurity of Federal Networks and Critical Infrastructure*. Examples of ECSP cybersecurity projects include:

- Data Loss Prevention (DLP) Program: The project is to establish an end-to-end DLP program, which is intended to provide the governance and oversight necessary to guide the implementation, operation, and sustainment of DLP technologies within VA. The DLP solution will reduce the risk of sensitive data leakage and enable policy-compliant use of sensitive data across approved traditional, mobile, and Cloud environments, as well as authorized networks, repositories, and devices.
- PII/PHI Encryption: The purpose of this project is to identify VA data stores that contain PII/PHI and the type and level of encryption used to protect sensitive data contained within each of the data stores. The end goal is to confirm that VA data stores that contain PII/PHI are encrypted per VA policies and federal regulations and that this data is adequately protected.
- Governance, Risk, and Compliance (GRC) Refresh: The purpose of this project is to provide automation to support ongoing security documentation updates to reflect the current operating environment. These access privileges will likely allow for authorization reciprocity between VA and DoD in support of EHRM. GXXB

Enterprise Resilience Framework

The Disaster Recovery and Continuity of Operations (DR/COOP) Division of Enterprise Command Center works continuously with ITOPS Divisions, Security Operations, and VA Stakeholders to identify mission-critical systems and mission essential functions (MEFs). It develops detailed Contingency Plans for each of these systems and MEFs in accordance with the FISMA contingency planning controls. The Office of Inspector General (OIG) also reviews a

subset of Contingency Plans annually, and as of the last OIG report, it identified no material weaknesses with the VA FISMA contingency planning controls. EXXB

Strategic Cybersecurity Goals

VA has integrated the ECSS into its overarching strategy to promote collaboration, enable data protection, and provide resiliency in the face of a broad spectrum of threats through the realization of strategic cybersecurity goals and objectives. EXXA

1. Enhance Enterprise Cybersecurity and Privacy Risk Management

- Create an agency-wide cybersecurity and privacy risk management strategy
- Integrate cybersecurity and privacy into enterprise-wide risk management programs and processes
- Enhance the High Value Asset (HVA) risk management program
- Integrate the NIST Cybersecurity Framework with VA’s existing cybersecurity risk management processes

2. Ensure Secure Interoperability Both Within and Outside VA

- Ensure that data is protected regardless of its location
- Ensure that access methods are secure, flexible, and support VA business processes
- Leverage shared security and privacy capabilities
- Collaborate with partners and third-party providers to meet VA cybersecurity and privacy requirements

3. Deliver Exceptional Customer Service

- Partner with stakeholders to provide security and privacy services that add business value
- Integrate cybersecurity policies, standards, architectures, and services with business and IT processes
- Enhance VA-wide governance processes that link cyber investments with mission outcomes

4. Enable Secure and Resilient Business Operations

- Improve cyber hygiene to minimize exposure to potential attack vectors, and cyber threats
- Accelerate adoption of innovative and effective cyber technologies to address cybersecurity and privacy gaps
- Employ mechanisms to take a proactive approach to cybersecurity and privacy threats
- Validate and enhance cross-organizational incident response and continuity of operations plans

5. Cultivate a VA Cybersecurity and Privacy Workforce and Culture

- Recruit, train, and sustain a cybersecurity and privacy capable workforce

- Enhance VA cybersecurity and privacy commitment and accountability across the organization
- Develop a privacy and cybersecurity-aware VA culture
- Integrate a VA cybersecurity and privacy workforce planning capability

6.12 Enterprise Shared Services

Enterprise Shared Services (ESS) are centrally-provided services that are designed to be consumed by any part of VA with a business requirement and business need.⁸⁰ Shared services include both internal and external shared services, such as VAEC general support services. These services help improve and evolve information security, advance agile interoperability and data sharing, and reduce the total lifecycle cost of IT services. VA’s catalog of existing shared services includes CDW, Enterprise IAM, and BGS. Additionally, VA is identifying opportunities to reuse business functions and consolidate infrastructure services as shared services.

VA’s adoption of shared services is consistent with other federal agencies. OMB has long been an advocate of ESS, as demonstrated in the 25 Point Implementation Plan to Reform Federal IT Management in 2010 and the Federal Information Technology Shared Services Strategy in 2012. The latter recommends that CIOs adopt a “Shared-First” approach to IT service delivery to increase return on investment, eliminate waste and duplication, and improve the effectiveness of IT solutions. Not all services are meant to be shared. Rather, the ideal candidates are designs that meet common and frequent business or mission needs. A shared ESS/service-oriented architecture (SOA) infrastructure is needed to support federated service with mission partners and foster common operation and uniformity of shared services across the enterprise.

Figure 40 illustrates current stove-piped, system-specific solutions and a future environment ESS/SOA approach that will provide capabilities through services shared by many.

⁸⁰ White Paper – Shared Services Definition, Page 4

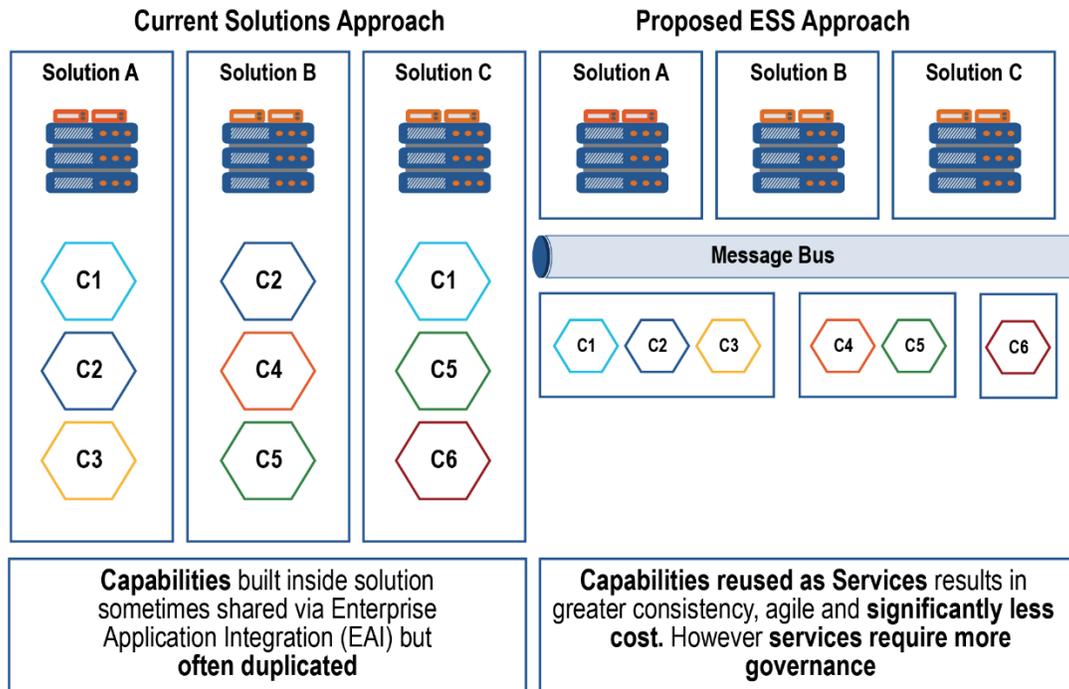


Figure 40: Current Environment vs. Future Environment ESS/SOA Approach

By utilizing shared services, IT project teams can focus their resources on meeting mission needs, rather than managing infrastructure services.⁸¹ By implementing ESS, VA can reduce development times and total lifecycle cost of IT, improve information security, and advance organizational interoperability and IT capabilities. GXXA HXXC

6.13 Enterprise Mobility Strategy

Mobility involves the collective set of people, processes, and technology associated with the increased availability of mobile devices, wireless networks, and information access services applicable to mobile computing within a business environment. VA’s Enterprise Mobility Strategy depicts a future in which Veterans, beneficiaries, and VA’s workforce can virtually access digital information and services anywhere, anytime, on any device. The Department is developing new and useful mobile applications that are easier and more convenient for Veterans to access virtual VA services, identify information, schedule appointments, and access web-enabled applications (e.g., MyHealtheVet). BXXB

VA will incorporate new federal security requirements in development by DHS, DoD, and NIST for mobile and wireless services into its enterprise mobility policies and procedures. Additionally, VA will identify the functional and security gaps with the current infrastructure, security policies, and framework servicing the mobility functionality to VA employees. The Department is preparing approaches for infrastructure and hardware investments in mobility and will migrate application performance monitoring tools to VAEC.

⁸¹ White Paper – Shared Services Definition, Page 3

VA will establish criteria for IoT technology selection and approval. These criteria are established on three principles: avoid or mitigate risks created by common IoT device and security vulnerabilities; ensure that devices are adequately maintained and supported by the vendor; and guarantee capability to update/patch device software and firmware. Device isolation architecture will limit potential damage of compromised IoT devices and prevent use of compromised device to attack VA networks. Additionally, it will provide comprehensive management for IoT endpoint devices and visibility into device attributes, such as ownership, performance, and operational status.

6.14 Risk Profile

The risk information portrayed in the OIT Risk Profile is developed almost exclusively through communication, collaboration, and cooperation between QPR, OIT Divisions, and IT Modernization Programs contributing to ERM activities. The OIT Risk Profile provides leaders with the opportunity to view an array of risks that affect various OIT Divisions and identify synergies for risk response.

The summary illustrates the priority risks included in the OIT Risk Profile. Four risk areas (Privacy Program Effectiveness, Records Management Effectiveness, IT Modernization, and Human Capital/Human Resources Management) produced more than one risk. Those risks are “bundled,” creating a portfolio of eight risk areas/risk titles that are depicted in Table 4, including risk alignment to OIT’s revised Imperatives/Strategic Goals.

Enterprise Risk Area/Title ⁸²	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5
Privacy Program Effectiveness (3 risks) <ul style="list-style-type: none"> • Privacy Program Effectiveness • Lack of Consistent Privacy Collaboration • Lack of Consistent Monitoring of PII/PHI on VA Servers 	X				X
Records Management Effectiveness (3 risks) <ul style="list-style-type: none"> • Records Management Program Effectiveness • Lack of Electronic Information Governance • Lack of Plan for Permanent Records Conversion 	X	X			X
IT Modernization (2 risks) <ul style="list-style-type: none"> • VA Medical Appointment Scheduling System Modernization • Modernizing the Financial Management System 	X	X	X		X
Human Capital/Human Resources Management (2 risks) <ul style="list-style-type: none"> • Critical Vacancies in IT Cyber and/or IT Cybersecurity-related Positions • Aging Workforce Including Retirement Eligible 	X			X	
Cybersecurity Program Effectiveness	X	X	X	X	X
Legacy Infrastructure Obsolescence	X	X	X	X	X
Information and Communication Technology (ICT) Strategic Sourcing	X	X	X		X
Enterprise Infrastructure Solutions Transition and Possible New Providers	X	X	X		X

Table 4: Enterprise Risk and Alignment to Strategic Goals

⁸² Based on Enterprise Risk Profile Dated May, 2019

7. Next Steps

OIT anticipates that the VA Enterprise Roadmap will evolve as VA's IT Strategy evolves to achieve the Department's future environment. The transformative initiatives and modernization timelines within the VA Enterprise Roadmap are accurate at the time of publishing and will be updated annually to represent changes in resources and evolving VA goals, objectives, and strategies. OIT will factor this evolution into IT strategic planning activities through its OIT Governance Framework and Strategic Planning Process. VA envisions the following next steps upon release of this version of the Enterprise Roadmap.

Internal Outreach and Managing Change

The following activities outline managing changes to the Enterprise Roadmap while emphasizing collaboration:

- Increase collaboration with Administrations, Business Partners, and VA Staff Offices.
- Introduce the document to OIT Governance Boards to review the major components and drive meaningful and strategic IT management governance decisions.
- Inform long-term IT planning, prioritization activities, UFR review, and support Enterprise and Platform Architecture efforts.
- Collaborate with OSS and ITRM to gather data on reinvestment strategies, cost savings, and cost avoidance.
- Inform VA Enterprise and System Architecture.
- Incorporate new guidance from OMB.
- Update the VA Enterprise Roadmap on an annual basis.

Implementation and Utilization

The following activities illustrate the use and value of Enterprise Roadmap to drive change and IT Transformation in VA:

- Review the Enterprise Roadmap content with Business Partners and VA Staff Offices.
- Drive meaningful conversations within OIT on issues related to decommissioning, IMS/IMP, dependency analyses, and risk management.
- Incorporate new insights from the PPBE process to drive planning and prioritization activities.
- Engage with OIT Governance through the Strategic Planning Working Group to use the Enterprise Roadmap for data-driven governance decisions.
- Assess links to VHA, VBA, NCA, OEHRM, and VA Staff Office Governance Boards.
- Continually integrate insights from OIT Division Operations Plans.
- Assess performance and value of the SCIF IT Capabilities.
- Correlate the SCIF milestones to milestones recorded in OMB investment business cases.

- Conduct external outreach: industry briefs; submission to OMB and Congress; and inclusion in VA's acquisition strategies with respect to Requests for Proposal, Requests for Information, and Requests for Quotation.

Appendices

- Appendix A: References
- Appendix B: OMB Reporting Traceability Matrix
- Appendix C: SCIF Capability Alignment with VA Secretary Priorities, OIT Strategic Goals, VA Priority Initiatives, and PMA CAP Goals
- Appendix D: SCIF Capability and VA Business Reference Model Alignment
- Appendix E: SCIF Capability Dependency and OIT Strategic Goal Alignment
- Appendix F: SCIF Capability Alignment with the Federal Health IT Strategic Plan Framework
- Appendix G: SCIF Capability Alignment with Major IT Investments
- Appendix H: Vet360 Logical Architecture
- Appendix I: Health Services Portfolio Milestones
- Appendix J: Benefits and Memorial Services Portfolio Milestones
- Appendix K: Corporate Services Portfolio Milestones
- Appendix L: Technology and Platform Services Portfolio Milestones
- Appendix M: Strategic Capability Integration Framework
- Appendix N: Abbreviations and Acronyms

Appendix A: References

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Appendix B: OMB Reporting Traceability Matrix

Code	Description	Enterprise Roadmap Section	IT Strategic Plan Section
<p>Note: The four-letter code for each of the following items has been included with content in the document where each item has been addressed.</p>			
<p>Agency Strategic Goals and Objectives</p>			
AXXA	Identify agency strategic goals and objectives supported by the IT strategic plan (AXXA).	1. Strategic Alignment	1.1 VA Strategic Goals, Objectives, Agency Priority Goals, and Secretary’s Initiatives
AXXB	Describe how activities of the IT Strategic Plan and Enterprise Roadmap advance these goals and objectives (AXXB).	Purpose 1. Strategic Alignment	2. Veteran Experience and Integration 3.2 VA Electronic Health Record Modernization 3.3 Health Data Interoperability – DoD/VA Interagency Program Office 3.4 Financial Management Business Transformation (FBMT)/ Integrated Financial Acquisition Management System (iFAMS) 3.5 Legacy IT Systems Modernization 3.7 Value Management Analytics
<p>Improving Services to Customers – Describe how your agency regularly evaluates existing and planned customer-facing services to:</p>			
BXXA	Measure customer use and satisfaction through analytics and other approaches (BXXA).	5.7 Analytics	2. Veteran Experience and Integration 3.7 Value Management Analytics
BXXB	Improve usability, availability, and accessibility of services, including optimization of services for mobile use (BXXB).	2.1 Electronic Health Record 2.2 Telehealth 2.3 Community Care 2.4 Other Health IT 2.5 Supply Chain Management 3.1 Benefits 4.1 Customer Relationship Management 5.1 Digital Modernization 5.2 Contact Center Modernization 5.4 Migration of Applications to the Cloud 5.6 Trusted Information Sharing 6.13 Enterprise Mobility Strategy	3. IT Modernization

BXXC	Advance agency performance goals (BXXC).	6.1 Veteran-focused Integration Process 6.2 Investment Review Process 6.4 DevOps Integration 6.6 Technology Business Management 6.7 IT Governance Transformation 6.9 Strategic Sourcing	2. Veteran Experience and Integration
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Governance and Management Processes – Describe the governance process the agency uses to ensure that current law and policy are followed when planning, prioritizing, funding, executing, and decommissioning IT investments. If there are differences in the way the governance process is implemented across organizational units, describe those differences and why they exist. At a minimum, address:

CXXA	The scope of the governance process, including Investment Review Board and other Portfolio Governance Boards (as appropriate) along with delegation of authority to bureaus or other organizational units (as appropriate) (CXXA).	6.7 IT Governance Transformation	1.3 IT Governance
CXXB	Which agency stakeholders are engaged, including “C”– level leadership (CXXB).	6.2 Investment Review Process	1.3.1 Investment Review Process
CXXC	The valuation methodology used to comparatively evaluate investments, including what criteria and areas are assessed (CXXC).		1.3 IT Governance 3.7 Value Management Analytics
CXXD	How the agency ensures investment decisions are mapped to agency goals and priorities (CXXD).	6.2 Investment Review Process 6.7 IT Governance Transformation	1.3 IT Governance
CXXE	A high-level description of the process used to assess proposed investments and make decisions, including frequency of meetings and how often the process is updated (CXXE).		1.3 IT Governance
CXXF	How you coordinate between investment decisions, portfolio management, enterprise architecture, procurement, and software development methodologies (CXXF).	6.2 Investment Review Process 6.4 DevOps Integration 6.7 IT Governance Transformation	1.3 IT Governance
CXXG	Describe the agency’s IT strategic sourcing plan, to include processes for addressing enterprise licenses (CXXG).	6.9 Strategic Sourcing	1.3 IT Governance 3.9.3 Strategic IT Sourcing: IT Commodity and Cost Optimization 3.9.4 Enterprise Licensing

CIO Authorities

DXXA	Describe how the agency policies, procedure and authorities implement CIO authorities, consistent with OMB Memorandum 11-29, “Chief Information Officer Authorities” (DXXA).	1. Strategic Alignment	1.1.2 VA CIO Roles, Responsibilities and Organizations
------	--	------------------------	--

Cybersecurity Management

EXXA	Summarize your agency’s strategy to ensure that IT investment and portfolio decisions align with the administration’s Cybersecurity Priority Capabilities and your agency’s IT security goals, and how you will continue to strengthen this alignment (EXXA).	6.11 Enterprise Cybersecurity	4. Cybersecurity, Privacy, and Business Continuity 4.3 Security and Privacy – IT Investment Alignment
EXXB	Describe your agency’s approach to ensure all mission critical applications have the proper continuity of operation and disaster recovery capabilities such that the agency can support the proper level of continuity of Government operations in accordance with Federal statute and guidance (EXXB).	6.11 Enterprise Cybersecurity	4.2 Strengthening Cybersecurity and Critical Infrastructure 4.4 VA Enterprise Cybersecurity 4.5 Business Continuity

Workforce

FXXA	Summarize your agency’s approach to IT human capital planning, including the ability to build a future ready workforce to support the agency’s strategic goals and objectives (FXXA).	4. Corporate Services Portfolio 4.3 Human Resources 6.14 Risk Profile	5. Workforce Development and Accessibility
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Managing Information as an Asset

GXXA	Include how your agency will promote interoperability and openness throughout the information life cycle and properly safeguard information that may require additional protection. Specifically address how information collection and creation efforts, system design, and data management and release practices will support interoperability and openness (GXXA).	2.1 Electronic Health Record 2.3 Community Care 3.1 Benefits 4.3 Human Resources 5.6 Trusted Information Sharing 6.8 Enterprise Data Management 6.12 Enterprise Shared Services	3.3 Health Data Interoperability – DoD/VA Interagency Program Office
GXXB	Describe how your agency ensures that personal information, including personally identifiable information (PII) and controlled, unclassified information (CUI), is accessible only to authorized personnel and how frequently these controls are verified (GXXB).	6.11 Enterprise Cybersecurity	3.1.1 Securing Personal and Sensitive Information

Commodity IT and Shared Services

HXXA	Describe your agency’s approach to maturing the IT portfolio, to include optimizing commodity IT (including data centers), rationalizing applications and adopting a service orientation approach (HXXA).	4. Corporate Services Portfolio 5.1 Digital Modernization 5.3 IT Infrastructure 5.4 Migration of Applications to the Cloud 5.5 Data Center Optimization and Consolidation	3.9 IT Infrastructure Portfolio Evolution
HXXB	Describe the agency’s plan to re-invest savings resulting from consolidations of commodity IT resources (including data centers) (HXXB).	6.9 Strategic Sourcing	

HXXC	Describe your agency’s approach to maximizing use of inter-and intra-agency shared services (such as those enabled by common platforms and lines of business) and shared acquisition vehicles for commodity IT, such as those determined by the Strategic sourcing Leadership Council, in order to reduce duplicative contract vehicles (HXXC).	6.12 Enterprise Shared Services	3.9.1 Enterprise Shared Services (ESS) 3.9.3 Strategic IT Sourcing: IT Commodity and Cost Optimization
Accessibility - Describe the agency’s approach to:			
IXXA	Creating a diverse environment where individuals of all abilities can work, interact, and develop into leaders (IXXA).	4.3 Human Resources	
IXXB	Integrating accessibility considerations into the processes used in developing, procuring, maintaining, or using IT (IXXB).	4.3 Human Resources	
IXXC	Building workforce skills to support an environment where Section 508 requirements and responsibilities are well understood, communicated, implemented, and enforced (IXXC).	4.3 Human Resources	5.2 Accessibility

Appendix C: SCIF Capability Alignment with VA Secretary Priorities, OIT Strategic Goals, VA Priority Initiatives, and PMA CAP Goals

Portfolio	SCIF Capability	VA Secretary Priority	OIT Strategic Goal	VA Priority Initiative(s)	PMA CAP Goal(s)
 Health Services	Electronic Health Record	• Electronic Health Record	• Goal 5: Achieve seamless and secure data interoperability across VA, DoD, Federal, and commercial partners	• EHRM	1, 2, 4
	Telehealth	• MISSION Act	• Goal 2: Drive IT and VA capability modernization through digital transformation	• Telehealth Modernization	1, 2, 4
	Community Care	• MISSION Act	• Goal 2: Drive IT and VA capability modernization through digital transformation	• VA Choice	1, 4, 9
	Other Health Information Technology	• MISSION Act	• Goal 2: Drive IT and VA capability modernization through digital transformation	• Mental Health Joint Action Plan	2, 4
	Supply Chain Management	• Business Systems Transformation	• Goal 3: Transform procurement and acquisition processes to support aggressive modernization efforts	• Supply Chain Modernization	1, 2, 7, 11
 Benefits and Memorial Services	Benefits	• Business System Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• Appeals Modernization • GI Bill	1, 2, 4, 9
	Memorials	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• IT Modernization	1, 4
 Corporate Services	Customer Relationship Management	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• IT Modernization	1, 2, 4, 5
	Finance & Acquisition	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• Financial Management Business Transformation	1, 5, 7, 9, 10, 11, 12
	Human Resources	• Business System Transformation	• Goal 4: Inspire a culture of digital transformation, IT modernization, and customer service	• HR Modernization	1, 3, 4, 5, 6, 13
 Technology and Platform Services	Digital Modernization	• Customer Service	• Goal 1: Deliver Exceptional Customer Experience	• Navigator – Contact Centers, Digital Access	1, 2, 4
	Contact Center Modernization	• Customer Service	• Goal 1: Deliver Exceptional Customer Experience	• Navigator	1, 2, 4, 5
	IT Infrastructure	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• IT Modernization	1
	Cloud Migration	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• IT Modernization	1
	Data Center Optimization & Consolidation	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• IT Modernization	1
	Trusted Information Sharing	• Customer Service	• Goal 5: Achieve seamless & secure data interoperability across VA, DoD, Federal & commercial partners	• IT Modernization	1, 2, 4
	Analytics	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• Stop Fraud, Waste and Abuse	2, 4, 9, 14

Appendix D: SCIF Capability and VA Business Reference Model Alignment

BRM Level & Code	Portfolio / BRM Description	Health Services					Benefits and Memorial Services		Corporate Services			Technology and Platform Services						
		EHR	Telehealth	Community Care	Other HIT	SCM	Benefits	Memorials	CRM	Finance & Acquisition	HR	Digital Modernization	Contact Center Modernization	IT Infrastructure	Migration of Applications to the Cloud	Data Center Optimization & Consolidation	TIS	Analytics
1. - VET001	Provide Services to Veterans and the Public	●	●	●	●		●	●	●			●	●				●	
1.1 - ELG002	Determine Eligibility and Approve Benefits	●	●	●	●		●	●									●	
1.2 - HC001	Provide Health Care Administration	●	●	●	●												●	●
1.3 - HC040	Deliver Health Care	●	●	●	●							●					●	●
1.4 - HC127	Conduct Health Care Research	●	●	●	●		●										●	●
1.6 - HC154	Provide Health Care Education	●	●	●	●									●			●	●
1.6 - HC163	Provide Public Health	●	●	●	●									●			●	●
1.7 - BEN001	Provide Veterans Housing						●										●	●
1.8 - BEN004	Provide Income Security for Veterans						●			●							●	●
1.9 - BEN009	Provide Veterans Education, Training & Rehabilitation						●					●					●	●
1.10 - MEM001	Provide Memorial Benefits and Services						●	●									●	●
1.11 - EMP001	Promote Veterans Employment and Retention										●						●	●
1.12 - DIS001	Conduct Disaster Preparedness Programs	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1.13 - CRM001	Manage External Veterans Affairs Relationships								●			●	●				●	●

BRM Level & Code	Portfolio / BRM Description	Health Services					Benefits and Memorial Services		Corporate Services			Technology and Platform Services						
		EHR	Telehealth	Community Care	Other HIT	SCM	Benefits	Memorials	CRM	Finance & Acquisition	HR	Digital Modernization	Contact Center Modernization	IT Infrastructure	Migration of Applications to the Cloud	Data Center Optimization & Consolidation	TIS	Analytics
2. - GRS001	Manage Government Resources	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.1 - ACQ001	Conduct Acquisition Management					●				●	●			●	●	●	●	●
2.2 - BUD001	Conduct Budget Formulation									●	●			●			●	●
2.3 - FFM001	Conduct Financial Management									●							●	●
2.4 - GRT001	Perform Grants Management									●							●	●
2.5 HCM001	Conduct Human Capital Management										●						●	●
2.6 - IT001	Provide Information Technology Services	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.7 - MAL001	Conduct Mail Operations Management								●			●		●			●	●
2.8 - RPM001	Perform Property Management					●			●	●							●	●
2.9 - SOM001	Perform Sales Order and Fulfillment Management					●											●	●
2.10 - TRT001	Conduct Travel, Relocation and Fleet Management									●	●						●	●
2.11 - REG001	Conduct Congressional, Legislative, and Regulatory Affairs								●	●							●	●
2.12-GOV001	Conduct Enterprise Governance	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

BRM Level & Code	Portfolio / BRM	 Health Services					 Benefits and Memorial Services		 Corporate Services			 Technology and Platform Services						
		BRM Description	EHR	Telehealth	Community Care	Other HIT	SCM	Benefits	Memorials	CRM	Finance & Acquisition	HR	Digital Modernization	Contact Center Modernization	IT Infrastructure	Migration of Applications to the Cloud	Data Center Optimization & Consolidation	TIS
2.13 - ADM001	Provide Organizational Leadership and Administrative Support	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.14 - LGL001	Provide Legal Guidance and Representation	●	●	●	●	●	●	●	●	●	●			●			●	●
2.15 - EMR001	Conduct Service Continuity	●	●	●	●	●	●	●	●	●	●			●			●	●
2.16 - SEC001	Manage Physical and Personnel Security													●			●	●
2.17 - IM001	Manage Information											●	●	●	●	●	●	●

Appendix E: SCIF Capability Dependency and OIT Strategic Goal Alignment

OIT Strategic Goal 1: Deliver exceptional customer service

OIT Strategic Goal 2: Drive IT and VA capability modernization through digital transformation

OIT Strategic Goal 3: Transform procurement and acquisition processes to support aggressive modernization efforts

OIT Strategic Goal 4: Inspire a culture of digital transformation, IT modernization, and customer service

OIT Strategic Goal 5: Achieve seamless and secure data interoperability across VA, DoD, Federal, and commercial partners

○ Capability Dependency
★ Core Dependency

Portfolio	SCIF Capability	OIT Strategic Goal Alignment	Electronic Health Record	Telehealth	Community Care	Other Health Information Technology	Supply Chain Management	Benefits	Memorials	Customer Relationship Management	Finance & Acquisition	Human Resources	Digital Modernization	IT Infrastructure	Cloud Migration	Data Center Optimization & Consolidation	Trusted Information Sharing	Analytics
Health Services	Electronic Health Record	1, 2, 5		○	○	○	○			○	○	○	○	★	○	○	★	○
	Telehealth	1, 2, 5	○		○	○				○			○	★	○	○	○	
	Community Care	1, 2, 5	★	○		○				○	○		○	○	○		○	○
	Other Health Information Technology	2, 5	★	○	○			○		○				○	○	○	○	○
	Supply Chain Management	2, 3, 5	○	○		○		○	○		★			○	○	○	○	○
Benefits and Memorial Services	Benefits	1, 2				○	○		○	○	○	○	○	○	○		★	○
	Memorials	1, 2					○	★		○	○	○		○	○			○
Corporate Services	Customer Relationship Management	1, 2	○	○	○	○		○	○			○	★	○	○	○	★	○
	Finance & Acquisition	2, 3, 5	○		○		★	○	○	○		○		○	★	○	○	○
	Human Resources	1, 2, 4	○					○	○	○	○		○	○	★	○	○	○
Technology and Platform Services	Digital Modernization	1, 2, 5		○				○	○	○		○		○	○		★	○
	Contact Center Modernization	1, 2	○					○	○	★			★					○
	IT Infrastructure	1, 2, 3													★	○		
	Cloud Migration	1, 2, 3, 5												★		○	○	○
	Data Center Optimization & Consolidation	2												★				○
	Trusted Information Sharing	1, 2, 5										○		○	★			○
	Analytics	1, 2, 5	○	○			○	○	○	○		○		★	○	○	★	

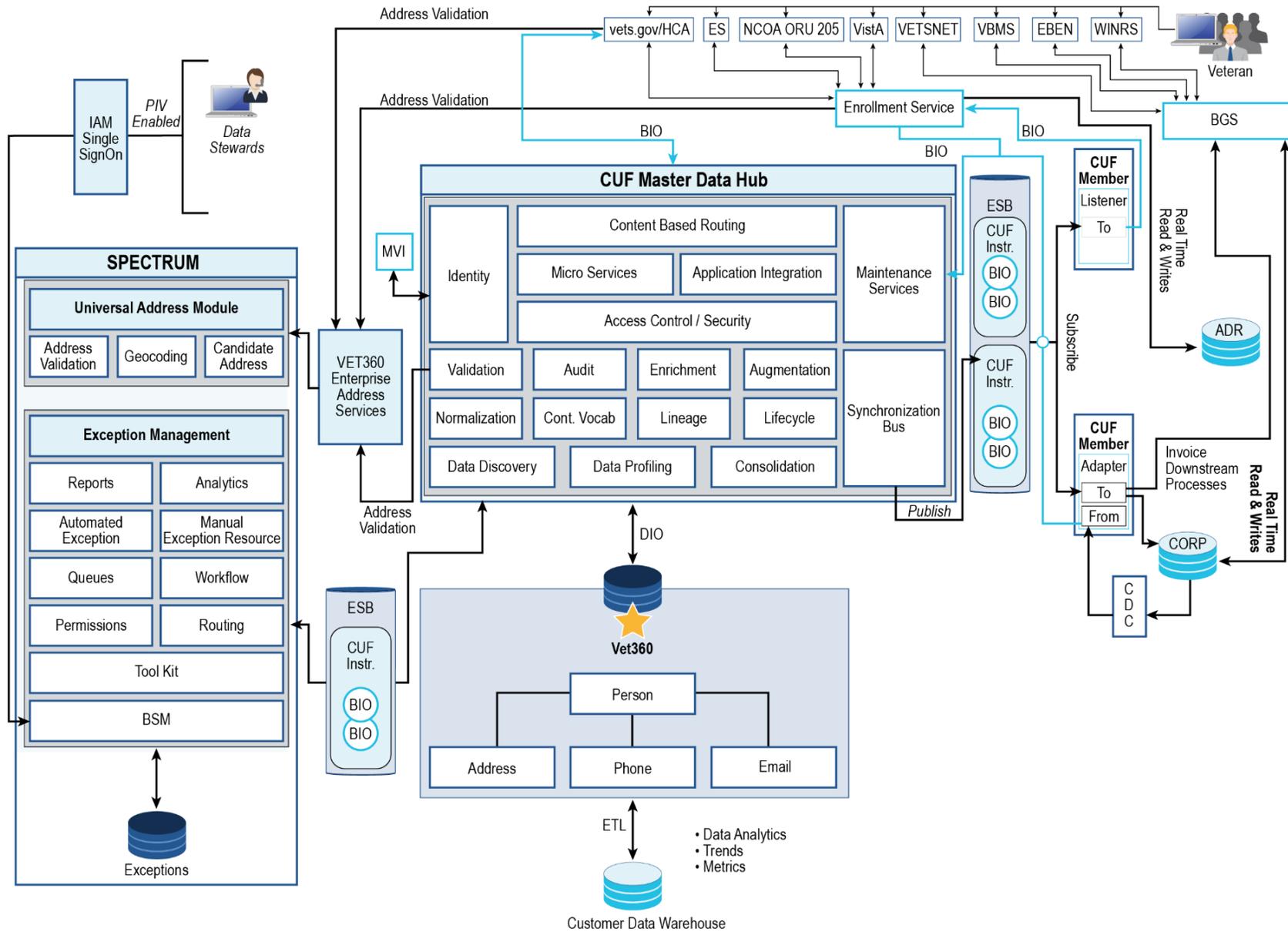
Appendix F: SCIF Capability Alignment with the Federal Health IT Strategic Plan Framework

Portfolio	SCIF Capability	Federal Health IT Strategic Plan Goal	Federal Health IT Strategic Plan Objective	Federal Health IT Strategic Plan Strategy
 Health Services	Electronic Health Record	• Goal 2: Enhance the Delivery & Experience of Care	• Usable health information that is secure and available when and where it is needed	• Electronic care plans • EMS/HIE Integration / Care coordination
	Telehealth	• Goal 1: Promote Health & Wellness for Individuals, Families, & Communities	• Greater patient access to health information	• Mobile applications for health • Patient education
	Community Care	• Goal 2: Enhance the Delivery & Experience of Care	• Safe, high-quality care that is customized and optimized through technology	• Clinical decision support • Patient matching / Provider-focused apps
	Other Health Information Technology	• Goal 3: Build a Data-Driven Culture to Accelerate Research & Improve Health	• Evidence-based research using health information at the population level to prevent disease, improve health quality and outcomes, and reduce cost	• Support allowable secondary uses of health information
	Supply Chain Management	• Goal 2: Enhance the Delivery & Experience of Care	• Efficient management of resources and a workforce confidentially using health IT	• System integration – integrated financial, resource, supply chain systems
 Benefits and Memorial Services	Benefits	• Goal 4: Connect Health Care & Health Data through an Interoperable Health IT Infrastructure	• Greater development and use of health IT capabilities	• Promote user-centered design
	Memorials	• Goal 4: Connect Health Care & Health Data through an Interoperable Health IT Infrastructure	• Greater development and use of health IT capabilities	• Promote user-centered design
 Corporate Services	Customer Relationship Management	• Goal 2: Enhance the Delivery & Experience of Care	• Efficient management of resources and a workforce confidentially using health IT	• System integration – integrated financial, resource, supply chain systems
	Finance & Acquisition	• Goal 2: Enhance the Delivery & Experience of Care	• Efficient management of resources and a workforce confidentially using health IT	• System integration – integrated financial, resource, supply chain systems
	Human Resources	• Goal 2: Enhance the Delivery & Experience of Care	• Efficient management of resources and a workforce confidentially using health IT	• System integration – integrated financial, resource, supply chain systems
 Technology and Platform Services	Digital Modernization	• Goal 2: Enhance the Delivery & Experience of Care	• Safe, high-quality care that is customized and optimized through technology	• Provider-focused apps to support care
	Contact Center Modernization	• Goal 4: Connect Health Care & Health Data through an Interoperable Health IT Infrastructure	• Greater development and use of health IT capabilities	• Promote user-centered design
	IT Infrastructure	• Goal 4: Connect Health Care & Health Data through an Interoperable Health IT Infrastructure	• Improved technology and communications infrastructure	• Telehealth / broadband infrastructure
	Cloud Migration	• Goal 4: Connect Health Care & Health Data through an Interoperable Health IT Infrastructure	• Improved technology and communications infrastructure	• Mobility of providers – Bring your own device, wireless networks, single sign-on
	Data Center Optimization & Consolidation	• Goal 4: Connect Health Care & Health Data through an Interoperable Health IT Infrastructure	• Secure health information that protects patient privacy	• HIPAA compliance of health IT infrastructure
	Trusted Information Sharing	• Goal 4: Connect Health Care & Health Data through an Interoperable Health IT Infrastructure	• Greater development and use of health IT capabilities	• Application Programming Interface • Interoperability Standards Advisory
	Analytics	• Goal 3: Build a Data-Driven Culture to Accelerate Research & Improve Health	• Evidence-based research using health information at the population level to prevent disease, improve health quality and outcomes, and reduce cost	• Machine learning and analytics • Access to big data

Appendix G: SCIF Capability Alignment with Major IT Investments

Portfolio	SCIF Capability	Unique Item Identifier	Investment(s)	Owner(s)
 Health Services	Electronic Health Record	029-55555301 029-55555305	Health Data and Information Electronic Health Record Modernization	EPMO IPO
	Telehealth	029-55555302	Health Management Platform	EPMO
	Community Care	029-55555300	Access to Care	EPMO
	Other Health Information Technology	029-55555303	Health Research	EPMO
	Supply Chain Management	029-77777502	Supply Chain Management	EPMO
 Benefits and Memorial Services	Benefits	029-66666400 029-66666401 029-66666402	Benefits Appeals Benefits Payments Veterans Benefits Management	EPMO
	Memorials	029-66666700	Memorials Automation	EPMO
 Corporate Services	Customer Relationship Management	029-66666404	Customer Relationship Management	EPMO
	Finance & Acquisition	029-77777501	Financial Management	EPMO
 Technology and Platform Services	IT Infrastructure	029-88888601	Enterprise Data Services	EPMO

Appendix H: Vet360 Logical Architecture



Appendix I: Health Services Portfolio Milestones

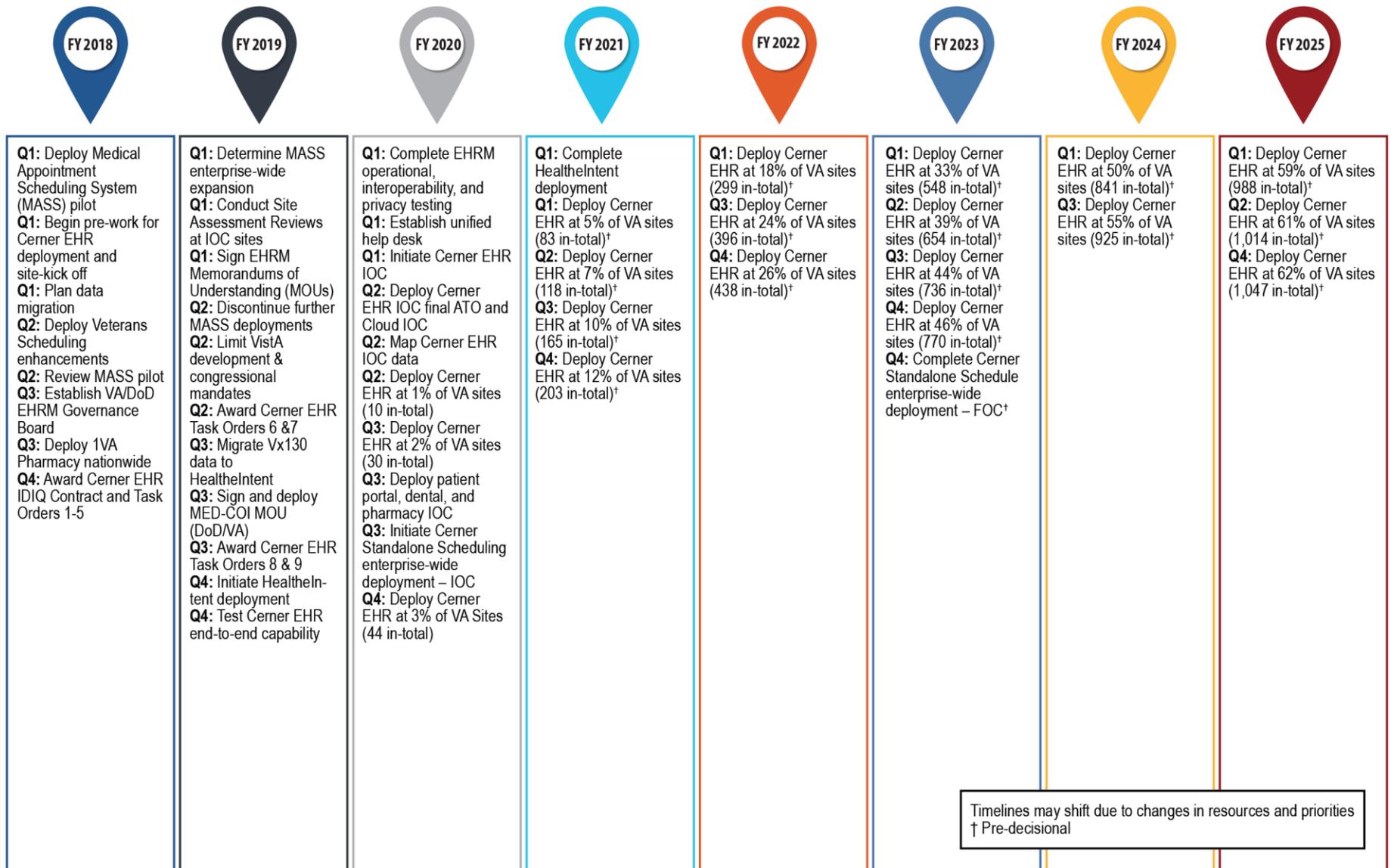


Figure 41: SCIF Electronic Health Record Milestones

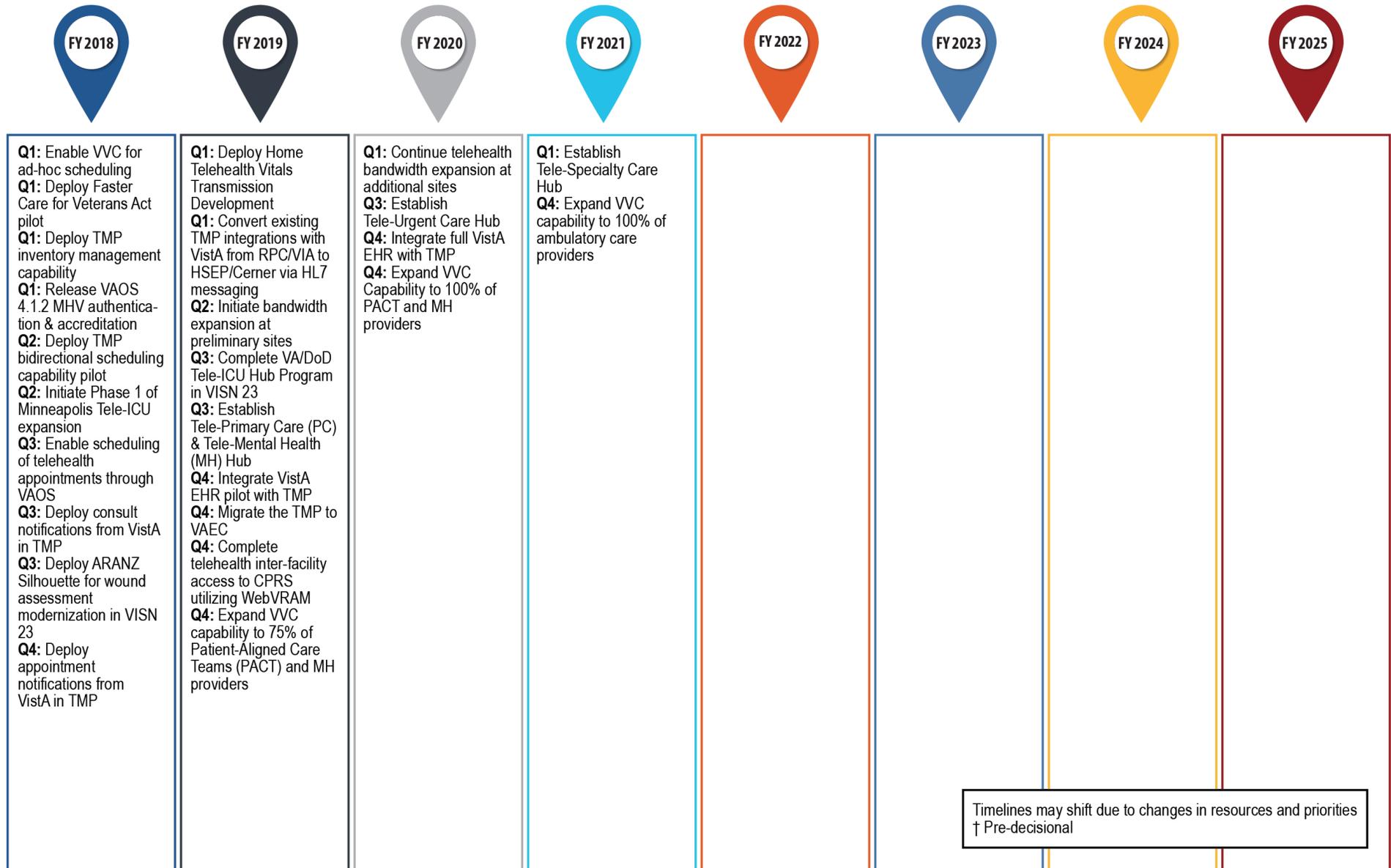


Figure 42: SCIF Telehealth Milestones

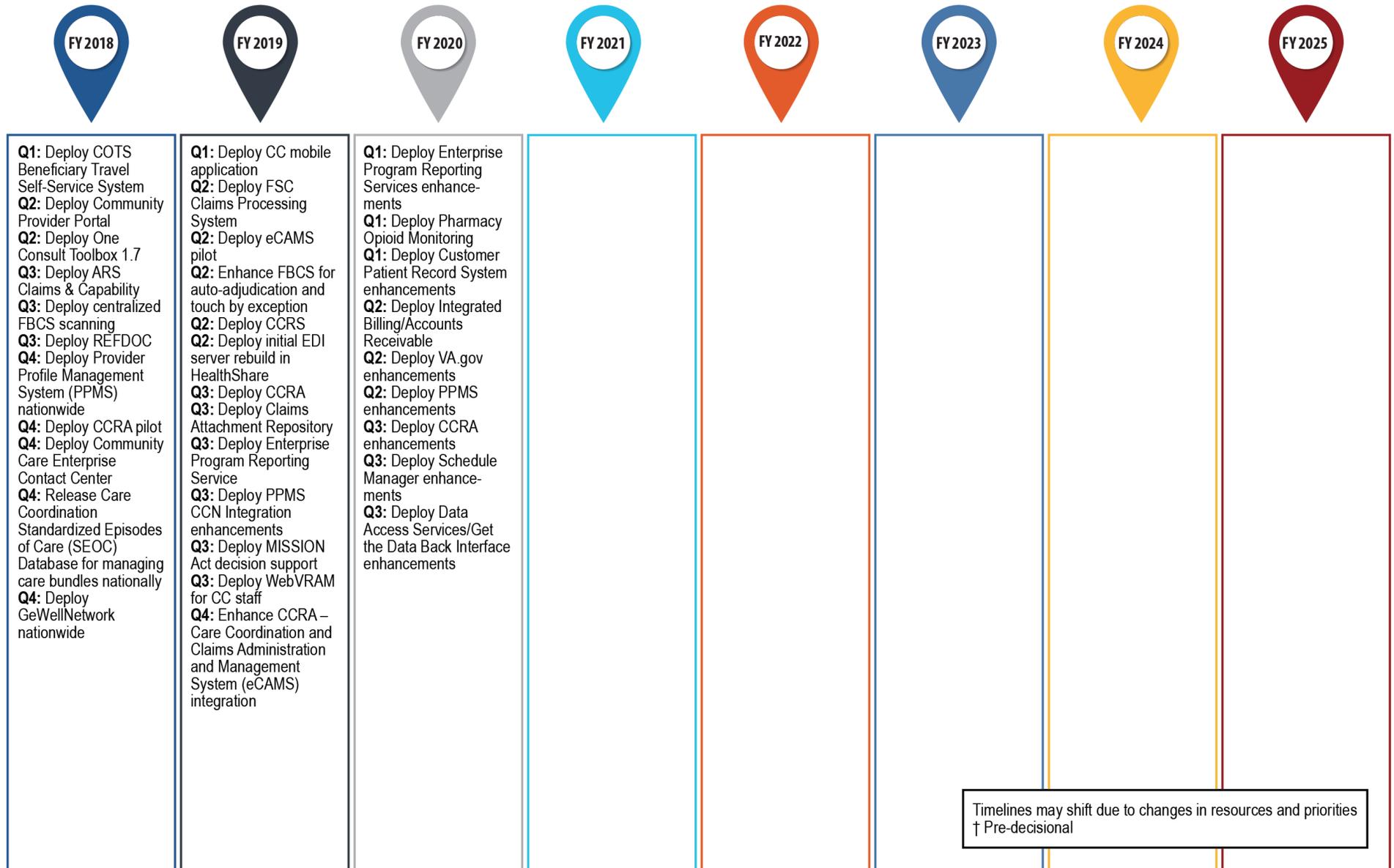


Figure 43: SCIF Community Care Milestones

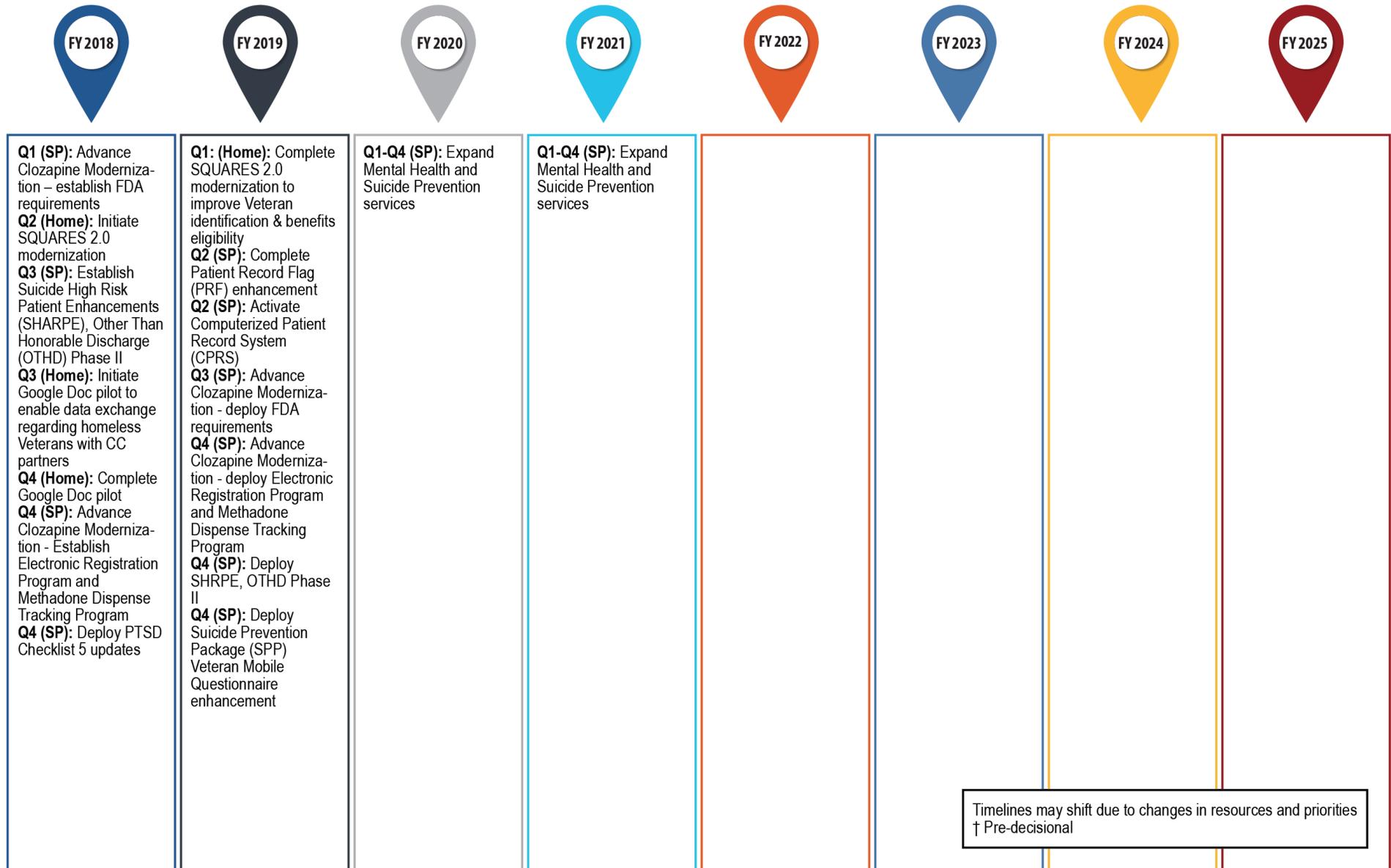


Figure 44: SCIF Other Health IT Milestones

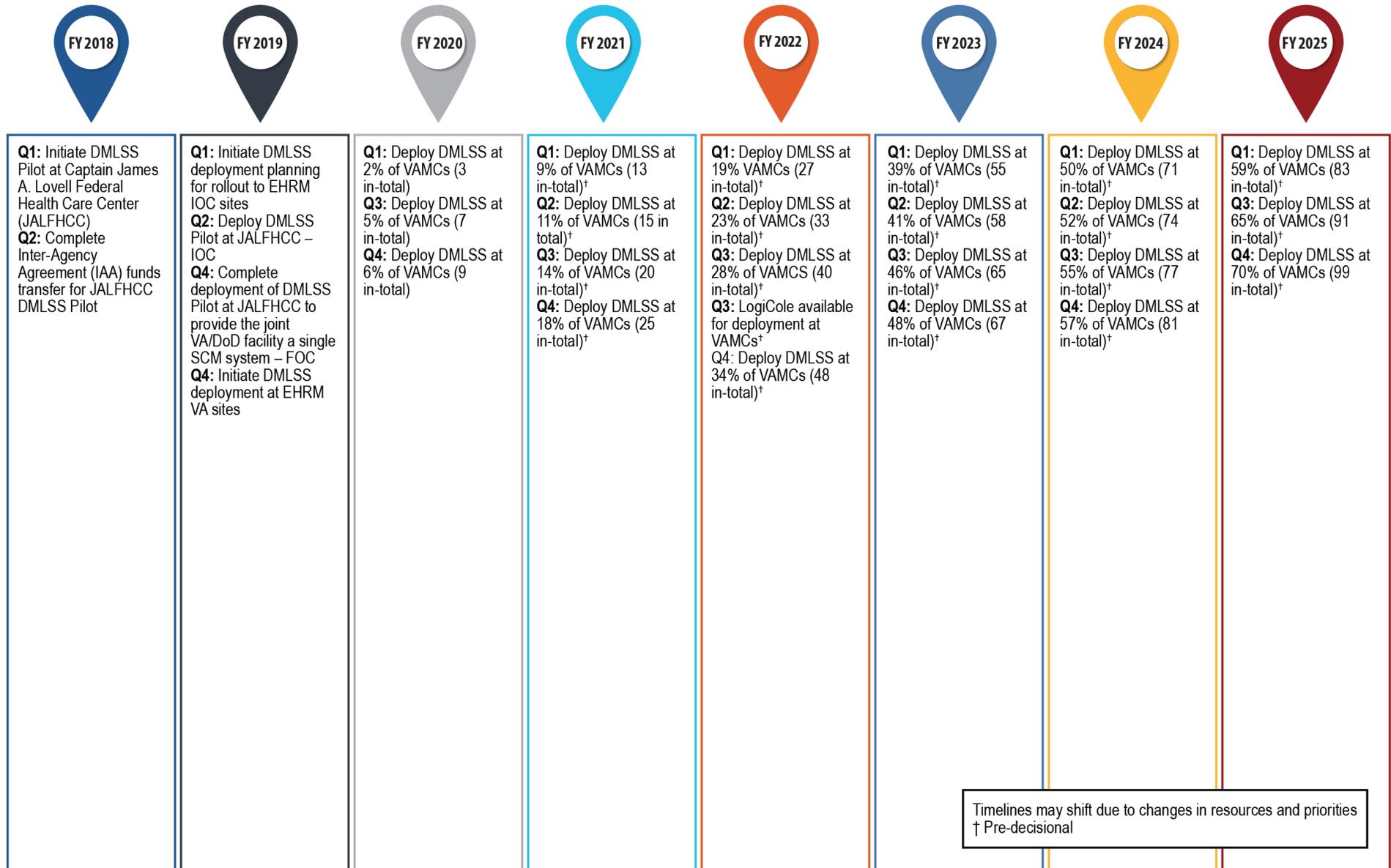


Figure 45: SCIF Supply Chain Management Milestones

Appendix J: Benefits and Memorial Services Portfolio Milestones

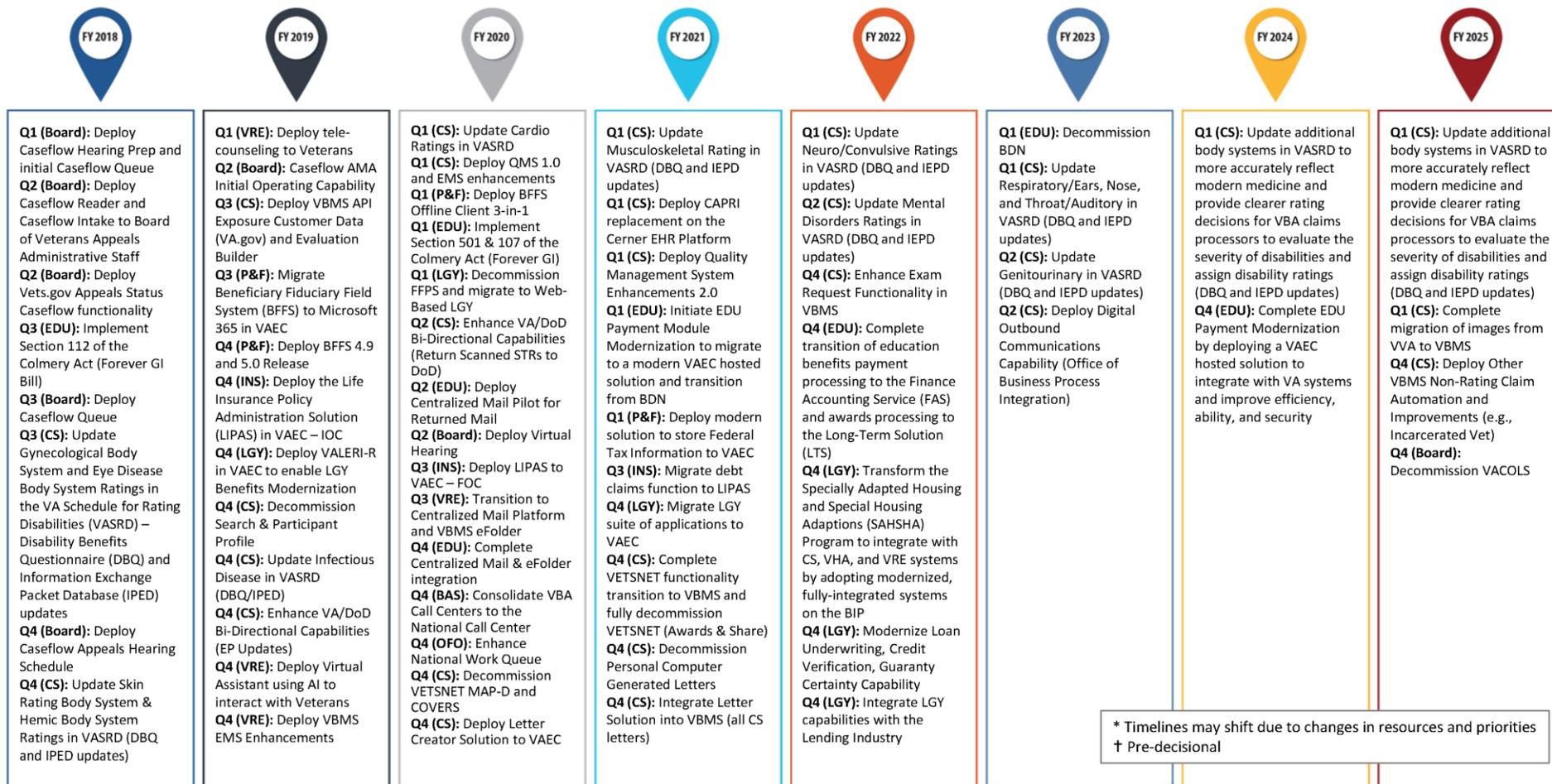


Figure 46: SCIF Benefits Milestones

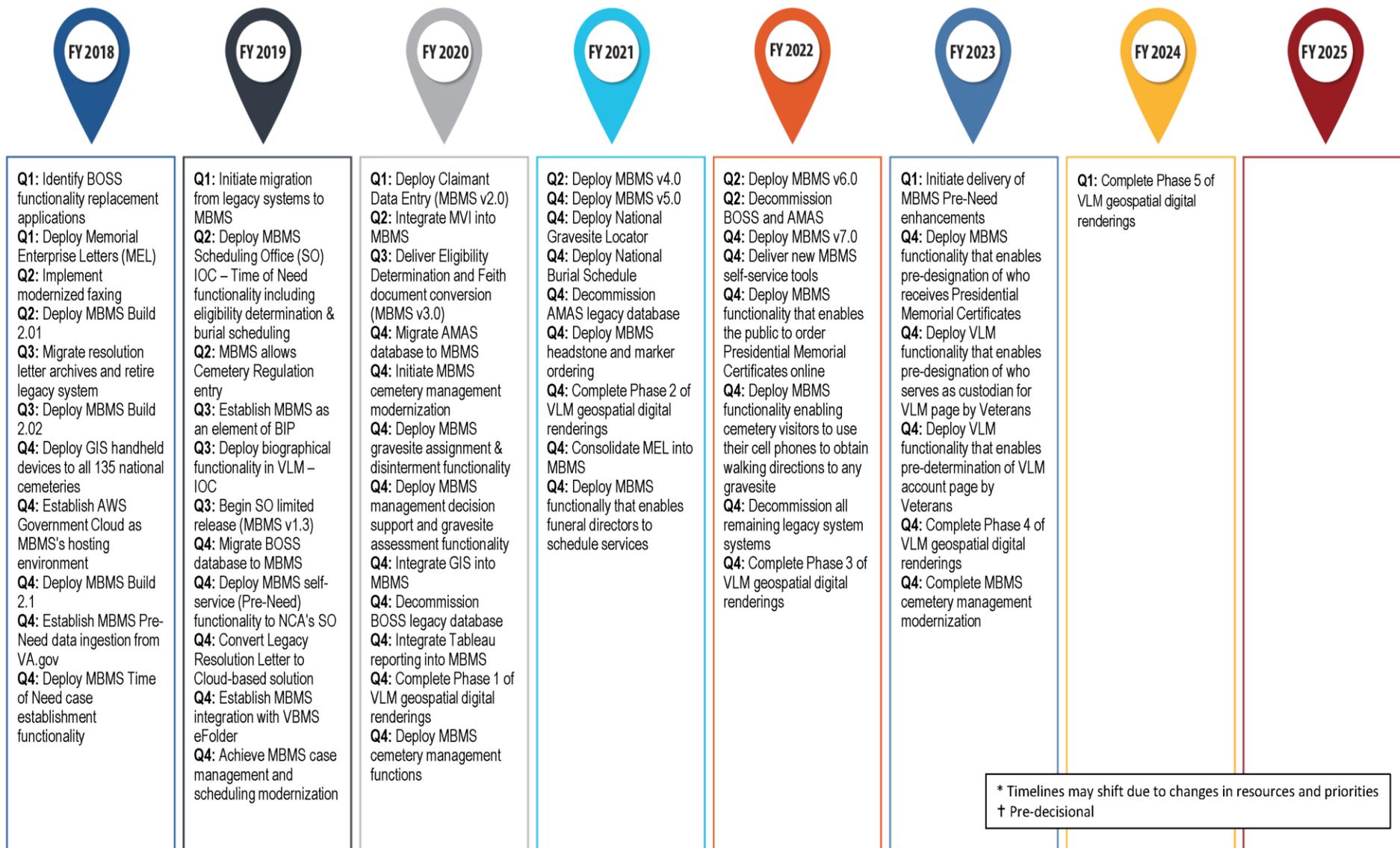


Figure 47: SCIF Memorials Milestones

Appendix K: Corporate Services Portfolio Milestones

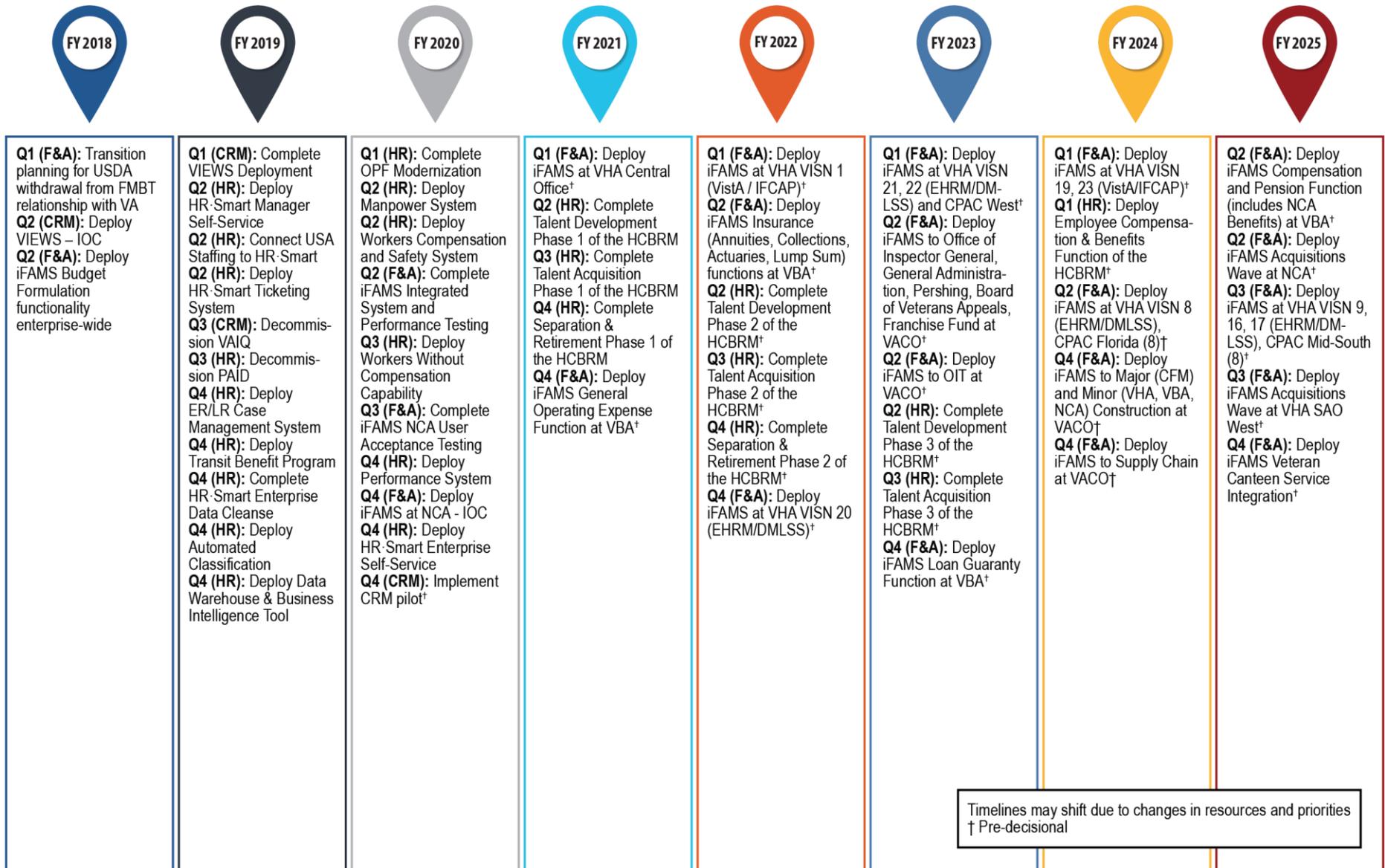


Figure 48: SCIF Corporate Services Milestones

Appendix L: Technology and Platform Services Portfolio Milestones

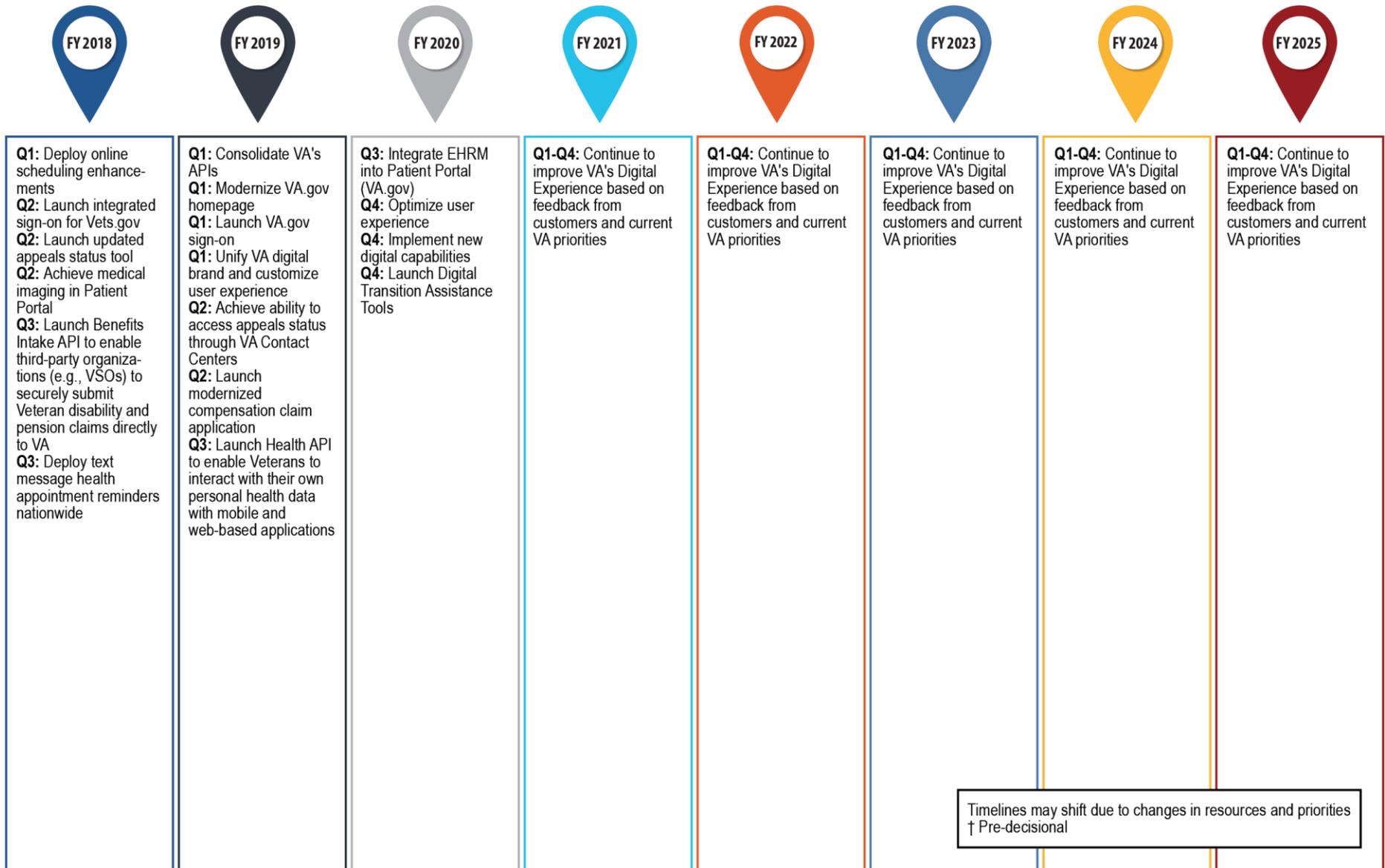


Figure 49: SCIF Digital Modernization Milestones

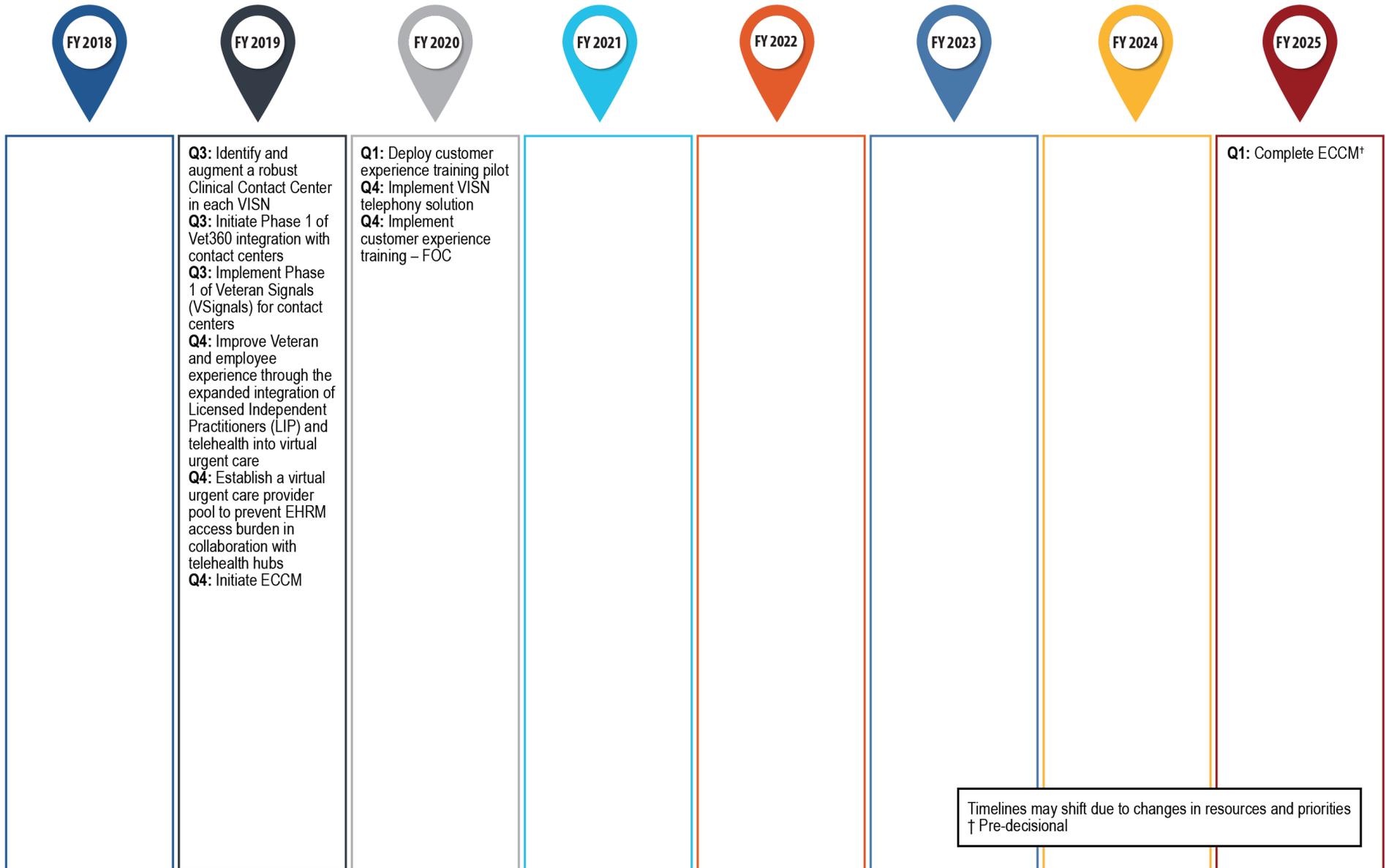


Figure 50: SCIF Contact Center Modernization Milestones

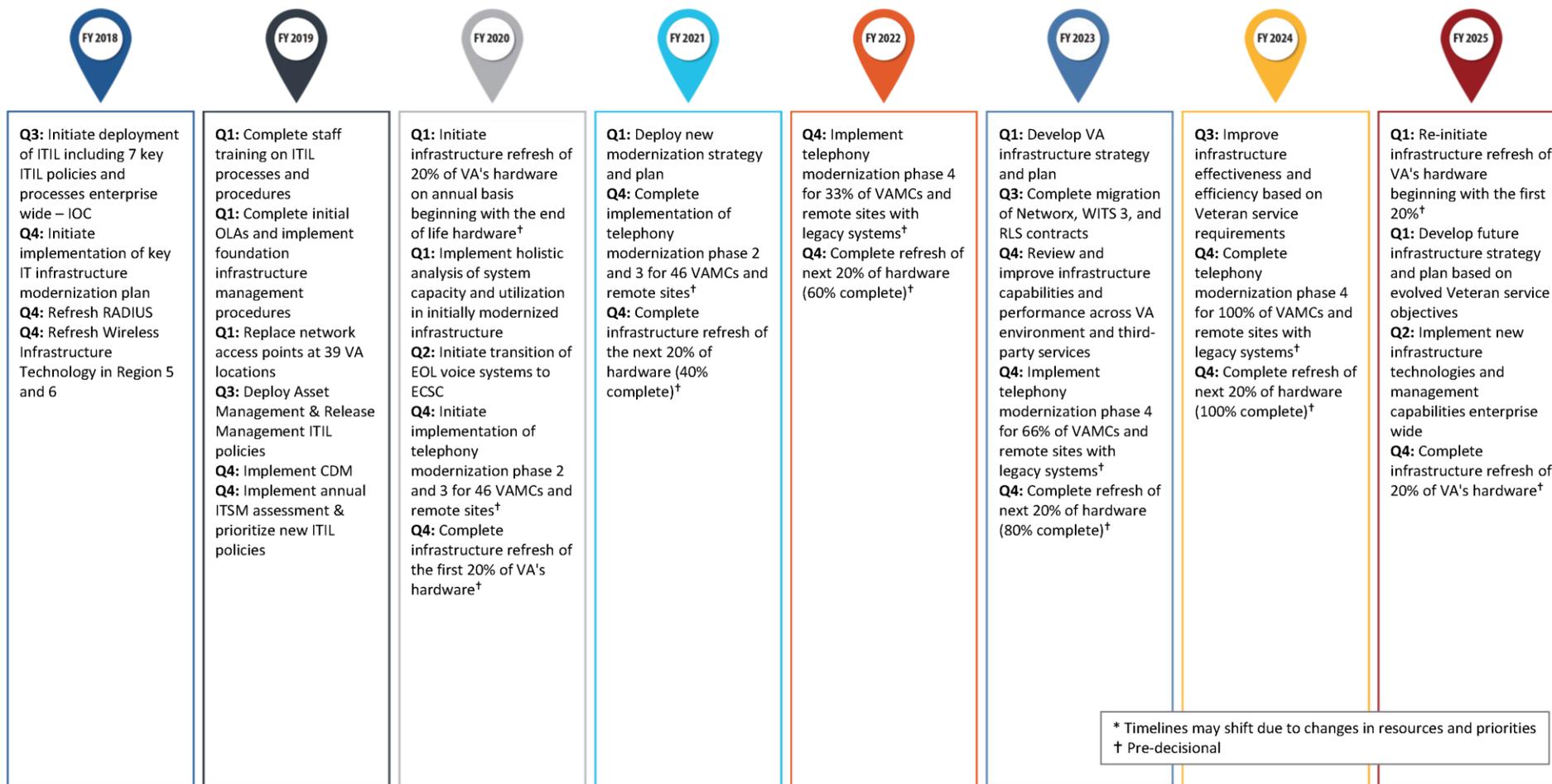


Figure 51: SCIF IT Infrastructure Milestones

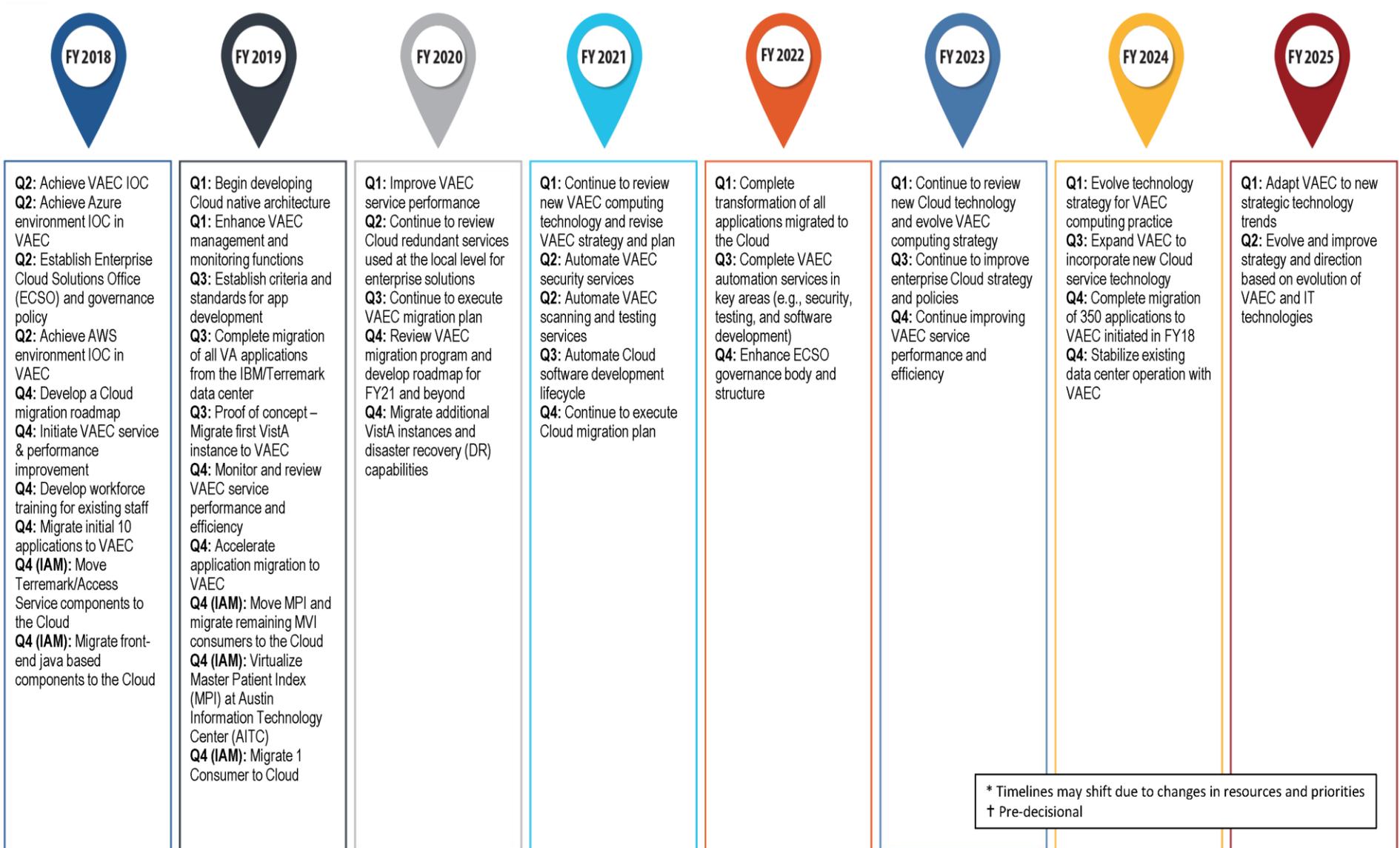


Figure 52: SCIF Migration of Applications to the Cloud Milestones

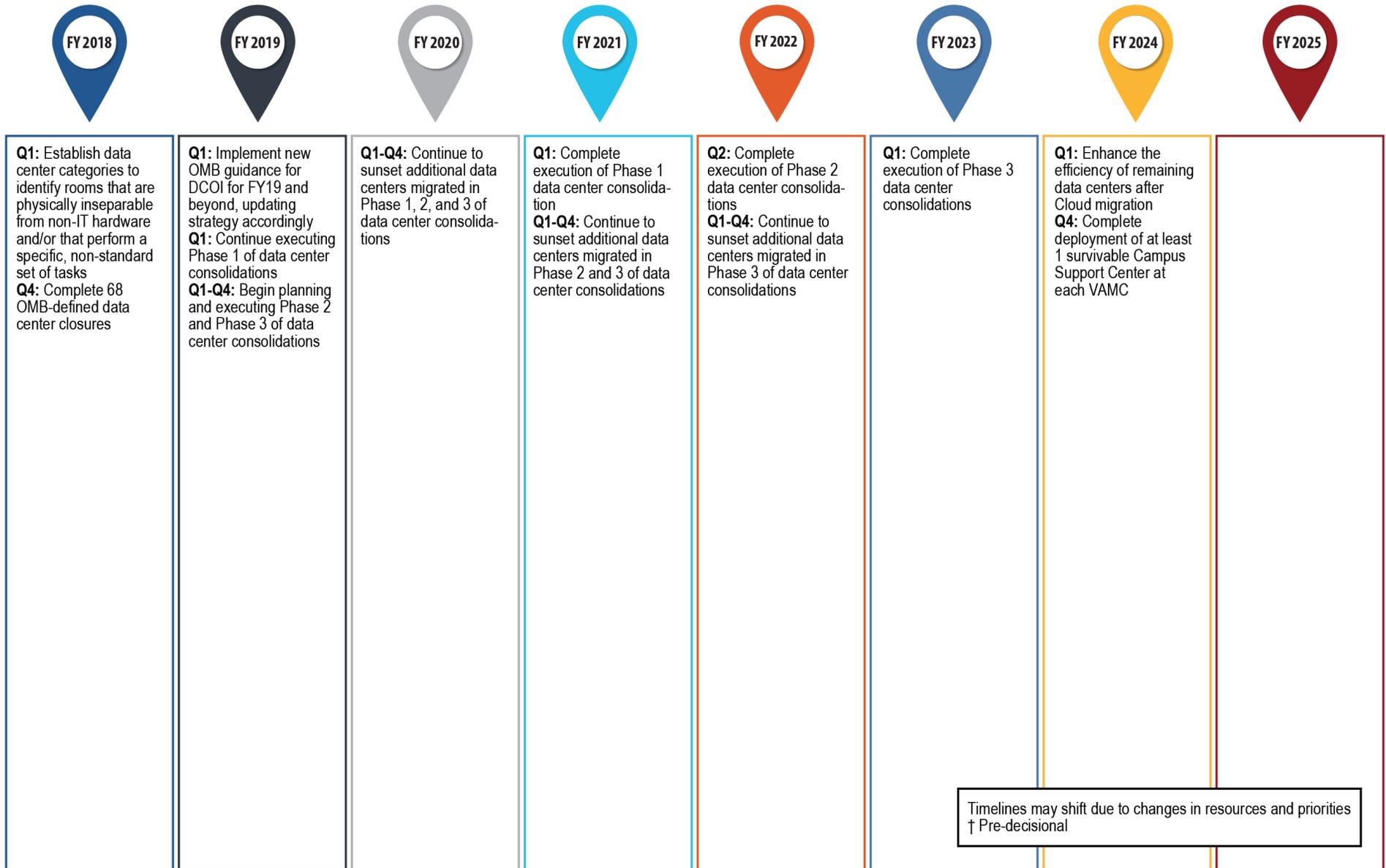


Figure 53: SCIF Data Center Optimization and Consolidation Milestones

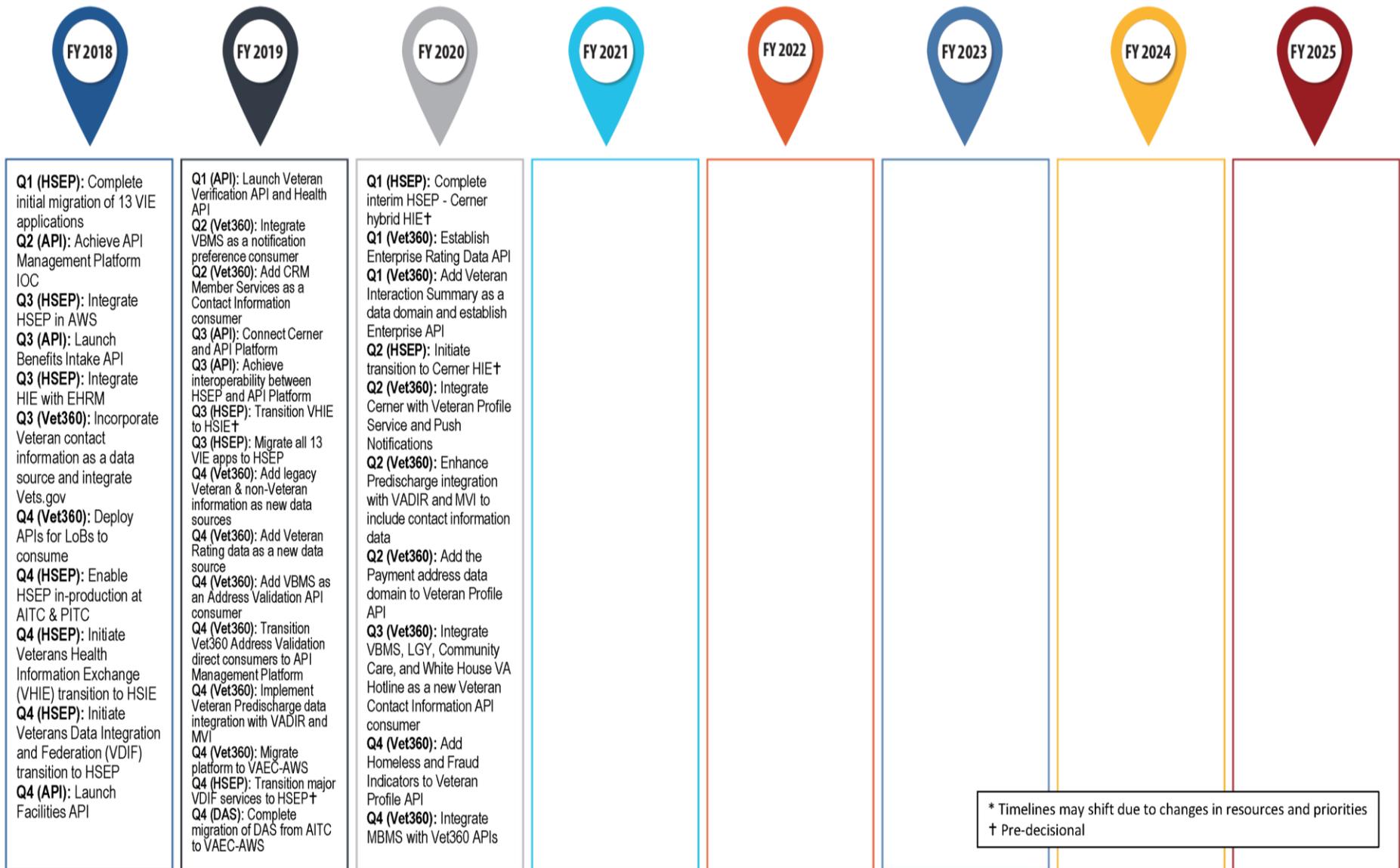


Figure 54: SCIF Trusted Information Sharing Milestones

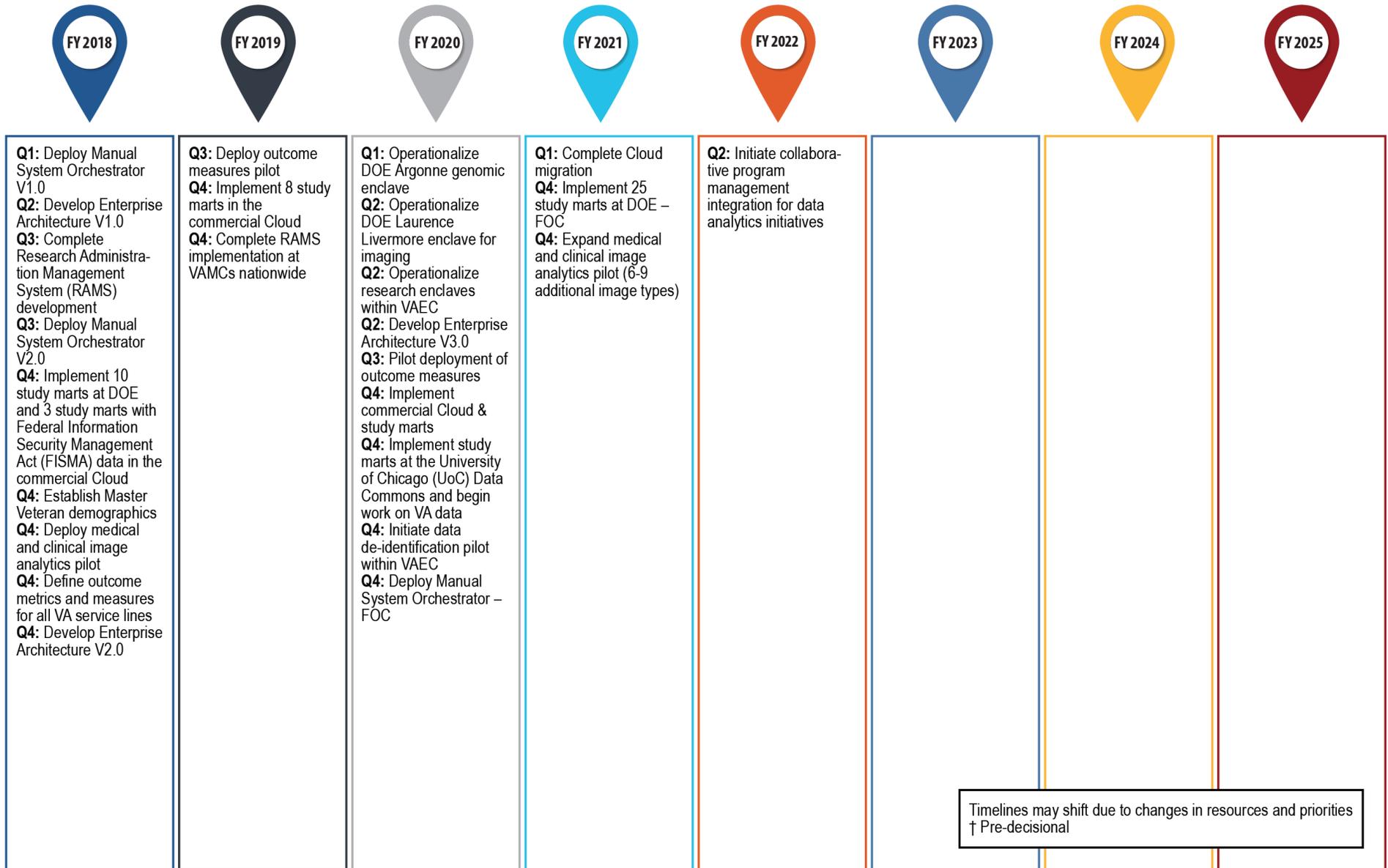


Figure 55: SCIF Analytics Milestones

Appendix M: Strategic Capability Integration Framework

Comprehensive IT Plan

In May 2017, Congress requested that VA develop a Comprehensive IT Plan (CIP) to guide its IT modernization activities, inform future IT strategy and EA decisions, and tackle oversight concerns regarding strategic IT investment. To address this Congressional request, VA's CIO tasked ITRM to create the CIP. The CIP team researched proven large-scale IT and digital transformation practices and facilitated stakeholder discussions with senior IT executives and business leaders to identify major modernization and decommissioning initiatives.

The CIP included milestones, risks, and dependencies for key initiatives within VA's five IT Portfolios (i.e., Health, Benefits, Memorials, Corporate, and Enterprise) across 17 key IT capabilities. ITRM developed the CIP as VA's seven-year IT Modernization Plan to transform the Department and improve Veteran experience. ITRM briefed the CIP to VA senior leadership, Congress, and industry leaders. The CIO published two iterations of the CIP on OIT's public-facing website on January 17, 2018 and March 30, 2018.⁸³

Comprehensive IT Plan Enables VA to Close GAO's Highest Priority Recommendation

GAO calls attention to agencies and program areas that are high risk due to their vulnerabilities to fraud, waste, abuse, and mismanagement or are most in need of transformation.⁸⁴ In May 2016, GAO identified VA as one of eight federal agencies having significant IT challenges in the GAO-16-46 Report, "Information Technology – Federal Agencies Need to Address Aging Legacy Systems."⁸⁵ In this report, it recommended that VA identify and plan to modernize or replace legacy systems as needed and in accordance with OMB's draft guidance, including time frames, activities for VA to perform, and functions for VA to replace or enhance.

In May 2018, VA delivered the CIP to GAO to address the significant IT challenges identified in the GAO-16-46 Report. In October 2018, GAO informed VA that the CIP provided a detailed roadmap for key programs and systems required for modernization. As a result of the CIP, VA will be able to better identify IT investments that have outlived their effectiveness and effectively plan for the modernization or replacement of these investments. Accordingly, GAO closed its recommendation to address obsolete IT investments—VA's highest priority recommendation.

OIT has incorporated the CIP's content into the FY 2019 edition of the VA Enterprise Roadmap in the form of Strategic Capability Integration Framework (SCIF) milestone graphics for each IT Portfolio section. Instead of developing new editions of the CIP, OIT will mature its content through these SCIF graphics in the Enterprise Roadmap. Combining CIP content with the EA and

⁸³ <https://www.oit.va.gov/library/files/strategy/ComprehensiveITPlan.pptx>

⁸⁴ <https://www.gao.gov/highrisk/overview>

⁸⁵ <https://www.gao.gov/products/GAO-16-468>

strategic context of the Enterprise Roadmap, provides a comprehensive vision for the future of IT at VA.

Appendix N: Abbreviations and Acronyms

Acronym	Expansion
21st Century IDEA	21st Century Integrated Digital Experience Act
ACTIV	Advanced Computational and Translational Initiatives for Veterans
ADS	Authoritative Data Source
AI	Artificial Intelligence
AIPG	Annual Integrated Planning Guidance
AMA	Veterans Appeals Improvement and Modernization Act of 2017
AMAS	Automated Monument Application System
AMO	Account Management Office
API	Application Programming Interface
ART	Agile Release Train
ATA	Anywhere to Anywhere
ATLAS	Advancing Telehealth through Local Access Stations
ATO	Authority to Operate
AWS	Amazon Web Services
Azure	Microsoft Azure Government
BAS	Benefits Assistance Services
BDN	Benefits Delivery Network
BFFS	Beneficiary Fiduciary Field System
BGS	Benefits Gateway Services
BIP	Benefits Integration Platform
BOSS	Burial Operations Support System
BOSS-E	Burial Operations Support System – Enterprise
BRM	Business Reference Model
CAP	Cross-Agency Priority
CCN	Community Care Network
CCP	Community Care Program
CCRA	Community Care Referral and Authorization
CCRS	Community Care Reimbursement System
CDC	Centers for Disease Control and Prevention
CDM	Continuous Diagnostics and Mitigation
CDW	Corporate Data Warehouse
CER	Veteran Counseling and Evaluation Records
CFO	Chief Financial Officers
CHAMPION	Computational Health Analytics for Medical Precision to Improve Outcomes Now
CHAMPVA	Civilian Health and Medical Program of the Department of Veterans Affairs
CIO	Chief Information Officer
CIP	Comprehensive IT Plan
CMOP	Consolidated Mail Outpatient Pharmacy
CMS	Centers for Medicare & Medicaid Services
COBOL	Common Business Oriented Language
COE	Center of Excellence
COTS	Commercial Off-the Shelf
COVERS	Control of Veterans Records System
CPAC	Consolidated Patient Account Center
CPRS	Computerized Patient Record System
CRM	Customer Relationship Management

Acronym	Expansion
CS	Compensation Service
CSF	Cybersecurity Framework
CTO	Chief Technology Officer
CX	Customer Experience
DAS	Data Access Services
DATA Act	Digital Accountability and Transparency Act of 2014
DCOI	Data Center Optimization Initiative
DevOps	Development Operations
DGC	Data Governance Council
DHA	Defense Health Agency
DHS	U.S. Department of Homeland Security
DLP	Data Loss Prevention
DMLSS	Defense Medical Logistics Standard Support
DoD	Department of Defense
DOE	U.S. Department of Energy
DR/COOP	Disaster Recovery and Continuity of Operations
DSCSA	Drug Supply Chain Security Act
DST	Decision Support Tool
DSVA	Digital Service at VA
EA	Enterprise Architecture
eCAMS	Claims Administration and Management System
ECCM	Enterprise Contact Center Modernization
ECSSO	Enterprise Cloud Solutions Office
ECSP	Enterprise Cybersecurity Strategy Program
ECSS	Enterprise Cybersecurity Strategy
ECST	Enterprise Cybersecurity Strategy Team
EDM	Enterprise Data Management
EDP	Enterprise Design Pattern
EDU	Education Service
EHR	Electronic Health Record
EHRM	Electronic Health Record Modernization
EPMD	Enterprise Program Management Division
EPMO	Enterprise Program Management Office
ePROMISe	electronic Project Management and Information System
EPRS	Enterprise Program Reporting System
ESA	Enterprise Security Architecture
ESB	Enterprise Service Bus
ESD	Enterprise Service Desk
ESR	Enrollment System Redesign
ESS	Enterprise Shared Service
eTEMS	enterprise Telecommunications Expense Management System
FAS	Finance and Accounting System
FBCS	Fee Basis Claims System
FDA	U.S. Food and Drug Administration
FDCCI	Federal Data Center Consolidation Initiative
FEBP Act	Foundations for Evidence-Based Policymaking Act of 2018
FedRAMP	Federal Risk and Authorization Management Program

Acronym	Expansion
FEHRM	Federal Electronic Health Record Modernization Program Office
FFPS	Funding Fee Payment System
FHIR	Fast Healthcare Interoperability Resources
FISMA	Federal Information Security Management Act
FITARA	Federal Information Technology Acquisition Reform Act
FMBT	Financial Management Business Transformation
FMS	Financial Management System
FOIA	Freedom of Information Act
FSC	Financial Services Center
FSSP	Federal Shared Service Provider
FY	Fiscal Year
GAO	Government Accountability Office
GenISIS	Genomic Information System for Integrative Science
GOTS	Government Off-The-Shelf
GRC	Governance, Risk, and Compliance
GSA	U.S. General Services Administration
HCBRM	Human Capital Business Reference Model
HIE	Health Information Exchange
HIPAA	Health Insurance Portability and Accountability Act
HISP	Health Information Strategic Plan
HL7	Health Level 7
HR	Human Resources
HR&A	Office of Human Resources and Administration
HRIS	Human Resources Information System
HRIT	Human Resources Information Technology
HRO	High Reliability Organization
HR-PAS	Human Resources Payroll Accounting Services
HSEP	HealthShare Enterprise Platform
HSRM	HealthShare Referral Manager
HTRE P3	Home Telehealth Reporting Enhancements Phase 3
HVA	High Value Asset
IaaS	Infrastructure as a Service
IAM	Identity Access Management
IDEA	<i>See 21st Century IDEA</i>
iFAMS	Integrated Financial Acquisition Management System
IFC	Interfaculty Consult
INS	Insurance Service
IOC	Initial Operating Capability
IoT	Internet of Things
IPO	Interagency Program Office
IPS	Insurance Payment System
IT	Information Technology
ITAM	Information Technology Account Manager
ITGB	Information Technology Governance Board
ITIL	Information Technology Infrastructure Library
ITOPS	Information Technology Operations and Services
ITRM	Information Technology Resource Management

Acronym	Expansion
ITSM	Information Technology Service Management
JALFHCC	Captain James A. Lovell Federal Health Care Center
JLV	Joint Legacy Viewer
KM	Knowledge Management
LAN	Local Area Network
LBS	Location-Based Services
LGY	Loan Guaranty Service
LIP	Licensed Independent Practitioner
LIPAS	Life Insurance Policy Administration Solution
LoB	Line of Business
LTS	Long-Term Solution
MASS	Medical Appointment Scheduling System
MBMS	Memorial Benefits Management System
MEF	Mission Essential Function
MGT Act	Modernizing Government Technology Act
MH	Mental Health
MHA	Mental Health Assistant
MHS	Military Health System
MISSION	Maintaining Internal Systems and Strengthening Integrated Outside Networks
ML	Machine Learning
MOU	Memorandum of Understanding
MSP	Managed Service Provider
MTF	Medical Treatment Facility
MVI	Master Veteran Index
MVP	Million Veteran Program
NCA	National Cemetery Administration
NCC	National Call Centers
NCPS	National Cybersecurity Protection System
NGL	National Gravesite Locator
NICE	National Initiative for Cybersecurity Education
NIST	National Institute of Standards and Technology
NWQ	National Work Queue
OBPI	Office of Business Process Integration
OCC	Office of Connected Care
OEHRM	Office of Electronic Health Record Modernization
OEI	Office of Enterprise Integration
OFO	Office of Field Operations
OHCM	Office of Human Capital Management
OHI	Office of Health Informatics
OIG	Office of Inspector General
OIS	Office of Information Security
OIT	Office of Information and Technology
OMB	Office of Management and Budget
ONC	Office of the National Coordinator for Health Information Technology
OPEN	Open, Public, Electronic, and Necessary
OPEN Government Data Act	Open, Public, Electronic, and Necessary Government Data Act

Acronym	Expansion
OPM	Office of Personnel Management
ORD	Office of Research and Development
OSS	Office of Strategic Sourcing
P&F	Pension and Fiduciary Service
PaaS	Platform as a Service
PACT	Patient Aligned Care Team
PAID	Personnel and Account Integrated Data
PAR	Periodic Automatic Replenishment
PC	Primary Care
PCGL	Personal Computer Generated Letters
PDMP	Prescription Drug Monitoring Program
PHI	Protected Health Information
PII	Personally Identifiable Information
PLM	Product Line Management
PMA	President's Management Agenda
PPBE	Planning, Programming, Budgeting and Execution
PPMS	Provider Profile Management System
PRF	Patient Record Flag
QPR	Office of Quality, Performance, and Risk
RAMP	Rapid Appeals Modernization Program
RAMS	Research Administrative Management System
REACH VET	Recovery Engagement and Coordination for Health – Veterans Enhanced Treatment
REFDOC	Referral Documentation
RFID	Radio Frequency Identification
RLS	Regional Local Service
RO	Regional Office
RPA	Robotic Process Automation
SaaS	Software as a Service
SAFe	Scaled Agile Framework
SAH	Specially Adapted Housing
SCHMC	Supply Chain Healthcare Master Catalog
SCIF	Strategic Capability Integration Framework
SEOC	Standardized Episodes of Care
SHA	Special Housing Adaptation
SMO	Service Management Office
SOA	Service-Oriented Architecture
SPP	Suicide Prevention Package
SQUARES	Status Query and Response Exchange System
SSoT	Single Source of Truth
TBM	Technology Business Management
The Board	The Board of Veterans' Appeals
TIC	Trusted Internet Connections
TIS	Trusted Information Sharing
TMP	Telehealth Management Platform
UFR	Unfunded Requirements
UoC	University of Chicago
USDA	U.S. Department of Agriculture

Acronym	Expansion
USDS	U.S. Digital Service
VA	U.S. Department of Veterans Affairs
VACOLS	Veterans Appeals Control and Locator System
VADIR	VA/DoD Identity Repository
VAEB	VA Executive Board
VAEC	VA Enterprise Cloud
VAIQ	VA Intranet Quorum
VALERI-R	VA Loan Electronic Reporting Interface Re-Design
VAMC	VA Medical Center
VAOS	VA Online Scheduling
VAPC	VA Private Cloud
VASRD	VA Schedule for Rating Disabilities
VBA	Veterans Benefits Administration
VBMS	Veterans Benefits Management System
VDIF	Veterans Data Integration and Federation
VEAR	VA Enterprise Architecture Repository
VECMS	VA Enterprise Case Management Solution
VEO	Veterans Experience Office
VETS Act	Veterans E-Health and Telemedicine Support Act of 2017
VETSNET	Veteran Service Network
VFW	Veterans of Foreign Wars
VHA	Veterans Health Administration
VHIE	Veterans Health Information Exchange
VICTARS	Veterans Insurance Claims Tracking and Response System
VIE	Vitria Interface Engine
IEWS	VA Integrated Enterprise Workflow Solution
VINCI	VA Informatics and Computing Infrastructure
VIP	Veteran-focused Integration Process
VISN	Veterans Integrated Service Network
Vista	Veterans Information Systems and Technology Architecture
VLM	Veterans Legacy Memorial
VoIP	Voice over Internet Protocol
VRC	Vocational Rehabilitation Counselor
VRE	Vocational Rehabilitation and Employment
VSO	Veterans Service Organization
VVA	Virtual VA
VVC	VA Video Connect
WAN	Wide Area Network
Web LGY	Web-Based Loan Guaranty
Wi-Fi	Wireless
WITS	Washington Interagency Telecommunications System
WLAN	Wireless Local Area Network
XaaS	Anything as a Service