

VA

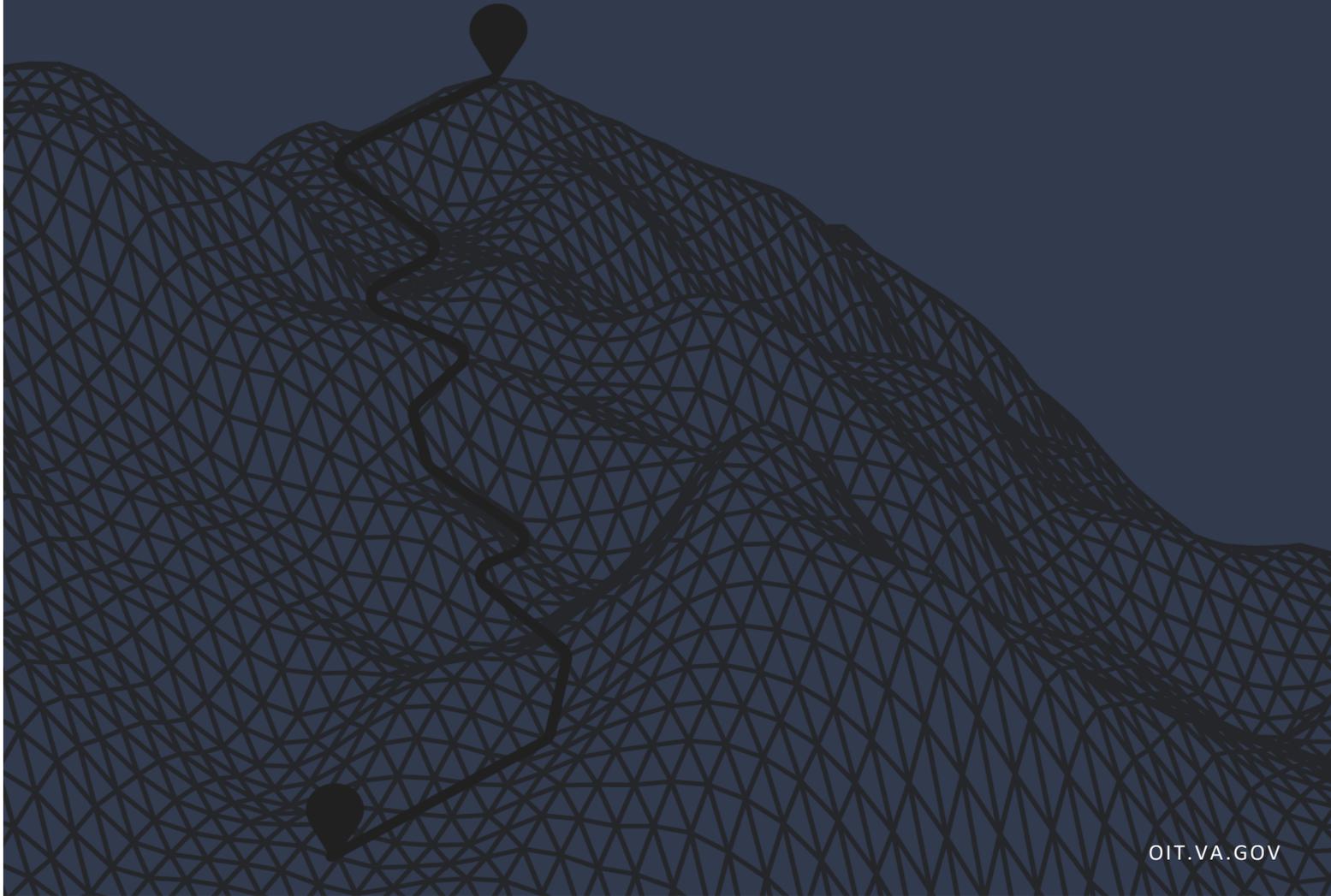


U.S. Department of Veterans Affairs  
Office of Information and Technology

DIGITAL TRANSFORMATION

# VA ENTERPRISE ROADMAP

Department of Veterans Affairs  
Office of Information and Technology  
FY 2020–2026 VA Enterprise Roadmap



OIT.VA.GOV

# RELEASE NOTES

Version Date	Version Description
3/31/2020	Draft distributed for comments and concurrence from OIT Divisions
6/30/2020	Draft submitted to CIO for comments and signature; Approved and signed July 2020
9/30/2020	CIO-approved version with comments from the VA Administrations and Staff Offices
12/11/2020	CIO-approved version with content updates from OIT Portfolios and Product Lines

**Table 1: Document Version History**

Table 1 details the version history of the FY 2020–2026 VA Enterprise Roadmap. Key updates to the document are as follows.

## 9/30/2020

### 2. Health Services Portfolio

- 2.1 Current Environment: included VHA Goals
- 2.2 Drivers: included VA’s Fourth Mission
- 2.3 Telehealth: included coronavirus pandemic in Drivers
- 2.5 Supply Chain Management: included VA’s coronavirus response in Current Environment and Future Environment and updated milestones

### 3. Benefits and Memorial Services Portfolio

- 3.6 Appeals: updated Current Environment, Drivers, Transformative Initiatives, and Future Environment

### 4. Corporate Services Portfolio

- 4.1 Human Capital Management: updated Current Environment, Drivers, Transformative Initiatives, and milestones

### 5. Technology and Platform Services Portfolio

- 5.4 Cybersecurity and Access Control Services: updated Identity and Access Management (IAM) milestones

### 8. Next Steps

Internal Outreach and Managing Change: updated activities

Implementation and Utilization: updated activities

## 12/11/2020

### 1. Veteran Experience Services Portfolio

- 1.1 Digital Experience: updated milestones
- 1.4 Customer Master Data Management: updated milestones

## 2. Health Services Portfolio

2.4 Medical Care: updated milestones

2.5 Health Care Administration: updated milestones

2.6 Telehealth and Scheduling: added VistA Scheduling Enhancement (VSE) and associated milestones

2.6 Community Care: updated Community Care Electronic Data Interchange (EDI)

2.7 Supply Chain Management: updated milestones

## 3. Benefits and Memorial Services Portfolio

3.1 Education and Veteran Readiness and Employment:

- Added EDU Electronic Notification
- Updated EDU Payment Module, Benefits Delivery Network (BDN) Decommissioning, Finance and Accounting System (FAS) Redesign, and VR&E e-Authorization and e-Invoicing
- Updated milestones

3.2 Insurance: updated milestones

3.7 Benefits Integration and Administration: added Enterprise Data Warehouse (EDW)

## 4. Corporate Services Portfolio

4.2 Acquisition and Property Management: updated milestones

4.3 Financial Management: updated milestones

## 5. Technology and Platform Services Portfolio

5.1 IT Infrastructure Operations and Services: added WAN Infrastructure Modernization and updated milestones

5.2 Cybersecurity and Access Control Services: updated Current Environment and Future Environment to include material weakness content

5.4 Platform Management: updated Hosting and Provisioning (Integrated Architecture Multi-Cloud Strategies) and milestones

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# PURPOSE

**The U.S. Department of Veterans Affairs (VA) is undergoing unprecedented information technology (IT) modernization and digital transformation to enable improved customer service and interoperability with internal and external partners.**

Veterans are entering the VA health care system with more complex physical and emotional conditions, and regardless of where they live, they expect and deserve effective and efficient service. VA is working to provide Veterans with a coordinated experience in delivering the highest quality of care, benefits, and memorial services. To achieve this, VA will build a unified enterprise of integrated and interoperable business processes and technical services. In particular, the VA Interoperability Leadership (VAIL) team was developed to serve as a coordinated leadership body focused on ensuring all steps of the Veteran’s journey are seamlessly enabled through interoperability. For more information on VAIL, refer to Section 7.6.

The Fiscal Year (FY) 2020–2026 VA Enterprise Roadmap is VA’s IT modernization plan. The Enterprise Roadmap documents the Department’s current business and technology environment from an architecture perspective and depicts the transformative initiatives that will enable VA to achieve its future environment. It provides an integrated view of VA Product Line milestones supporting the FY 2018–2024 VA Strategic Plan and FY 2020–2022 IT Information Resources Management (IRM) Strategic Plan. The integrated view supports IT planning, prioritization, budgeting, and decision making across VA. Additionally, the 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). VA’s Chief Information Officer (CIO), supported by the Office of Quality, Performance, and Risk (QPR), is responsible for the maturation of VA’s Enterprise Roadmap. VA’s Comprehensive IT Plan (CIP) helped establish the Enterprise Roadmap as VA’s IT modernization plan and is further discussed in Appendix H.

The 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, Cloud, digital technologies, 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

As VA’s IT modernization plan and long-range strategic planning tool, the Enterprise Roadmap depicts digital transformation as represented at a point in time. The timelines are notional, and the data is subject to change through QPR’s annual update process of the Enterprise Roadmap.

## How to Use the Enterprise Roadmap

The 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, the Office of Management and Budget (OMB), the U.S. Government Accountability Office (GAO), and the public. The Enterprise Roadmap contains valuable information for use across multiple levels at VA. Table 2 contains a short description of the potential uses of the Enterprise Roadmap by specific VA and Office of Information and Technology (OIT) roles. AXXB

Role or OIT Division	Enterprise Roadmap Purpose and Use
<b>Deputy Secretary</b>	<ul style="list-style-type: none"> <li>Obtain a comprehensive view of the Department’s enterprise IT transformation and report progress to OMB</li> </ul>
<b>Administration Leader</b>	<ul style="list-style-type: none"> <li>Reflect participation in business capability transformation within the context of change across VA, through Administration-specific and enterprise IT activities</li> </ul>
<b>Chief Information Officer</b>	<ul style="list-style-type: none"> <li>Demonstrate alignment of Product Lines and Transformative Initiatives to VA strategic goals and objectives</li> <li>Communicate with oversight entities (GAO, Congress, and OMB) on IT investments, modernization, and risk</li> <li>Leverage for governance decision making</li> </ul>
<b>VA Administration Architect</b>	<ul style="list-style-type: none"> <li>Ensure integration of the Administration’s strategy architecture into the EA and Enterprise Roadmap</li> <li>Represent the Administration’s business and technology environment from an architecture perspective</li> <li>Present a transition plan to show the sequence of actions needed to implement the IT (IRM) Strategic Plan</li> </ul>
<b>Administration Program Manager</b>	<ul style="list-style-type: none"> <li>Reflect Administration program information to verify alignment to VA strategic goals and objectives</li> <li>Increase awareness of programs and initiatives across the enterprise to leverage existing capabilities, identify gaps, and avoid overlap</li> </ul>
<b>VA Chief Enterprise Architect</b>	<ul style="list-style-type: none"> <li>Increase awareness, context, and value of EA—through its linkages with strategy, business, and IT</li> <li>Integrate with planning and streamline VA reporting</li> </ul>
<b>Account Management Office</b>	<ul style="list-style-type: none"> <li>Align, budget, and prioritize business IT requirements</li> <li>Influence the development of the Joint Business Plans (JBPs)</li> </ul>

Role or OIT Division	Enterprise Roadmap Purpose and Use
<b>IT Resource Management</b>	<ul style="list-style-type: none"> <li>• Ensure strategic alignment and Portfolio Management</li> <li>• Leverage for prioritization and Unfunded Requirements (UFRs)</li> <li>• Institutionalize as a key planning input into Planning, Programming, Budgeting, and Execution (PPBE)</li> <li>• Utilize for Governance decisions</li> <li>• Leverage as a guide for Product Line Management (PLM)</li> <li>• Support Technology Business Management (TBM)</li> <li>• Shape workforce of the future</li> </ul>
<b>Enterprise Program Management Office</b>	<ul style="list-style-type: none"> <li>• Leverage for modernization and budget planning</li> <li>• Drive design patterns</li> <li>• Inform acquisition</li> <li>• Enforce standards and interoperability</li> <li>• Migrate applications to the Cloud</li> <li>• Integrate Development Security Operations (DevSecOps)</li> </ul>
<b>Office of Strategic Sourcing</b>	<ul style="list-style-type: none"> <li>• Formulate acquisition strategies and enterprise licensing</li> </ul>
<b>Office of Information Security and Office of Quality, Performance, and Risk</b>	<ul style="list-style-type: none"> <li>• Manage enterprise risk</li> <li>• Align with cybersecurity strategy</li> <li>• Integrate DevSecOps</li> </ul>
<b>IT Operations and Services</b>	<ul style="list-style-type: none"> <li>• Leverage for modernization and budget planning</li> <li>• Support solution engineering</li> <li>• Inform IT Service Management (ITSM)</li> <li>• Integrate DevSecOps</li> <li>• Enhance VA Cloud operations and support</li> </ul>
<b>Administrations and Staff Offices</b>	<ul style="list-style-type: none"> <li>• Align with VA Strategy, PPBE, modernization, and Administration priorities</li> </ul>
<b>VA Franchise Fund Enterprise Centers</b>	<ul style="list-style-type: none"> <li>• Provide supportive system expertise and Software as a Service (SaaS) capabilities across functional areas, such as Financial Services, IT, Human Capital Learning and Development Services, Identity Management, Personnel Security, and Debt Management</li> </ul>

**Table 2: Purpose and Use of the Enterprise Roadmap by Role**

# STRUCTURE

## The Enterprise Roadmap contains eight major sections.

VA’s OIT is implementing Product Line Management (PLM) as an IT organizing model to improve accountability and transparency and increase IT cost efficiency and effectiveness. OIT defines a Product Line as a functional grouping of similar IT systems and products that support a specific VA capability for the Veterans Health Administration (VHA), Veterans Benefits Administration (VBA), National Cemetery Administration (NCA), and other business customers. OIT currently identifies 27 Product Lines within five Portfolios. Figure 56 in Section 7.1 depicts OIT’s current PLM Structure.

Sections 1–5 of the FY 2020-2026 VA Enterprise Roadmap provide an integrated view of OIT Product Lines. Section 6 introduces alignment and use, Section 7 highlights OIT Transformation, and Section 8 includes next steps. The appendices contain architecture diagrams, alignment graphics, and acronyms and abbreviations used.

OIT will incorporate Data Analytics and Knowledge Management and End User Operations into the Enterprise Roadmap once OIT institutionalizes these Product Lines. The Enterprise Roadmap will evolve as OIT refines the Product Lines and implements Technology Business Management (TBM). The FY 2020-2026 VA Enterprise Roadmap provides a narrative overview of the current and future environment, drivers, transformative initiatives, milestones, and architecture diagrams for 25 VA Product Lines organized within the following Portfolios:

### Section 1: Veteran Experience Services Portfolio

- 1.1 Digital Experience
- 1.2 Contact Center
- 1.3 Eligibility and Enrollment
- 1.4 Customer Master Data Management

### Section 2: Health Services Portfolio

- 2.1 Medical Care

- 2.2 Health Care Administration
- 2.3 Telehealth and Scheduling
- 2.4 Medical Research, Education, and Population Health
- 2.5 Community Care
- 2.6 Supply Chain Management

### Section 3: Benefits and Memorial Services Portfolio

- 3.1 Education and Veteran Readiness and Employment
- 3.2 Compensation and Pension
- 3.3 Loan Guaranty
- 3.4 Insurance
- 3.5 Appeals
- 3.6 Benefits Integration and Administration
- 3.7 Memorial Benefits and Services

### Section 4: Corporate Services Portfolio

- 4.1 Acquisition and Property Management
- 4.2 Financial Management
- 4.3 Human Capital Management
- 4.4 SecVA/Congressional/Legal Affairs

### Section 5: Technology and Platform Services Portfolio

- 5.1 IT Infrastructure Operations and Services
- 5.2 Cybersecurity and Access Control Services
- 5.3 Trusted Information Sharing
- 5.4 Platform Management

# 1. VETERAN EXPERIENCE SERVICES PORTFOLIO

This section documents the current environment, drivers, transformative initiatives, and future environment for the Veteran Experience Services Portfolio and contains the following Product Lines:

- 1.1 Digital Experience
- 1.2 Contact Center
- 1.3 Eligibility and Enrollment
- 1.4 Customer Master Data Management

## Current Environment

The Veteran Experience Services Portfolio supports VA in improving CX as Veterans, family members, and caregivers navigate the journey from military service through the spectrum of VA services. Veterans often have a fragmented and inconsistent experience when interacting with VA's contact centers or digital content, and the Department lacks a standardized method to verify Veteran status or link Veterans with their existing information at VA when they apply for services. Through the transformative initiatives within Veteran Experience Services, VA is committed to creating an interactive experience with the Veteran that is consistent, easy, intuitive, and personalized. This includes modernizing its digital tools to create an online experience on par with the private sector as well as consolidating, integrating, and sharing data across the Department so that Veterans and customers receive the same information regardless of how or where they interact with VA.

## Drivers

VA provides services to 10 million Veterans, survivors, family members, caregivers, and personal representatives, and over 10 million people access its digital tools and content each month. Disparate technology, siloed data, and unstandardized processes contribute to a variable and disjointed CX. This environment makes it difficult for users to find and navigate VA's digital tools and content, inhibits VA from tracking a single engagement record for a Veteran, and results in frequent and multiple requests for Veterans to prove their identity and

status. The President's Management Agenda (PMA) and 21st Century Integrated Digital Experience Act (21st Century IDEA) further call for a world-class, Veteran-centric CX. VA is serving as the lead agency for PMA Cross-Agency Priority (CAP) Goal 4 (Improving Customer Experience), and CX is a key component of the FY 2018–2024 VA Strategic Plan. Additionally, the coronavirus pandemic is impacting technology within the Veteran Experience Services Portfolio.

## Transformative Initiatives

The Veteran Experience Services Portfolio includes the following key transformative initiatives:

- Veteran-Facing Services/VA.gov
- VA Online Scheduling (VAOS)
- Enterprise Contact Center Modernization (ECCM)
- White House VA Hotline
- Veterans Signals (VSignals)
- Enrollment System Modernization (ESM)
- VA Data Access Modernization
- VA Profile

## Future Environment

Through the initiatives in the Veteran Experience Services Portfolio, VA will deliver seamless and personalized experiences for Veterans and customers across all digital services and communication channels. It will provide a unified, consistent experience that benefits Veterans regardless of how they choose to interact with VA. The Department will streamline and modernize its digital experience so it is more user-friendly and puts VA at the leading edge of digital modernization across government. Additionally, an authoritative data source (ADS) will provide accurate and consistent customer profile data that is easily and reliably accessible for enterprise-wide use. Private sector innovators will be able to deliver world-class

services to VA’s customers securely using VA data. The Department will be able to focus entirely on the customer’s experience—regardless of the nature of the interaction, service, or product it is providing—and build long-term relationships as part of a holistic approach that treats Veterans, not just their conditions.

## 1.1 Digital Experience

### 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, Veterans Service Organizations (VSOs), and any of VA’s users are no different; they expect an online experience on par with the private sector companies they interact with in their day-to-day lives. Rather than deliver digital tools and content in stovepipes offered under competing brands with different logins, VA is working to modernize and consolidate digital tools into an enterprise-wide self-service platform accessible from a single place: VA.gov. [BXXB]

### Drivers

Over 10 million people access VA’s digital tools and content each month, and through user research, the Department has found that these users often have a difficult time navigating VA websites, logins, and tools. VA’s studies show that users have a challenging time finding tools and services, experience disjointed navigation between sites, and think that the user experience is focused more on the Administrations than it is on the users. Historically, VA has given users reasons to not “Choose VA.” [BXXA]

The 21st Century IDEA further solidifies the goal of creating a citizen-friendly digital experience. The legislation requires agencies to digitize citizen-facing services and establishes minimum criteria for accessibility, ease of use, and security. Public-facing agency websites must have a consistent design and be compliant with U.S. General Services Administration (GSA) web standards. Additionally, the Foundations for Evidence-Based Policymaking (FEBP) Act of 2018 requires all federal agencies to designate a chief data officer (CDO), maintain comprehensive data catalogs, and ensure that all non-sensitive government data is available in machine-readable formats by default. PMA CAP Goal 4 (Improving Customer Experience) and the Secretary of Veterans Affairs’ focus on CX are also major forces driving the improvements to VA’s digital experience.

In order to align VA’s digital experience with users’ expectations—and to meet the goals put forth by the 21st Century IDEA—VA has been focusing on digital modernization efforts guided by the following objectives:

1. Increase the use of VA’s self-service tools.
2. Enable faster access to care and more timely delivery of services.
3. Improve the experience users have when interacting with VA.

VA’s Digital Modernization Strategy was developed with input from experts across VA and approved by senior leadership, and it focuses on an enterprise-wide approach to transforming and modernizing VA’s digital experience.

### Transformative Initiatives

#### *Veteran-Facing Services/VA.gov*

VA has hit a significant milestone in its digital modernization efforts. It has been working to modernize and consolidate various tools into an enterprise-wide self-service platform accessible from a single place: VA.gov. The new VA.gov launched in November 2018, and it now serves as the single front door to VA. The Department designed VA.gov based on the findings from research conducted with over 5,000 Veterans, Servicemembers, caregivers, and family members. The global navigation on VA.gov web pages allows users to sign in or search VA.gov, and just below that are the top tasks Veterans told VA are the most important to them—representing over 80% of the tasks users visited VA.gov to accomplish. The page is now 508-compliant, and users can log in with a new or existing VA account of their choice to get a personalized experience of existing VA services, regardless of which VA Administration provides those services. Once users are logged in, they can access their agency-wide user profile, allowing them to view and update the information VA has about them.

Since relaunch, the Customer Satisfaction Score for all VA.gov websites (including both modernized and legacy pages) rose from 52.9% to 57.6% (a 9% increase). The Customer Satisfaction Score among users who saw one of the newly modernized pages rose to 66.3% (a 25% increase). Figure 60 in

Appendix C presents the VA.gov topology basics.

**BXXA BXXB**

### **VA Online Scheduling**

VA is currently in the process of integrating VA Online Scheduling (VAOS) into VA.gov as a part of the integrated health tools. 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. Up next, OIT will be working on the following:

- Community care appointment requests.
- Self-schedule integrations.
- Phased rollout on VA.gov to all production users.
- Addition of parity features with legacy tool (e.g., past appointments and video).
- Communications around phasing out legacy tool and switching My HealthVet (MHV) to point to VA.gov.
- Research and design around alternatives to messaging.
- Research and design around integrating Cerner.

### **VAMC Redesign**

Veterans told VA that VA Medical Center (VAMC) websites are confusing to navigate, contain outdated or missing information, and do not match their VA health care journey. The Department researched, designed, and built a mobile-first user experience that gets users to all content and tools in just one to two clicks. VHA Digital Media partnered with OIT's Digital Experience Product Line to develop the new VAMC website by using a modern technology stack, VA application programming interfaces (APIs), the new content management system, the VA.gov Design System, and global content strategy and governance.

As part of this effort, VA conducted 76 moderated research sessions (like interviews and usability testing) with Veterans, family members, caregivers, and patient advocates and 814 unmoderated research sessions (like surveys) with Veterans. For VISN 4, it streamlined the total site pages from 300 to 40 search-engine optimized, Veteran-first pages and the total site word count from 350,000 to 46,000 plain-language words. The Department is nearing completion of the redesign for VISNs 4 and 19 and is expanding to VISNs 2, 6, 16, 21, and 23 based on lessons learned. **BXXA BXXB**

### **Facility Locator/Community Care Refresh**

Veterans think of VA as the brick-and-mortar MyVA, where they go to receive help and care, and VA facilities humanize the Department through in-person support and services. Many of the key Veteran touchpoints are intrinsically linked to facilities: engaging with benefits, VA health care, and cemeteries and burials. Through moderated user research, VA found that Veterans often search for and select a facility based on (1) service and then (2) distance, but on the backend, separate workflows and access to location information creates confusion for the Veteran. Veterans need consistent information between online and physical locations and are skeptical of information on VA.gov.

In order to improve the Veteran experience, VA is currently addressing known usability and accessibility issues, resolving data quality issues, integrating with new VAMC websites, refining data analytics capabilities, and improving Veterans' search experience by aligning VA and community care service names with Veteran-facing language.

**BXXB**

### **Modernize Tier 2 & 3 Web Content**

The 2018 relaunch of VA.gov centered on rewriting and consolidating Veteran-focused benefit content. What remains is thousands of pages of secondary and tertiary web content spread across hundreds of subdomains. This content predominantly addresses audiences other than Veterans (e.g., medical professionals, business partners, Congress, press, or the public) and topics other than benefits eligibility and application processes. This effort comprises building templates, workflows, and governance structures within the modernized content management system that will enable program offices to create and manage those pages, along

with a navigation and information architecture within VA.gov to allow users to easily find and consume them.

### **Profile 2.0**

The Profile 2.0 effort involves developing the next iteration of the Veteran Dashboard. The dashboard will ensure that logged in Veterans can quickly complete tasks on VA.gov, clearly see all the information VA knows about them, and receive notifications of relevant updates about them or actions they need to take.

### **Single Sign-On**

To deliver a single digital VA where Veterans can track and manage their health care and benefits, VA must create a unified login and authentication experience that provides secure access to products and tools built on different platforms. The immediate need is to support the initial operating capability (IOC) launch of the Cerner Electronic Health Record (EHR). There are multiple entry points for a Veteran to access their health care information—VA.gov, MHV, or the new Cerner portal—and the Department must ensure that logging in to any of those digital experiences allows a Veteran to seamlessly flow between them all without requiring re-authentication. BXXB

### **Tier 1 Help Desk and Contact Center**

As part of the effort to modernize call centers, the Enterprise Contact Center Council has been focused on trying to create a new call center that will act as a "one-stop" phone number for Veterans to get answers to identified Tier 1 questions or be directed to the correct call center/phone number for any questions a Tier 1 agent is unable to answer. This call center will be associated with the MyVA311 phone number (turning into just VA411). VA is building the Tier 1 call center on the foundation of the White House VA Hotline.

### **eBenefits Consolidation**

A key component of VA's Digital Modernization Strategy is the consolidation of disparate web products and tools onto a single, modern platform where Veterans can easily log in to track and manage their benefits. VA is re-platforming features from eBenefits on to VA.gov, prioritizing those features that are most important to Veterans. These include Viewing Rated Disabilities, Applying to Add

Dependents, Add or View a Representative, Viewing Payment History, and more.

### **Future Environment**

Through the relaunch of VA.gov, the Department is demonstrating that it is possible to transform the online experience. 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 artificial intelligence (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.

See Figures 1 and 2 for the FY 2020–2026 milestones that the Digital Experience Product Line will complete to achieve its future environment.

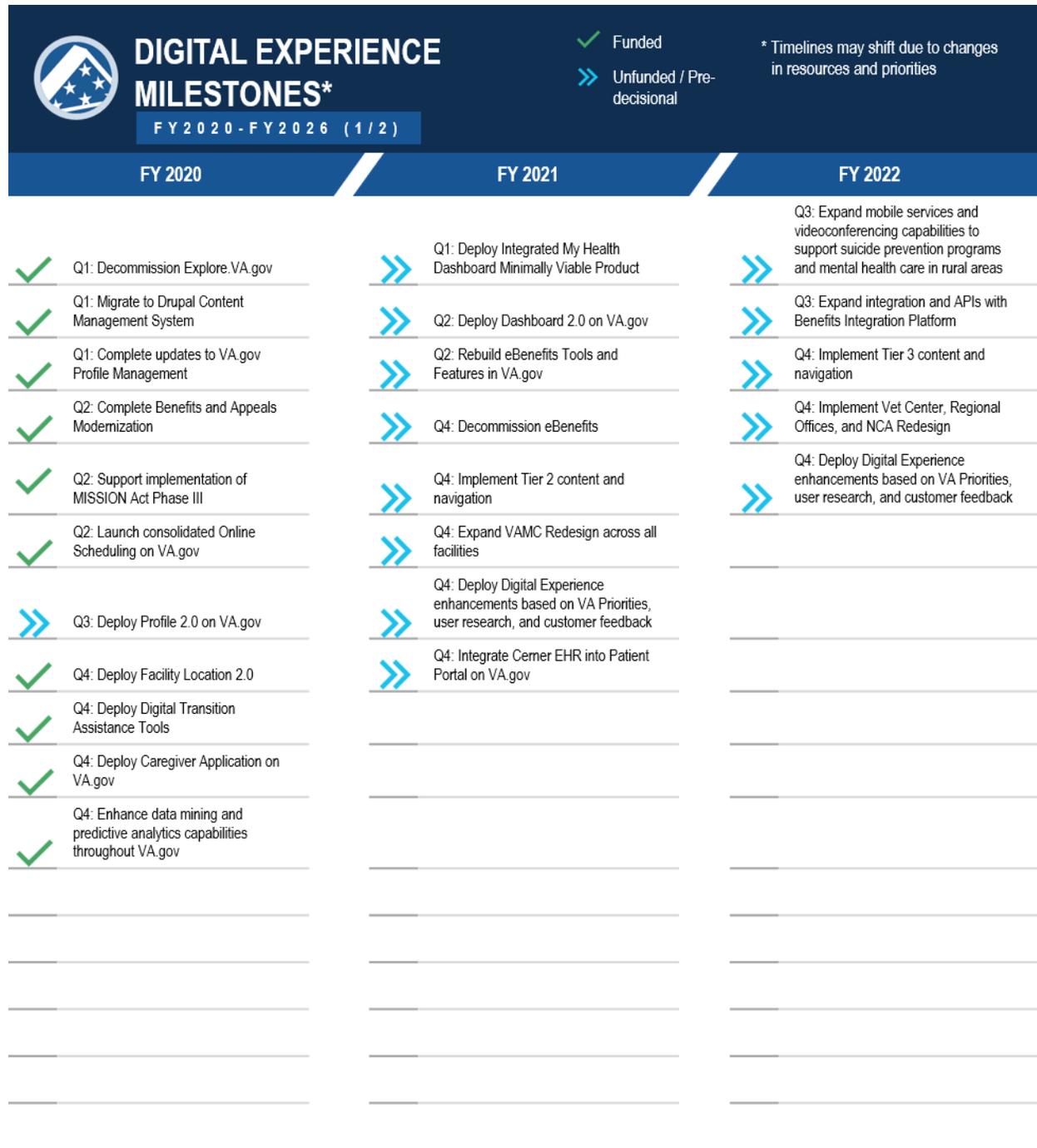


Figure 1: Digital Experience Milestones (1/2)



Figure 2: Digital Experience Milestones (2/2)

## 1.2 Contact Center

### 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 12,500 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. 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.

Additionally, 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, the Veterans Experience Office (VEO) is engaging key stakeholders and using human-centered design techniques to elicit and document business requirements for an enterprise CRM platform. VEO has also leveraged Salesforce to develop the White House VA Hotline for at-risk Veterans. In developing enterprise solutions, VEO is

aiming to consolidate, integrate, and share data across the Department so that Veterans and customers receive the same information regardless of how or where they interact with VA, which will improve CX on a holistic level.

### Drivers

VA's contact centers are the door to a complex environment that Veterans must navigate when contacting the Department. 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 ranges from contact centers with dedicated staff to staff that answer phones while simultaneously managing in-person interactions.

VA's use of disparate CRM technology also 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. 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. VA is currently working with the White House, OMB, and GSA to support a government-wide center of excellence (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. BXXB HXXA

PMA CAP Goal 1 (IT Modernization) and CAP Goal 4 (Improving Customer Experience) as well as the 21st Century IDEA are driving the Department's contact center and CRM transformation. 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. 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. Additionally, advances in AI (e.g., machine learning [ML], chat bots, and voice assistants), advanced data analytics, virtual care platforms, Cloud, and standard 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 investments. Figure 61 in Appendix C identifies the logical structure of VA's Enterprise Contact Center in the future environment.

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's goal is to have all VA contact centers on one system by 2028. To accomplish this, the Department is completing an Analysis of Alternatives, selecting an enterprise solution, and awarding the ECCM telephony and CRM contracts to implement the infrastructure to support the ECCM operating model.

### *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 7.8. BXXA

### *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, regional/Veterans Integrated Service Network (VISN) virtual care centers. Clinical contact centers will be standardized to deliver 24/7 access to scheduling, pharmacy, clinical triage, and virtual care with licensed independent practitioners as well as provide care coordination. 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 licensed independent practitioners 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 Electronic Health Record Modernization (EHRM) and community care. Benefits of modernized clinical contact centers also include support to VA's Fourth Mission during the coronavirus pandemic. For more information on the Future Environment of VA's Virtual Care Center Model, refer to Figure 71 in Appendix C. BXXB

### **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 (VCL) services. Of these agents, 93% are a Veteran, military family member, caregiver, or survivor. The hotline also interfaces with the Master Veteran Index (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. The Department is also expanding the hotline, adding up to 100 agents at the Salt Lake City VAMC to support additional demand to include the VA Maintaining Internal Systems and Strengthening Integrated Outside Networks (MISSION) Act.

### **VA Solid Start**

The VA Solid Start (VASS) requires VA to be proactive in contacting Servicemembers and Veterans to inform them of available mental services—an improvement to CX and opportunity to improve and save lives. This initiative supports enhancements to an existing platform to improve the enterprise-wide CRM and telephony platform (deployed within VBA National Call Centers) to enable it to make and track outgoing calls to transitioning Servicemembers and Veterans (estimated to be over two million per year) as part of VA's overall Suicide Prevention initiative.

VA will deliver VASS in two phases: Phase 1 is the minimum viable product that will enable VBA call agents to view Veteran benefits and eligibility information; configure, view, and update a Call Diary; “click-to-call” a Veteran from the Call Diary; generate reports; and monitor contact metrics. Phase 2 will enable call agents to view and update Veterans' contact data from VA Profile, view Veterans' Contact History, designate user roles, send email confirmations, leverage automated field population via integrations, receive transferred calls, initiate creation of a Veteran record in the Corporate Database, and send snail mail via integration.

### **Voice Access Modernization Infrastructure**

The Voice Access Modernization (VAM) Infrastructure initiative supports VBA Call Centers—impacting about 4,000 configured call center agents and 100,000+ calls a day from Veterans and their families—and provides interactive voice response (IVR) based self-service, intelligent call routing, an agent desktop, call center reporting, workforce management, and a quality assurance solution. VA is upgrading and expanding the capabilities of the VAM solution, intending for VAM to become the basis for the VA enterprise contact center solution.

### **CRM Platform Enhancements**

The CRM Platform Enhancements effort involves a common application platform that provides a highly capable call center that can improve work management, time management, and data accuracy. The application systems and requirements reflect the breadth of efforts required to transform VA's CX practices. The program helps enable data sharing and facilitates informed and complete responses across three Administrations and business lines; optimize desktops to improve VA customer service for Veterans in crisis, health benefits, health eligibility services, and community care; as well as track Veteran feedback. As a part of this effort, the Department is currently working to integrate CRM applications with VA Profile, expand the Community Care (CommCare) CRM Clinical Contact Center (C3), and deploy the Veterans Integrated Clinical Contact Center Management System to VISN 8 VAMCs and other VISNs as prioritized.

### **CRM/Unified Desktop Optimization**

VA is currently deploying the CRM/Unified Desktop Optimization (UD-O) in production to the eight VBA National Call Centers and the Pension Management Center. CRM/UD-O provides Microsoft Dynamics CRM functionality to the call agents, allowing them to quickly and accurately respond to Veterans' inquiries. CRM/UD-O enhancements will allow for expanded access to VA information needed by the VBA agent and external stakeholder community. Therefore, expansion will enable integrated access to customer service centers via phone, web, mobile, and in person contact and will further the goal of becoming a Public Contact Service Center that services customers through their preferred access channels. Figure 62 in Appendix C displays the CRM/UD-O architecture.

### **Member Services CRM**

This effort is a continuation of two previous CRM development projects: Health Resource Center (HRC) and Health Eligibility Center (HEC). The Member Services CRM application has been deployed in production to several user groups within the VHA Member Services organization located in Topeka, KS; Canandaigua, NY; Atlanta, GA; Fort Riley, KS; and Waco, TX. The original HRC project included the transition from the HRC's legacy Siebel based CRM solution to a Microsoft Dynamics based CRM solution, providing an efficient desktop, workflow, contact history, and KM capabilities. This project will provide enhancements to the Member Services CRM application and continue the rollout to additional end users. The goal is to provide Member Services contact center agents with a single desktop view that will enable a 360-degree view of Veteran-specific data in the areas of health benefits, first-party payment processing, pharmacy support, health care eligibility, and enrollment including income verification for VA's health benefits that are tied to financial needs assessments.

VA is replacing Member Services' legacy Siebel system with the Member Services CRM, deploying the Member Services CRM to First Party (FP) and Consolidated Patient Account Center (CPAC) user groups, and deploying the Member Services HEC-CRM case management application. Additionally, Member Services is providing capability for call centers to manage Veteran documentation utilizing Microsoft Azure Cloud architecture.

### **Patient Advocate Tracking System - Replacement**

The Patient Advocate Tracking System (PATS) is VA's electronic system of record for documenting and tracking patient complaints to support patient advocate responsibilities. VHA's Patient Advocacy Program was created to ensure that Veterans and their families have their complaints addressed in a convenient and timely manner. Veterans and their families can submit complaints to a VA medical facility by telephone, email, internet, mail, or in person. Complaints are also received through congressional inquiries. To replace PATS at all VAMCs and provide additional functionality, the Department is completing the national rollout of the Patient Advocate Tracking System - Replacement (PATS-R) CRM application. BXXA

### **Veterans Signals**

The purpose of the Veterans Signals (VSignals) project is to implement a COTS, Software as a Service (SaaS) customer experience management (CEM) tool that empowers Veterans, eligible dependents, caregivers, survivors, VA employees, VSO members, and community leaders to provide near real-time feedback for services and benefits provided by VA across all service lines. Low-burden surveys and digital comment cards provide VA with a real-time understanding of current customer and employee interaction experiences to adjust and support short-term service recovery and long-term program and system improvement.

VSignals delivers actionable intelligence on what is influencing Veterans' trust in the services and benefits VA provides. VSignals provides experience management information to the Secretary and VA leadership in multiple ways:

- Deploying and managing the VA-wide Trust Survey to measure macro themes and trends.
- Deploying and managing Service-Level Measurement to measure micro themes and trends.
- Scraping social media to detect and monitor conversations related to macro and micro trends.
- Deploying and managing the Digital Comment Card to provide the capability to submit real-time feedback.
- Reviewing Veteran insights within seconds of a survey or digital insight submission.
- Searching intelligently through insight data to monitor priorities, compliments, concerns, and recommendations.
- Applying descriptive, predictive, and prescriptive analytics to identify emerging topics and priorities.

The Department is currently incorporating new Line of Business (LoB) related surveys and dashboards into VSignals and introducing new features to the tool, such as the Mobile Application and Next Generation Reporting. VSignals' program success has elevated VA to Lead Agency Partner for PMA CAP Goal 4, Improving Customer Experience with Federal Services. BXXA BXXB

### **Education Call Center CRM**

The Education Call Center (ECC) CRM is currently being used in production by ECC contact center agents located in Muskogee, OK. The system was developed using a combination of out-of-the-box Microsoft Dynamics functionalities and integration with back-end VA systems. ECC CRM functionality provides a consolidated means of answering, tracking, and reporting calls from Veteran beneficiaries and school officials. At present, VA is enhancing ECC CRM to improve system reporting, latency, and integration with MVI.

### **Veterans Crisis Line**

The Veterans Crisis Line (VCL) application suite serves as the point of contact for Veterans in crisis. It also functions as a workflow management and follow-up software that enables VCL staff and Suicide Prevention Coordinators to provide care and support for Veterans in crisis; see that care through to VA hospitals, other agencies, or community care; and provide VA health care staff with an updated view of any care given to the Veteran at a VAMC through the Computerized Patient Record System (CPRS)/Veterans Information Systems and Technology Architecture (Vista). Quality control is also part of the suite to ensure that all points of care are conducted according to protocol and no Veteran's care or follow-up is compromised. Figure 63 in Appendix C presents the VCL architecture, including its interaction with Vista.

### **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. It will use a Veteran-centric omnichannel operating model, as shown in Figure 64 in Appendix C, 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. BXXB

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. This platform will provide a consolidated interface and means of answering, tracking, and reporting contact points to improve CX and service delivery. It will make call center agents' jobs easier and their interaction with Veterans and customers faster and more efficient. 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. To support the development of future CRM architecture, VA has created a CRM reference architecture, shown in Figure 65 in Appendix C, which will help select the best delivery method for particular CRM-related technologies.

As a CEM platform, VSignals will gather continuous customer feedback in a consistent and systematic manner. It will allow that feedback to be analyzed for sentiment and experience. VA can then use the insights gained from this analysis to prioritize customer follow ups, flag at risk situations, and identify ways to improve business processes. CEM will enable VA to focus entirely on the customer's experience, regardless of the nature of the interaction, service, or product being provided.

See Figures 3 and 4 for the FY 2020–2026 milestones that the Contact Center Product Line will complete to achieve its future environment. BXXA BXXB

 <b>CONTACT CENTER MILESTONES*</b> FY 2020 - FY 2026 ( 1 / 2 )		 Funded	 Unfunded / Pre-decisional	* Timelines may shift due to changes in resources and priorities
FY 2020	FY 2021			FY 2022
 Q1: Complete VAM upgrade and expansion	 Q1: Integrate Members Services VBMS with HEC			
 Q1: Deploy VASS minimum viable product	 Q1: Deploy continued enhancements for Member Services Call Centers			
 Q1: Complete CommCare C3 Expansion and Optimization IOC	 Q1: Incorporate Mobile Applications into VSignals			
 Q1: Deploy Community Signals	 Q1: Incorporate VR&E feedback channel into VSignals			
 Q1: Deliver Member Services FP and CPAC minimum viable product	 Q1: Incorporate Community Care feedback channel into VSignals			
 Q1: Deploy UD-O On Demand Defects Release and Workflow Enhancements	 Q1: Incorporate IC3 feedback channel into VSignals			
 Q2: ECCM Phase 1: Integrate VA Profile with Contact Centers	 Q1: Incorporate ORM feedback channel into VSignals			
 Q2: Deploy VASS Phase 2 to enable system automation/agent interaction	 Q1: Incorporate HR&A feedback channel into VSignals			
 Q2: Complete CRM/UD-O usability enhancements	 Q2: Implement ECCM Phase 2 Tier 1			
 Q2: Deploy Member Services CRM to FP/CPAC & deploy HEC-CRM	 Q2: Incorporate OPIA feedback channel into VSignals			
 Q2: Deploy PATS-R Nationwide	 Q2: Incorporate INS feedback channel into VSignals			
 Q2: Incorporate Emergency Medicine, Inpatient, & Appeals feedback channels into VSignals	 Q3: Incorporate LGY feedback channel into VSignals			
 Q3: Deploy VASS post minimum viable product and IVR	 Q3: Incorporate FSC feedback channel into VSignals			
 Q3: Integrate CRM Applications with VA Veteran Profile	 Q4: Incorporate Fiduciary feedback channel into VSignals			
 Q3: Member Services HRC FP/CPAC Go Live and HEC-CRM Go Live	 Q4: Incorporate TED feedback channel into VSignals			
 Q3: Implement ECCM Phase 1 Tier 1				
 Q3: Incorporate Enterprise Contact Center Council, VHA Member Services, and VA Community Care feedback channels into VSignals				
 Q4: Deploy CommCare PATS-R, VSignals, CPRS/VA Profile Integration				

Figure 3: Contact Center Milestones (1/2)



## 1.3 Eligibility and Enrollment

### Current Environment

The Enrollment System (ES) is the entry point for all Veterans needing health care within VA or through community care. ES compiles military service, demographics, and financial data from VA health care facilities and other internal and external authoritative sources to process Veterans' applications for enrollment and support benefits determinations in an automated fashion. Once compiled, ES shares this information with the VA health care facilities treating the Veteran. Figures 66 and 67 in Appendix C depict the major ES sub-systems and components and their interaction.

ES is the authoritative source for VHA enrollment data and provides services to access the data for internal and external entities. Its functionality works in parallel with the VistA Registration Eligibility and Enrollment (REE) system; therefore, functionality within ES must be mirrored by VistA REE in order to ensure appropriate processing of records while both systems are used across the enterprise. Major internal users of ES include HEC, Health Administration Center (HAC), and HRC, and external users include the U.S. Social Security Administration (SSA), the U.S. Department of Defense (DoD), and Centers for Medicare & Medicaid Services (CMS).

The initial release of ES provided the foundation for future capabilities that are vital for consolidating health benefits eligibility determinations for all VA programs, reducing Veteran and administrative staff burdens, enhancing enrollment services to make it easier for Veterans and beneficiaries to access benefits, and providing self-service opportunities for Veterans and beneficiaries. Current risks and issues for ES include managing dependencies with the development schedules of other VA systems, obtaining the necessary funding to support ongoing development efforts, and carrying system technical debt, which has accrued over the past 10 years while ES has been in production. BXXB

### Drivers

Main drivers for the Eligibility and Enrollment Product Line include the FY 2018–2024 VA Strategic Plan and the VA Priorities. Accordingly, the Product Line is focused on customer feedback to make

access to eligibility services as seamless, effective, and efficient as possible; adding functionality that allows VA employees to identify and assign benefits to Veterans affected by the MISSION Act; and using systems and technology to enable employees to enhance the quality of the care and services Veterans receive.

VA's shift to a Development Security Operations (DevSecOps) framework is also fundamentally changing the way the Eligibility and Enrollment Product Line develops and operates. The Product Line is preparing for the transition by using DevSecOps tools and developing ways to automate development, testing, and release activities. It must develop integrated teams that use DevSecOps pipelines that provide visibility into all builds, deployments, testing, and release activities and must adopt continuous integration and continuous delivery (CI/CD) as the norm.

The Department's goal to move to Cloud computing is another driver for the Eligibility and Enrollment Product Line. It has begun adopting Cloud computing to enable agile product delivery, data sharing, and enhanced security. This adoption reduces the IT burden for both developers and operations staff.

### Transformative Initiatives

#### *Enrollment System Modernization*

Enrollment System Modernization (ESM) focuses on improving the functionalities in ES required to process Veterans' applications for enrollment, manage enrollment correspondence and telephone inquiries, share Veterans' eligibility and enrollment data with VA and non-VA organizations, and support national reporting and analysis of VHA enrollment data. ESM 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. ESM also provides self-service opportunities for Veterans, which allow them to save, submit, and edit health benefit application information online, expediting the enrollment and eligibility process.

It will also enable VA to comply with MISSION Act legislation to include enhancing ES in order to comply with grandfathered status eligibility requirements. Additionally, ESM will involve migrating ES to the Cloud for increased scalability,

improved performance, and potential cost efficiencies. ESM will continue to improve VA's services to Veterans, caregivers, and their families by facilitating registration, enrollment, and eligibility throughout the enterprise.

### **Future Environment**

Through ESM, the Eligibility and Enrollment Product Line will provide more efficient and effective eligibility and enrollment decisions and reduce delays to services for Veterans. As ESM progresses, OIT will migrate ES to the Azure Cloud environment. The Cloud migration will allow for improved enterprise functionality with automated expansion and compression of processing capability based on system demand. The Cloud architecture will also allow for fully automated testing and the ability to seamlessly accommodate the planned expansion of system utilization related to the decommissioning of VistA REE—with an anticipated addition of 20,000 new users across the enterprise. BXXB

In addition, as the Product Line transitions its software development methodology from the Veteran-focused Integration Process (VIP), DevSecOps will allow for continuous development and releases multiple times per day as needed to support the production release of functionality. The change to DevSecOps will reduce the risk associated with software defects in planned production releases and the time required to go from user stories and requirements to the release of functionality in production. Major benefits will include faster deployment times, improved quality, and reduced costs associated with software development for eligibility and enrollment services.

See Figures 5 and 6 for the FY 2020–2026 milestones that the Eligibility and Enrollment Product Line will complete to achieve its future environment.





Figure 6: Eligibility and Enrollment Milestones (2/2)

## 1.4 Customer Master Data Management

### Current Environment

Customer Master Data products are key to VA’s goal to improve CX as Veterans, family members, and caregivers navigate the journey from military service through the spectrum of VA benefits. These products deliver key components of customer data and well-developed, user-friendly channels through which data can be submitted and consumed by customers and their advocates. Customer Master Data Management encompasses two overarching goals: 1) provide an infrastructure for capturing, synchronizing, and maintaining the integrity of customer data and 2) ensure this data is available enterprise wide and to customers in order to provide and adjudicate VA benefits.

Across VA and beyond, providing appropriate services to Veterans requires determining who they are, confirming military service information, and comprehensively linking program records from across the Department. Yet, there is not currently a single, simple, centralized method to reliably and accurately verify the Veteran status of a given individual or link an individual with all of the information VA may have about that person. Existing identity databases are incomplete, difficult to integrate with, and funded under a pay-to-play model. This leads business lines to execute their own individual identity checks and add records via non-standard methods, making the problem worse. Different VA components do not trust authoritative sources and regularly check different databases in different ways, leading Veterans to be accurately identified for receipt of some services but not for others. The status quo also incurs high costs in VA employee time, as they must navigate complex integration processes, build duplicative identity databases and crosswalks, and reconcile conflicting records.

VA’s multi-channel strategy depends on an infrastructure built on effective management of customer data and the delivery of an authoritative 360-degree view of its customers, spanning from military service to discharge to Veteran status. The centerpiece for VA Customer Data is VA Profile, which provides this 360-degree view and is being

designed for enterprise-wide use as “One Source of Truth.” BXXB

### Drivers

Currently, a Veteran who applies for a VA benefit or service is frequently asked to prove his or her identity and Veteran status by producing a DD-214 or other evidence, even if VA already has a record of the person’s service. Depending on the sequence in which Veterans apply for benefits, they may even be asked to prove their status to VA multiple times despite having already done so before; worse still, Veterans may be told they never served and have their access to benefits delayed or even denied as a result. Many VA components have outdated policies requiring Veterans to provide a physical DD-214 rather than using computable identity and Veteran information.

Additionally, Veteran studies show that VA’s key customers are frustrated and confused by the lack of uniformity of their basic common data across the Department. For example, bad addresses return 40% of mail annually. Several VA systems (the Administrative Data Repository, VBA’s Corporate Database, and VistA) store Veterans’ mailing addresses, and Veterans now have the ability to view and update their addresses on VA.gov. Due to these multiple sources and the lack of a standard process for verifying these addresses, VA struggles to reconcile and maintain accurate mailing addresses for Veterans. Erroneous mailing address data results in the Department sending prescriptions and other health care related correspondences to incorrect addresses. Having a single set of mastered common data will reduce customers’ frustration, decrease the cost of storing bad data, and mitigate the risk to Veterans.

Managing data at an enterprise level reduces IT development lifecycles; lowers project failure rates; enables enterprise applications; and provides analytics and cross-unit data/information for decision making. The most critical dependency for Customer Master Data Management is the successful partnership of VEO, businesses, and OIT in communicating and collaborating effectively to deliver these critical data management services. Data quality and integrity depend on development of clear business rules, communication of

technological issues, and ongoing engagement around emerging barriers and delays.

## **Transformative Initiatives**

### ***VA Data Access Modernization***

VA has two initiatives to improve the quality and usability of VA's key enterprise data: the VA Data Access Modernization Campaign and the VA Identity and Military History Data Strategy, the latter of which is discussed in the following section. The first, the VA Data Access Modernization Campaign, will ensure that all data consumers (including VA systems, external customers, and the Cerner EHR) can quickly and easily access up-to-date, authoritative administrative data on Veterans. Its guiding principle is that VA should be able to easily draw on everything it knows about a Veteran to provide accurate, personalized services. This initiative aims to establish VA Profile as a comprehensive customer profile as well as facilitate access to all data across VA. This means that 1) basic administrative VA Profile information is available to internal and external systems in a single API call and 2) internal and external systems can easily identify and access the authoritative source for any piece of VA data.

Under this vision, existing ADSs will generally remain authoritative for the data they provide VA Profile. However, VA Profile will become authoritative for those common data elements that do not clearly belong to any one system and may conflict across copies, such as contact information. Because this vision relies on retrieving data from other VA systems, the single greatest dependency is ensuring streamlined, reliable access to source systems. In the long run, this initiative anticipates the deprecation of all other legacy integrations for administrative data so that all of VA relies on service calls to VA Profile for Veteran customer information. While VA should pursue this strategy regardless of EHRM, the Cerner EHR implementation creates additional urgency, as Cerner requires a single authoritative source of administrative data.

### ***VA Identity and Military History Data Strategy***

The second initiative to improve the quality and usability of VA's key enterprise data is the VA Identity and Military History Data Strategy, which is a more targeted initiative to ensure the comprehensiveness and integrity of VA's identity

and military service data. In addition to improving access to administrative data, VA must improve the comprehensiveness of its key datasets. As previously mentioned, there is not currently a standardized method to verify Veteran status or link a Veteran to his or her information within VA, and VA's existing identity and military record databases are highly incomplete. Therefore, this strategy outlines a concrete series of steps to achieve complete and actionable coverage of these data domains in the respective ADSs, the Master Person Index (MPI) and the VA/DoD Identity Repository (VADIR).

This initiative includes the Enhanced Common Population Project, which aims to ensure MPI, the Defense Eligibility Enrollment Reporting System (DEERS), and VADIR each contain all known Veterans by importing additional key databases of known Veterans. It also works toward adding missing identities or military service records to key databases via standard, documented processes. Lastly, the VA Identity and Military History Data Strategy will implement use of the Title 38 Veteran Status Code in order to authoritatively and automatically analyze military service data for eligibility decisions. Today, different VA business lines independently and manually review raw military service records to determine if individuals have sufficient military service to qualify for various benefits and health care. This process is duplicative and prone to system and human error, as thousands of staff are entrusted to accurately and reliably apply complex eligibility rules. To obviate the need for these redundant and unreliable reviews, VADIR has begun implementing the Title 38 Veteran Status Code, which summarizes the status of an individual's military service into one of several categories. This typology will be expanded to comprehensively reflect the range of Veteran eligibilities used at VA.

### ***VA Profile***

Due to a lack of standardization and synchronization of Veteran information, VA is developing VA Profile as the enterprise-wide ADS for Veteran, Guardian, and Associated Individual customer profile data and a centralized place for VA systems to access this information. VA Profile is a data source platform that modernizes VA systems by ensuring that VA customer common data is synchronized and shared across VA, regardless of the channel used to update the information. The platform will include common data managed by VEO (e.g., demographics,

socioeconomic data, and contact information) as well as shared data managed by various LoBs outside of VEO (e.g., health eligibility, disability rating, and next of kin). VA is currently building out additional data domains and onboarding consumers to VA Profile along with further adoption of the Enterprise Address Validation Service. This includes establishing the Enterprise Rating Data API, integrating the Cerner EHR with the Veteran Profile Service, delivering push notifications for changes to contact information and eligibility and enrollment data, and integrating additional consumers like Veterans Benefits Management System (VBMS), Loan Guaranty Service (LGY) Community Care, and Caregivers.

VA Profile will establish, maintain, and synchronize customer information for these Person Types, ensuring all VA LoBs are using the same information and enabling these customers to view and update their information in one place. VA Profile will become the ADS for VA common data, and working with this platform, an enterprise master data management solution will support the storage and interface of information provided to Veterans. The implementation and deployment of this solution will also help VA reduce costs and improve the quality of information and governance. Figure 68 in Appendix C provides insight into VA Profile’s ecosystem design and details the data types, sources, and customer profiles that its master data management will integrate. Figure 69 in Appendix C provides additional insight, depicting the logical architecture of VA Profile.

**Customer Experience Data Warehouse**

CX data is captured across distributed elements and components of the enterprise as customers journey from issue to resolution and as they have various interactions with VA. The Customer Experience Data Warehouse (CxDW) effort seeks to consolidate customer data and metrics from across the agency into a single usable database. Information from phone systems, phone carriers, IVR systems, case management tools, and call center tools will be consolidated so that a complete picture of a Veteran’s journey can be formed.

To enable insights into the journey, VEO seeks to deploy the following technology business solutions:

- An OIT data management strategy to capture and rationalize the vast amount of

data that will be generated from multiple Veteran touchpoints (e.g., contact center interactions; outreach efforts and surveys; interactions at VAMCs, Regional Offices, Memorial Services, and Appeals; and social media).

- Methods and mechanisms to link all interactions to a single journey.
- AI and ML approaches to discover customer patterns; predict or anticipate customer needs; and augment customer, employee, and agent tasks.
- AI-based robotic process automation (RPA) to eliminate manual tasks from the customer and agent journeys.
- A consolidated reporting and analytics capability for all products in the Customer Master Data Management Product Line.

These solutions will help VA understand customers, their experiences, and patterns; perform timely service recovery; and continuously improve customer service across the Department. BXXA

**Veterans Information Solution & VA/DoD Identity Repository**

The VA/DoD Identity Repository (VADIR) provides VA’s sole authoritative military history source via real-time, authoritative DoD personnel records. The VADIR database is a back-end database system and does not contain a centralized application. The Veterans Information Solution (VIS) is a stand-alone application that displays VADIR (and other) data to end-users. VADIR is unique from all other VA systems, as it can provide VA users with a view of those who are currently on active duty and may be starting to transition to Veteran status—a view into the type of current affiliation. VIS/VADIR enables the bi-directional sharing of information between DoD and VA. It improves automation and processing efficiencies and supports current and future high-priority initiatives. Specifically, VADIR is a real-time replication of the DoD Defense Manpower Data Center/Person Data Repository.

**Military Service Data Sharing/Customer Gateway Services**

Military Service Data Sharing (MSDS) maintains web service functionality required by all VA LoBs with a need for an authoritative source for determining

eligibility and entitlement to VA benefits. MSDS removes the “burden of proof” on Veterans to provide paper evidence (e.g., DD-214) when requesting access to health care or applying for benefits.

## Future Environment

The VA Data Access Modernization Campaign envisions a VA in which:

- Veterans provide their data to VA just once, rather than repeatedly for different services.
- In many cases, Servicemembers’ data will be automatically available prior to engaging with VA.
- Internal teams know where to find authoritative data when building applications and can easily and reliably access that data.
- The Cerner EHR has a single authoritative source for VA and DoD administrative patient data.
- A thriving ecosystem of private sector innovators deliver world-class services to Veterans and other VA customers securely using VA data.

Additionally, VA Profile 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 as well as a comprehensive view of their Master Records. At full operating capability (FOC), VA Profile will have governance, data, services, tools, processes, and technology that VA can reliably use for customer service activities, operations, and data profiling.

See Figures 7 and 8 for the FY 2020–2026 milestones that the Customer Master Data Management Product Line will complete to achieve its future environment. BXXB



Figure 7: Customer Master Data Management Milestones (1/2)



## 2. HEALTH SERVICES PORTFOLIO

This section documents the current environment, drivers, transformative initiatives, and future environment for the Health Services Portfolio and contains the following Product Lines:

- 2.1 Medical Care
- 2.2 Health Care Administration
- 2.3 Telehealth and Scheduling
- 2.4 Medical Research, Education, and Population Health
- 2.5 Community Care
- 2.6 Supply Chain Management
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. Implement VA MISSION Act: Improving Access to Care
8. Modernize Electronic Health Records
9. Transform Financial Management System and Contract Management System
10. Transform Supply Chain

### Current Environment

VHA is the largest integrated health care system in the U.S., providing care at 1,255 health care facilities to over nine million Veterans enrolled in the VA health care program. To support its mission to provide exceptional health care that improves Veterans' health and well-being, VHA established the following long-range goals:

1. Make VHA the provider and care coordinator of choice for Veterans
2. Deliver comprehensive and integrated whole health care
3. Innovate as a learning and teaching organization
4. Increase the efficient and effective use of resources across the enterprise

Supporting the VA Priorities, VHA's three priorities are to Restore Trust, Create a Learning Organization, and Modernize Systems. Modernization is VHA's blueprint to deliver on both sets of priorities to create a VHA that always anticipates and meets the needs of Veterans, its employees, and other beneficiaries. To meet its priorities and become a highly reliable, integrated health care 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)
2. Streamline VHA Central Office

VHA's 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 health care 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 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.<sup>1</sup>

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 (PHI) and brings VA into conformance with community providers and health plans. As a part of the MISSION Act, ATA has increased 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 health care professionals to practice, regardless of their location in any state, their health care profession through the practice of telemedicine. This authority extends to situations where the provider or beneficiary are not on federal property. BXXB

Furthermore, in times of national crisis, such as the current coronavirus pandemic, VA provides services to the nation based on requests from states while being clear that Veterans are first. This is known as VA's Fourth Mission. VA has determined to make 1,500 beds available for the Federal Emergency Management Agency (FEMA). These beds will be a combination of acute care and intensive care beds for non-Veteran patients available at various VA locations around the country.

## Transformative Initiatives

The Health Services Portfolio includes the following key transformative initiatives:

- Electronic Health Record Modernization (EHRM)
- Suicide Prevention Package
- Prescription Drug Monitoring Program (PDMP) Solution

- Centralized Scheduling Solution (CSS)
- Telehealth Modernization
- VA Video Connect (VVC)
- Multi-Cloud Research Environment
- Community Care Modernization
- Community Care Referral and Authorization (CCRA)
- Caregiver Record Management Application (CARMA)
- Defense Medical Logistics Standard Support (DMLSS)

## Future Environment

The Health Services Portfolio will provide innovative solutions to support VHA in becoming a high reliability organization and delivering exceptional, coordinated, and connected care for Veteran health and well-being. More specifically, it will modernize care and service delivery by operationalizing the VA 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 health IT systems will provide clinicians, administrators, and patients with the IT tools that are not part of the EHR but are needed to support health care delivery. In addition, trials of pharmacogenomics, precision oncology, and genomic return of results in the area of mental health will transform the nature of VA health care. The future environment, especially the EHR of the future, will need to accommodate precision medicine in a learning healthcare system. VHA technology will ultimately align with its structures, processes, and people to deliver new experiences for employees, partners, and Veterans. BXXB GXAA

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<sup>1</sup> 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.

## 2.1 Medical Care

### 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 EHR system, VistA has been essential to the Department's ability to deliver health care 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 health care 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 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, which occurred in October 2020.

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 pioneered 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 and 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 failed to truly transform the EHR system or achieve interoperability.

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 Fast Healthcare Interoperability Resources (FHIR) apps, platform architecture, Cloud deployments, digital disruptors (e.g., Apple and Amazon), RPA, AI, ML, genomics, blockchain, and big data analytics—are shaping the evolution of EHR platforms.

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. BXXB

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. [GXAA](#)

## Transformative Initiatives

### **Electronic Health Record Modernization**

In June 2017, VA announced that the Electronic Health Record Modernization (EHRM) program will implement the Cerner EHR solution to replace the medical record components of VistA. 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 implement Cerner Millennium at VA medical facilities nationwide. Cerner Millennium is the same EHR Platform that DoD is deploying through MHS GENESIS.

In order to achieve efficiency and implementation synergies, VA is aligning the deployment of the commercial EHR with DoD's ongoing rollout of Cerner, starting in the Pacific Northwest. VA will deploy the Cerner EHR at IOC sites in 2020 and continue with a phased implementation at over 1,600 sites through 2027. VA will sustain VistA until the Cerner EHR is fully implemented. The Cerner EHR will be a single longitudinal clinical health record from active duty to Veteran status. It will provide Veterans and clinicians with a complete picture of patients' medical history, driving connections between military service and health outcomes through data analytics. EHRM will ensure interoperability between VA and DoD, enabling the seamless sharing of records. The Cerner EHR will be a catalyst for fundamental change in the way VA delivers Veteran-focused, provider friendly care. Figure 70 in Appendix C presents an overview of the EHRM future environment FOC. [BXXB GXAA](#)

### **Suicide Prevention Package**

The Suicide Prevention Package 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 clinicians in more effectively measuring response to care and treatment effectiveness. The Suicide Prevention Package will enable VA to provide personalized treatment based on an individual's response to specific therapies. It will help clinicians better diagnose Veterans and, in turn, strengthen VA's ability to manage Veterans at risk of suicide.

### **Suicide High-Risk Patient Enhancements**

VA is improving Patient Record Flags (PRFs) in VistA/CPRS. These flag assignments are displayed on Veteran EHRs to providers during the patient look-up process. VA relies on PRFs to identify patients whose current clinical status requires immediate action. This alert enables 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 to improve the flagging of Veterans' charts when they are identified as being at high clinical risk for suicide. It allows PRFs to be visible nationwide as well as improve national management of Veterans at risk of suicide. Facilities will be able to update high-risk flags at the local site, which will then be updated at all care sites. 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 VA program that uses a 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 effectiveness of the White House VA Hotline and Veteran Crisis Line, VA provided hotline staff and VA clinicians 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. [GXAA](#)

### ***Prescription Drug Monitoring Program Solution***

MISSION Act Section 134 requires VA participation in a national network of state-based Prescription Drug Monitoring Programs (PDMP). VA's current PDMP program lags behind industry practices and inhibits the Department's compliance with the MISSION Act. VA's current PDMP workflows are highly manual and the Department's does not have a central connection point to state PDMPs.

VA's modern PDMP solution will enable providers to retrieve controlled substance prescription monitoring data from external sources and within patients' EHRs. VA clinicians will be able to update patient notes with applicable prescription-related data, and efficiently use patient prescription history. VA clinicians will be able to use the PDMP solution to seamlessly query state PDMP databases. VA's modern PDMP solution will enable interstate PDMP data sharing and integrate with VistA, CPRS, and the Cerner EHR. GXAA

### ***Clozapine Modernization***

The Clozapine Modernization initiative is a vital component of the overall effort to address Veteran suicide. Clozapine is an 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 initiative increases the efficiency and accuracy of VA's clozapine treatment system and ensures VA's ability to remain compliant with the Clozapine Risk Evaluation Management Strategy of the U.S. Food and Drug Administration (FDA). VA has developed modern functionality to allow for daily collection and storage of clozapine prescription and dispensing data. This will improve safety and dispensing of clozapine orders for Veterans at high risk for suicide. GXAA

### ***ScripTalk®***

ScripTalk is a modern tool that enables VA to generate prescription labels that a Veteran can hear. VA 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**

Full integration of the Cerner EHR will take several years, beginning with the IOC sites in October 2020. VA will deploy the Cerner EHR to all VAMCs, clinics, Veterans Centers, mobile units, and ancillary facilities. Once fully implemented in 2027, 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 Cerner EHR will support improved health outcomes, patient safety, and quality of VA care. Through the institutionalization of the Federal Electronic Health Record Modernization Program Office (FEHRM), VA and DoD Leaders will align strategies to implement an integrated EHR system. FEHRM will provide a comprehensive and agile management authority to execute requirements necessary for interoperability of a single, seamless integrated EHR. VA is at the forefront of IT for women's health and will also redesign its electronic medical record to track breast and reproductive health care.

In addition, 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, health care 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 Veterans' suicide risk and better equip health care 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. GXAA

See Figures 9 and 10 for the FY 2020-2026 milestones that the Medical Care Product Line will complete to achieve its future environment.





## 2.2 Health Care Administration

### Current Environment

The Health Care Administration Product Line includes systems, applications, and capabilities that enable the interoperability of Veteran data between non-VA providers and VA, as well as between VistA and the Cerner EHR to ensure Veterans' EHRs remain current across providers. Additionally, continuous analysis and business intelligence on comprehensive data sets is being conducted to improve health care for all Veterans. As VA continues to implement the MISSION Act and transitions from VistA to the Cerner EHR over the next 10 years, VA will need to ensure that each Veteran's EHR is up to date, complete, and not fragmented while multiple EHR systems are in operation at the same time.

### Drivers

The MISSION Act implementation and EHRM influence all facets of Health Care Administration.

### Transformative Initiatives

#### *Centralized Scheduling Solution*

VA will implement the Centralized Scheduling Solution (CSS) software as a component of the Cerner EHR implementation. The implementation will be on an accelerated timeline and implementing at all VA medical facilities, including those yet to upgrade to the Cerner EHR. VA will realize efficiencies by accelerating the implementation of the scheduling system. CSS will improve access for Veterans and streamline workflow for staff. BXXB

#### *Veteran's Resource-Based Appointment Scheduling Solution*

There are several scheduling initiatives—Centralized Scheduling, the Telehealth Management Platform (TMP), Scheduling Manager, and VistA Scheduling Enhancement (VSE)—under development. However, none fully meet VHA requirements or needs. Telehealth services seeks clarification and a roadmap on how resource-based scheduling will work across VHA and how telehealth will be integrated into that solution.

### Future Environment

The Health Care Administration products and services will ensure a complete Veteran EHR by

integrating Veteran data from non-VA providers and between VistA and Cerner, as VA continues to implement the MISSION Act and transitions from VistA to Cerner over the next 10 years. The Veterans Data Integration and Federation (VDIF) will be key to this. Data analytics will be used to improve treatments and Veteran population health care facilitated by the Health Data and Analysis Platform and VDIF. Additionally, the enhancement and maintenance of administrative capabilities that will not be replaced by Cerner (e.g., the Caregiver Record Management Application [CARMA], AudioCare, and Informed Consent) will streamline Health Care Administration processes and procedures. GXAA

See Figures 11 and 12 for the FY 2020–2026 milestones that the Health Care Administration Product Line will complete to achieve its future environment.





## 2.3 Telehealth and Scheduling

### 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. VA launched the Blue Button initiative and has now seen 38 million Blue Button downloads by Veterans since August 2010. The most recent feature launched on VA’s portal allows Veterans to download their full imaging files, including the opportunity to burn a disc with their Digital Imaging and Communications in Medicine (DICOM) files as well as a viewer for these files.

Additionally, VA has dramatically expanded the digital tools it offers Veterans. For example, the Annie App, an automated protocol-based two-way text messaging system, allows personalized texts that aid Veterans with self-care. VA is piloting a health chat feature, and VA’s mobile app store now has 45 apps available to assist Veterans in monitoring and managing health issues, to include smoking cessation and mental health care. In FY 2019, VA provided more than 2.6 million telehealth episodes of care to more than 900,000 Veterans. VA’s patient portal, MHV, continues to grow, now with more than five million registered users. In FY 2019, there were more than 20.6 million prescription refill requests. Since its inception in June of 2008, more than 86 million VA Secure Messages have been initiated by VA patients or their care teams. MHV typically supports 1.1 million Veteran interactions monthly, to include accessing personal health data.

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, Veterans of Foreign Wars, 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

homes or are unable to easily access a VA facility to receive remote health care at a convenient location. VA is also implementing virtual reality therapy through telehealth clinics, giving patients an opportunity to use the digital health technology at home for remote patient care. Lastly, to improve efficiency and reduce operating costs, VA has migrated the Office of Connected Care's Mobile Application Infrastructure Support (e.g., MHV) to the VA Enterprise Cloud (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 health care by providing services when geographical distance separates the patient and practitioner. VA now considers telehealth mission critical for effectively delivering quality health care 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 health care 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 health care 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, and Section 151 positions VA to alleviate such shortages.

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.

With its extensive experience with telehealth and its national footprint, VA is well-positioned to lead health care providers in combating the spread of the coronavirus pandemic, utilizing telehealth capabilities and working in collaboration with private telehealth providers and public-private partnerships. This is consistent with VA’s federally mandated mission to support the private sector during national emergencies. Telehealth and other virtual modalities of health care are particularly advantageous in an infectious disease epidemic: they facilitate remote patient screenings, supporting self-quarantine and other infection control practices that lessen communal contact, and thus reduce opportunities for viral transmission. The Coronavirus Aid, Relief, and Economic Security (CARES) Act includes telehealth provisions that relax guidelines for Medicare coverage and provide new allowances for connected health at federally-qualified health centers, rural health clinics, and hospices.

In response to the pandemic, VHA worked closely with OIT to address and stay ahead of the anticipated increase in demand for virtual care. VA has seen over a 1,200% increase in video visits from home with 10,654 visits in the first week of March 2020 to 139,854 visits in the first full week of July 2020. In May 2020, VA recorded its first day with two million minutes of VA Video Connect (VVC) visits. This system has expanded to the VA Commercial Cloud, and VA continues to scale capacity to meet the exponential increase in demand for telehealth appointments. Since the emergence of the pandemic, VA has deployed 244 tele-intensive care unit (ICU) carts across 91 VAMCs, and every VA facility with ICU beds is now equipped with 24/7 virtual access to critical care specialists.

## Transformative Initiatives

### *Telehealth Modernization*

New telehealth technology is transforming VA’s ability to deliver convenient, accessible health care to Veterans. VA recognizes three telehealth modalities to deliver services to Veterans in 50 clinical specialties: First category - Clinical Video Telehealth, uses real-time interactive video conferencing to assess, treat, and provide care to a patient remotely. The second category - Store-and-

Forward Telehealth, uses 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.

The Home Telehealth Reporting Phase 4 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. Figure 71 in Appendix C presents the future environment of VA’s Virtual Care Center Model. BXXB

### *VA Video Connect*

VA Video Connect (VVC) is a mobile application that allows Veterans to access VA health care 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 health care 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 health care teams via live video from the comfort of their preferred location, thereby increasing their access to VA health care 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

### ***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 and Tele-Mental Health Clinical Resource Hubs to fill service gaps in primary care and mental health. VA’s Tele-Primary Care and Tele-Mental Health 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. 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 health care 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. BXXB

### ***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 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.

### ***VistA Scheduling Enhancement***

VHA serves an estimated 8.5 million enrolled Veterans and employs over 250,000 staff, including more than 1,500 physicians. Over 50,000 employees use the VistA Scheduling Enhancement (VSE) capability to make approximately 60 million outpatient appointments. As the health care industry changes for Veterans, VHA must be able to adapt quickly to the changing needs of the environment by monitoring patient demand, resource supply drivers, and operational efficiency indicators. VA intends for the project support to be a

bridge between legacy VistA and the next generation of CSS. The purpose of VSE is to provide support to VHA schedulers by improving appointment reliability and scheduling workflow functions. The project delivers critical, near-term enhancements via a calendar-based overlay to legacy VistA scheduling, which improves scheduling accuracy.

### Future Environment

VA will shape the future of health care 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. It 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.

VA is piloting ATLAS at select Walmart, American Legion, and Veterans of Foreign Wars locations. For a Veteran to attend an appointment at an ATLAS site, the site must be associated with the VAMC in which the Veteran is enrolled for care. Family members who receive care through VA can visit ATLAS sites for select VA appointments. This initiative is intended to address VA Telehealth to rural and underserved Veterans. ATLAS will allow Veterans to be examined at their local VSO posts through virtual appointments with medical professionals across VA. This nationwide access provides Veterans with convenient access to care in their community. ATLAS also provides Veterans with a private, comfortable appointment room to receive VA care.

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 health care. It will enable the provision of in-home VA health care services, delivering mission-critical health care that is particularly important for Veterans with mobility challenges and those in rural areas. BXXB

See Figures 13 and 14 for the FY 2020–2026 milestones that the Telehealth and Scheduling Product Line will complete to achieve its future environment.





## 2.4 Medical Research, Education, and Population Health

### Current Environment

Across the enterprise, VA uses analytics as one of its tools to improve health care for Veterans. The Department has one of the largest health care related data repositories in the world, the Corporate Data Warehouse (CDW), and maintains 24 years of data on over 22 million Veterans. The CDW enables access to Veterans’ data for analytics supporting population health, health research, and precision medicine. VA research relies on VA Informatics and Computing Infrastructure (VINCI) as the research-specific CDW platform to host > 4000 research specific study marts at steady state. VA hosts the Million Veteran Program (MVP), which has the world’s largest gene bank (genomic information on over 800,000 Veterans). VA also has one of the world’s largest collections of digitized images (radiology, pathology, and other medical images). However, VA’s analytical capabilities have long lagged behind other federal agencies and industry counterparts, especially in Cloud computing.

The current analytics environment is fragmented and constrained by infrastructure and resource limitations even though the Cloud offers accelerated speed of execution, agility, and lower cost. VA is frequently unable to control VA research data throughout the data lifecycle (from generating, sharing, and archiving data), and it has had difficulty sharing this information with researchers tasked with developing advanced medical treatments. VA research has three primary goals: (1) increase Veterans’ access to high-quality clinical trials, (2) increase the substantial real-world impact of VA research, and (3) put VA data to work for Veterans. In order to meet these goals, VA research has developed a research EA to improve how it uses data to make real-time, fact-based decisions. Elements of this EA include legacy VA systems on premise, elements in VAEC, capabilities being built in Cerner as part of the EHRM process, and the U.S. Department of Energy (DOE) capabilities in its National Laboratories. This EA has been translated into the Enterprise Roadmap and Multi-Year Plan (MYP) for the purposes of using the OMB Planning, Programming, Budgeting, and Execution (PPBE) process to carefully build the necessary infrastructure.

VA sponsors over 120,000 trainees and is the largest single health care trainer in the US. Many of the IT needs for education overlap with the research needs. Therefore, programs/projects designed to help facilitate infrastructure connectivity and data sharing between VA and academic affiliates are needed. VA’s Public Health mission uses many of the same capabilities as VA research (e.g., CDW) as well as many registries for special focus analytics. The Public Health mission also requires the building of infrastructure in the Cloud and understanding the challenges of EHRM and the Cerner transition.

### Drivers

Analytics enables organizations to standardize and improve the quality of health care, research, education, and public health processes. As the largest integrated health care system in the U.S., VA requires innovative ways to collect, manage, and report data throughout the system. VA is subject to several regulatory compliance standards including federal CIO guidance (the Cloud Smart policy and Federal Data Center Consolidation Initiative), the Federal Information Security Management Act (FISMA), the Federal Information Technology Acquisition Reform Act (FITARA), those from the National Archives and Records Administration (NARA), the Health Insurance Portability and Accountability Act (HIPAA), Privacy Act, and Protections for Human Subjects (45 CFR Part 46). Many independent groups audit VA research data including the Office of Inspector General (OIG), OIT, VHA Privacy Office, VHA Office of Research Oversight and others. Audits for control of research data over the entire data lifecycle must be maintained. Figure 15 presents the Research Data Life Cycle.

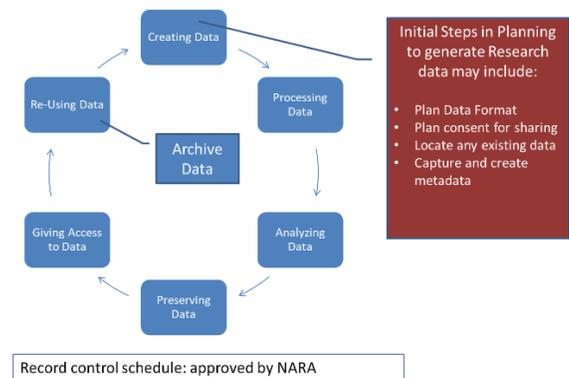
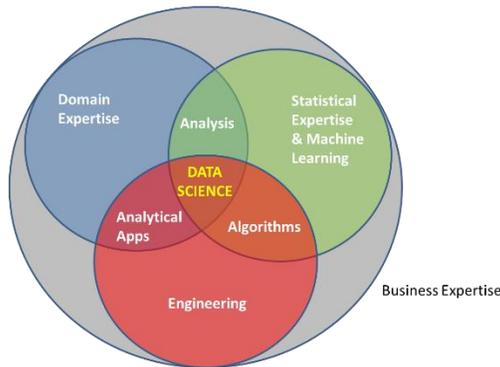


Figure 15: Research Data Life Cycle

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. New classes of skilled employees are needed that combine domain expertise, engineering, and statistical expertise. Figure 16 presents the skills needed in data science.



**Figure 16: Skills Needed in Data Science**

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 titled “Maintaining American Leadership in Artificial Intelligence” was signed in February 2019 and will drive AI research and development activity within government agencies.

Managing large amounts of data of different data types, with different sets of provenances and different data ownership/stewardship requirements, serves as an additional driver for Medical Research, Education, and Population Health modernization. For example, data gathered under informed consent can be treated in ways that are different from data gathered under a waiver of HIPAA. The VA research EA conceptualizes a capability (system orchestration) that would automate/semi-automate the data

management processes across a potential multi-tenant hybrid Cloud. This capability would allow VA oversight and continued ownership of data while tracking any data sharing required to make VA data a true national resource. Currently, most of this system orchestration occurs manually if at all.

**Transformative Initiatives**

***VA Informatics and Computing Infrastructure***

VA Informatics and Computing Infrastructure (VINCI) was started in 2011 as part of a major initiative to improve research access to VA data and to facilitate the analysis of that data while ensuring Veterans' privacy and data security. VINCI currently 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 integrates this data into a suite of databases and provides health services data and research tools to 4,000+ VA investigators in support of its research mission. It will continue to serve as a legacy system (on premises at the Austin Data Center) and will also help support access to data syndicated from Cerner throughout EHRM. VINCI plays a vital role in Natural Language Processing and deep phenotyping for analytic purposes. It is not expected to be decommissioned because of its importance in accessing the 24 years of data on 22 million Veterans. Currently, VINCI consists of about six petabytes of data and about 2,000 computing cores.

***Genomic Information System for Integrative Science***

Initiated in 2011 as a major initiative, the Genomic Information System for Integrative Science (GenISIS) (i.e., the high-performance computing system that supports genomic research) hosts MVP genomics data and makes that data and the genomic tool sets needed to analyze the data available to VA MVP scientists. GenISIS hosts the 800,000+ curated and quality-controlled genotype files for MVP-enrolled Veterans, making it the largest gene bank in the world. Currently, about 30 active genomic science

projects are active in GenISIS, far short of the MVP program goals of supporting at least 100 active research programs but exceeding the computing capability of GenISIS. With about five petabytes of data and about 1500 computing cores, it no longer has enough capacity to store or analyze next-generation whole genome sequence data, and Cloud alternatives must be sought to continue the work of MVP.

### ***System Orchestration (Legacy)***

VA research has two legacy systems that together make up part of the system orchestration capability discussed above. The Research Administrative Management System was initiated in 2011 as a major initiative but has been discontinued in favor of a COTS product that handles the Institutional Review Board/committee approvals needed for VA research. This COTS system will need to be integrated into the future system orchestration platforms.

The other legacy system is VINCI's Data Access Request Tracker (DART), which serves as a gatekeeper to the creation of an investigator-specific study mart in any of VA's analytic environments—assuring that just the right data is made available to the right people. The use of DART will continue; however, the system will need to be integrated with the COTS platform mentioned above and enhanced with storage intelligence and capacity management systems to become the future environment system orchestrator.

### ***Department of Energy Partnership***

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 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 health care 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 PHI that must comply with FISMA-Moderate standards and 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 the system orchestrator described above 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 72 in Appendix C displays the multi-Cloud research environment and its elements.

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 spaces 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.

### ***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 health care 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 2.1.

## **Future Environment**

### ***Artificial Intelligence***

The VHA Office of Research and Development (ORD) has laid out a blueprint for advancing artificial intelligence (AI) development through a program of data curation and collaboration between private and public research institutions. VHA ORD initiated the AI Institute because of the emerging relevancy of AI in direct care (e.g., the Google Deep Mind and VA collaboration on acute kidney injury recently presented in *Nature*—one of the premier scientific journals in the world). Collaborations like this will serve as a template for VA to advance its AI research. Sharing newfound applications of AI and ML between the Federal Government and private sector will allow for the consilience of best practices, creating a knowledge base that would be unfeasible were the two spheres to work in isolation. Focused on strategies, policy, and partnerships, the AI Institute will play a greater role in the VA research IT EA as it matures.

### ***Genomic Return of Results***

With the MVP already in a world-wide leading position, VA research is exploring ways of returning clinically relevant genomic results back to the provider and patient for direct action. In conjunction with Cerner and the Cerner clinical decision support toolbox, this offers the potential of accelerating patient care in areas like pharmacogenomics, precision oncology, population health screening and prevention, chronic disease management, carrier testing, rare disease diagnosis, and wellness/performance training.

### ***Cerner Population Health Platforms***

The transition to the Cerner EHR via EHRM will bring a suite of platforms into grasp for VA research, education, and population health. The opportunity to see a longitudinal Veteran record (extending from active duty status to Veteran status) data as part of these population health analytic platforms represents a major advance. The Cerner HealthIntent platform serves as a large Hadoop

data lake for multiple data sources and types. On top of HealthIntent, Cerner has built analytic platforms to serve various health care customers (e.g., HealthEDW, HealthRegistries, HealthAnalytics, HealthDataLabs). The EHRM data migration and data syndication plans begin to link VA’s traditional data model and technologies to the newer Cerner data model and technologies, and careful attention to developments and maturity of these platforms is needed as the 10-year implementation horizon advances.

### ***Additional Capabilities***

Potential capabilities relating to the connectedness of research (e.g., Connected Health—using smartphones, tablets, SMS messaging, secure email, tele video, etc.—to recruit, enroll, engage and provide feedback for research and education missions); trainee tracking and analytics using the Cerner Lights-On network; research collaboration with others using the Cerner Learning Health Network; and their partnership with Amazon Web Services (AWS) Cloud services will aid VA in becoming a learning health system with the ability to provide precise diagnostics and delivery of 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 analysts require to complete their duties and responsibilities. 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 VA to identify risks and provide preventative care for illnesses that significantly impact the Veteran population.

See Figures 17 and 18 for the FY 2020-2026 milestones that the Medical Research, Education, and Population Health Product Line will complete to achieve its Future Environment.



Figure 17: Medical Research, Education, and Population Health Milestones (1/2)

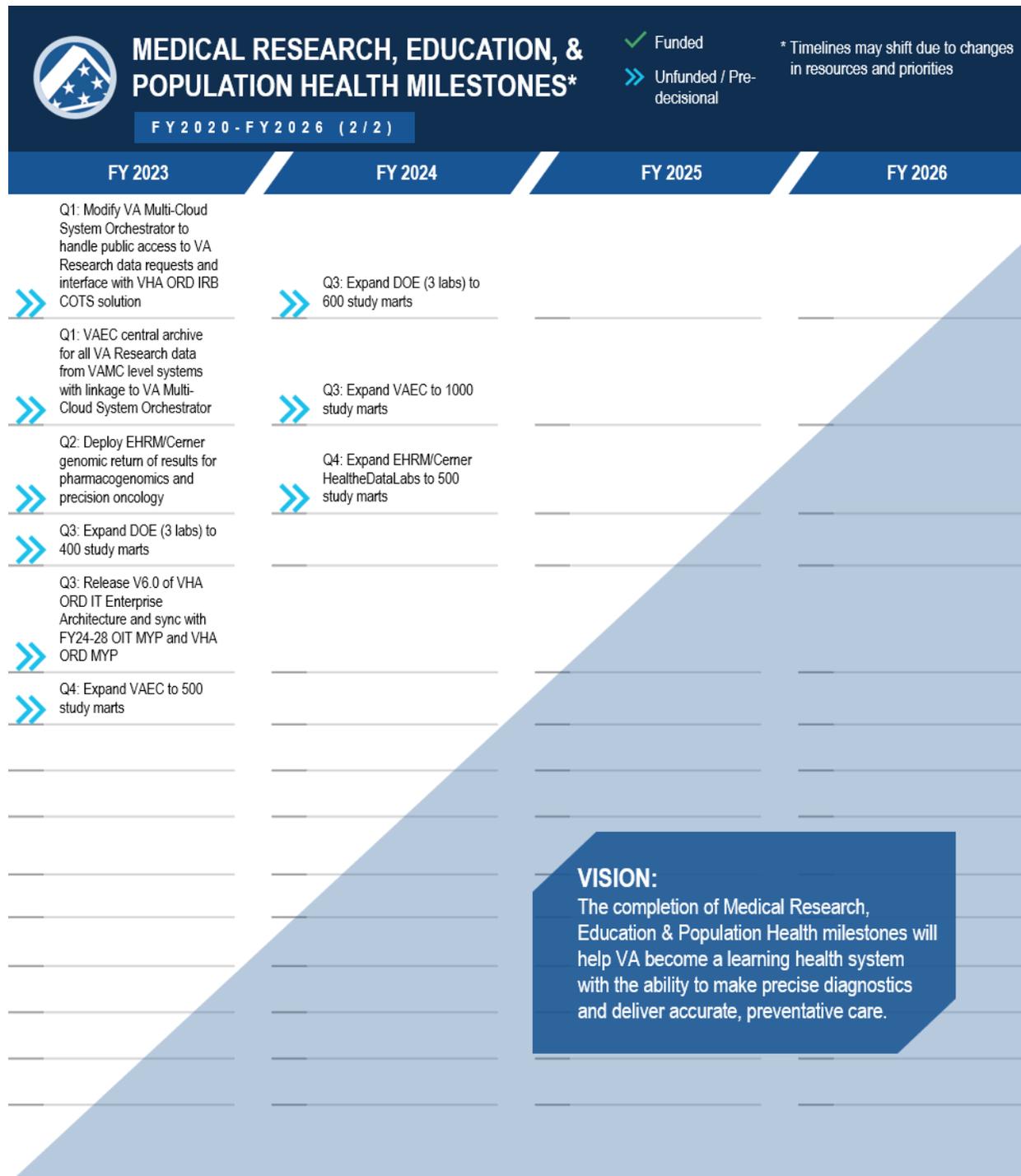


Figure 18: Medical Research, Education, and Population Health Milestones (2/2)

## 2.5 Community Care

### Current Environment

Community care is a nationwide program that utilizes partnerships with the private sector, academia, and government entities to provide eligible Veterans access to care. OIT works closely with VHA to identify operational efficiencies and innovative scalable technology solutions, including secure email technology that provides a safe, fast, and efficient mechanism for VA staff to share Veterans' PHI with community providers; a safe health information sharing system that allows community providers to securely view Veteran health information; and a referral documentation tool that automatically pulls digital data from several sources into a PDF that can then be directly uploaded to a community care provider's system.

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 Veterans to receive care from a local community care provider, paid for by VA. The Community Care Product Line allows Veterans, providers, and VA staff to access VA tools for care coordination, referral and authorization management, review and update of medical information, provider portals, billing via electronic data interchange (EDI), 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 consists of manual processes and workarounds that are often unreliable. Funding constraints are a significant issue since Choice has gone away and may impact projects delivering key functionality during FY 2020. Figure 73 in Appendix C presents an 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. To streamline VA's community care programs, the president signed the MISSION Act into law on June 6, 2018. The MISSION Act is focused on consolidating VA's existing disparate programs into a single Community Care Program (CCP) and building an integrated, holistic system of care that combines the best of VA and its federal, academic, and private sector partners.

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. 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. 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.

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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 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 health care.

Furthermore, 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***

A large component of the MISSION Act is focused on community care. Community care IT systems provide critical capabilities to improve Veterans access to care, coordination of care, scheduling, referrals and claims processing.

New and modernized IT systems and business processes for community care have resulted in:

- Fewer manual processes.
- Increased automation.
- Increased availability of performance metrics.
- Broader options for care coordination.
- Faster, easier, more auditable information sharing.

Some of these key IT systems are highlighted below.

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### ***Community Care Referral and Authorization***

The Community Care Referral and Authorization (CCRA) system 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—to develop CCRA, which is hosted in VAEC. CCRA manages medical records sharing as well as referral, authorization, and coordination of all VA care assigned to community providers. Additionally, this solution provides an external portal for community care providers to receive referral packages that include relevant administrative and medical documentation.

CCRA has been deployed to all VAMCs and the success of the application is dependent on EHRM's interface requirements. VA is scheduled to meet its IOC testing goal of March 2020. CCRA will provide Veterans with prompt referrals to a community provider of their choice. CCRA will provide community providers with referrals and authorizations consistent with industry standards and decrease administrative burden on VA clinical and community provider staff. Ultimately, CCRA will increase Veteran access to care by reducing turnaround times for appointments. CCRA has provided approximately one million Referrals & Authorizations to date. **BXXB**

### ***Community Care Reimbursement System***

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 CCRS to validate claims submitted by contracted entities within the newly established CCN and will enable VA to generate reimbursement payments to the contracted entities. CCRS will automate post payment audit activities for reimbursements and facilitate revenue operation activities.

### ***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 store the authoritative information on provider agreements, contact information, credentialing, and licensing data for each CCN and non-CCN provider. PPMS will include workflow and tracking capabilities for its direct users. Additionally, PPMS will update provider information daily based on information from CCN contractors.

### ***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 the CCN 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 Locator is integrated with the VAOS application. This

integration with VAOS will expedite community care scheduling and reduce appointment wait times.

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### ***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 will never interact with EPRS directly, however, 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.

### ***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 CCRA; 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. Over 3 million claims have been received by the eCAMS Application to-date.

### ***Decision Support Tool***

The Decision Support Tool (DST) was a critical new tool developed as a result of the MISSION Act. It is designed to standardize the way VA providers and staff determine the appropriate location for a Veteran to receive care. DST can be accessed either during the consult order workflow or from a signed consult in CPRS. DST informs VA providers and staff of the availability of services in VA and the Veteran’s eligibility for the new Veterans using the CCP. DST consolidates MISSION Act eligibility criteria for accessing care in the community, Veteran demographic information, average drive times,

average wait times, and standard episodes of care information into one dashboard.

This information guides VA in ordering provider’s decision to refer a consult service within the local VA facility, to a nearby VA facility via Interfacility Consult, or to a community care provider. DST documents the outcome of the referral decision process. In addition, use of DST generates structured data to report on system-wide compliance and utilization. DST has had 2.7 million user sessions and an average of 26,000 users per weekday.

### ***Referral Documentation***

Referral Documentation (REFDOC) is a web application that quickly compiles medical information from VistA and the CDW to form a complete referral package for community care staff to send to community care providers. 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 Azure Rights Management, 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 assisting 1,335 active users in creating over 818,837 packages, avoiding costs of approximately \$8.3 million and improving timeliness of medical record transfers to third parties by reducing the average processing time by 10 minutes per package. **BXXB**

### ***Caregiver Record Management Application***

Section 162 of the MISSION Act requires VA to implement an IT system to assess and improve the Family Caregiver Program. VA’s Caregiver Record Management Application (CARMA) will allow for qualified family of severely disabled Veterans to receive stipends from VA for providing caregiver services. CARMA was developed to support Veterans receiving aid from a caretaker in the comfort of their home, and to provide financial support to caregivers through automated stipend payments. VA developed CARMA on the Salesforce platform to manage the program applications and triage cases and digitally modernize the caregiver process from the traditional paper system. CARMA will enable VA to approve benefits more efficiently for Veterans and their caregivers.

Phase 2 of CARMA was released on January 28, 2020, and will fully automate stipend payments processing for eligible caregivers. Phase 3 of CARMA

is fully funded and is on schedule to be completed in September 2020. Phase 3 will allow Veterans and caregivers to apply for registration in the program electronically, as beneficiaries currently apply in person or by mail. In addition, CARMA must have the current governing regulations coded so they are reflected in the system and must have interfaces to a number of other systems in order to provide the full functionality. This functionality will be tested extensively and, if deemed to be acceptable, will be certified by the Secretary. The program will then expand to additional Veteran populations, specifically those injured during active duty on or before May 1975. Eventually, the goal will be to expand to all Veterans injured during active service.

#### ***Community Care Electronic Data Interchange***

VA's current Electronic Data Interchange (EDI) Gateway system was built to support limited data transfer when EDI messaging was implemented in VA. The Department has upgraded this 16-year-old system to handle only data movement operations and moved its EDI-processing capabilities to a new system named EDI Transaction Application Suite (TAS). EDI TAS now plays a critical role in parsing and validating all EDI transactions that VA receives and sends for community care. EDI has processed approximately 61 million transactions for both Veterans and Veteran family member programs during the past year.

#### ***Standard Episodes of Care System***

The Standard Episodes of Care system meets the requirement for a system that bundles approved services so that clinicians can add these bundles to patients consult records in a standardized fashion, reducing the amount of time spent manually entering consult instructions and providing uniformity among the patient records and across facilities for how patient care is prescribed for similar complaints.

#### ***Attachment Retrieval System***

The Attachment Retrieval System (ARS) stores attachments sent via EDI process transaction sets (e.g., medical results from non-VA providers). VA ingests these transactions so that its staff can respond to community providers expediently and maximize the speed and efficiency of patient care. These transactions provide important information that can be communicated between VA and community partners quickly and efficiently. Additionally, they are utilized to evaluate health

information related to a patient's visit and provide authorization, as well as allow the agency to quickly process claims related to patient care improving access for patients and confidence in community partners. The transactions facilitate the agency's requests for additional information and notify community partners of the status of a health care claim or encounter. BXXB

#### ***Claims Processing & Eligibility System***

The HAC Claims Processing & Eligibility System manages the eligibility and claims payments functions for five congressionally mandated programs: CHAMPVA; CHAMPVA Caregiver; Children of Women Vietnam Veterans (CWVV); Foreign Medical Program; and Spina Bifida. The primary application is CHAMPVA, which is a comprehensive health care program in which VA shares the cost of covered health care services and supplies with eligible beneficiaries. In conjunction with CHAMPVA, caregivers' health care claims now are processed with the CHAMPVA portion of the application under a different beneficiary type of Caregiver. The CWVV Health Care Program is a health benefits program administered by VA for children with certain birth defects born to women of Vietnam Veterans.

#### ***Direct Secure Messaging System***

The Direct Secure Messaging System allows Veterans, VA providers and staff, and CCN providers to securely exchange information between VA and Direct Trust partner providers. The project also includes establishing compliance with Regulatory and Security standards via the purchase and installation of the Hardware Security Module that securely stores partner encryption certificates. Additionally, it will provide enhanced delivery notifications and technical support to Direct Trust partners to ensure information needed to support Veteran care is accessible to providers. These enhancements will allow Veterans the access to quality care without losing continuity of medical history.

#### ***eHealth Exchange***

The eHealth Exchange Enhancements (eHXE) project is a multi-faceted business and technology initiative that includes a portfolio of health, benefits, personnel, and administrative information sharing capabilities. The project will allow VA to meet requirements for sharing clinical information with non-VA partners to ensure compliance with national standards. The eHealth Exchange System will allow

VA providers and staff to securely retrieve medical information for a Veteran from external medical organizations where the Veteran may have received an episode of care. In addition, external health organizations will have access to Veteran medical records.

### **Future Environment**

The MISSION Act will continue to fundamentally transform elements of VA's health care 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 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. Community care IT systems provide critical capabilities to improve Veterans access to care, coordination of care, scheduling, referrals and claims processing. Ultimately, VA will seamlessly coordinate care and exchange information with community care providers. In order to continue to sustain these critical community care systems as well as develop new systems, it is imperative to have appropriate funding.

See Figures 19 and 20 for the FY 2020-2026 milestones that the Community Care Product Line will complete to achieve its future environment.

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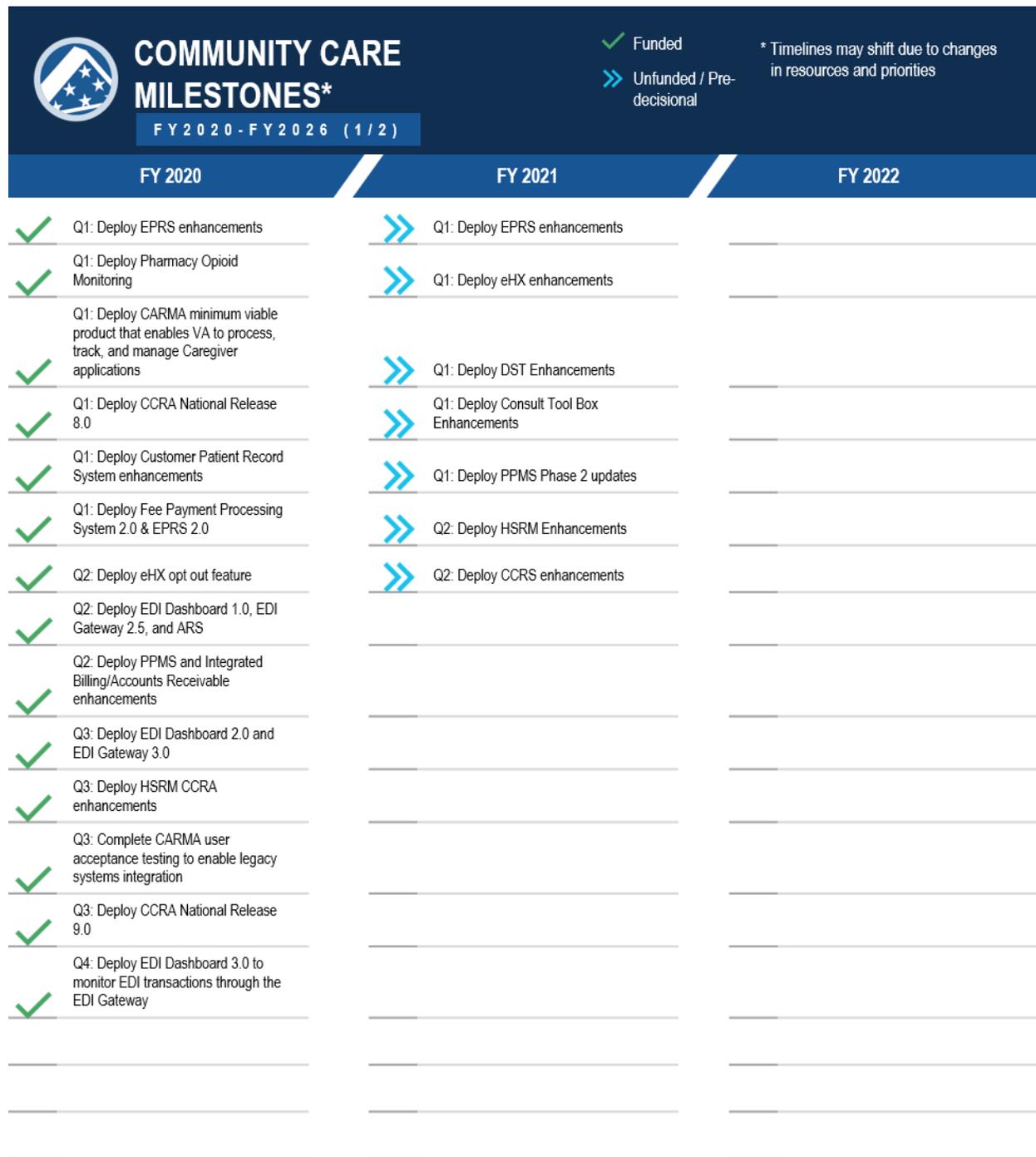


Figure 19: Community Care Milestones (1/2)



## 2.6 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.

The implementation of the current Supply Chain Management modernization efforts is working toward building 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 is achieving greater efficiencies by partnering with other government agencies, such as DoD, and leveraging the expertise to modernize supply chain operations while remaining fully committed to providing quality health care. Figure 74 in Appendix C presents an overview of Supply Chain Management systems.

Due to the coronavirus pandemic, VA experienced the same challenges as other hospitals and hospital systems in the country and around the world. However, as the largest integrated health care system in the country with 170 hospitals, VHA was able to share supplies and personnel resources between sites based on immediate healthcare needs. Additionally, VA has entered a memorandum of understanding with the FDA and National Institutes of Health (NIH) 3D Print Exchange to share data and coordinate on open-source medical products for the coronavirus response. VA is also working closely with America Makes to provide

resources that will connect health care providers and 3D printing organizations.

### Drivers

In 2019, Secretary Wilkie established four priorities to reorganize and transform the way VA provides services for its Veterans nationally: Customer Service, MISSION Act Implementation, Electronic Health Record, and Business Systems Transformation. In order to transform business systems, it is necessary to modernize human resource management, finance and acquisition, and supply chain management. The VA Logistics Redesign program is being executed in accordance with the VA Acquisition Program Management Framework, VA Directive 7402. The VA Logistics Redesign acquisition and implementation effort will include the software licensing, product integration, configuration management, testing, deployment planning, hosting, organizational change management, training, sustainment, and a myriad of other efforts necessary to support an enterprise-wide business transformation.

VA is coordinating the implementation activities of DMLSS, Cerner EHR, and the Integrated Financial and Acquisition Management System (iFAMS). On March 26, 2019, the Chief Acquisition Officer, Assistant Secretary for Management, and Chief Financial Officer issued a memorandum, *Enterprise-Wide Adoption of Integrated Financial and Acquisition Management System as Future-State Acquisition System of Record*, that directed iFAMS as VA's enterprise finance and acquisition system of record. On March 27, 2019, the Secretary issued a memorandum, *Enterprise-Wide Adoption of Defense Medical Logistics Standard Support (DMLSS)*, that directed VA to adopt and implement the DoD's DMLSS application as the fully integrated supply chain solution. In addition, on October 19, 2019, the Assistant Secretary for Management and Chief Financial Officer issued a memorandum, *Alignment of Integrated Financial and Acquisition Management System (iFAMS) with LogiCole Availability*, that directed iFAMS to integrate directly with LogiCole (the future Cloud-based version of DMLSS) to conserve resources and minimize the length and number of change management activities at VAMCs.

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 \$10 billion per year. 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 health care 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.

## **Transformative Initiatives**

### ***Defense Medical Logistics Standard Support***

The 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 health care logistics system employed throughout DoD's Defense Health Agency that delivers an automated, integrated, and comprehensive range of medical logistics management functions. At a minimum, DMLSS will be used by Logistics for inventory management and property accountability, Biomedical Engineering, Facilities Management, and Environmental Management to manage work orders, scheduled maintenance, safety recalls, and other functions necessary to provide a safe and effective environment of care. DMLSS will reduce the time VA health care providers and professionals spend on logistics planning and management and will improve the effectiveness, efficiency, and quality of health care delivery.

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 staff at JALFHCC. OEHRM has identified DMLSS as a key component for EHRM's successful deployment, effectively transitioning the JALFHCC from a pilot initiative to the first implementation of the DMLSS solution for the enterprise.

Using the same system as DoD will reduce training costs as many VA employees are Veterans and may

have familiarity with the DMLSS user interface and processes. The DMLSS solution will use the DMLSS environment already deployed within DoD. The technical solution will employ an InterSystems HealthConnect interface between the DoD DMLSS application and VA's internal legacy financial systems.

### ***LogiCole***

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. LogiCole, the Cloud-based version of DMLSS, will be available to VA as a shared service from DoD in FY 2023. LogiCole will interface with VA EHR (Cerner Millennium) and iFAMS to enable the simplification of required interfaces with the supply chain management system. Interface activities with partner systems will require deep dives into legacy and modernization requirements and synchronization of data, testing, and governance activities from FY 2020 to 2023. Partnering with other government agencies to implement a medical supply chain system with synergies to the EHR and iFAMS may enable improved resource efficiency, responsiveness, and safety when combined with data improvements.

### ***Supply Chain Master Catalog***

VA lacks a Supply Chain Master Catalog (SCMC) 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 SCMC 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.

VA partnered with a vendor to configure the SCMC, which will be a SaaS, Cloud-based catalog that harmonizes all VA contract information to become the single source of truth for all supply chain products available for procurement. The SCMC will be fully searchable, using unique identifiers for each product in order to standardize and enrich data at over 140 VistA sites. The SCMC 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. VA will deploy DMLSS as the supply chain management system across the enterprise starting with VISN 20. The initial roll out of DMLSS encompasses a client-server solution, which requires a DMLSS server to be hosted within VA medical facilities. The InterSystems HealthConnect interface to VA legacy financial systems will transition to VAEC-AWS by FY 2021.

With the transition to LogiCole in FY 2023, supply chain management activities will pivot away from a client-server solution and be fully managed in the Cloud. LogiCole's synergies with the EHR and iFAMS will enable improved resource efficiency, responsiveness, regulatory compliance, access to care, quality, and safety when combined with data improvements. The Denver Acquisition and Logistics Center and its Remote Order Entry System will be integrated into DMLSS and the Cerner EHR to enable order fulfillment efficiencies for designated products and services.

Additionally, VA intends to establish Regional Readiness Centers, geographically distributed to support the four VISN Consortiums. VISNs formed consortiums to foster collaboration among medical centers and to enhance operations and delivery of health care to Veterans by using regional contracts and joint networks for referring patients and conducting telehealth. The Regional Readiness Center capability will build resiliency into the supply chain to enable VHA to sustain continuous services to Veterans and resume normal pre-coronavirus operations. BXXB

See Figures 21 and 22 for the FY 2020–2026 milestones that the Supply Chain Management Product Line will complete to achieve its future environment.





Figure 22: Supply Chain Management Milestones (2/2)

## 3. BENEFITS AND MEMORIAL SERVICES PORTFOLIO

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

- 3.1 Education and Veteran Readiness and Employment
- 3.2 Compensation and Pension
- 3.3 Loan Guaranty
- 3.4 Insurance
- 3.5 Appeals
- 3.6 Benefits Integration and Administration
- 3.7 Memorial Benefits and Services

### Current Environment

The Benefits and Memorial Services Portfolio aims to provide technology solutions to support VBA's and NCA's essential programs and services, delivering initiatives for digitization, modernization, automation, and interoperability of their 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. 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.

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 of Veterans' Appeals' (the Board)

direction, OIT deployed the system enhancements necessary to implement the AMA across three major Benefits systems: Caseflow, VBMS, and Benefits Gateway Services (BGS).

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 – Enterprise (BOSS-E) as NCA's main IT system to ensure that all aspects of the interment process are completed efficiently and effectively. BOSS-E 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.

### Drivers

The VA Priorities and new legislation drive Benefits and Memorial Services modernization. The Harry W. Colmery Veterans Educational Assistance Act of 2017, otherwise known as the Forever GI Bill or Colmery 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.

Additionally, the 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 the goal to complete appeals at the Board for direct review is 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.

Furthermore, 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.

## Transformative Initiatives

The Benefits and Memorial Services Portfolio includes the following key transformative initiatives:

- Education Service (EDU) Managed Service
- Finance and Accounting System (FAS) Redesign
- VR&E Case Management Solution
- Veterans Benefits Management System (VBMS)
- National Work Queue (NWQ) Enhancement
- Beneficiary Identification and Record Locator Subsystem (BIRLS) Transformation
- Guaranty Certainty
- Life Insurance Policy Administration Solution (LIPAS)
- Electronic Insurance (EIN) Enhancement
- Caseflow
- Benefits Integration Platform (BIP)
- Enterprise Data Warehouse (EDW)
- Memorial Benefits Management System (MBMS)
- Veterans Legacy Memorial (VLM)

## Future Environment

VBA 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 the Benefits Integration Platform (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.

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

NCA will implement the Memorial Benefits Management System (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. BXXB HXXB

### 3.1 Education and Veteran Readiness and Employment

#### Current Environment

VA's Education Service (EDU) provides benefits to Veterans, Servicemembers, and their qualified family members, such as paying college tuition, identifying the right school or training program, and providing career counseling. Since 1944, the GI Bill has helped qualifying Veterans and their family members pay for college, graduate school, and training programs. From the Montgomery GI Bill to the Forever GI Bill, VA offers a robust variety of education and training benefits to meet a wide range of education goals including certificate programs, vocational and technical programs, on-the-job training, apprenticeship, correspondence, post-secondary degrees, and work-study programs. VA is working with institutions of higher learning and commercial partners to ensure beneficiaries have all the information they need to best utilize their VA education benefits. In addition to providing benefits for Veterans, the Education and Veteran Readiness and Employment Product Line is responsible for the financial processing of these benefits through direct communication with various internal and external systems.

EDU's current IT environment is outdated, with legacy systems built upon obsolete software languages and unsupported hardware. Legacy systems duplicate functionality and pose significant risks to EDU's ability to provide benefits in a consistent, secure, and timely manner. Legacy systems have led to an inconsistent Veteran experience and inhibit the consideration of COTS solutions and managed services.

The Veteran Readiness and Employment (VR&E) program provides service-disabled Veterans and transitioning Servicemembers a full range of services including vocational planning, case management, job skills training, career counseling, and job placement assistance. VR&E also assists Veterans and Servicemembers in starting their own businesses and independent living services for those who are severely disabled and unable to work in traditional employment. VR&E relies on outdated legacy IT systems to provide benefits to Veterans. Due to VR&E's current IT environment, it is limited in its oversight ability and data reliability.

The Finance and Accounting System (FAS) provides the user interface used by the Office of Financial Management staff to review, create, authorize, and concur with financial transactions posted for Veterans and their beneficiaries. Currently, FAS relies on outdated legacy IT systems with no graceful recovery from errors, poor performance, and lack of visibility into job status.

#### Drivers

Current legislation driving EDU and VR&E modernization to improve and enhance services provided by VBA includes the Harry W. Colmery Veterans Educational Assistance Act of 2017, otherwise known as the Forever GI Bill or Colmery Act, and the Veterans Benefits and Transition Act of 2018. The Colmery Act expands access to GI Bill benefits, eliminating the requirements for Veterans to use their Post-9/11 GI Bill benefits within 15 years of their last 90-day period of active duty service. Additionally, all Purple Heart recipients are eligible for 100% of the benefits regardless of the number of years or days served. The bill also increases the rate of benefit eligibility for the National Guard and Reserves.

The Veterans Benefits and Transition Act of 2018 prohibits colleges and universities from penalizing Veterans for tuition bills that VA did not pay on time, provides Veterans with electronic proof that they will be receiving housing payments from VA, and supports Servicemembers transitioning out of the military by providing a list of programs and organizations that can support the transitioning Servicemembers. Additionally, the Veterans Benefits and Transition Act provides homeless Veterans and those who are transitioning after being incarcerated with better access to jobs programs and enhanced employment benefits for guardsman and reservists.

EDU and VR&E are exploring ways to modernize the entire IT environment to enable improved data management and CX that will lead to effective program decisions and evaluations. This will enable EDU and VR&E to accurately report outcomes and Veteran participation in benefits services. EDU and VR&E will have access to authoritative performance measures and trending data needed to plan benefits services and to evaluate performance outcomes.

Modernization efforts such as implementing FAS-Redesign will upgrade legacy IT systems, allow timely

recovery from errors, and enhance performance and visibility into job status.

Additionally, the Electronic Certificates of Eligibility automates the manual process of providing Certificates of Eligibility, making certificates available to Veterans when needed. The Comparison Tool enhancements allow Veterans to compare rates and housing allowances for various schools, providing Veterans the opportunity to make informed decisions on schools best suited for their needs.

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## Transformative Initiatives

### *EDU Managed Service*

The Managed Service project improves the delivery of benefits to Veterans and reduces IT development and sustainment costs. The increased efficiency in automation and IT support, reduction in staffing needs for claims processing, and compliance surveys and auditing functions for VA approved programs will result in a reduction of staffing needs for EDU. EDU will likely transition claims processing, compliance survey, and auditing personnel to other types of work.

### *EDU Automation of Supplemental and Original Claims*

The focus of this initiative is to make improvements to education IT systems that will enhance the delivery of the Post-9/11 GI Bill benefits to Veterans, Servicemembers, and qualifying family members as well as minimize the use of resources. Automated certificates of eligibility (original claims) will significantly reduce the wait time for some Veterans to learn of their eligibility for Chapter 33 benefits. In addition, increased supplemental claims automation will significantly improve service delivery to claimants and reduce the full-time equivalents required to administer the program. Increased automation of both supplemental and original claims is included in Section 115 of the Colmery Act.

### *EDU Work Study Management System Modernization*

VA will replace the legacy Work Study Management System (WSMS) with a modern solution to manage work study. This modernization effort will eliminate the need for paper applications, timecards, and correspondence, as well as limit the need for email correspondence. Additionally, WSMS modernization will save employee time and increase accuracy and

quality. WSMS modernization will result in an estimated 25% reduction in workload by eliminating the capturing of submitted documents. VA can realize an additional 65% reduction in workload through WSMS automation.

### *Colmery Act Implementation*

VA will implement significant changes to its education systems in order to enhance and expand education benefits for Veterans, Servicemembers, families, and survivors in response to the Forever GI Bill. VA is conducting technical analysis and planning for a modernized and streamlined solution for managing Veterans' education claims. Key elements are increased automation, streamlined processes, robust reporting and business intelligence, data management, improved interoperability with VA, VBA, or non-VA information systems. Additionally, VBA will implement remaining provisions of the Colmery Act and deliver proper award calculation changes in compliance with Colmery legislation.

[GXAA](#)

### *EDU Electronic Letters*

Electronic communication will focus on the opportunity for Post-9/11 GI Bill beneficiaries to view their letters online instead of receiving hard copy letters. This will greatly reduce the current costs of printing and mailing Post-9/11 GI Bill correspondence. Over 800,000 Claimants receive multiple, multi-page letters over the course of a year. eBenefits and Long-Term Solution (LTS) Connectivity will enable post-9/11 GI Bill letters to be released from LTS to the eBenefits portal, allowing students to view their education correspondence online and VBA to process an additional 301,538 claims annually. VA will require legislative adjustments to remove the current mandate that the Department's education correspondence be delivered via the United States Postal Service to fully implement the Electronic Letters initiative.

### *EDU Payment Module*

Modernization of the EDU claims processing system includes replacing the finance and accounting functionality provided by the Benefits Delivery Network (BDN) with the Enterprise Management of Payments, Workload, and Reporting System for VA (eMPWR-VA)—also known as FAS-Redesign. VBA will gain increased operational efficiency, productivity, and flexibility from a modern benefit payment processing solution.

### ***Benefits Delivery Network Decommissioning***

The Benefits Delivery Network (BDN) is VBA's legacy database, Education benefits processing, and payment system. BDN processes entitlements for the Compensation Service (CS), Pension and Fiduciary Service (P&F), EDU, and VR&E. 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. BDN does not have the capability for EDU to enhance its current claims processing capabilities to support legislative changes, evolving business needs, and to meet the challenge of additional claims volume. In addition to the risks in maintaining a system built in the 1970s, there is diminishing software knowledge and hardware support for the legacy system.

Decommissioning BDN is a VA priority and the Department has targeted the legacy system for retirement since 2003. VBA partnered with OIT in 2017 to develop a decommissioning roadmap to migrate functions to more modern and advanced systems, while allowing the BDN 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 legacy system. Once decoupled, OIT will transition BDN functionality to modern systems with self-service functionality. OIT transitioned compensation and burials functionality to VBMS. The transition of payments will be migrated to FAS-Redesign (eMPWR-VA), and awards, entitlement, and eligibility will be transitioned to the Next Generation GI Bill solution (LTS or its successor system).

### ***EDU Centralized Mail***

To achieve the target future environment, EDU will transition into the Centralized Mail portal and the VBMS eFolder to enable the upload and receipt of all EDU correspondence as well as digitization and storage into the Veteran's electronic folder. The Centralized Mail portal was deployed to all three Regional Processing Offices (RPOs); however, it will require additional enhancements to efficiently support education returned mail effort and daily claims processing.

### ***EDU Electronic File Management***

The Image Management System is the paperless imaging and workflow processing application used

by the two RPOs to manage electronic claims folders, incoming work, and workflow throughout the Education Division. In 2017, the Image Management System was modernized into a web-based format and consolidated into one system. To achieve the target future environment, EDU will have to integrate with the VBMS eFolder. This will enable the capture of all Veteran EDU-related information in one designated repository. In 2019, the Centralized Mail portal was released to each RPO.

### ***EDU Electronic Notification***

Electronic notification will also focus on allowing VA to notify all education beneficiaries of their education benefits online or via another electronic method instead of sending hard copy letters. Like the Electronic Letters, this initiative will reduce the costs of printing supplies and postage as well as decrease resources to reprint letters and answer calls from the ECC. Implementation of an electronic notification approach for benefits will give beneficiaries the ability to elect their communication preference and access all communication that VA has sent regarding their claim at any time.

### ***Finance and Accounting System Redesign***

The Finance and Accounting System (FAS) is one of VBA's primary legacy systems. FAS has a history of processing performance issues that impact VBA's ability to make timely and accurate payments to Veterans and their dependents. VA will redesign FAS to a modern, web-based architecture and platform. The redesigned FAS application—known as eMPWR-VA—will enhance VA's ability to efficiently process benefit payments, track finance related workload, and improve finance reporting capabilities to improve user experience and implement emerging requirements from the Office of Financial Management, Department of Treasury, and other regulatory bodies.

### ***VR&E CWINRS Decommissioning***

Corporate Waco-Indianapolis-Newark-Roanoke-Seattle (CWINRS) is VR&E's legacy electronic case management system that is used to manage caseloads and program costs. CWINRS allows VR&E staff to review and maintain data on program participants as they move through the VR&E process.

Rather than continue to enhance the legacy system and in an effort to improve oversight and data

quality, VA will decommission CWINRS and replace it with a modern Case Management Solution. VR&E will leverage the SaaS model to replace CWINRS and modernize the way VR&E counselors view and manage VR&E cases. The effort to decommission CWINRS will continue with the development and deployment of the Systems Integration-Payment, Core Veteran Identity, and document storage integration for VR&E managed service.

#### ***VR&E Case Management Solution***

VA will implement a modern and integrated Case Management Solution. This SaaS initiative will replace the legacy case management system, CWINRS, modernizing the way in which VR&E counselors are able to view and manage VR&E cases. The modern Case Management Solution will serve as the integrator for many transformative initiatives undertaken across VR&E and will enable an improved level of service. Additionally, VR&E will integrate the Case Management Solution with the electronic Virtual Assistant (e-VA) system. e-VA is an AI-based virtual assistant that enables counselors to schedule appointments, communicate with program participants, as well as perform various case management activities enabled by text message or email.

#### ***VR&E Centralized Mail & VBMS eFolder***

Transitioning VR&E onto the Centralized Mail platform and VBMS eFolder will enable the receipt of all mail through a central portal, digitization, and storage of documents, such as the Veteran Counseling and Evaluation Records, into the eFolder. This will streamline the intake and upload of documents received by the Regional Office into the eFolder and eliminates the need for manual workarounds. Centralized Mail and eFolder will enable the VR&E's transition to a paperless environment and eliminate current challenges of returned paper mail.

#### ***VR&E Virtual Assistant (e-VA)***

VA will implement a Virtual Assistant that will leverage AI to communicate with Veterans participating in the VR&E Program. This SaaS technology will deliver routine communications, assist with appointment scheduling, and collect digital documents from the Veterans as needed throughout their plan of service. The AI-based virtual assistant will integrate with the modern Case Management Solution to assist VR&E counselors with Case Management activities.

#### ***VR&E Tele-counseling***

VR&E implemented tele-counseling in FY 2019 as an optional service to virtually connect counselors with their Veterans. VR&E launched the VVC platform, which is also used by VHA to conduct tele-counseling. VVC is accessible on any web-based device with a webcam and microphone, allowing Veterans to meet with their Vocational Rehabilitation Counselor virtually. Tele-counseling increases VA's responsiveness to Veterans' needs, reduces travel costs and time, and improves access to necessary VR&E services. BXXB

#### ***VR&E e-Authorization and e-Invoicing***

VR&E transitioned to the shared e-Authorization and e-Invoicing platform, Invoice Payment Processing System (IPPS). This system enables vendors to receive electronic authorizations from and submit electronic invoices directly to VR&E. Since implementation of the platform, IPPS has standardized and streamlined the invoice payment process, significantly reducing the administrative constraints associated with manual invoice processing.

### **Future Environment**

VA's EDU and VR&E programs will implement modern systems to enable Veterans and Servicemembers to receive personalized counseling and support to help guide their career paths, ensure the most effective use of their VA benefits, and achieve their goals. EDU, the Office of Financial Management, and VR&E will increase their use of modernized systems that integrate with other VBA business lines by leveraging SaaS, managed services, and shared services. In an effort to enhance the delivery of benefits, VR&E will reduce the ratio of counselors to Veterans and provide field personnel with 3-in-1 devices and wireless hotspots. HXXB

See Figures 23 and 24 for the FY 2020–2026 milestones that the Education and Veteran Readiness and Employment Product Line will complete to achieve its future environment.





## 3.2 Compensation and Pension

### Current Environment

Currently, VBA processes more than 12 million benefit transactions every month and distributes billions of dollars in Veteran entitlements each year. To provide benefits in a secure and timely manner, significant enhancements to the Compensation Service (CS) and Pension and Fiduciary Service (P&F) require digital modernization of the IT environment.

Additionally, diminishing knowledge of legacy systems within VBA underlies the urgency for these CS and P&F's decommissioning efforts. As such, CS and P&F seeks to retire the following legacy systems: Veterans Service Network (VETSNET), SHARE, Search and Participant Profile, VETSNET Modern Award Processing Development (MAP-D), VETSNET Awards, Virtual VA (VVA), and PC Generated Letters (PCGL).

Pension Management Centers and Fiduciary Hubs remain rooted in legacy VETSNET applications. As VBA works toward reducing dependency on those systems/platforms, P&F also seeks modern systems that leverage automation and rules-based capabilities to more efficiently process claims and enhance integration. Figure 75 in Appendix C presents an overview of the Compensation and Pension Services Product Line.

### Drivers

The Secretary's mandates and new legislation also drive the CS and P&F modernization. Recent legislative changes will allow more Servicemembers to access benefits for Lump Sum Retirement Pay. To achieve the requirements of this new legislative action, CS and P&F requires significant enhancements to the Benefits IT environment. In addition to legacy system decommissioning, CS and P&F seek significant IT solutions for the Service-Member Baseline Wellbeing Assessment, Integrated Disability Evaluation System Redesign, Rating and Non-Rating VBMS automation, Quality system improvements, and interagency data sharing aimed at improving claims processing timeliness.

Of the 180 million electronic documents being migrated from the legacy platform VVA to VBMS, 0.15% contain Federal Tax Information (FTI). Since VBMS data is maintained at contractor facilities, those documents must remain in the VVA repository until contractors are permitted access to FTI. The

inability to store FTI data under contractor control presents an obstacle to technology modernization efforts as the full VVA technical footprint will remain and cost the government and federal taxpayers an estimated \$46 million over the next 10 years. Although P&F is again seeking to introduce legislation allowing contractors to handle FTI, this process is dependent on several external entities, including Congress sponsoring and ultimately voting this into law. Because such an outcome is uncertain and would take at least several more years for VBA to implement, there is a critical need to explore technical solutions as an alternative to legislative action.

### Transformative Initiatives

#### *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 eFolder, and VBA currently processes 98% of disability compensation claims electronically in VBMS.

To further improve VBMS, OIT is developing Exam Management Vendor functionality within the system. The functionality will enable VA to provide required data transfer schemas to exam vendors to support receipt of exam results as data in addition to PDF documents of exam results, which are maintained in the VBMS eFolder. Additionally, the Exam Management Vendor functionality will support management of Disability Benefit Questionnaires, which utilize the VA Schedule for Rating Disabilities framework for 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. Additionally, OIT is implementing

Separation Health Assessments, commonly referred to as Disability Exams 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 claims processors identify VBMS enhancements daily that support faster and more accurate claims processing. Those user-driven optimizations are reviewed, prioritized, and implemented on a recurring basis. VBA anticipates building on the VBMS technological platform to develop 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. BXXB

#### ***VBMS/VHA Integration***

Dedicated development resources are required to align VBMS with EHRM deployment and build VHA examination ordering functionality in VBMS. Integration of VBMS/VHA with EHRM will facilitate the ordering of VHA examinations through VBMS, which will save employee time, reduce administrative burdens, and improve the quality of the Compensation and Pension exam process. Eliminating the need for logging into multiple systems to order exams will cut down on confusion and duplicative exam orders, reducing claim delays. Resources are also required to ensure VHA treatment records are readily available to VBA claims processors to review and upload directly into a Veteran's eFolder within VBMS to support Veterans' disability claims.

#### ***VBMS Automated Exams***

This initiative requires the dedication of development resources for VBMS automation of ordering routine future examinations and Claims for Increase and to reduce the number of exams that must be manually ordered. The automation of ordering these exams will decrease the likelihood of an exam being held up awaiting medical examination requests. This automation also frees up claims processors to focus on more critical work.

#### ***Claims Automation***

Claims automation and modernization will enhance the Veterans experience by adding self-service features and removing duplicative efforts. Reducing the number of manual activities will lead to fewer errors and improve the quality of service delivered. Claims automation will also enable the retirement of multiple legacy systems while streamlining the claims process by allowing VBA personnel to focus on the most critical work.

Claims automation will also include modernization of the CLAIMS server to upgrade the current server to ensure the critical architecture components remain stable and operational. CLAIMS server is required to allow all user types real time access to service treatment records at any VAMC to assist in the claim disability process.

#### ***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. This will reduce the number of Freedom of Information Act (FOIA) and document requests across VA and ultimately decrease the strain on personnel resources, which will increase productivity. Additionally, eFolder Enhancements will enable the retirement of multiple legacy systems (e.g., VVA) and reduce Veteran information security risks. GXAA

#### ***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 and providing the user a standardized list of tracked items. The distribution provides timely and accurate decisions to Veterans by including all work types in the distribution tool where all claims are equitably distributed based on resources and priorities, therefore improving the process. The targeted users are NWQ users and Claims Processors, with a total of 12,460 impacted users. The standardized list of tracked items allows for efficiencies in managing and distributing the workload, with opportunities to accurately identify problem areas within the different cycles of the claims process. The purpose is to improve the quality of benefits claims processing and the employee experience.

VBA is also working toward implementation of a singular, unified, dynamic system that will adjust with changes in business drivers. The NWQ must continue to evolve to enable national distribution of all compensation, pension, and fiduciary work. The NWQ enhancements will expedite claims processing with an estimated time savings of about 719,000 hours per year and 50,000–71,000 additional completed rating claims. The reduction of manual routing of deferred claims will result in a potential time savings of about 10,000 hours per year for supervisors and provide the functionality needed to allow the inclusion of all work types in the NWQ distribution process.

### ***Blue Water Navy***

On January 29, 2019 the Federal Circuit Court reached a decision requiring VBA to extend the presumption of service connection to "Blue Water" Navy Veterans. VA expects dramatic increases in the number of claims arising from this decision and productivity enhancements are needed to enable VBA to process the additional Blue Water Navy claims more efficiently, as well as any specific Blue Water changes needed for VBMS. This not only includes direct development needs but also increases in IT support and maintenance due to increased VBA staffing to keep pace with the growth in claim volume. Implementing greater automation and efficiency gains within legacy modernization and enhancement projects will allow VBA to process Blue Water Navy claims and legal requirements without an increase in claims backlog or delivery time.

### ***Beneficiary Identification and Record Locator Subsystem Transformation***

The Beneficiary Identification and Record Locator Subsystem (BIRLS) is a middleware record system that is built on a COBOL mainframe and contains basic identifying information of VA claimants including current location of claimant's folder and service information. VBA is focused on decommissioning BIRLS, which includes migrating BIRLS unique data and functionality to ADSs and minimizing the duplication of data that is already available elsewhere. This effort will promote the transition to modern data processing platforms and minimize the need for end users to access multiple systems to verify and validate data. By decommissioning BIRLS, VBA will allow for new system development that is easier, cheaper, and more efficient.

### ***P&F FTI Technical Solution***

P&F has a critical need to implement modern technical solution to store FTI data. Legislation allowing contractors to handle FTI is not guaranteed, and, if approved, could take several years to implement. The server location where FTI documents would ultimately be stored would need to comply with safeguarding directives set forth by the Internal Revenue Service's (IRS) Publication 1075. Currently, the VBMS-A interface passes FTI data back and forth from the Corporate Database using Apache 2.2 web technology. In a like manner, it is possible that FTI documents could be sent and retrieved by end-users from a Cloud-based environment, such as VBMS, to VA server storage without requiring direct involvement from IT contractors.

### ***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. VA migrated BFFS 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.

### ***Legacy System Decommissioning***

VBA's legacy systems are becoming increasingly outdated, with many dependent on obsolete

software languages and unsupported hardware. Legacy system functionality and data are duplicated in multiple VBA systems. Sustainment costs of legacy systems are significant given the age of hardware and software. Therefore, Benefits will transition CS and P&F functionality from legacy systems such as VETSNET, SHARE, Search and Participant Profile, VETSNET MAP-D, VETSNET Awards, VVA, BIRLS, PCGL, and Control of Veterans Records System (COVERS).

VA will transition legacy system data and functionality to modern platforms including VBMS. External customers, program offices, and VBA business lines will leverage alternative interfaces or data sources to meet their business process requirements once provided by legacy systems. VA will migrate BIRLS functionality into VBMS and BIRLS data into the Corporate Database, enabling cost savings and decreasing VA system complexity. If VA implements a modern solution to handle and store FTI, the Department will decommission the MAP-D system from the VETSNET suite and the SHARE system and transition data and functionality to VBMS. Decommissioning legacy systems will enable VA to unify information storage for Veterans' benefits and realize cost savings.

### Future Environment

CS and P&F will implement emerging technology, including innovative ways to design and develop automation architecture, leverage existing data to support and inform claims processor actions, enable inter/intra agency data sharing, and execute award/claims actions aimed at improving claims processing timeliness and accuracy. CS and P&F processes are a mixture of subjective and objective decisions. To maximize the benefits of technology, OIT will assign a technology visionary to CS and P&F to assist with a business practice that lends itself to long-term opportunities for automation and improvements.

Greater automation will increase CS and P&F productivity, including expansion of end-to-end processing of burial claims (including automated claims establishment), routing of claims, and batch processing of actions required upon the death of a beneficiary. Additionally, automation will enable data extraction of pension claim forms with rules-based income computations, letter generation, retrieval of service treatment records, and digitization of business processes. VBA is also

exploring ways to modify Federal Regulations regarding the handling of FTI and IRS essential audit improvements.

See Figures 25 and 26 for the FY 2020–2026 milestones that the Compensation and Pension Product Line will complete to achieve its future environment. BXXB





Figure 26: Compensation and Pension Milestones (2/2)

### 3.3 Loan Guaranty

#### Current Environment

The mission of Loan Guaranty Service (LGY) is to maximize Veterans' and Servicemembers' opportunity to obtain, retain, and adapt homes by providing a viable and fiscally responsible benefit program in recognition of their services to the nation. VBA LGY's vision is to empower Veterans with information and access to innovative products and services by providing a Veteran-focused experience, strengthening its partnerships, driving continuous performance improvements, and never forgetting who VA serves.

To accomplish this, the priorities depicted in the Drivers section will propel the LGY program forward through increased Veteran transparency, improved collaboration with industry partners, and innovative solutions to increase participation and reduce program risk. These priorities directly support LGY's strategic objectives and align with LGY goals, which make VA Home Loans the product of choice and promote positive Veteran outcomes. Figure 76 in Appendix C presents the as-is data architecture for the LGY Product Line.

#### Drivers

##### *Veteran Access to Benefits*

LGY provides a viable and progressive loan program as a benefit for eligible Veterans and Servicemembers to obtain homes while maximizing fiscally responsible opportunities for Veterans and Servicemembers to retain their homes or avoid foreclosure during times of financial hardship. Demand for the VA Loan Guaranty Program has grown substantially since the VA Loan Electronic Reporting Interface (VALERI) was deployed in 2008. Without modernization, LGY will have difficulty supporting Veterans and their growing volume of loan needs.

##### *Automation*

The mortgage banking industry has focused on lending process automation to capitalize on reduced time and costs and increase quality. In keeping with mortgage industry trends, LGY will focus on re-imagining its current platform to create an end-to-end process environment, which will allow it to transform inefficient processes, improve transparency and communication for all

stakeholders, and create synergies in the marketplace to remain competitive for all Veterans.

##### *Reporting*

The Federal Government continues to focus on increased transparency, business intelligence, and reporting to better serve Veterans and the taxpayer. LGY must focus on business intelligence solutions to generate meaningful, evidence-based insights to address growing transparency and data demands.

LGY modernization also involves leveraging the VA Enterprise through integration with enterprise services such as VA Profile as well as the unified Veteran interface, VA.gov. VA Profile is the foundation of a longitudinal Veteran Record, which consists of common Veteran data exposed by authoritative services. VA.gov is focused on delivering digital services to Veterans clearly and efficiently while ensuring secure, easy access to program information and benefit process information.

#### Transformative Initiatives

##### *Workflow Automation*

By integrating all core benefit delivery processes into a single platform to streamline benefit delivery, LGY will see marked improvements with the Electronic Certificates of Eligibility redesign, Web LGY and VALERI enhancements, updated and enhanced LGY workflow requirements, procurements, development, and maintenance.

##### *Guaranty Certainty*

Guaranty Certainty will provide lenders with a more intuitive loan process to increase Veterans' home loan options and improve Veteran experiences through improved functionality development, improved tool development and requirements to enhance the experience, and a smoother workflow. LGY will be better positioned to compete successfully in the industry market with rollout of policies and communications that stay in step with the industry best practices.

##### *Lender-Empowered Appraisal Risk Management*

Reducing risk and improving Veteran outcomes through upfront lender appraisal reviews is a priority for LGY. Through improvements to the Appraisal Management Services development and deployment, policies, communications, and functionality of the legacy tools will be enhanced

and additional integrations with Guaranty Certainty and Analytical Quality System (AQS) will provide a faster, more informative experience for Veterans. Ensuring the smooth transition of legacy data through the use of effective tools, upgrades, and interfaces will ensure accuracy and expediency for Veterans.

#### ***Industry Partner Performance Monitoring***

Improving lender and servicer performance through transparent analytics and policy integration will allow LGY to stay competitive and place the Veteran as the top priority. By utilizing multiple avenues (e.g., servicer tier ranking, ongoing lender scorecard updates and disbursement, combined lender and servicer scorecard data requirements, procurement, development of meaningful metrics, and portal integration), LGY is better able to keep a finger on the pulse of the industry to ensure Veterans are the top priority for service.

#### ***Enhance Customer Experience***

In an effort to improve the Veteran experience, self-service portals for Veterans and program participants will be available to assist Veterans and lenders/servicers with managing loans. With a transition to VA.gov, understanding self-service participant programs, and understanding Veteran and user requirements, LGY can plan for the development of a self-service portal that is designed and developed with the Veteran experience in mind.

**BXXB**

#### ***Targeted Risk Based Audits***

Ensuring program compliance through targeted reviews that protect Veteran interests will be achieved through updated Full File Loan Review (FFLR) utilizing user-centered design, improved loan audit requirements and deployment of these requirements, establishment of metrics and workflow development, implementing these actions at the Regional Loan Center (RLC), and conducting the lender-driven pilot.

#### ***Improved Loss Mitigation and Retention Monitoring***

Keeping Veterans in their homes through early identification of plan failures is critical to the success of the LGY program. By enhancing non-performing loan (NPL) default reporting standards and NPL workflow development and deployment as well as conducting a successful pilot program, LGY will provide a consistent and reliable approach to improved retention of homes for Veterans that are

facing financial hardships or unexpected life circumstances.

#### ***Proactive Program & Operational Risk Management***

Improving program integrity through analytics and streamlining oversight functions will provide Veterans with a program they trust and rely on. With a redesign of the LGY oversight accuracy project, ensuring requirements are well vetted and that RLC site access is user-friendly, Veterans will benefit from the LGY program in a proactive way. Additionally, by ensuring that LGY oversight risk management infrastructure procurement, deployment, and maintenance are a focus moving forward, risks to the Veteran and to the overall process will be mitigated.

#### ***Streamlined System Enhancement/ Sustainment***

Streamlining how LGY maintains and enhances existing and new systems to better serve Veterans will be obtained through successful enhancement and sustainment of data infrastructure, development operations, IT, and overall execution of system updates and changes.

#### ***Future Environment***

LGY will utilize the VALERI Re-Design (VALERI-R) program for end-to-end benefit processing, and VALERI-R will automate liquidation and claims processing for regional systems. Enrichments to VALERI-R will allow LGY modernization to drive improvements and enhancements to home loan services by engaging with the Veteran and lending industry for all loan lifecycles. These enhancements will require technological investments in four key areas to improve the Veteran and vendor experience: increasing API-based system-to-system interaction, implementing a Cloud native data analytics platform, maturing DevSecOps practices in the Cloud, and maturing the VALERI-R platform.

By utilizing API-based interactions, LGY will enable external partners to integrate using these APIs instead of leveraging the LGY graphical user interface based applications that require re-keying data originating from external partner systems. This will allow integration with internal authoritative VA platforms via service layers instead of tight coupling. Overall, use of API-based interactions will aid in carrying out enhanced service orchestration and synchronization. In addition to the integration of

external interfaces, VALERI-R will interface with internal systems such as iFAMS.

A Cloud native data analytics platform will help establish a robust, scalable data analytics platform that meets business requirements needed to measure and predict business performance and risk. This platform will aid LGY in adopting industry best practices to build the necessary tools and technologies for the data layer; integration and ingestion layer; extract, transform, load (ETL)/processing layer, and business intelligence layer. This will also allow LGY to adopt Cloud native and open source analytical tools for data exploration, modeling, reporting, and big data analytics. These enhanced tools and capabilities will better prepare LGY for implementation of data governance and other data architecture standards while operationalizing the data analytics platform.

Regarding maturing DevSecOps practices in the Cloud, LGY will automate push-button deployments that strike a balance between quality and speed. With an end-to-end CI/CD pipeline, it will be better to establish an “everything as code” culture within LGY, allowing for an enhanced focus on monitoring and alerting requirements, product line and regulatory compliance, and cost management.

Lastly, as the LGY Product Line is improved upon, the VALERI-R platform can be leveraged by more closely aligning to the Digital Transformation Center’s design patterns and best practices. This will allow for improved and flexible evaluation of opportunities to add business capabilities and increase automation for all loan servicing related workflows. HXXA

See Figures 27 and 28 for the FY 2020–2026 milestones that the Loan Guaranty Product Line will complete to achieve its future environment.





Figure 28: Loan Guaranty Milestones (2/2)

## 3.4 Insurance

### Current Environment

Insurance Service (INS) provides valuable life insurance benefits that extend financial security for a Veteran’s family given the extraordinary risks involved in military service. INS provides Servicemembers and Veterans with seven unique insurance programs. VA provides decision-making tools to enable individuals to determine the appropriate insurance protection given their needs. INS has an operational need for a modern insurance system that will provide a sustainable solution to improve operations. Its legacy systems are becoming increasingly outdated as they depend on obsolete software languages and hardware that is difficult to support. INS currently utilizes two primary legacy systems: the Insurance Payment System (IPS) and Veterans Insurance Claims Tracking and Response System (VICTARS). IPS, which is hosted on the mainframe, has an original code base from 1959 while VICTARS, which is built on a client server architecture, has a code base from 1995.

### Drivers

Legacy systems pose significant risks to VBA’s ability to provide benefits in a consistent, secure, and timely manner. Many of VBA’s legacy systems are built upon obsolete software languages and unsupported hardware. The inefficiencies required to conduct business through legacy systems have led to inconsistent Veteran experience, complex system interfaces, and duplication of customer data and functionality, which leads to non-authoritative data sources. VBA’s legacy systems inhibit the consideration of COTS solutions and managed services. Diminishing knowledge of these legacy systems indicates an urgency for decommissioning efforts.

INS legacy systems use outdated equipment and procedures causing difficult transitions for new employees accustomed to modern methodologies. The IPS mainframe-based product utilizes overnight batch processing, which can cause client-server processing delays when errors occur. The instability of the IPS legacy system results in processing issues, such as delayed claims processing and incorrect or delayed payments. Legacy INS system instability also leads to difficulty maintaining accurate and timely financial accounting information.

Furthermore, INS uses a thick client Windows legacy system named VICTARS. VICTARS receives information from IPS daily. Due to this relationship between IPS and VICTARS and the overnight IPS batch processing nature, delays may occur since processing is not real-time and processed work can be rejected at a later point.

### Transformative Initiatives

#### *Life Insurance Policy Administration Solution*

The Life Insurance Policy Administration Solution (LIPAS) will replace VICTARS and IPS, which are aging mainframe and client server applications; modernize business processes; and integrate Veterans’ insurance records with the VBMS eFolder and VBA Corporate Database. 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. Additionally, the selected policy administration solution will provide a sustainable IT environment that will improve operations through a modern, Cloud-based/web-based, real-time commercial insurance product. The selected administration solution will be implemented via a contract provider and ultimately supported by a managed service provider (MSP).

#### *Electronic Insurance Enhancement*

INS also requires additional self-service capabilities of the Electronic Insurance (EIN) website through features that allow:

- Veterans to check status of loan requests on the website.
- Users to securely submit documents through website that are then uploaded to VICTARS and eventually e-Folder.
- Veterans to update beneficiary designation online.

The modern EIN enhancements will allow Veterans to check the status of loan requests on VA.gov. It will allow users to securely submit documents through VA.gov and update beneficiary designations online.

#### *Operational Excellences on Behalf of the Veterans*

INS continues to look for and implement steps to increase the Veteran experience as well as enhance operational effectiveness. In this regard, INS is enhancing monitoring in an effort to detect potential

issues before they cause an outage. Batch processing is being improved to maximize upload timing and processing efficiency. Finally, new initiatives are being implemented to Tier 2 and 3 support to ensure faster resolution time for issues culminating in greater efficiency for the Veteran and end user.

### ***Legacy System Decommissioning***

VBA's legacy systems are becoming increasingly outdated, with many being dependent on 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, the Benefits Portfolio will transition functionality from legacy systems such as IPS and VICTARS.

### **Future Environment**

The Insurance portfolio will be serviced and managed using the LIPAS COTS managed service product from EXL, LifePRO. INS will orient the future environment around a uniform, Veteran-centric approach in VAEC using this COTS product. LIPAS will support VA's buy-first strategy for services that can be delivered most effectively through managed services or COTS solutions. Additionally, LIPAS will leverage web-services design to develop functionality, interfaces, and modernize systems to improve the Veteran experience

INS 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 INS's core modernization efforts: leveraging integration of more functionalities; increasing utilization of Cloud-based commercial products; enhancing currently integrated systems; standardizing record sharing between federal agencies, and replacing or retiring legacy systems, such as IPS and VICTARS.

See Figures 29 and 30 for the FY 2020–2026 milestones that the Insurance Product Line will complete to achieve its future environment.





## 3.5 Appeals

### Current Environment

The Board of Veterans' Appeals (Board) has jurisdiction over appeals arising from determinations by Agencies of Original Jurisdiction, including VBA, VHA, NCA, and the Office of the General Counsel (OGC). Approximately 96% of VA appeals considered involve Veterans' claims for disability compensation. In FY 2019, the Board decided 95,089 appeals—the highest number for any FY. The Board surpassed its FY 2020 decision goal of 91,500 decisions on August 18, 2020, and as of week 47 in FY 2020, the Board had achieved 102% of that goal. The Board is on pace to decide over 100,000 appeals in FY 2020. The projected appeals workload has prompted the Board, as the sponsor of the Appeals Process, to work with OIT and other VA partners to seek a cohesive and unified strategy to address all aspects of appeals modernization.

OIT and the Board successfully released the Caseflow IOC necessary to implement the AMA on February 19, 2019. Enhancements necessary to implement the AMA were also deployed to VBMS and BGS. IOC of the Appeals Resource Management System (ARMS) followed on January 31, 2020. Additionally, the Board deployed and utilizes a Microsoft Word macro template known as the Interactive Decision Template (IDT), which streamlines decision writing, enhances quality review, enables digital signatures, and generates companion letters to veterans. IDT is maintained by Board personnel and served as a catalyst for the Board's increased output. Figure 77 in Appendix C presents the primary products within the Appeals Product Line.

### Drivers

Veterans have the right to appeal if VA rejects their benefits or services claim. Historically, Veterans have waited six years on average before a final appeals decision. As a result, the number of pending appeals increased significantly. Due to increasing appeals volume, the effectiveness of VACOLS became a concern. The Board's legacy systems were built upon obsolete software languages and unsupported hardware. VACOLS was the Board's primary appeals database and IT system. The inefficiencies required to conduct business through VACOLS and other legacy Board systems have led to inconsistent Veteran experience, challenges with timeliness, and

complex system interfaces. Additionally, requirements to integrate with other VA systems inhibits the Board's consideration of COTS solutions and managed services.

VA implemented the AMA in February 2019 and is improving the appeals process by creating three decision review lanes—Higher-Level Review, Supplemental Claim, and Appeal to the Board while automating the steps in the processes. The new categorization of appeals enables improved timeliness of review and agility of adjudication. VA's goal is to complete Higher-Level Reviews and Supplemental Claims in an average of 125 days. If a Veteran chooses the appeals lane for direct review by the Board, the goal is to complete decisions in an average of 365 days. The AMA is also transforming the notification requirements and improving the quality of the adjudication process.

Modernization of VA's Enterprise Appeals Process is necessary to enable VA to adjudicate appeals efficiently through timely and high-quality decisions of those appeals. If the VA appeals process along with supporting technologies is not modernized, Veterans, their families, dependents, and beneficiaries will continue to experience multi-year delays in receiving a decision on their appeals.

### Transformative Initiatives

#### Caseflow

The Board and OIT are expanding Caseflow capabilities through enhanced services, including but not limited to intake, which will enable additional types of cases (Court of Appeals for Veterans Claims remands, Board original jurisdiction, and contested claims including attorney fee and apportionment cases); substitution appeals (while maintaining the original docket date); and cases with an appellant with no entry in the VA database (e.g., family members). The addition of a drop-down menu when processing claims and ordering examinations will reduce rework among claims processors due to insufficient exam processing and increase Caseflow reporting metrics. VA will enable Caseflow to pull all decision tables from the Corporate Database through VBMS. Expanding Caseflow functionality to pull all decision tables from Corporate through VBMS will increase decision claim accuracy and processing.

The expansion of Claim Label functionality for VBA in Caseflow will enable users to update claim label

attributes for proper VBMS routing and processing, which will increase efficiency for end users as they can use a single system to update claim label attributes. This will also reduce inaccurate reporting and increase proper routing to the appropriate processors. Once implemented at the Board, enhanced abilities to manage, process, and track appeals with improved functionality for feedback, reporting, and tracking capabilities in Caseflow will improve supervisors' ability to engage in meaningful performance management for their employees—a key element of effective employee engagement.

### ***Virtual Tele-Hearings***

VA developed a virtual tele-hearing solution that enables Veterans to attend their Board hearings via secure video conferencing over the internet from wherever they are using non-VA cellphones and computers. Virtual tele-hearings enable VA to record and then store the hearings and allow Veterans to access them remotely. Additionally, virtual tele-hearings provide a consistent, streamlined approach to conducting remote Board hearings and will improve the overall reliability while reducing costs.

The Board and multiple OIT departments collaborated to develop virtual tele-hearing technology and integrate it with Caseflow. This IOC allows Veterans to virtually attend their Board hearings with a Veterans Law Judge without needing to travel to a VA location. Additionally, the technology provides more flexibility for Veterans Law Judges to preside over hearings remotely as needed. BXXB

### ***Legacy System Decommissioning***

VA is modernizing the appeals process with a plan to iteratively replace the legacy system VACOLS with a new automated, integrated, and end-to-end workflow system, Caseflow, and a resource management system, ARMS. Transitioning the processing and management of legacy appeals to these systems will reduce the IT footprint and sustainment costs by consolidating the IT landscape. Business user efficiency will also be achieved as users will not need to switch between systems for legacy and AMA appeals.

## **Future Environment**

The Board is committed to improving the effectiveness and timeliness of deciding Veteran

appeals of VA benefits and services decisions and will ensure faster and more responsive decision resolution for Veterans. This will be accomplished by delivering appeals processing and management capabilities that support configuring and implementing a Veteran-centric appeals processing and management solution.

Appeals modernization will enhance Veteran experience by adding process automation and self-service features and removing duplicative efforts. Reducing the number of manual activities will lead to fewer errors and thus improve the quality of decisions. Furthermore, appeals automation will enable the retirement of VACOLS while streamlining the process. In addition to automation, self-service features will reduce the manpower necessary to intake appeals. Retiring VACOLS will streamline the Appeals Product Line, which will free up development funds to be redirected to increase automation and self-service functionality.

In order to achieve these goals, the Board will complete the automation in Caseflow to intake decision reviews; process appeals from VBA, VHA, and NCA; and improve the timeliness of decisions. Virtual tele-hearing functionality is designed to reduce or eliminate travel time and reach additional Veterans isolated from VA facilities. This will be strengthened by leveraging strategic partnerships that extend access to broadband video capability to Veterans who lack such technology. Lastly, the Appeals Product Line will include a data lake to aggregate data from disparate sources to improve congressionally mandated reporting and workload management. It will also provide the data necessary to implement AI into the appeals workflow from mail intake to decision dispatch. By modernizing the Board's systems, VA will ensure that the Board receives and processes Veterans' appeals and supporting evidence to result in legally correct decisions on their appeals in a more efficient and faster manner, reducing the cost per appeal and ultimately improving CX.

See Figures 31 and 32 for the FY 2020–2026 milestones that the Appeals Product Line will complete to achieve its future environment. BXXB





Figure 32: Appeals Milestones (2/2)

## 3.6 Benefits Integration and Administration

### Current Environment

The Benefits Integration and Administration (BIA) Product Line was formed in late 2019 and focuses on products that provide (1) platform, (2) data and business intelligence, (3) system integration and automation, and (4) administrative capabilities within the benefits and memorial services space. It currently consists of the following seven products:

- Benefits Integration Platform (BIP) – A Kubernetes- and Docker-based Platform as a Service (PaaS) tightly coupled with a modern API framework.
- Benefits Enterprise Platform (BEP) – A collection of non-Cloud systems that run Apache, WebLogic, and SiteMinder and host various VBA applications, including BGS.
- Corporate Database – A collection of non-Cloud systems that primarily host an Oracle-based database (containing benefits data) and VETSNET.
- VBA Corporate Data Warehouse – An Oracle based data warehouse containing benefits data used for online analytical processing.
- Courseware Delivery System (CDS) – A legacy web-based training system that supports VBA training initiatives.
- Adobe Learning Suite (ALS) – A modern web-based training system that supports VBA training initiatives and uses Adobe Captive Prime, a SaaS hosted in Adobe Cloud.
- Centralized Mail Tableau Reporting – A Tableau based data visualization tool used by VBA to analyze data within the Centralized Mail Portal database.

Although there are seven products within the BIA Product Line, BIP is the centerpiece product. BIP is a modern Kubernetes- and Docker-based PaaS that resides within VAEC in the AWS GovCloud environment. It currently hosts VBMS components, MBMS components, and various services (e.g., APIs) within its production cluster. In addition, the BIA Product Line includes the Systems Implementation Office (SIO), which is a services organization that provides critical release and deployment

management, asset and configuration management, and quality control services for VBA systems.

Technology employed by some products within the Product Line is outdated and becoming increasingly obsolete. This includes hardware and software as well as the methods and processes used to develop and deliver the software. This results in increased cost, complexity, and development timelines and reduces the value of the services provided to customers. For example, BGS does not provide representational state transfer (REST) or JavaScript Object Notation based interfaces and has a heavy reliance on complex legacy Oracle Tuxedo based services. This significantly limits integration options and slows efforts to enhance and fix existing services. Figure 78 in Appendix C presents the AWS GovCloud for the BIA Product Line.

### Drivers

Legacy technology poses a significant risk to VBA's and NCA's ability to provide benefits in a consistent, secure, timely, and cost-effective manner. The inefficiencies that result when conducting business with products with legacy technology have led to inconsistent Veteran experiences, complex system interfaces, data duplication, function duplication, and other issues. Moreover, legacy technology inhibits the consideration of COTS solutions, Cloud solutions, and managed services. Equally important, diminishing knowledge of legacy technology within VA and among its partners highlights the criticality of its decommissioning and modernization efforts.

Recent legislative changes will expand and simplify access to benefits for Veterans. To achieve the requirements of the new legislation, VBA and NCA must significantly enhance their IT environments. The BIA Product Line will support this effort by helping decommission or refactor systems that employ legacy technology and shift to modern technology and software development methods.

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### Transformative Initiatives

#### *Benefits Integration Platform*

The Benefits Integration Platform (BIP) provides a platform that allows teams supporting VBA and NCA to quickly and easily develop, deploy, scale, and manage container-based applications in a multi-tenant Cloud environment. It is deployed in the VAEC AWS GovCloud environment and leverages

modern tooling, including Kubernetes, Docker, Jenkins, GitHub, Nexus, Vault, Consul, SonarQube, Fortify, Twistlock, Prometheus, Kibana, and Dynatrace. It includes a Java Spring Boot based API framework that provides patterns for building well-integrated, well-structured, and standardized (i.e., OpenAPI Specification based) APIs. New capabilities on the horizon include multi-region disaster recovery and a Kong based API gateway.

BIP will help VBA decommission BIRLS, replace BDN, process Chapter 33 payments, provide timely claims processing and payments, and minimize manual claims work for field employees. BIP will enable enhanced use of managed services and COTS solutions as well as integration with iFAMS for all VA financial transactions. Additionally, it will ensure that VA services are consistent across LoBs, provide integrity of common information related to each Veteran, and normalize business processes for managing claims. Moreover, BIP will have enterprise-wide functionality in the form of the Corporate Database, NWQ, and eFolder that will be accessible to all VA Administrations and Staff Offices. Finally, BIP will aid VBA in transitioning 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.

The BIA Product Line will transition VBA and NCA functionality to BIP through FY 2026, migrating major applications, such as Forever GI Bill Chapters, BDN, and VETSNET. Additionally, the Product Line will integrate VALERI-R, a portal for loan servicers, and Caseflow, an application that streamlines benefit claims appeals into BIP.

### **Corporate Database**

The Corporate Database is a critical component of the BIA Product Line that acts as a repository for most benefits related data. Over 40 distinct applications, including VBMS and FAS, connect to the Corporate Database to read and write benefits related data. If the database were to go down, it would impact roughly 20,000 VA employees and 15,000 VSOs as they would be unable to submit and process claims. VBA estimated that one day of down time for these users would equate to \$300 million in lost productivity. The database is Oracle-based and will undergo significant modernizations over the next six years, including various software and

hardware upgrades, the implementation of a record archiving strategy, and a Cloud migration.

### **Enterprise Data Warehouse**

The Enterprise Data Warehouse (EDW), managed by the Office of Performance Analysis and Integrity, leverages the transactional data of the Corporate Database to enable the production of business intelligence for VBA. These mission essential business intelligence functions include cleansing data, directing ETL processes, constructing data marts, extracting data for internal and external stakeholders, creating workload management tools, and producing performance information.

With more than 100 terabytes of data, VA recently modernized the EDW with new Oracle servers. The EDW makes business intelligence available through two primary media: Tableau visualizations and Oracle Business Intelligence Enterprise Edition (OBIEE). Tableau servers host 1) the Employee Performance Report—a daily, detailed transaction-based compilation of the performance of individual claims processors; 2) Omaha—a daily workload management tool refreshed several times a day; and 3) more than 250 additional workbooks containing 2,000+ individual reports important to the functioning of the Disability Compensation and Pension business lines. OBIEE provides similar essential content for the other VBA business lines. The EDW also includes SAS servers, primarily to support modeling, simulation, and forecasting. While the CDW is critical to the ability of the VBA workforce to do their work, the EDW is critical to doing that work efficiently.

### **Product Integration into the Portfolio**

Given the BIA Product Line is relatively new, an initiative will be undertaken in FY 2020 and FY 2021 to analyze the seven products within the Product Line; identify long-term Product Managers and Product Owners; and outline detailed product roadmaps, dependencies, and optimizations. Overall, the goal of this effort is to seamlessly integrate the Product Line into the Benefits and Memorial Services Portfolio and uncover and foster synergies with other Product lines, both inside and outside the Portfolio.

### **Future Environment**

VBA will continue to position itself to leverage BIP, the Corporate Database, and the system integration

and automation capabilities provided by the BIA Product Line. As a result, these strategic systems and capabilities must continue to evolve and mature to meet the growing needs of the Department. To do this, tooling and frameworks within BIP will be enhanced and expanded to provide a more robust feature set for tenants, and the Corporate Database will be optimized and moved to the Cloud to improve operational performance and stability. Furthermore, the Product Line will develop new APIs and automation that improve accessibility to benefits related data, hastens benefit claims processing, streamlines appeals management, and enhances overall benefits and service delivery. BXXB

HXXA

BIA will continue to be at the forefront of the modernization and optimization effort within VA's operating environment. This will be achieved by increasing the utilization of Cloud-based products and services and leveraging human-centered design to develop highly efficient interfaces and systems. BIA will also support VA's buy-first strategy for products and services that can be delivered most effectively through managed services or COTS solutions. Furthermore, AI, containerization, open source, Infrastructure as Code, and serverless architecture technologies will be leveraged to improve efficiencies, facilitate the retirement of legacy systems, and posture VA for future growth and stability.

See Figures 33 and 34 for the FY 2020–2026 milestones that the BIA Product Line will complete to achieve its future environment.



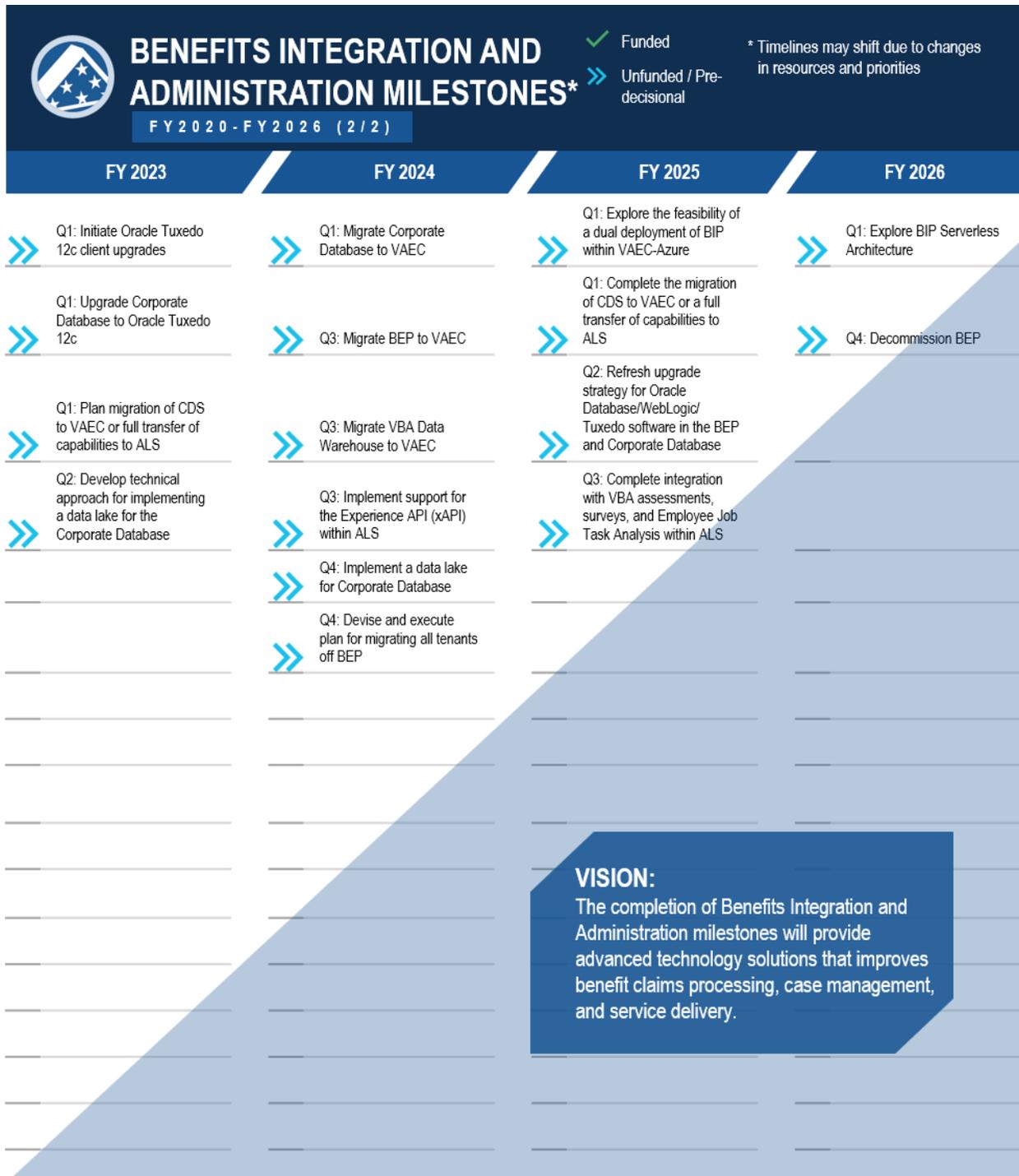


Figure 34: Benefits Integration and Administration Milestones (2/2)

## 3.7 Memorial Benefits and Services

### Current Environment

NCA oversees the largest cemetery system in the country with over four million Americans memorialized by burial in VA's national cemeteries. Over the past 25 years, NCA developed BOSS-E as its main IT system to ensure all aspects of the interment and inurnment processes are completed efficiently and effectively. BOSS-E supports cemeteries nationwide with 3.7 million occupied gravesites and processes over 135,000 new interments annually. The legacy system consists of 14 custom-developed modules that are complex and difficult to update.

Implemented in 1994, BOSS-E 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 VA systems, and relies on manual processes. To transition to a modern solution and decommission BOSS-E, OIT is developing MBMS. Figure 79 in Appendix C presents the MBMS v2.0 interim system interface model.

### Drivers

NCA's legacy IT systems cause operational inefficiencies and present security risks. Specifically, the legacy case management system, BOSS-E, lacks the functionality of a modern software application. BOSS-E requires NCA personnel to manually make scheduling decisions based on textual information, which may be interpreted multiple ways causing confusion and, at times, redundancy. Manual processes can lead to high telephonic hold times and present opportunities for improper scheduling. NCA must implement robust IT systems to address current risks, adapt to increasing Veteran interments and inurnments, and ultimately enable efficient delivery of memorial benefits to Veterans and their families. Modernizing legacy systems and processes is one of VA's strategies in the FY 2018–2024 VA Strategic Plan. The effort also aligns with VA's objective of IT Modernization, PMA Cap Goal 1 (IT Modernization), as well as the VA Priorities.

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 providing excellent customer service that is consistently positive for Veterans and

their families in terms of ease, effectiveness, and emotional resonance. Furthermore, the 2018 Presidential Memorial Day Proclamation, announced the development of a single-source tool to memorialize Veterans and safeguard their legacy. In response, the Veterans Legacy Memorial (VLM) was developed via Cloud technology and APIs. The VLM is an online memorialization platform to maintain Veterans' legacies honored in perpetuity. Via the VLM portal, families, colleagues, friends, VA stakeholders, and the public may search and contribute information and imagery through the VLM digital memorial space, which includes a profile page for each of the approximately 3.7 million Veterans enabling a significantly elevated outreach, visibility, and digital presence.

### Transformative Initiatives

#### *Memorial Benefits Management System*

VA is implementing the Memorial Benefits Management System (MBMS) to automate manual NCA business processes; enable the Department to decommission legacy Memorials systems, platforms, and processes; and increase standardization and access to authoritative data across LoBs. VA is leveraging and expanding the newly established BIP functionality to incorporate NCA requirements to develop MBMS. VA has developed MBMS in VAEC and the Salesforce platform and will ensure interoperability with VA systems and services for increased efficacy and efficiency of Memorial Benefits to Veterans. GXAA

MBMS leverages BIP to build a cohesive, enterprise system to replace NCA's legacy BOSS-E to facilitate common workflows; provide enterprise services, solutions, and data; and modernize NCA capabilities and technology. The goal of MBMS, as NCA's modernized, enterprise platform, is to integrate with and migrate the functionality of disparate systems, to expedite memorial benefits processing and improve the overall Veteran experience.

The first major area of NCA operations to use MBMS is the National Cemetery Scheduling Office, which is the central call center for anyone scheduling a burial, interment, or inurnment at a National Cemetery. The Case Management, Eligibility, and Outreach module uses the Salesforce COTS platform, which brings case management functionality and automated workflow processes into one integrated system.

The Cemetery Regulations, Reports, and Testing module, a companion module, allows individual cemeteries to indicate, on a calendar-type form, the hours and capacity for services. This information is displayed to the National Cemetery Scheduling Office to enable accurate and consistent scheduling for Veterans and their families. Additionally, MBMS will automate all business processes associated with tracking orders and delivery of monuments. It will 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 135,000 yearly interments. Finally, MBMS will enable NCA end-users to perform eligibility, benefits, and cemetery management functions using one system.

### ***Veterans Legacy Memorial***

The Veterans Legacy Memorial (VLM) is an interactive online memorialization platform designed to honor the service and sacrifice of the nation’s Veterans. The digital memorialization platform enables visitors to honor and pay their respects to Veterans interred at VA national cemeteries by allowing public contributions to Veterans’ pages. VLM’s online portal includes digital pictures of headstones and markers as well as burial records that family members, survivors, and friends can view.

VLM has incorporated architecture and functionality specializing in Cloud infrastructure, principles, and protocols of user experience and human-centered design. The project is the latest from VA’s IT and Digital Modernization program, and it aligns with the PMA.

The public can search the site for Veterans, find out in which of the National Cemetery they are buried, and read summary details of their lives and service. Future capabilities will expand to allow families, survivors, fellow Veterans, and others to add historic photos, view gravesite photographs, view gravesites on a map, get directions to a gravesite, and share memories on a deceased Veteran’s memorial page. Such capabilities will include provisions that allow NCA to manage the site in a manner that maintains the same level of decorum that customers experience in VA’s National Cemeteries.

As a digital, Cloud-based, and internet-enabled platform, VLM enhances the concept of Veterans Legacy Program and scales it to include greater than

3.7 million Veterans currently laid to rest in National Cemeteries. Most importantly, VLM allows the American public to share in NCA’s mission to “honor all Veterans in perpetuity.”

### ***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 MBMS, VA systems, and COTS solutions. VA 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
- Nationwide Gravesite Locator
- Presidential Memorial Certification
- Daily Burial Schedule
- Memorial Enterprise Letters
- Kiosk – Nationwide Gravesite Locator
- Business Intelligence National Cemetery Administration
- Management and Decision Support System (MADSS)
- Monument Application Scanning System
- Gravesite Assessment Reporting (GAR)
- Outer Burial Receptacles
- Resolution Letters

### ***Infrastructure Modernization***

The telephony/unified communications modernization effort migrates NCA to the Cisco Unified Call Center Enterprise platform to efficiently address the volume of calls from Veterans, families, and their representatives. The new solution will greatly reduce queue times by leveraging newer technology with the ability to seamlessly onboard additional staff for high-volume cycles and to transfer calls within NCA and VA offices. The Network Data Circuit component provides greater

bandwidth to support utilization of common share drives, MBMS functionality, and geospatial/geolocation technology and enhance the use of VA web applications. NCA has several new initiatives requiring mobile technology. NCA will leverage Wi-Fi to provide limited Wi-Fi to upload gravesite and internment data while also providing limited capability for visitors to view this data via their mobile devices.

Modernization provides NCA the flexibility to modernize wide area network (WAN), wireless, and telephony environments and adapt to future implementations, such as the VAEC and Cerner EHR solutions. However, most NCA telecommunication spaces are outdated and do not conform to recommended OIT policy. To facilitate the overall infrastructure modernization initiatives requires remediation of aged telecommunication spaces across NCA sites to facilitate NCA's infrastructure modernization of network data circuits, telephony, and WAN/Wi-Fi and bring the NCA in compliance with OIT standards. This effort will also increase network and physical security at the specific site locations.

### ***Enterprise Interoperability***

Via enterprise interoperability, OIT seeks to team with NCA to identify, define, assess, and communicate the dependencies, constraints, interfaces, and parallel execution paths among VA's disparate systems. This effort aims to converge the functional, logical, and physical connections and interfaces with NCA capabilities and technologies to better execute programs as well as transfer and utilize data across functional business areas. This is a key driver towards enterprise services and solutions for increased efficacy and efficiency of memorial benefits to the nation's Veterans.

### **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 other VA systems. MBMS will streamline VA's management and operation of the cemeteries that NCA oversees and serve as NCA's system of record once VA migrates all BOSS-E applications to the modern platform. Additionally, VA will leverage shared services in order to meet the

mission needs of NCA and realize cost savings by reducing duplicative and antiquated systems. NCA will use VA enterprise-wide solutions, where available, and procure COTS solutions for services that are integral to NCA's mission. For these reasons, ensuring that Memorials functionalities converge effectively with systems in other OIT Portfolios will be key to the success of the Memorials modernization.

Memorials' initiatives will lead to new features that benefit Veterans, their families, and NCA employees. These features include seamlessly referenced authoritative data from appropriate sources, automated approvals, and geographic information system (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 online self-service Pre-Need or Time of Need applications for burial services and all other memorial benefits. VLM will preserve, commemorate, and share the stories of Veterans and will provide a digital memorial page for each Veteran interred at VA national cemeteries. BXXB  
HXXC

Figure 80 in Appendix C depicts the target high-level operational view of the Memorial Benefits and Services Product Line. See Figures 35 and 36 for the FY 2020–2026 milestones that the Memorial Benefits and Services Product Line will complete to achieve its future environment.





Figure 36: Memorial Benefits and Services Milestones (2/2)

## 4. CORPORATE SERVICES PORTFOLIO

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

- 4.1 Acquisition and Property Management
- 4.2 Financial Management
- 4.3 Human Capital Management
- 4.4 SecVA/Congressional/Legal Affairs

### Current Environment

The Corporate Services Portfolio provides IT support to VA's Administrations, Staff Offices, and boards—including the Office of Management (OM), Financial Services Center, OGC, and Office of Human Resources and Administration (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 Services transformative initiatives, VA is taking steps to transform its Acquisition and Property Management, Financial Management, Human Capital Management, and SecVA/Congressional/Legal Affairs (SCLA) technology to improve the Department's service to Veterans.

### Drivers

Both internal business imperatives from across VA and external guidance drive Corporate Service modernization efforts. The current Corporate Services 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 human resources (HR) systems being over 30 and 50 years old, respectively. Additionally, these legacy systems do not 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 the need to

link financial and acquisition systems for effective management of the entire acquisition lifecycle.

### Transformative Initiatives

The Corporate Services Portfolio includes the following key transformative initiatives:

- Knowledge Management System
- Veterans Enterprise Management System (VEMS)
- Financial Management Business Transformation (FMBT)
- Fair Debt: Veteran Debt Processing Enhancements
- HR Shared Services
- Enterprise HR-Smart Enhancements
- Enterprise Talent Development
- VA Emergency Alerting and Accountability System (EAAS)
- eDiscovery
- Government Accountability Office (GAO) Module

### Future Environment

VA envisions the Corporate Services Portfolio as an integrated service delivery platform that places the Veteran or employee 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 while considering and aligning to the Department's evolving priorities in a fiscally constrained environment. It will also establish cross-agency councils to standardize VA data and recommend where shared services are employed. 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. BXXB HXXC

## 4.1 Acquisition and Property Management

### Current Environment

The current environment of the Acquisition and Property Management Product Line consists of a majority of COTS legacy products, some of which are over 30 years old. These products feature hardware and software that are devoid of the flexibility to readily adapt to the necessary upgrades to improve user experience.

VA will ultimately decommission the preponderance of products within the Acquisition and Property Management Product Line and replace their capabilities via Financial Management and Business Transformation's (FMBT) implementation of iFAMS and other systems providing core property management capabilities. This is due to the fact that it is paramount to link financial systems with acquisition systems in order to effectively manage the entire acquisition lifecycle consisting of the pre-solicitation, pre-award, and post-award phases. However, there are legacy applications within the Product Line that will remain in service after FMBT and require long-term sustainment and modernization. Figure 81 in Appendix C provides an overview of VA's Acquisition and Property and Management systems, their internal and external interfaces, and their transformation status.

### Drivers

VA OIG has recommended that the CIO implement a policy to ensure cost-effective utilization of IT equipment, installed software, and services and ensure coordination of acquisitions with affected VA organizations. This will help ensure that VA's operating framework and organizational needs are considered prior to acquisitions.

Additionally, the Deputy Secretary of VA is mandated to maintain a listing of VA-certified Veteran-Owned Small Businesses (VOSBs), and the VA Office of Small and Disadvantaged Business Utilization (OSDBU) is responsible for enabling the Deputy Secretary to meet this congressional mandate. OSDBU has a proprietary system that is expensive to operate and maintain. As a key business partner for the Acquisition and Property Management Product Line, OIT recently replaced the proprietary system OSDBU used to certify VOSBs

with the Veterans Enterprise Management System (VEMS).

Other drivers influencing the Acquisition and Property Management Product Line include decommissioning legacy systems in preparation for FMBT and managing contracts in compliance within the Federal Acquisition Regulation in a timely and cost-efficient manner. The latter is currently fulfilled via the Electronic Contract Management System (eCMS).

### Transformative Initiatives

#### *Knowledge Management System*

VA requires a method to resolve inefficiencies and improve effectiveness of procurement spending in several areas, including data systems, procurement policies and oversight, acquisition workforce, and contract management. Therefore, the Department has launched the VA Acquisition Knowledge Portal, which serves as a central point of access for end-to-end acquisition lifecycle information and resources to empower VA's acquisition workforce. The acquisition community has access to acquisition guidance, training, best practices, and other innovative tools to assist its productivity and professional development. The Acquisition Knowledge Portal also provides a link to VA's education and training resources along with acquisition communities of practice.

#### *Veterans Enterprise Management System*

In order to reduce operation and maintenance costs while improving VA's ability to add functionality, OIT recently replaced OSDBU's proprietary system used to certify VOSBs with the Veterans Enterprise Management System (VEMS). VEMS was built using a COTS product, Microsoft Dynamics CRM, and provides OSDBU the means to accept Veteran applications for certification as a VOSB, adjudicate the applications, and maintain a listing of VOSBs and Service-Disabled Veteran-Owned Businesses (SDVOSBs).

However, due to its inability to meet technology and performance standards, VA is no longer authorized to use Microsoft Dynamics CRM as part of VEMS. Therefore, the Acquisition and Property Management Product Line has partnered with OSDBU to migrate the VEMS COTS solution from a PaaS product to Microsoft Dynamics 365, a SaaS product. The upgrade will also require refactoring of

core components, including the VIP Veteran-facing portal and an upgrade from SharePoint 2016 to SharePoint Online. This will reduce operational and maintenance costs and simplify implementation of future business capabilities for OSDDBU.

The modernized IT business system will enable OSDDBU to more efficiently meet its mission to expand the opportunities of SDVOSBs, VOSBs, small disadvantaged businesses, HUBZone businesses, and woman-owned small businesses to add value to the work of VA.

#### ***Electronic Contract Management System***

The Electronic Contract Management System (eCMS) is a portfolio of integrated systems consisting of GOTS and COTS solutions that provides tools and functionality to assist VA Acquisition staff in managing contracts in compliance with the Federal Acquisition Regulation, the VA Acquisition Regulation, and VA acquisition best practices. eCMS is designed to optimize the workflow necessary to complete acquisitions in the most timely and cost-efficient manner and to ensure VA Administrations and Staff Offices can obtain the products and services that will best meet their needs in accomplishing the VA mission.

eCMS includes the Automated Acquisition Management System, its contract writing portfolio that uses clause logic to build contracting documents' verbiage and schedule and has functionality to allocate line items to accounting strings. OIT is currently working toward integrating eCMS and iFAMS and retiring the Virtual Office of Acquisition within eCMS. The system will remain in sustainment mode while VA transitions to FOC within iFAMS for both the finance and acquisition functions that have been identified.

#### ***Property and Performance Management Tool***

The Property and Performance Management Tool (PPMT) provides data aggregation that has automated reporting and business intelligence tools to manage the Office of Real Property's (OPR) portfolio. OPR's major lease portfolio alone consists of 92 active projects, totaling 5.8 million square feet with a total contract value of \$4.8 billion. As shown in Figure 82 in Appendix C, PPMT is hosted on a SharePoint platform within the Microsoft Azure Cloud. It performs lease and task tracking as well as other project management functions, providing accessible data that will track each portfolio and corresponding key performance indicators. This

allows OPR to easily identify portfolio and project statistics, accomplishments, and risks; provide internal and external stakeholder data; and programmatically identify areas for improvement. OIT continues to conduct market research with industry to identify emerging capabilities that may be of value to OPR.

#### ***Project Management and Accountability System***

The Project Management and Accountability System (PMAS) has been replaced by VIP as the authoritative source for VA project tracking. However, PMAS remains an active system to provide access to legacy project data. PMAS provided guidance for planning, management control, processes, and roles and responsibilities for VA IT projects. The PMAS Dashboard tracked and reported PMAS project increment deliverable dates, cost, and status; content for Monthly Progress Reports; provided a centralized project scheduling tool; and supported automated updates to OMB IT Dashboard.

#### ***Modernization of the VA Forecasting of Opportunities Tool***

VA is not currently in compliance with the Small Business Act, which requires that it forecast certain contract opportunities that can be performed by small businesses owned and controlled by socially and economically disadvantaged individuals. The current tool is non-compliant with required standards, as it lacks functionality and returns incorrect information.

VA will implement an integrated Cloud-hosted solution that improves user experience and the services that OSDDBU offers. The solution should have the ability to drive business and IT strategy execution from the top down by defining a portfolio of strategic goals and initiatives as well as streamline and standardize intake capture, workflow, prioritization, resource scoping, and approval processing for simple and complex project work demand.

#### **Future Environment**

The future environment of the Acquisition and Property Management Product Line consists of overcoming the operational risk associated with legacy systems; managing all enterprise application development activities; and formulating strategy and technical direction, guidance, and policy to ensure

that IT resources are acquired and managed for VA in a manner that adheres to various federal laws and regulations. By supporting a small number of highly reliable, flexible, and comprehensive target systems that continuously evolve to support new requirements, the Product Line will be better poised to manage products throughout their lifecycle. Additionally, effective use of 24/7 Watch Officers will allow for rapid and effective response to system difficulties and increased customer satisfaction.

By migrating to a DevSecOps environment, VA will be better positioned to integrate its finance and acquisition systems. This will enable the Department to better manage the entire acquisition lifecycle, consisting of the pre-solicitation, pre-award, and post-award phases, while remaining focused on modernizing resources management, legal, training, and information management systems. As OIT pilots the Acquisition and Property Management Product Line, it will continue to elongate its platform with respect to systems that are critical to the contracting cadre within VA. The Product Line will enhance its vision by incorporating agile practices and human-centered design. Utilizing the expertise of a technical director in conjunction with the architecture team, the Product Line will identify interdependencies among systems, allowing for greater advancement in modernization.

See Figures 37 and 38 for the FY 2020–2026 milestones that the Acquisition and Property Management Product Line will complete to achieve its future environment.





## 4.2 Financial Management

### Current Environment

VA's financial management systems do not substantially comply with the federal financial management system requirements and the U.S. Government Standard General Ledger at the transaction level, as required by Federal Financial Management Improvement Act of 1996 (FFMIA) Section 803(a). Its current financial system, the Financial Management System (FMS), has over 100 primary interfaces with legacy systems, and its hardware and software are no longer updatable. The legacy software inhibits VA from fixing audit issues, including security and privacy concerns.

VA has cancelled two major efforts to replace FMS since 1999. Prior to VA's FMBT program, the Department'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 management environment. To replace FMS, the FMBT program is implementing iFAMS as VA's modern financial and acquisition management system.

Similarly, Veteran debt processing at VA is outdated and fragmented. The Department currently sends VA debt letters via paper copy and stores them in multiple systems of record to include VVA, VBMS, and VistA. Therefore, VA is working toward implementing a holistic solution to enhance Veteran debt processing.

### Drivers

VA's legacy financial management system is 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.

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.

Legislation driving Veteran debt processing enhancements includes the Veterans Benefits and Transition Act of 2018 and the Economic Growth, Regulatory Relief, and Consumer Protection Act. PMA CAP Goals 4 (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 drivers for this modernization.

### Transformative Initiatives

#### *Financial Management Business Transformation*

VA's Financial Management Business Transformation (FMBT) program is implementing iFAMS to replace FMS. 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 83 in Appendix C 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. Also found in Appendix C, Figure 84 provides more detail on the iFAMS enterprise service bus (ESB) based on the high-level iFAMS architecture while Figure 85 presents the configuration approach for iFAMS.

FMBT is using a tailored version of the Scaled Agile Framework (SAFe) for project management to deliver iFAMS functionality in small increments to enable VA to deliver business value sooner. Through its Office of Enterprise Integration (OEI), the Department is coordinating the implementation activities of iFAMS, the Cerner EHR, and LogiCole.

***Fair Debt: Veteran Debt Processing Enhancements***

VA is committed to protecting the interests and welfare of Veterans who rely on the Department to provide dependable, high-quality health care. VA is developing a plan to implement a holistic solution to address issues related to debts incurred by Veterans and legislative requirements. The modern solution will 1) consolidate the debt management view to notify Veterans and track delays and disputes of Veteran debt, 2) develop a common format to notify Veterans electronically or by mail on debt management legislative requirements, and 3) develop a medical database to provide community-care-related Veteran debt for Credit Reporting Agencies to use in determining Veteran liability versus VA.

**Future Environment**

FMBT will deploy iFAMS as a federally compliant, Cloud-hosted financial and acquisition management solution with transformative business processes and capabilities. iFAMS will interface with the Cerner EHR and LogiCole (supply chain and logistics) to modernize VA's financial and acquisition management systems, and it will implement remediation actions related to repeated material weaknesses and compliance findings reported in VA's Agency Financial Report. The system will increase the transparency, accuracy, and reliability of financial information across VA, resulting in improved fiscal accountability to American taxpayers and strengthening the Department's ability to provide care and services to Veterans.

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. VA Administrations and Staff Offices will coordinate with OEI on business processes and decisions involving integration and interdependencies, and OEI will optimize budgeting and financial management through a Department-level requirements process, which will collect, review, and validate requirements.

Regarding Veteran debt processing, VA will provide timely notification to debtors such as Veterans and their families, make debt letters available online, and allow Veterans and beneficiaries the ability to opt-in to receiving correspondence electronically. It will also provide greater awareness of the debt,

including the original debt amount, remaining balance, and payments made. Credit Reporting Agencies will be able to verify whether a debt furnished to them is a Veteran's medical debt, and VA will be able to submit a notice to Veterans when the Department has assumed liability for all or part of their medical debt.

See Figures 39 and 40 for the FY 2020–2026 milestones that the Financial Management Product Line will complete to achieve its future environment.

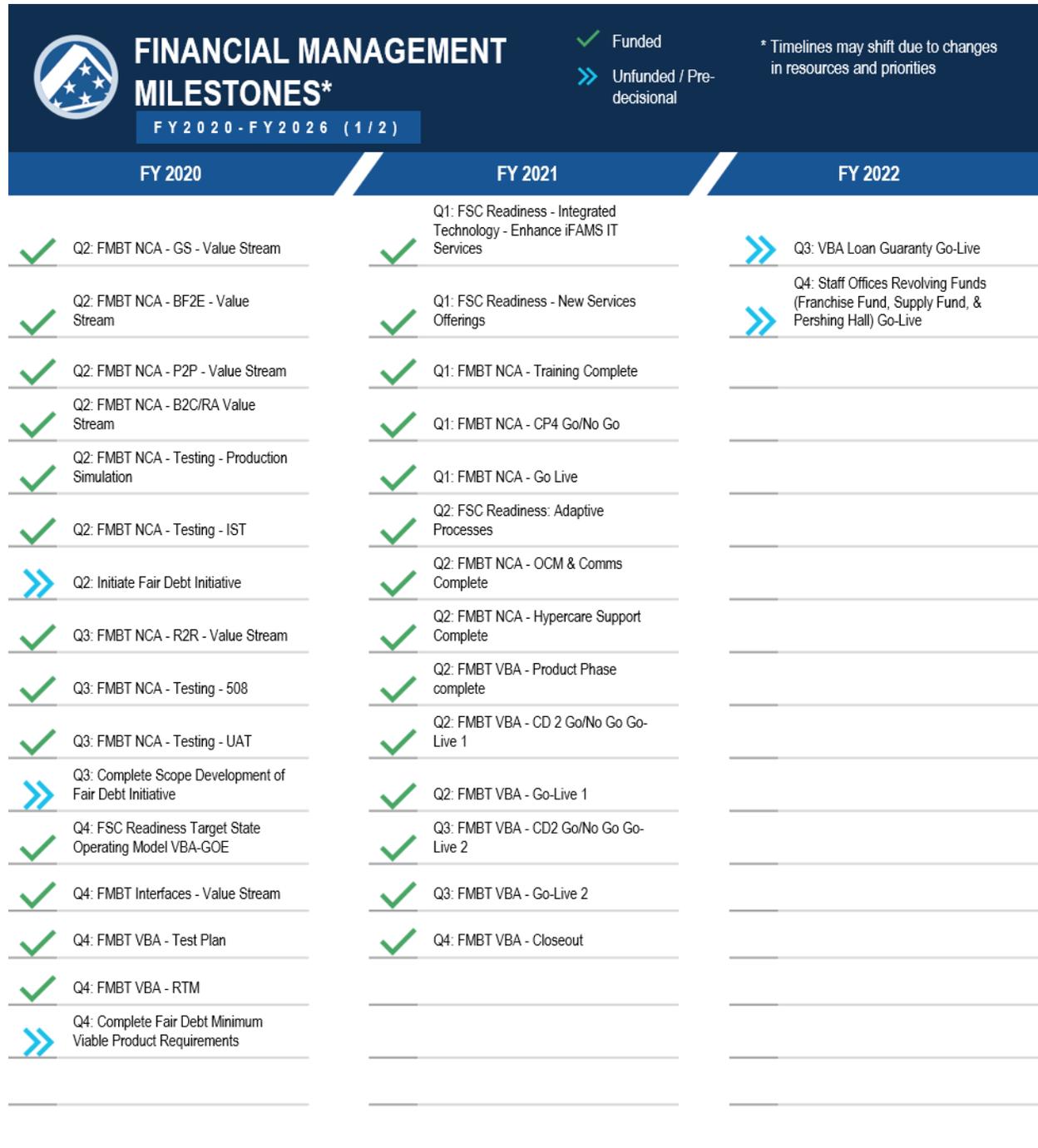


Figure 39: Financial Management Milestones (1/2)



## 4.3 Human Capital Management

### Current Environment

VA's HR IT environment consists of a set of applications that support the Department's human capital business functions for approximately 390,000 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.

VA's current HR environment leads to a significant cost associated with sustaining outdated and heavily configured functionality that uses different workflows and business processes. It causes inconsistent and often unreliable data standards and reporting methods. Additionally, it increases workload and decreases 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 decommissioning of the Personnel and Accounting Integrated Data (PAID) system, the transition to shared services with HR-Smart, the replacement of VA's current Personal Identity Verification (PIV) Card Management System with USAccess, case management for employee relations and labor relations cases, and automated classification to drive uniformity and equity in hiring. Additional efforts to implement integrated enterprise-wide HR capabilities that support high-quality, consistent HR service delivery across the Department are ongoing.

In addition, the Human Capital Services Center (HCSC) provides common human capital support services for learning management, employee accountability, internship succession management, and learning content to VA employees, contractors, volunteers, and affiliates. The three enterprise-wide applications supporting HCSC services are Talent Management System (TMS) 2.0, integrated electronic training courses and books provided by leading external content providers, and the VA Emergency Alerting and Accountability System (EAAS).

HCSC's current environment competes with duplicate systems across the Department. The

duplicate systems increase cost to the Department and increase inconsistencies regarding reporting processes. Challenges also include access to consistent and reliable authoritative data sources for personnel data on employees, contractors, and other VA affiliates.

### Drivers

VA's HR modernization efforts are driven by business imperatives from across the Department and from external sources, including GAO, OMB, and the Office of Personnel Management's Human Capital Business Reference Model (HCBRM). 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 redundant and 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 due to its outdated programming language. In 2017, GAO also indicated the challenge of addressing the five areas of concern related to including VA health care on its High Risk List in 2015. To address one of the five areas of concern "Inadequate Training for VA Staff," VA's Training Work Group Action Plan highlighted the need for—among other things—a single learning management platform, standard training methods, and a common approach to role-specific competency modeling.

Additionally, under the Homeland Security Presidential Directive 12 (HSPD-12), the VA Office of Operations, Security, and Preparedness (OSP) is required to issue PIV cards to its employees, contractors, and affiliates. VA's current PIV Card System is nearing the end of its expected lifecycle and encountering technology issues that make it cost-prohibitive to further maintain and enhance. To avoid a work interruption and to provide adequate security controls as required by FISMA, VA must replace the current PIV Card System.

The DHS FEMA Federal Continuity Directive 1 (FCD-1) mandates all organizations have a method to identify and activate designated continuity personnel to sustain essential functions in accordance with approved continuity plans and procedures. Continuity programs are to include procedures to sustain administrative services, personnel accountability, and support services to employees not identified as continuity personnel. Personnel accountability is a critical capability for all organizations, as they must have the means and process in place to contact and account for employees. VA EAAS is the Department's primary system to meet the FCD-1 mandate.

PMA CAP Goal 3 (Workforce of the Future) and the MISSION Act also guide VA's transformation of its HR capabilities. Digital self-service tools, Cloud technology, and AI (ML, virtual reality, RPA, chat bots, augmented analytics, etc.) will enable this modernization by streamlining and improving HR processes. FXXA IXXA IXXB IXXC

## Transformative Initiatives

### ***Personnel and Accounting Integrated Data System Decommissioning***

VA is among a handful of federal agencies that relies on multiple archaic legacy systems to include the Personnel and Accounting Integrated Data (PAID) system. 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. 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 by establishing Human Resources Payroll & Accounting Services (HR-PAS) within VAEC and leveraging HR-Smart. The full decommissioning of the legacy HR system is projected in FY 2020.

### ***Human Resources Payroll & Accounting Services***

Human Resources Payroll & Accounting Services (HR-PAS) serves as the central repository for combined HR and payroll data and performs business functions in support of VA financial and HR systems. While continuing to support the retention of 30+ years of historical data currently stored in PAID, VA and HR-PAS staff 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 Financial Services Center, and act as a central repository to aggregate HR and payroll data and reports.

### ***HR Shared Services***

By adopting and expanding shared services for HR functions, VA will continue to 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 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 has deployed self-service capabilities for managers with integration to the USA Staffing talent acquisition system. The link between HR-Smart and USA Staffing allows HR and related staff to follow a vacancy from recruitment to the onboarding of a new hire.

### ***Enterprise HR-Smart Enhancements***

VA will enhance the capabilities of the HR-Smart system, adding manager and employee self-service, workers without compensation (WOC), and manpower functionalities.

#### ***Manager Self-Service:***

Manager Self-Service (MSS) provides self-service functionality for managers to view their departments' organizational structures, submit Personnel Action Requests, and receive alerts for upcoming actions needed regarding their staff. MSS reduces the burden of manually submitting an SF 52, Request for Personnel Action, to HR to process personnel transactions. MSS provides an electronic means to view department employee data, review action suspense, view organizational hierarchy, and improve communication between HR and managers.

*Employee Self-Service Portal:*

The Employee Self-Service Portal will provide a single point of entry that will integrate with other enterprise HR solutions. The portal will capture information from employees' self-service systems in one place, reducing the time employees spend on administration and HR actions and increasing the time they can spend in their functional areas. This capability will offer self-service functionality for employees to view personal and professional information, make fundamental updates to this information, and receive alerts for upcoming organizational actions needed.

*Workers Without Compensation:*

VHA has authority to appoint qualified individuals, involved directly or indirectly in patient care activities, on a without compensation (WOC) basis. Annually, the Office of Academic Affiliations (OAA) manages WOC appointments for approximately 130,000 Health Professions Trainees (HPTs). Lack of an enterprise records information management system for tracking HPTs results in incomplete data for the Congressional Health Services Training Report and negatively affects the onboarding and off-boarding experience for WOC appointees.

VA will implement a WOC capability that provides an efficient and standardized solution to onboard WOCs each year and maintain records for these individuals throughout their tenure with VA. This initiative will streamline the application process, create standardized documentation for records and reporting, and allow for a trackable functional population. The implementation of this capability will support an end-to-end WOC on- and off-boarding solution (to include adherence to proper background investigation policy) and improve current reporting and tracking capabilities.

*Manpower:*

The Manpower System is an enterprise solution that enables the effective execution of manpower management and shares data with the HR system of record, HR-Smart. The system will give VA end-to-end visibility for HR needs and vacancies as well as enable manpower offices to validate new, encumbered, and vacant position before a hiring action occurs. The importance of this effort is highlighted in VA's FY 2018–2024 Strategic Plan, as the Manpower System will improve the Department's management of manpower and

provide VA with a greater ability to recruit and retain a world-class workforce.

**HR-Smart Data Cleanse Initiative**

During the transition from PAID to HR-Smart, 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 allowed VA to identify and replace invalid and inaccurate information that does not support existing business processes. As a result, it created efficient processing, reducing issues that impact employees' pay, driving effective position management, and providing more accurate reporting functions within HR-Smart and downstream systems.

**HRIT Service Desk Ticketing System**

VA enhanced the HRIT Service 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 enterprise solution defects, manage reporting needs, and plan future enhancements. The HRIT Service Desk supports around 5,000 end users with system access and day-to-day, system-related operational activities. The ticketing initiative assists service desk staff in providing a seamless user experience and eliminate submission of duplicate tickets in separate help desk systems.

**Next Generation Personal Identity Verification**

VA is replacing its current internal Personal Identity Verification (PIV) Card System with the federal shared service USAccess PIV Card System provided by GSA. Replacing the internal VA PIV Card System will enable OSP and OIT to shift the burden of PIV Card System operational readiness to the FSSP, GSA. VA will use a fixed priced leasing program in lieu of procuring, owning, refreshing, and maintaining the IT systems required to produce PIV badges. This will improve its ability to accurately fund the cost of PIV badges and alleviate the burden of remaining current with federal identity policy for PIV.

Next Generation PIV (NextGen PIV) will substantially improve identity management and security for VA. This effort will redirect resources across the VA

Enterprise from operating and maintaining PIV systems to providing solutions to Veterans.

### ***Enterprise ALERT-HR***

HRIT has deployed ALERT-HR, an employee relations/labor relations (ER/LR) case management system. ALERT-HR provides reporting, case documentation management, and case history functionality to support VA. The benefits of ER/LR case automation include enhanced visibility across the enterprise, enhanced efficiencies through a reduction in paperwork, elimination of homegrown systems, an automated workflow to increase accountability, and a real-time reporting capability.

### ***Enterprise Automated Classification***

Automated Classification provides a framework for positioning the right candidate in the right job and encourages uniformity and equity in hiring by establishing a common reference across VA. To achieve success for candidates, VA is currently working to establish one authoritative source for classification. This effort will reduce and potentially eliminate manually intensive processes and improve efficiency and standardization for VA classification.

[IXXA IXXB IXXC](#)

### ***Enterprise Safety/Workers' Compensation Information Management System***

VA currently faces challenges with its legacy enterprise Workers' Compensation and Occupational Safety and Health Management Information System, including insufficient resources to develop or maintain the system to meet the performance requirements of VA's safety and workers' compensation stakeholder communities. Therefore, VA will develop a new Department-wide system of record, Enterprise Safety/Workers' Compensation Information Management System (SWIMS), for Workers' Compensation and Occupational Safety and Health data to satisfy the Occupational Safety and Health (OSH) Act of 1970, Section 19(a)(3) and (5). SWIMS will be a reliable safety recordkeeping system and include effective management of workers' compensation claims under OSH Act Section 19 (a)(3).

### ***Enterprise Performance Management System***

In order to remain competitive and provide best-in-class capabilities to Veterans and VA employees, VA will deploy an enterprise-wide, automated performance management solution. When fully implemented, the enterprise performance

management solution will automate the management of employee performance guidance and business workflows (i.e., planning, developing, monitoring, rating, and rewarding employee contributions), including sending completed performance forms directly to the electronic Official Personnel Folder. As a system of record, the solution will provide consistency in automated business processes and optimize process improvements throughout the VA Enterprise. An automated system will result in improved organizational performance, increased employee productivity and retention, and employees having a clear understanding of the importance of their contributions to VA's organizational goals and objectives—an attribute critical for effectively serving Veterans.

### ***Enterprise Talent Development***

In order to develop and sustain a high-performing workforce that meets VA's strategic and operational goals and objectives, VA will implement a new enterprise talent management solution. VA currently uses TMS 2.0 as its enterprise learning and employee development system of record. This solution meets many of VA's existing business requirements and can support nascent initiatives such as succession management, leadership development, and competency management. TMS 2.0 supports over 630,000 current VA employees and affiliates, and that number is expected to grow.

The future solution will include a comprehensive, modernized, and intuitive set of tools to support employees and other workforce members in their individual development planning, succession management, career development, competency assessment, skills acquisition, and training goals. This solution will replace TMS 2.0, integrate with VA's other human capital management and business solutions, and serve as an authoritative data source to facilitate data management and data sharing across the Department. VA is currently assessing alternative solutions that will ensure it addresses VA's strategic goals, major initiatives, and capability gaps in its mission-critical talent development requirement. [FXXA IXXA IXXB IXXC](#)

### ***Enterprise Talent Acquisition***

The Enterprise Talent Acquisition capability will fill technology gaps to properly equip VA with the tools necessary to attract, recruit, assess, and select candidates with the right skills and competencies to support Veterans while also increasing HR

transparency and automation. These capabilities will streamline the hiring process for acquiring business professionals and medical professionals. VA's ability to effectively identify vacancies, receive budget approval, source and screen candidates, and onboard new staff for critical hiring areas is essential to ensuring VA is able to compete in the Federal and Private Talent Acquisition arena and has the appropriate resources in place to serve Veterans' needs.

### ***Separation and Retirement***

A Separation and Retirement System will provide an enterprise-wide solution that automates separation and retirements and its associated business workflows. As the system of record, it will provide consistency in automated business processes and optimize process improvements throughout the VA Enterprise. This will result in Separation Counseling that involves determining the terms, entitlements, and benefits options of separation (e.g., leave balance payout or transfer of account, severance, pension, and Temporary Continuation of Coverage) as well as conducting counseling activities to assist separating employees and their families with the transition and completion of necessary documents. Retirement Planning and Processing will include retirement counseling between the HR department and prospective retiree as well as retirement application processing, which includes input from the prospective retiree, HR, and payroll.

### ***Enterprise Employee Benefits***

The Employee Benefits functionality is a web-based, enterprise-wide application to provide retirement and benefits information that will interface with HR-Smart and the Defense Finance and Accounting Service (DFAS) to pull information. Benefits Management is a collaborative process of establishing and maintaining a quality and competitive portfolio of insurance and tax-saving benefits for federal employees, retirees, and their families. This functionality will manage aspects of the employee experience by providing a modern intuitive technology that automates the benefits administration process through a self-service tool to view benefits statements and perform what-if retirement scenarios.

### ***New Pay (Enterprise Pay Integration)***

New Pay is a SaaS solution launched by GSA that modernizes federal payroll processing services government wide. While DFAS is the current payroll

provider for VA, the Department is currently holding discussions to determine if the New Pay solution will be a suitable replacement for the Defense Civilian Pay System, DFAS's payroll system. As a part of those discussions, it is also considering the transfer of payroll support services from DFAS back to VA.

### ***Human Capital Business Reference Model Alignment***

HRIT, in conjunction with OIT's Account Management Office (AMO), is realigning VA's HR service delivery model to the core and non-core functions of the Office of Personnel Management's Human Capital Business Reference Model (HCBRM). The HCBRM is the federal authoritative model that incorporates all HR business mission areas, capabilities, service lines, and business functions.

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 across all VA Administrations; and increasing competition among potential shared service providers. The HCBRM alignment will result in an enterprise solution with institutionalized, standard practices and policies that are used by all Administrations within VA. FXXA IXXA IXXB IXXC

### ***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 IT (IRM) 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. IXXA IXXB IXXC

**Centralized Internship Program IT Solution**

HCSC will acquire and deploy an IT solution that streamlines current Department-wide internship programs. Implementation will improve program oversight, workforce planning, recruitment and retention metrics, and succession planning while improving customer service through customer relationship management tracking and customer and participant surveys.

**HR&A Voice of the Employee System**

Expanding VA’s current capabilities, the Voice of the Employee System (VOES) will allow for Department-wide, employee-centric data gathering, providing real-time engagement and advanced analytics. VOES will provide HR&A leadership with the ability to understand critical events along every employee journey, detect patterns, and capitalize on moments that matter. HR&A can leverage this capability across multiple HR initiatives to find new Department-wide insights and increase proactive communication with employees at critical times.

**Mentor and Coaching Management System**

The Mentor and Coaching Management System will be used to scale, standardize, and manage mentoring and coaching relationships throughout the Department. The system will also provide Department-wide reporting on mentor and coaching hours, allow for vetting of mentors and coaches, facilitate the matching process, and facilitate the development of mentors and coaches.

**VA Emergency Alerting and Accountability System**

VA Emergency and Alerting and Accountability System (EAAS) is a Federal Risk and Authorization Management Program (FedRAMP) certified SaaS notification system that enables reliable mass communication across a wide range of channels and devices. This ensures that every VA employee, contractor, and affiliate can be kept safe, informed, and connected during critical situations regardless of their location. VA EAAS provides VA the ability to:

- Send mass alerts to employees, contractors, and affiliates for events such as hurricanes, earthquakes, fires, and local emergencies.
- Reduce the risk of injury and loss of life by providing wider coverage and faster alerts.
- Capture the safety status of employees through the use of multiple devices (i.e., phones, cell phones, mobile app, SMS text, and email).
- Provide leadership with a full spectrum of employee accountability and safety reports.

The product roadmap includes integration with VA Core Data and Birthright applications, deployment of the desktop pop-up client enterprise wide, addition of the mobile application to all government furnished equipment (GFE) cellular devices, and migration of remaining redundant legacy notification systems to the VA EAAS platform.

**Future Environment**

To adequately support the Department’s 500,000+ personnel, HRIT will modernize VA’s HR systems in order to provide cost-effective, standardized, and interoperable HR solutions to support the strategic management of human capital. VA will develop HR data standards for efficient and reliable data exchange and leverage existing HR system capabilities to supply innovative core and non-core solutions between shared service resources. VA will implement a modern end-to-end system designed to enter HR data one time and move that data in concert with employees throughout the HR lifecycle.

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. Figure 86 in Appendix C depicts the future operational environment of VA’s HR and payroll.

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.

FXXA

See Figures 41 and 42 for the FY 2020–2026 milestones that the Human Capital Management Product Line will complete to achieve its future environment.



Figure 41: Human Capital Management Milestones (1/2)



## 4.4 SecVA/Congressional/Legal Affairs

### Current Environment

The SecVA/Congressional/Legal Affairs (SCLA) Product Line contains IT products to support the activities of the Office of the Secretary of VA, OGC, and the Office of Congressional and Legislative Affairs (OCLA). It also includes products to enable regulatory activities, such as matter intake and tracking under the Office of Accountability and Whistleblower Protection (OAWP). The Product Line currently consists of the following 14 products:

- FOIAXpress – A COTS product that automates the business process for FOIA requests.
- General Counsel Legal Automation Workload System (GCLAWS) – A legacy system that supports the activities of the VA's legal practice organization with case management tracking, correspondence control, and statistical analysis.
- Enterprise Risk Registry – A web-based enterprise risk registry system to track and manage enterprise risks.
- eDiscovery Clearwell – A legacy solution that allows OGC to preserve and produce electronic data as evidence in a civil or criminal legal case or in response to another information disclosure request.
- Events Management Analytics Platform – A system that assists the VHA Employee Education System – Events Division with updating required reports and forms to comply with congressional guidelines.
- Matter Tracking System – A Microsoft Dynamics 365 solution that integrates OAWP's business processes, providing required congressional reporting.
- Police Program Inspection Compliance – A COTS product that the Office of Security and Law Enforcement will use to enhance nationwide oversight of Police Service Program operations.
- Social Security Number Reduction – A tool that enables VA to identify Social Security

number usage within the Department in any media.

- Open Data Publishing – A modern SaaS publishing and engagement capability that will provide a single place for all customers to reach VA's Open Data.
- Case and Correspondence Management (CCM) – A Salesforce-based document and workflow case management system that integrates correspondence and case management functionalities into one system.
- GAO Module – A Salesforce-based document, meeting, and workflow management system used to manage VA's responses to GAO inquiries.
- White House VA Hotline – A Salesforce system that agents use in VA call centers to log issues and inquiries from Veterans and provide resolutions.
- Veteran Status Query and Response Exchange System (SQUARES) – A Salesforce system that enables service providers to retrieve reliable, detailed information about Veteran status and eligibility for homeless programs.
- VA Functional Organization Manual (FOM) System – A Salesforce system comprising VA's authoritative database for current organizational structure, missions, functions, and tasks.

Figure 87 in Appendix C provides an overview of SCLA systems and their interactions with systems in other Product Lines.

### Drivers

VA requires a reliable electronic discovery tool to comply with the Federal Rules of Civil Procedure (FRCP); the VA Accountability and Whistleblower Protection Act of 2017; and VA Directive 0500, Office of Accountability and Whistleblower Protection: Investigation of Whistleblower Disclosures and Allegations Involving Senior Leaders or Whistleblower Retaliation. VA Directive 0500 requires that OAWP has access to electronic communications (e.g., emails) and documentation for the purposes of conducting investigations and verifying implementation of OAWP

recommendations. The Department has determined that the tool it currently uses to support electronic discovery, eDiscovery Clearwell, is inadequate to meet the purposes for which the tool is needed, subjecting VA to extremely high risk of legal sanctions if it is unable to meet legal requirements related to electronic discovery. To remedy this situation, VA will implement a re-platformed eDiscovery solution that will meet requirements.

Further driving SCLA modernization, the Department requires a modern system to process and effectively respond to GAO inquiries; GAO performs evaluations, audits, investigations, and analyses at the request of congressional committees or subcommittees or where statutorily required by public laws or committee reports.<sup>2</sup> Drivers for the White House VA Hotline include expanded functionality to meet user requirements as well as the coronavirus pandemic. Due to its purpose as the main gateway for Veteran inquiries, the White House VA Hotline is under expansion to handle a significant increase in call volume during the coronavirus pandemic, and requirements connected to the national emergency may supplant other planned development.

## Transformative Initiatives

### *eDiscovery*

OGC and OAWP require an effective system to preserve, collect, process, review, analyze, and produce Electronically Stored Information (ESI). This system is required to respond to ESI requests to comply with court orders, to assure whistleblower protection, and to meet other information disclosure requests. The eDiscovery re-platform project will execute a technical refresh by replacing the current eDiscovery Clearwell tool with a solution that will be capable of holding more data, have better processing capabilities, and provide an easy-to-use user interface.

### *Government Accountability Office Module*

The U.S. Government Accountability Office (GAO) is an independent, nonpartisan agency that examines how taxpayer dollars are spent and provides Congress, the public, and federal agencies with

objective, reliable information to help the government save money and work more efficiently. VA's OCLA is the lead office with statutory responsibility for Department management and coordination of all matters involving Congress, including GAO inquiries.<sup>3</sup>

OCLA uses the GAO Module to process inquiries by determining the proper subject matter experts to provide information, obtaining the needed information, and then submitting the requested information in the form of a final report to GAO. OIT has developed primary functionality for the GAO Module, and the system is undergoing limited IOC production use and testing. OIT will continue to develop the remaining backlog of user requirements to reach full production deployment to OCLA and 15 designated program offices.

### *White House VA Hotline*

Veterans, their family members, and other concerned parties use the White House VA Hotline to request assistance with VA programs and benefits. The hotline is administered by VEO and is staffed by more than 300 agents who receive extensive training on VA programs and services. The White House VA Hotline case tracking system utilizes VA's Salesforce platform and provides end-to-end call management features, including case, complaint, and account management; role and team-based auto-assignment; and knowledgebase features. The system can handle a range of document attachments with cascading picklists and access to other time-saving functions, such as real-time case status, Service Level Agreement compliance, Email-to-Case, Web-to-Case, chat, and survey request capabilities.

VA is working to integrate the White House VA Hotline with the Master Person Index – Enhanced (MPI-e) for improved Veteran and person lookup and upgrade computer-telephony integration (CTI) for improved interactions between the hotline computer interface and telephony functions. The Department also conducts periodic quality assessments and evaluates case trends for opportunities to improve workflow and data quality issues, and otherwise empower VA employees to resolve Veterans' concerns quickly and efficiently.

<sup>2</sup> GAO-17-767G

<sup>3</sup> U.S.C. Title 38 Part I Chapter 3

For more information on the White House VA Hotline, refer to Section 1.2.

### ***Veteran Status Query and Response Exchange System***

In order to facilitate access to homeless services and related programs, the VA National Homeless Program Office administers the Veteran Status Query and Response Exchange System (SQUARES) to enable internal and external service providers to retrieve Veteran status, homeless program eligibility, and VHA enrollment status. Representatives can enter unique identifiers, such as the Veteran's name, date of birth, and Social Security number, to quickly obtain program status and eligibility information. VA staff, organizations receiving VA homeless program grant funding, Continuum of Care Programs, and community-based homeless services organizations use SQUARES.

OIT has developed a significant SQUARES enhancement on the Salesforce platform. In addition to VADIR, SQUARES 2.0 queries MPI-e and ES. It provides users with 1) identity traits of the matched individual(s) found in VA databases, which allow users to assess whether the match is accurate; 2) a nuanced Veteran status indicator that identifies key limits for homeless program eligibility; and 3) VHA eligibility. The application also allows 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. BXXB

### ***VA Functional Organization Manual System***

The Functional Organization Manual (FOM) System is VA's authoritative source for current organizational structure, department missions, functions, and tasks. The FOM System refers to the Salesforce database management application used to maintain organizational information ultimately provided by the FOM document. OEI maintains the FOM database using submissions prepared and approved by all VA Administrations and Staff Offices. The FOM is a core reference document for the Department to describe what gets done by whom, for whom, and under what authorities.

### **Future Environment**

The re-platformed eDiscovery solution will supply VA with the ability to provide data requested by Federal

courts, Congress, and others in a timely manner, thus drastically reducing the risk that VA is subject to serious legal sanctions, poor publicity, budget hold, or other adverse action. This will increase Veteran trust in VA services while assuring funds needed for Veteran services are not siphoned off due to costly legal sanctions.

OCLA and other necessary program offices will be able to utilize the GAO Module at FOC to ensure that the Department's responses to GAO inquiries are effective and timely. This will assist VA in maintaining transparency in how taxpayer dollars are spent and providing accurate information to GAO in its aim to help the government save money and work more efficiently. Additionally, the White House VA Hotline will be equipped with expanded capacities and capabilities so that agents can seamlessly assist customers with VA programs and services. Furthermore, Veterans will be able to more easily access homeless services and programs, as internal and external service providers are able to quickly access reliable data on Veteran status, homeless program eligibility, and VHA eligibility via SQUARES. BXXB

See Figures 43 and 44 for the FY 2020–2026 milestones that the SCLA Product Line will complete to achieve its future environment.

 <b>SECVA/CONGRESSIONAL/LEGAL AFFAIRS MILESTONES*</b> FY 2020 - FY 2026 ( 1 / 2 )			 Funded  Unfunded / Pre-decisional	* Timelines may shift due to changes in resources and priorities
FY 2020	FY 2021	FY 2022		
 Q1: Deploy FOM minimum viable product	 Q2: Complete acquisition of eDiscovery	 Q2: Deploy IOC of re-platformed eDiscovery solution		
 Q1: Deploy GAO Module minimum viable product		 Q4: Complete deployment of re-platformed eDiscovery solution		
 Q1: Deploy updated knowledge base functionality within SQUARES 2.0				
 Q2: Complete eDiscovery Analysis of Alternatives				
 Q2: Deploy updated FOM training materials				
 Q2: Decommission SQUARES 1.0				
 Q2: Complete White House VA Hotline (WHHL) and PATS-R integration				
 Q2: Deploy GAO Module – FOC				
 Q3: Deploy custom code enhancements within FOM				
 Q3: Deploy help desk case setup and routing function within SQUARES 2.0				
 Q3: Complete WHHL and MPI-e integration				
 Q3: Complete WHHL and CTI integration				
 Q4: Complete planning for eDiscovery re-platforming				

Figure 43: SecVA/Congressional/Legal Affairs Milestones (1/2)



## 5. TECHNOLOGY AND PLATFORM SERVICES PORTFOLIO

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

- 5.1 IT Infrastructure Operations and Services
- 5.2 Cybersecurity and Access Control Services
- 5.3 Trusted Information Sharing
- 5.4 Platform Management

### 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 Department must modernize legacy infrastructure and leverage Cloud technologies to alleviate technical debt, enable interoperability, and ultimately improve customer service and delivery of care. FITARA, the Data Center Optimization Initiative (DCOI), and the federal Cloud computing policy guide VA in areas of this effort. Additionally, VA's Enterprise Cybersecurity Strategy (ECSS), findings from GAO and OIG, and federal and VA data security standards direct the Department in safeguarding its infrastructure, systems, and data. The PMA and the MISSION Act also drive modernization within the Technology and Platform Services Portfolio. EXXA

### Transformative Initiatives

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

- Networkx Transition Project
- Data Center Consolidation Initiative (DCCI)
- .gov Cybersecurity Architecture Review (.govCAR) Program
- Identity and Access Management (IAM)
- Veterans Data Integration and Federation Enterprise Platform (VDIF-EP)
- Lighthouse: VA's API Management Platform
- Hosting and Provisioning (Integrated Architecture Multi-Cloud Strategies)
- VA Enterprise Cloud (VAEC)

### Future Environment

The Technology and Platform Services Portfolio will supply efficient and modern telecommunications and infrastructure technologies that are capable of integrating with newly adopted solutions, and VA will achieve highly reliable and available infrastructure to develop and host Cloud services and applications across the Department. Data standardization and synchronization will enable seamless information sharing and reuse for collaboration and research. Additionally, the Department will continue to evolve its Enterprise Cybersecurity Program (ECSP) to protect Veteran information and VA data, systems, and infrastructure as well as maintain a cyberspace ecosystem that is resilient to threats. VA will also aggressively implement APIs, PLM, and DevSecOps to drive digital transformation. HXXA

## 5.1 IT Infrastructure Operations and Services

### Current Environment

The cost of enhancing and maintaining VA's operational systems hosted on large and complex on-premise infrastructure is growing at a rate one would expect of the largest health care system in the U.S. and one of the largest in the world. Current sustainment, operations, and maintenance costs comprise more than 80% of VA's IT spend and are increasing, but congressional appropriations are not keeping pace. Consequently, there is insufficient funding for new investment in development and modernization. This underfunding forces VA leadership to make choices. Prioritization of expenditures at times generates uncommonly high return on investment but unfortunately leaves portions of the infrastructure close to or past manufacturer end-of-sale dates and in some cases past the manufacturer's recommended end-of-life. Older desktops and laptops and exponential storage growth contribute to an unbalanced state of technical debt. VA requires proper funding, which will allow infrastructure elasticity and lead to advancement of new capabilities and innovative technologies.

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 SaaS solutions and conducting technical refreshes of network devices across all VA Service Areas as a result of integrating new solutions into enterprise operations.

VA values FITARA; DCOI; and the federal Cloud computing strategy, Cloud Smart, as the framework needed to ensure IT resources are properly aligned with agency missions and related programs. In addition to the acquisition of large-scale Cloud Services, VA has several types of physical data centers that have evolved over the years, based on mission requirements: Core Data Centers, Campus

Support Centers, Mission Support Centers, and Network Support Centers.

By utilizing DCOI to inform VA's DCCI efforts, VA is significantly reducing the number of physical data centers through consolidation or through migration to the Cloud, positioning VA to eliminate or repurpose the rooms for other mission services. The DCCI effort under VA's Infrastructure Operations (IO) is improving progress in data center closures through implementation of continuous improvements in the consolidation process and VA's expanded Cloud capabilities. Simultaneously, by utilizing the Cloud Smart policy to inform the Department's Virtualization First efforts and Cloud Strategy, VA is significantly reducing the number of physical servers in the remaining data centers, positioning VA to eliminate legacy hardware. The effort to migrate applications to VAEC is well underway; VA's Enterprise Cloud Solutions Office (ECSO) has moved beyond IOC and is moving applications to the off-premise Cloud. HXXA

### Drivers

As the integrated framework upon which its digital services operate, IT infrastructure is critical to VA's foundation. As VA aggressively integrates new solutions and services into enterprise operations, such as EHRM, it is also enhancing and modernizing its infrastructure to meet architecture, design, and operational standards to support additional resource requirements. Modernization of VA's IT systems is important to security, cost, and mission. However, due to insufficient funding, technical debt inhibits the Department's ability to optimize and transform at the pace one would expect of such a large healthcare system. 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. 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.

Additionally, as part of an ongoing effort to consolidate and optimize agencies' data centers, in June 2019, OMB released Memorandum M-19-19 extending DCOI through the end of FY 2020 and established an updated DCOI policy. In December 2019, the National Defense Authorization Act

(NDAA) included the extension of FITARA through the end of FY 2022; the related update to the DCOI memo is still pending. M-19-19 shifts agencies' focus toward consolidating "general compute" data centers—those that host business applications that are largely hardware-agnostic—rather than special purpose data centers. OMB recommends these as key targets for application rationalization. The new policy also revised the optimization performance metrics to yield better transparency into how effectively or efficiently an agency is running data centers and whether the agency is improving over time.

In addition to technical debt, new IT systems (e.g., the Cerner EHR) and bandwidth needs (e.g., expansion for telehealth) are driving infrastructure upgrades. Furthermore, in response to the coronavirus pandemic, the Department has requested additional funding to support increased use of simultaneous telehealth appointments, which includes 180,000 devices for telework and telehealth, as well as upgrade associated bandwidth for employees and health care providers. HXXA

## Transformative Initiatives

### *Networkx Transition*

To implement the services model, VA requires timely transition of its 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. 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. 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.

With the contracts expiring in 2023, this transition provides a flexible platform to support agency migrations to modern telecommunications and IT service offerings. 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.

As VA accomplishes its main computing architecture objectives (Implement Enterprise Cloud Services, Network Modernization and Convergence, Unified Communications, Contact Center Modernization, and Data Center Consolidation and Hosting), VA architecture will become readily capable of leveraging managed services through Networkx Transition, allowing the Department to reduce and control costs, increase efficiency and competitiveness, and provide scalability. VA will then be able to discontinue legacy telecommunications services at any time as modernized or managed services are funded and available to replace them. This effort supports VA's transformational vision to transition from a capital expenditure model to an operating expenditure model. Implementing managed service enterprise telecommunications and infrastructure technology solutions through Networkx Transition will expedite modernized infrastructure, provide greater scalability, reduce service and technical debt, shift compliance burden, and improve IT service delivery to facilitate VA's ability to focus on creating an experience that leads Veterans to choose VA.

### *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. Therefore, VA is developing an enterprise-wide telephony solution that will modernize telephony technology and set consistent standards across the Department. This will 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 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.

Currently, 45% of VAMCs and remote sites have already modernized with Cisco Voice over Internet Protocol and are poised to take advantage of the fully unified communications technology stack. An additional 6% will complete modernization projects in 2020. Further, VA is focusing on upgrading the remaining 83 VAMCs as well as VBA and NCA sites, with a DevSecOps 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 as well as best practices from both public and commercial industry.

#### ***NCA Infrastructure Modernization***

VA is embarking on a multi-year initiative to upgrade NCA's legacy infrastructure, such as telephony, telecommunications, and Wi-Fi, at over 100 VA national cemeteries for connectivity between staff, applications, systems, and process to execute the vital NCA mission. VA deployed 500 iPads to enable Global Position System (GPS) and GIS data for graveside, and marker tracking, in addition to electronic workflow management. VA is implementing Wi-Fi at NCA administrative buildings to support the recently fielded iPads and is piloting security camera monitoring at national cemeteries to determine enterprise feasibility. For more information regarding NCA infrastructure modernization, refer to Section 3.7.

#### ***Enterprise Service Desk Managed Service Provider***

The Enterprise Service Desk provides around-the-clock technical support to all end users of VA technology. Shifting to a managed service approach for the Enterprise Service Desk, a managed service provider (MSP) will serve as the single point of contact for 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.

#### ***Server and Storage Farm***

OIT has focused on utilizing IaaS, SaaS, and 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.

#### ***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 has completed its transition from on-premise email for mobile devices to Cloud-hosted (Office 365) 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 capitably 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 an FY 2020 pilot for an agile Device as a Service vehicle to provide laptops to contractors in a full managed services model. Additionally, the Department has awarded an end user device contract for FY 2020 that provides additional services (including imaging and integration with the IT Service Management [ITSM] Tool) to allow IT Operations and Services (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.

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.

### ***WAN Infrastructure Modernization***

The WAN Infrastructure Modernization Project is an enterprise-level project to modernize bandwidth capacity and flatten the WAN. VA is realizing bandwidth modernization through deployment of Metro Ethernet based Multi-Protocol Label Switching (MPLS) replacing legacy time-division multiplexing (TDM) circuits. The new modernized circuits allow the Department to meet growth and demand in an expedient manner, reducing time to deliver from 120 days to 30 days or less. The Enterprise WAN Migration Project delivers the VA Enterprise WAN flattening initiative. This results in every VA site being a single hop away from all other sites, greatly decreasing latency and increasing enterprise resiliency.

### ***Wi-Fi Infrastructure Modernization***

The 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 on 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 [LAN] systems) and video applications (e.g., telehealth, multicast streams, and point-to-point video conference). Location-based services coverage is a design intended to support radio-frequency identification 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.

### ***Data Center Consolidation Initiative***

VA’s Data Center Consolidation Initiative (DCCI) includes identifying the services, tools, applications, and systems that are hosted in a data center and coordinating with their respective owners to transition them to the Cloud (as the first option) or consolidate them (as the second option) wherever possible.

Coordination between VA organizations and services is vital when migrating mission-critical systems to ensure delivery of the related services is not interrupted. 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.

Because DCCI and VAEC are two complementary and collaborative initiatives but are not dependent on one another, ECSO and the on-premise operations subdivision within IO are engaged in collaboration to support DCOI objectives and identify Cloud migration candidates. VAEC provides a destination for VA applications that are migrating from legacy VA data centers. As more applications migrate to the Cloud, fewer resources (e.g., power, space, and cooling) are necessary at VA data centers. Consequently, this allows for more data center consolidations and closings. As a result, ECSO and on-premise operations actively collaborate to identify opportunities suited for both efforts.

As ECSO and on-premise operations are closely correlated, ECSO’s pre-production and production schedule inform data center consolidation center

schedules. Furthermore, possible migration candidates are identified based on data center consolidation plans and added to the VAEC wave plans. ECSO and on-premise operations also collaborate to identify co-dependencies for data center consolidation and application migration candidates. Importantly, there will be a coordinated effort to ensure DCOI-related metrics are aligned and progress is tracked against outlined plans.

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 as it relates to the migration of the systems.
- Recommend and execute transformative data center consolidations to enhance operational efficiency.
- Align physical data center facility operations with OIT organizational mission functions.
- Provide appropriate process and information management interfaces.
- Synchronize migration of systems, platforms, and applications to VAEC or SaaS with DCOI to better manage data centers and infrastructure targeted for decommissioning. HXXA

## 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 TBM implementation (For more information regarding TBM, refer to Section 7.2.). Figure 88 in Appendix C 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 such as VAEC,

WAN/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.

OIT will transition from a capital expenditure model, which is government-owned and operated, to an operating expenditure model, which is currently provided by government Cloud service providers (CSPs) certified at the FedRAMP High level within the overarching VAEC environments, SaaS, IaaS, and Anything as a Service. An operating expenditure model will expedite modernized infrastructure, provide greater scalability, reduce service and technical debt, and improve IT service delivery. The Anything as a Service model, specifically, offers a path to reduced costs and streamlined workflows.

However, the transition to an operating expenditure model is not without risks. VA must maintain the institutional knowledge and drive to support the business in an innovative and agile manner through DevSecOps methodologies. Architecture and Engineering will be critical to the long-term success of any operating expenditure initiatives.

Furthermore, VA's fully deployed hybrid Cloud environment, referred to as VA's Cloud Ecosystem, will evolve over time to increase efficiency and dynamics 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. This includes reducing VA-owned data centers and the cost of sustaining on-premise infrastructure. 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. HXXA

See Figures 45 and 46 for the FY 2020–2026 milestones that the IT Infrastructure Operations and Services Product Line will complete to achieve its future environment.





## 5.2 Cybersecurity and Access Control Services

### Current Environment

VA's Office of Information Security (OIS) performs a critical purpose, including serving as an effective steward of Veteran and VA data, safeguarding VA's information systems, and protecting Department infrastructure from continuously evolving cybersecurity threats. In support of this purpose, OIS established the Enterprise Cybersecurity Program (ECSP) under the authority of an official memorandum issued by the VA Chief Information Security Officer that authorized ECSP as the Department's sanctioned program to manage VA's cybersecurity activities and projects and achieve strategic information security goals.<sup>4</sup>

ECSP enables VA to make effective cyber risk-based decisions by establishing a governance structure that combines OIT leadership and other stakeholders who are both internal and external to VA. This allows leadership and stakeholders to communicate across various security areas and other business processes, including strategic planning, capital planning, and investment control, and fulfill the 2020 OIS strategic goals. Under the VA ECSP, the Department is monitoring remediation efforts and compensating controls to address Material Weakness #4 in the FY 2019 Agency Financial Report (Information Technology Security Controls) through cybersecurity project prioritization, planning, and execution.

Regarding Access Control Services, the Office of Identity, Credential, and Access Management builds the business requirements—as well as VA's Identity, Credential, and Access Management Strategic Plan and Technology Solutions Roadmap—for establishment of enterprise solutions to: manage the identity lifecycle, manage the onboarding and offboarding of VA users to the VA network, and support logical/physical access in coordination with OIT's development, implementation, and operation of Identity and Access Management (IAM) systems and services. IAM provides enterprise-level identity and easy access for all VA persons of interest to the appropriate systems, supporting each at the

appropriate levels across the enterprise and providing multiple credentialing choices. EXXA GXXB

### Drivers

The Enterprise Cybersecurity Strategy (ECSS), which was updated in 2020, sets the direction of ECSP for forward-looking cybersecurity risk-based decision making to protect Veterans' information. ECSP aligns itself to the ECSS to drive forward business efforts, modernization initiatives, and policy changes for Department cybersecurity. VA requires a well-communicated cybersecurity strategy such as the ECSS given the size and complexity of the organization's cybersecurity environment. The ECSS is executed in close collaboration with key business stakeholders both within and outside of VA (i.e., with GAO and OIG). ECSP uses metrics derived from the ECSS, findings from GAO reports, and OIG audits to prioritize the activities of the ECSP Cybersecurity Projects. The ECSP activities are therefore aligned with VA's strategic cybersecurity goals and are selected to mitigate challenges identified by GAO and OIG.

Additionally, the centralized, enterprise-wide identity and access management provided by IAM eliminates previously duplicative efforts created and maintained by dozens of stove-piped LoB systems and enables the VA LoBs to focus on providing services and benefits to Veterans and other VA customers. Enterprise-level management of these services provides more consistent and increased data quality, as well as high availability, and ensures compliance with federal and VA data security standards, including: National Institute of Standards and Technology (NIST) Special Publications 800–53 and SP 800–63; the Homeland Security Presidential Directive 12 (HSPD-12); OMB M-19-17 and Directive 14-03; the Federal Identity, Credential, and Access Management Roadmap and Guidelines; and the VA/DoD Joint Strategic Plan. EXXA GXXB

### Transformative Initiatives

#### *Data Loss Prevention Program*

The establishment of an end-to-end Data Loss Prevention (DLP) Program provides the governance

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<sup>4</sup> The memorandum was signed and officially released in April 2018.

and oversight necessary to guide the implementation, operation, and sustainment of DLP technologies within VA. The DLP solution is designed to 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.

#### ***.gov Cybersecurity Architecture Review Program***

The .gov Cybersecurity Architecture Review (.govCAR) Program is a threat-based cybersecurity assessment, based on the DHS assessment methodology, that provides insight into current enterprise capabilities and assists VA in making threat-driven decisions. .govCAR is part of DHS's ongoing initiative to modernize agencies, like VA, to identify gaps, weaknesses, and redundancies in its threat coverage by analyzing security capabilities through an adversarial lens. The data and findings developed from the program provide VA leadership with insights into potential innovation enhancements that assist in modernizing and evolving the Department's current cybersecurity capabilities and ultimately augment its overall cybersecurity posture. OIS inputs .govCAR findings into ECSP to drive threat-based enhancement of VA's cybersecurity capabilities. [EXXA EXXB GXXB]

#### ***Information Security Continuous Monitoring/Continuous Diagnostics and Mitigation***

The Information Security Continuous Monitoring (ISCM)/Continuous Diagnostics and Mitigation (CDM) project intends to establish an ISCM program that integrates VA's continuous monitoring tools, capabilities, and stakeholders and acquires new tools to enhance visibility into VA's networks and assets. The project also implements the CDM program, which provides capabilities and tools to continuously identify cybersecurity risks, use impact values to prioritize risks, and enable OIT to mitigate problems in a sequential and prioritized manner. ISCM/CDM results in increased visibility into VA's cybersecurity posture by identifying assets on VA's network, monitoring user activity, and viewing network traffic to protect against potentially malicious activity. [EXXA EXXB GXXB]

#### ***Enterprise Mission Assurance Support Service Program***

The Enterprise Mission Assurance Support Service (eMASS) Program implements eMASS as VA's

Governance, Risk, and Compliance (GRC) tool to provide oversight of information system security. The eMASS Program supports VA's modernization and automation of processes through dashboard reporting, workflow automation, and continuous monitoring supporting the Risk Management Framework for Assessment and Authorization. The eMASS Program also improves network visibility and increases identification of cyber risks while improving accountability so that VA leadership can mitigate risks affecting VA's mission and business objectives.

#### ***Cyber Workforce Program***

The Cyber Workforce Program maintains an agile and effective cyber workforce in order to meet the Department's strategy and cyber priorities. The Cyber Workforce Program will establish a centralized process of assessing and reporting key data concerning the cyber workforce. This information includes cyber roles, skill sets, development areas, and workforce gaps. VA has invested in preliminary assessments of the current cyber workforce. The Department has also determined next steps to remain compliant with federal requirements and allow VA to modernize and stay on the cutting edge of a dynamic industry.

#### ***Identity and Access Management***

Enterprise Identity and 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.

The program's combined set of capabilities works together throughout the IAM lifecycle from granting to removing authorized access for integrated applications. IAM services uniquely identify persons of interest; facilitate data sharing between VA LoBs and external partners; streamline granting and removing electronic permissions to access VA technology systems, resources, and data and ensure that only authorized users are granted access; provide role-based/attribute-based and Single Sign-On access; allow beneficiaries to use electronic or digital signatures; and allow Veterans to receive a VA credential without having to appear at a VA facility.

To improve the reliability of services and reduce operation and maintenance cost, IAM has migrated to VAEC and supports consuming application migration through integrations and enumerations. VA will enhance IAM with capabilities related to onboarding and off-boarding, required MISSION Act support, and Single Sign-On. It will also integrate identity, provisioning, and authentication services across the enterprise and extranet boundaries.

### Future Environment

ECSP's robust governance framework and processes support VA's incorporation of future technology and emerging requirements, fulfillment of strategic goals, and mitigation of future cybersecurity challenges. ECSP provides the structure for cybersecurity projects to implement innovative solutions to automate workflows, augment cybersecurity posture, and streamline processes. Additionally, the program has an established framework that facilitates governance bodies, such as the Information Security Committee and the Standards and Architecture Council. These governance bodies develop the necessary decisions, standards, and policies to oversee the current and future environments of VA's technologies and solutions. The Information Security Committee, Standards and Architecture Council, and other governance bodies work closely with ECSP to find challenges in meeting strategic goals and highlighting potential gaps. These various components of ECSP drive VA towards its target future environment by continuing to mature VA's cybersecurity posture, cybersecurity intelligence capabilities, and cybersecurity culture.

ECSP's implementation plans refer to the detailed actions required to fully address the material weakness findings. These actions are contained within 35 individual plans of action tailored to meet each of the specific OIG findings. All plans are part of the larger VA ECSP implementation plan designed to address the five distinct goals critical to evolving and maturing the overall VA cyber environment to achieve Federal CIO priorities.

In addition, IAM will continue to evolve and integrate with the organizations and systems with which VA interacts, such as DoD, to ensure that all VA persons of interest and system users are seamlessly and accurately managed. To augment IAM services, VA will implement a robust Identity Governance and Administration (IGA) solution to

manage digital identity and access rights across multiple systems. The IGA solution will act as a centralized repository to manage the complete lifecycle of user access, including both coarse-grained and fine-grained authorization—from initial request, approval, and provision of access to timely removal of access based on termination, transfer, access review, or role change. This solution will enable implementation of role-based access control through role mining, role creation, and enterprise provisioning. Figure 89 in Appendix C depicts the conceptual future environment of the IGA solution.

See Figures 47 and 48 for the FY 2020–2026 milestones that the Cybersecurity and Access Control Services Product Line will complete to achieve its future environment. EXXA EXXB GXXB

 <b>CYBERSECURITY &amp; ACCESS CONTROL MILESTONES*</b> FY 2020 - FY 2026 ( 1 / 2 )			
FY 2020		FY 2021	
✓	Q2: Deploy Employee Onboarding enhancements to IAM	➤	Q1: Deploy EHRM/Cerner integrations with IAM – IOC
✓	Q2: Integrate SSOi and SSOe login/ log-in functionality within Cerner EHR – EHRM IOC	➤	Q2: Deploy EHRM/Cerner account provisioning/de-provisioning in IAM – Wave A
✓	Q2: Integrate IAM file-based provisioning capability to add and update Cerner users	➤	Q3: Integrate IAM with iFAMS with VBA & NCA
✓	Q2: Add the National Provider Identifier as a IAM data element to the user record to support EHRM	➤	Q3: Deploy functionality to store, update, and view person sensitivity levels in IAM
✓	Q2: Integrate Identity Services that enable EHRM to add patients to Cerner and provide the corresponding person identifiers of non-Cerner systems for use in patient care	➤	Q3: Integrate IAM provisioning with VBA Common Security Services
✓	Q2: Deploy Caregiver ID capability in IAM in support of the MISSION and Patronage Acts	➤	Q3: Deploy EHRM/Cerner account provisioning/de-provisioning in IAM – Wave B
✓	Q2: Integrate SSOe with VA.gov	➤	Q4: Deploy Electronic Verification of Vital Events (EVVE) subscription in IAM
✓	Q2: Integrate two-factor authentication with legacy VBA applications	➤	Q4: Deploy MVI TK proofing process to support Identity Trait changes
✓	Q2: Deploy functionality to store, update, and view all person types in IAM	➤	Q4: Deploy EHRM/Cerner account provisioning/de-provisioning in IAM – Wave C and D
✓	Q3: Integrate Login.gov as a credential service provider in IAM		
✓	Q3: Deploy self-service password reset capability in IAM		
✓	Q3: Deploy MVI Toolkit (TK) enhancements to resolve VA person types		
✓	Q4: Integrate IAM with iFAMS with VHA		
✓	Q4: Deploy SSO enhancements to support the Digital Veteran Platform and Health Share Enterprise Platform		
✓	Q4: Deploy Access Services integration with Splunk		
			Q1: Deploy enhancements to support MVI as authoritative source of demographic data
			Q1: Deploy EHRM/Cerner integrations with IAM – Wave E
			Q1: Integrate IAM with the Physical Access Control System (ePACS)
			Q1: Deploy capability for IAM MVI to be the single authoritative source for Social Security number verification with SSA
			Q2: Deploy MVI messaging infrastructure to support new HL7 FHIR standard
			Q2: Deploy MVI TK enhancements to resolve VA person types
			Q2: Deploy EHRM/Cerner integrations with IAM – Wave F
			Q3: Upgrade MVI matching algorithm
			Q3: Deploy EHRM/Cerner integrations with IAM – Wave G
			Q4: Deploy EHRM/Cerner integrations with IAM – Wave H
			Q4: Deploy EVVE subscription enhancements
			Q4: Deploy non-person entity (service to service) enterprise authentication services

\* Timelines may shift due to changes in resources and priorities

✓ Funded  
 ➤ Unfunded / Pre-decisional

Figure 47: Cybersecurity and Access Control Milestones (1/2)

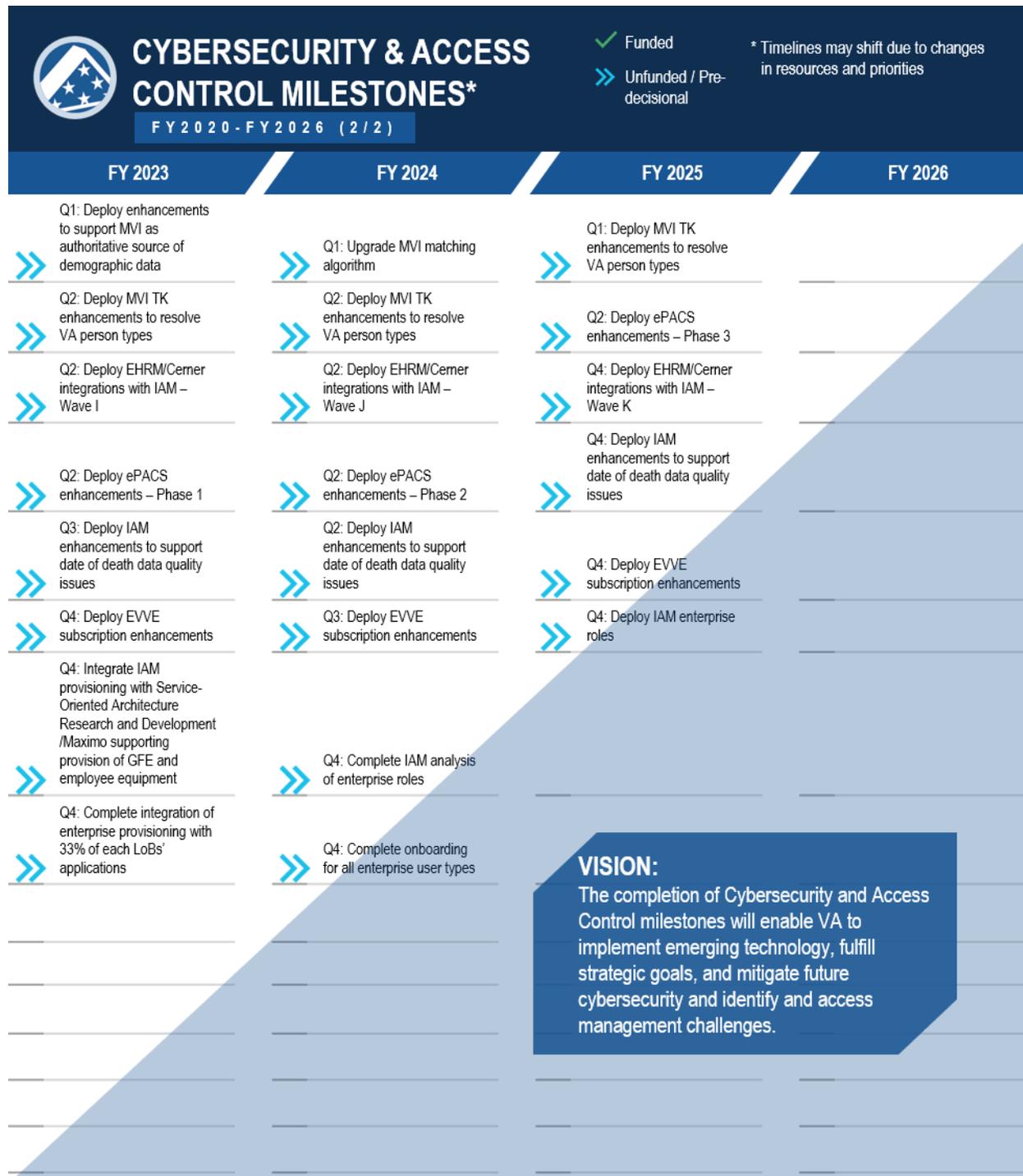


Figure 48: Cybersecurity and Access Control Milestones (2/2)

## 5.3 Trusted Information Sharing

### Current Environment

Trusted Information Sharing provides VA with an essential capability to establish data interoperability and integration as it pursues modernization. Trusted Information Sharing includes business process management, master data management, API management, ADSs, and future integration components. Since the establishment of the Department, VA has experienced challenges in achieving interoperability. Disparate modernization initiatives and lack of a stable enterprise interoperability strategy have led to non-standard user interfaces, data exchanges, and performance monitoring as well as security challenges. VA collects and stores information from multiple channels, LoBs, systems, and applications. Due to the numerous sources of information, the Department has faced significant challenges in establishing 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 and Joint Legacy Viewer have improved VA's interoperability capabilities. Supporting MISSION Act and EHRM, the Veterans Health Information Exchange is currently modernizing information systems and incorporating new policies for information sharing. The Joint Legacy Viewer 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 FEHRM 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. This transformation has now begun with 1) the recent production launches of Apple and Humetrix for Veteran health history access, 2) nearly every major software vendor supporting VSOs in the effort to help Veterans

submit benefits claims, and 3) DST and VAOS supporting the MISSION Act. In total, Lighthouse now has 26 applications consuming APIs in production. BXXB

### Drivers

Health care data interoperability plays a key role in all four of VA's 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 health care 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 health care, 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.

Furthermore, legislative and regulatory actions have addressed the need to improve interoperability and increase health data sharing. The 21st Century Cures Act aims to achieve improved interoperability; the Office of the National Coordinator for Health Information Technology (ONC) and CMS have outlined their approach to information blocking, APIs, and FHIR standards for interoperability; and ONC's draft Trusted Exchange Framework and Common Agreement rule intends to establish baseline technical and legal requirements for sharing electronic health information nationwide across disparate networks.

### Transformative Initiatives

#### ***Veterans Data Integration and Federation Enterprise Platform***

The Veterans Data Integration and Federation Enterprise Platform (VDIF-EP), formerly HealthShare Enterprise Platform, is a standards-based, health care IT integration and interoperability platform. The COTS product is a single, common middleware platform to service and enable VistA and includes the ability to read, write, and share VistA data. VDIF-

EP is VA's HealthShare Enterprise solution and includes both HealthShare and Health Connect components for the enterprise. The Department has established VDIF-EP to federate VA patient data, support the migration of patient data from VistA to the Cerner EHR, and facilitate HIE within VA and with external partners.

VDIF-EP 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. The solution 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 the Vitria Interface Engine with VDIF-EP, migrating 13 Vitria Interface Engine applications to the new enterprise middleware platform. VDIF-EP will provide the entire enterprise with secure, governed access to Cerner EHR data and VistA legacy data and help VA meet MISSION Act Section 132 requirements. Figure 90 in Appendix C highlights the current environment, transitional environment, and future environment of HIE between DoD and VA.

#### ***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.

#### ***Lighthouse: VA's API Management Platform***

VA is committed to leveraging APIs to accelerate the creation of transformational digital tools that support Veterans as they engage with VA. Accordingly, the Department has established Lighthouse, its API Management Platform that employs an open-source API gateway platform on a private VA Cloud. Lighthouse connects data from many sources and enables both internal and third-party developers to build better patient experiences for Veterans and their families. Since establishing Lighthouse, VA has launched Benefits, Facilities,

Health, MISSION Act, and Veteran Verification APIs. These APIs are facilitating benefits claims submissions, facility inquiries (e.g., available services and appointment wait times), secure transfer of Veterans' health data, determination of Veterans' MISSION Act eligibility for both urgent and community care, and electronic verification of Veteran status. Lighthouse will also be launching LGY and Appeals APIs to enable Veterans to receive assistance on home loans and benefits appeals in a timelier fashion. In addition, USAJobs.gov will be moving to production for the Veteran Verification API.

VA's Health API conforms to the Argonaut FHIR API standards and will enable Veterans to interact with their personal health data within innovative mobile and web-based applications. For example, new capabilities through the Health API allow Veterans to access an aggregated view of their VA and non-VA health data through the Health app on Apple iPhones. As shown in Figure 91 in Appendix C, the Department will ultimately use its Health APIs to establish an innovation ecosystem that will improve its ability to exchange data internally and externally with business partners and foster innovation.

Additionally, VA is advancing its API strategy by treating APIs as products and employing Cloud-native technologies, agile development, and a DevSecOps release process. It will leverage Lighthouse APIs to access ADSs to accelerate delivery of VA products, build new applications, and provide the same source of truth to VA and Veterans. VA's future API architecture, shown in Figure 92 in Appendix C, 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.

**BXXB**

#### **Future Environment**

VA will establish a Trusted Information Sharing 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 VA Profile, HealthShare, and Lighthouse, is crucial to ensuring that compatibility and integration is possible. Therefore, as VA Profile integrates different data

types from data sources, the Department will develop links and interfaces to connect the interoperability platforms. Additionally, VDIF-EP 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 health care research as well as 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. Once fully implemented, it will allow critical health data to flow securely between patients and their health care 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. To accomplish this, Lighthouse will make every online transaction and service delivered by VA available as a public and documented API that is fully accessible by third parties. Third-party developers will be able to rapidly innovate and contribute to VA functions by developing innovative solutions, allowing VA to make changes to its underlying systems, retire legacy databases, and make necessary upgrades without disrupting the user experience.

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 health care 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. Lastly, APIs will enable MISSION Act use cases, such as helping Veterans assess their eligibility and receive community care efficiently. BXXB

See Figures 49 and 50 for the FY 2020–2026 milestones that the Trusted Information Sharing Product Line will complete to achieve its future environment.





## 5.4 Platform Management

### Current Environment

The objective of the Platform Management Product Line is to provide VA Portfolios with a service catalog of items that will enable DevSecOps by creating enterprise platform services. A platform service is based on platform technologies, which are systems build upon a platform architecture that distributes the system out into different levels of abstraction. This is done to differentiate between core platform functions and the application layer that sits on top of and uses underlying common services. Enterprise platform management services are currently a decentralized paradox within VA, as there are various solutions throughout the Portfolios and Product Lines. There are several hosting and provisioning methodologies, numerous SharePoint farms, and several instances of CRM solutions within VA.

The current environment of VA's IT enterprise is a significant factor in the need to migrate to the Cloud as part of enterprise platform services. 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 as well as ECSO as key enablers of the overall VA Cloud Strategy. 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 2019, VA saw numerous accomplishments that contribute to achieving its strategic goals and objectives, including:

- Enabling the closure of the external IBM/Terremark data center in Culpeper though

migrating applications to VAEC, saving VA over \$50 million annually.

- Migrating very large, mission-critical applications, such as VBMS.
- Supporting over 60 operational applications systems in production environments, with over 100 more in the development queue.
- Completing the migration of the first example of a VistA instance to operate in a Cloud environment, showing this key VA system can take advantage of Cloud computing.
- Acquiring a strong set of VAEC Operational Tools for use by ECSO operations and VA applications teams.
- Successfully passing an OIG security audit, proving the ability of VA Cloud computing to protect mission-critical information.

### Drivers

To support VA modernization efforts, enterprise platform management services are a critical element that will enable the VA Portfolios to align with the VA EA Vision and Strategy and support DevSecOps. Platform Management Product Line goals continue to support VA Strategic Goal #4 through IT infrastructure modernization by leveraging Cloud technologies, IaaS, and PaaS. These objectives address challenges to rapidly delivering enterprise IT solutions to customers in response to changing business requirements.

Furthermore, 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 the government to the Cloud and bringing the Cloud to the government. 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 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. Other Cloud First directives include the following memorandums: *Use of VAEC to Host Applications*; *Use of SaaS, Managed Service and Cloud-based Native Technologies and Approaches*; and *Use of VAEC for New Development*. HXXA

## Transformative Initiatives

### ***Hosting and Provisioning (Integrated Architecture Multi-Cloud Strategies)***

Hosting and Provisioning is implementing a VA Enterprise Container Solution. The solution is a PaaS product that enables development teams to accelerate development, deploy software efficiently, and operate in a scalable manner. Containerization decouples applications, allowing each component to perform its task independently and providing the ability to deploy with zero downtime. It also provides a one-stop location for end-to-end enterprise solutions to support the application and hosting modernization. The focus is on providing a common enterprise turn-key platform as a service solution whereby development and operations teams work collaboratively to conduct application assessments supporting the refactor and replatform of traditional applications. The solution smartly uses infrastructure resources to support containerization of traditional applications; deliver and support infrastructure as code, CI/CD, a common operations picture, zero-downtime deployments, and patching; and obtain real-time cost versus budget.

These container platform services consist of operations management and application management. Operations management provides cluster management, event management, infrastructure management, applications management, and cost analysis. Application management provides developer and DevSecOps tooling, modernization tooling, and enterprise framework and runtime services. All container platform services are encompassed in a Cloud-agnostic construct to service multi-Cloud performs and management. The VA Enterprise Container Solution is constantly moving towards the advancement of the IO organization and the maturity of the VA Platform Concept of Operations (ConOps) vision by planning and collaborating on modernization strategy and services and analyzing

application modernization, cost models, and ServiceNow catalog offerings.

### ***Repositories (GitHub)***

VA currently has a need for a single source, enterprise-level code repository. An enterprise code repository aggregates code and provides the ability to collaborate and reuse code across VA. Rational, an IBM COTS product, previously provided the capabilities for a code repository but has reached the end of its lifecycle. Therefore, VA is implementing GitHub, a SaaS solution, as the source code repository to replace this portion of the Rational product.

### ***CRM (Microsoft Dynamics)***

Microsoft Dynamics 365 CRM for Government is a multi-tenant architecture made up of traditional web application and SQL database servers deployed across two Azure for Government data centers for business continuity. The Microsoft Dynamics SaaS architecture primarily allows VA call center employees to closely interact and manage interactions with customers and Veterans. CRM customers access back-end on-premise systems via API integration hub and routing capabilities. Figure 94 in Appendix C depicts VA’s Microsoft Dynamics 365 CRM architecture.

The CRM Platform Management team is tasked with embracing and enhancing the VA’s Cloud First, Digital Services, DevSecOps, and PLM initiatives for improving customer relationships and CX. The CRM Platform Management team will transition VA management oversight, licensing, operations, and customer support for the Microsoft Dynamics 365 platform from the VA Product Development team.

### ***Governance and Strategy***

The team will establish service-level agreements with customers and a service-level agreement for problem resolution and/or performance. The governance team will ensure standardized processes for maintaining VA Systems Inventory records aligning with Portfolio and Product Line Management. Lastly, the team will work toward providing common services and service catalog items provided by enterprise platform management.

### ***VA Enterprise Cloud***

VA has implemented 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 NIST, FedRAMP, and VA, reducing the time each application should take to obtain a VA Authority to Operate (ATO).

VA created a new organization to lead the VAEC effort—ECISO. ECISO leads the implementation of the VA Cloud Strategy. VA has partnered with contractors exhibiting strong Cloud computing expertise. Through ECISO, VA has developed Cloud-specific processes integrated with existing VA practices such as VIP to provide project team support throughout the Cloud lifecycle. ECISO has built VAEC, adding VA-specific infrastructure on top of the standard CSP offerings to address VA-specific needs and policies. Prior to this effort, VA lagged behind other federal agencies in its adoption of the Cloud but now is increasingly seen as a Cloud leader among its peers.

VAEC currently utilizes the two leading commercial Cloud platforms: AWS GovCloud 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, ECISO 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. Figure 95 in Appendix C 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 turn 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: the Cloud Smart policy; high-capacity Cloud contracts to support governance and overall migration to Cloud service; public/community Cloud criteria; early adopters of VAEC to capture and apply early lessons learned; and VAEC-specific Cloud computing enterprise design patterns. In accordance with OMB Memorandum 16-21, enterprise design patterns enable the Department to provide and reuse source code for VA products.

Figure 96 in Appendix C presents the VA Cloud Strategy and the goals, objectives, and actions required to implement and operate VAEC. Together, they will develop the foundation for VAEC and help build future standard operating procedures, roadmaps, and concepts of operations.

### ***Communication & Collaboration Services (SharePoint Platform)***

The enterprise SharePoint Online Platform (SPOL) is a SaaS solution to which VA is migrating all its on-premise SharePoint farms in order to provide a centralized solution for administration and assistance to customers. VA’s SharePoint environment is currently decentralized with approximately 44 SharePoint farms supported by different teams and contracts. Within the Platform Management Product Line, the Communication & Collaboration Services team is currently in the process of centralizing SharePoint to Microsoft 365 or the Azure farm as needed.

SPOL provides enterprise-wide collaboration sites with many attributes for sharing and storing documents, videos, efforts, management of tasks, and more. It is an integral part of Office 365 and will

integrate with all other components provided by the Office 365 platform. This platform provides multiple teams the opportunity to operate from anywhere in an efficient manner with live actions shared at once. Centralizing this capability will reduce lifecycle management and cost by eliminating the necessity to develop and maintain a scalable SharePoint architecture, manage licensing, and provide associated support.

SPOL is executing a new community of practice to ensure training, customer experience, and a feedback loop for improvements to the platform. With over 2,800 members, the community of practice currently has two weekly sessions for demonstrations and questions as well as monthly updates of strategy and roadmap items. Individuals throughout VA with various degrees of expertise participate and assist each other along with Microsoft and platform personnel. Continued growth and knowledge sharing pathways will be targeted moving forward.

### Future Environment

VA will realign its current development and deployment methodology to DevSecOps, which will allow enhanced automation and authorization to operate throughout the software delivery pipeline, eliminate mistakes, and reduce attacks and downtime. This shift will also reduce the bottleneck effect of older security models on the modern continuous delivery pipeline. The Platform Management Product Line will provide Infrastructure as Code, containerization, CI/CD, and automated testing as means to support DevSecOps.

Additionally, 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 leverage CSP native services and other tools. 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 DevSecOps 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. HXXA

See Figures 51 and 52 for the FY 2020–2026 milestones that the Platform Management Product Line will complete to achieve its future environment.

 <b>PLATFORM MANAGEMENT MILESTONES*</b> FY 2020 - FY 2026 ( 1 / 2 )			
FY 2020		FY 2021	
FY 2020		FY 2022	
✓	Q1: Draft Microsoft Dynamics (MSD) 365 CRM transition plan & perform program, system, and budget analysis	✓	Q1: Review new VAEC computing technology and revise VAEC Strategy
✓	Q1: Complete Hosting & Provisioning (H&P) Container Cloud Pak Pilot	✓	Q2: Automate VAEC security services & VAEC scanning and testing services
✓	Q1: Improve VA Enterprise Cloud (VAEC) service performance	✓	Q3: Automate Cloud software development lifecycle
✓	Q2: Establish SharePoint (SP) team, review migration plan, and initiate process improvement	✓	Q4: Execute VAEC Migration Plan
✓	Q2: Draft MSD 365 CRM transition artifacts, business processes, and implement platform monitoring	✓	Q4: Deploy VA-Platform One across VAEC and data centers & implement VA-Platform One Cost Model
✓	Q2: Select H&P platform to utilize for proof of concept	✓	Q4: Deploy Service catalog item via ServiceNow portal
✓	Q2: Continue to review Cloud redundant services used at the local level for enterprise solutions	✓	Q4: Develop and implement VA-Platform One ConOps to support application modernization
✓	Q3: Update SP strategy and implement process improvements	✓	Q4: Conduct container experiments, proof of concept, & market research
✓	Q3: Transition MSD 365 CRM platform management responsibility to the Platform Management Product Line	✓	Q4: Implement Application Analyzer to support application modernization
✓	Q3: Conduct H&P proof of concepts for VA enterprise container solution	✓	Q4: Develop Service Offerings for Hosting in the IO Franchise Fund
✓	Q4: Establish SP project to recover hardware cost with Azure farm	✓	Q4: Create MSD 365 SaaS CRM SNOW service catalog and automate forms
✓	Q4: Manage all new MSD 365 CRM customer requests for licenses and platform provisioning	✓	Q4: Create and implement strategy for innovation and improvements in MSD 365 SaaS Platform
✓	Q4: Review VAEC Migration Program	✓	Q4: Plan activities to achieve PLM maturity level 2–5 to align MSD 365 with ACOE strategy and goals
✓	Q4: Migrate VistA instances and disaster recovery capabilities to VAEC	✓	Q4: Establish SP guidelines and best practices & provide SP Platform Solutioning services
✓	Q4: Execute VAEC Migration Plan	✓	Q4: Develop SPOL Training pathways & enhance the SPOL Support Model
			Q1: Review new Cloud technology and evolve VAEC computing strategy
			Q3: Improve enterprise Cloud strategy and policies
			Q3: Complete VAEC automation services in key areas (e.g., security, testing, and software development)
			Q4: Improve VAEC service performance and efficiency
			Q4: Execute VAEC Migration Plan
			Q4: Monitor Azure FedRAMP ATO and hosted customer applications using MSD 365 SaaS
			Q4: Plan and develop activities to complete HR required tasks
			Q4: Create MSD365 SaaS CRM SNOW service catalog and automate forms
			Q4: Create and implement strategy for innovation and improvements in MSD 365 SaaS Platform
			Q4: Plan activities to achieve PLM maturity level 2–5 to align MSD 365 with ACOE strategy and goals
			Q4: Remediate MSD 365 SaaS findings in CRM AoA Study
			Q4: Improve Data Management Interface processes and procedures
			Q4: Develop Service Offerings for Hosting in the IO Franchise Fund
			Q4: Engage stakeholders for Hosting Services
			Q4: Perform process improvement and optimization

Figure 51: Platform Management Milestones (1/2)



Figure 52: Platform Management Milestones (2/2)

## 6. STRATEGIC ALIGNMENT

The Enterprise Roadmap aligns with guiding memorandum, strategy, principles, and priorities. This section and Appendix B outline clear traceability between the Enterprise Roadmap and internal and external guidance. This traceability enables VA leaders to gain greater insight into initiatives enabling VA IT modernization. AXXB

### 6.1 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. 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 drivers. Multiple agencies and leaders across the Federal Government 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. Appendix D documents the alignment of the Product Lines, VA Priority Initiatives, and PMA CAP Goals.

### 6.2 Federal Health IT Strategic Plan

The U.S. Department of Health and Human Services, led by ONC, released the draft 2020-2025 Federal Health IT Strategic Plan (FHITSP). The FHITSP, which was developed in collaboration with over 25 federal organizations, is intended to guide federal health IT activities. The FHITSP’s goals are deliberately outcome-driven, with objectives and strategies focused on using health IT as a catalyst to empower patients; lower costs; deliver high-quality care; and improve health for individuals, families, and communities. ONC and its federal partners have taken and will continue to take steps to ensure that stakeholders in the healthcare sector benefit from the electronic access, exchange, and use of health information. Appendix F documents the alignment of

the Product Lines and FHTISP Goals, Objectives, and Strategies.

### 6.3 OMB Memorandum 13-09

OMB Memorandum 13-09 consolidated previously collected IT plans, reports, and data calls into the IRM Strategic Plan and the Enterprise Roadmap. The Enterprise Roadmap is Appendix A to the IT (IRM) Strategic Plan. In alignment with the IT (IRM) Strategic Plan, the Enterprise Roadmap documents VA’s current and future views of its business and technology environment from an architecture perspective. 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 Enterprise Roadmap addresses OMB Memorandum 13-09 reporting requirements substantively, and its alignment to OMB guidance is documented in OIT’s August 2020 guide to CIO roles, responsibilities, and relevant agency authorities. Appendix B includes a traceability matrix that identifies the sections in which VA fully addresses the OMB Reporting Tasks in the IT (IRM) Strategic Plan and Enterprise Roadmap.

### 6.4 OMB Circular A-11

OMB Circular A-11 strengthens the Federal Government’s focus on IT portfolio management and commitment to assess the effectiveness of current IT management practices and 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 must clearly demonstrate that each investment is necessary to help meet the agency’s strategic goals and mission. Each IT investment should demonstrate the improvement of mission and program performance. Agencies demonstrate the IT investment requirements and governance process through Agency Major IT Business Cases, an IRM Strategic

Plan, an Enterprise Roadmap, and Agency IT Portfolio Summary submissions. VA will demonstrate how IT investments support the Department’s mission, goals, and objectives as documented in the IT (IRM) Strategic Plan and annual Enterprise Roadmap submission to OMB.

## 6.5 VA Priorities

The 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. VA will achieve this increase in access in part through greater customer service, implementation of the MISSION Act, EHRM, and transformation of VA’s business systems. The foundation of VA’s comprehensive modernization effort is the four VA Priorities:

- **Customer Service** – We will be 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.
- **MISSION Act Implementation** – VA is committed to ensuring Veterans have a wide variety of options for their health and well-being as mandated, especially through a Community Care Network and expansion of support to caregivers of Veterans.
- **Electronic Health Record** – We will modernize our appointment system to connect VA to the Department of Defense, private health care providers, and private pharmacies.
- **Business Systems Transformation** – VA resources are spent on the care and services Veterans need most, and systems and technology enable employees to enhance the quality of the care and services Veterans deserve. Emphases will be on appeals modernization, FMBT, the Forever GI Bill, and supply chain transformation.

## 6.6 VA Strategic Plan

The FY 2018-2024 VA Strategic Plan communicates the vision for VA’s future and the major transformation the Department will undergo over the next seven years. VA’s strategic goals, objectives, and strategies guide decision making to improve the Department. The VA Strategic Plan incorporates the VA Priorities, which continue the progress the Department has embarked on and accelerates its transformation. The Department’s path is shaped by the VA Priorities, which define VA’s operational focus that will enable the Department to become a stronger organization that provides better outcomes. Achieving these priorities requires the implementation of the VA Strategic Goals in Table 3, 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. In addition, VA established FY 2020–2021 Agency Priority Goals: Decision Reviews and Appeals, Suicide Prevention, Telehealth/ Connected Care, and Veteran’s Experience with VA.gov.

VA seeks to build a high reliability organization that is people-centric, results-driven, and forward-looking. VA’s goals focus the Department on improving customer service through the alignment of strategy, 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, and at the right time. Attention to these priorities and goals and the diligent implementation of the strategic objectives and strategies will result in positive and enduring outcomes for Veterans and their families. Table 3 documents VA Strategic Goals and Objectives, which align to OIT Imperatives/Goals.

**AXXA**

VA STRATEGIC GOALS	VA STRATEGIC OBJECTIVES
<p><b>1. Veterans choose VA for easy access, greater choices, and clear information to make informed decisions.</b></p>	<p>1.1: VA understands Veterans’ needs throughout their lives to enhance their choices and improve customer experiences.</p> <p>1.2: VA ensures Veterans are informed of, understand, and can get the benefits, care, and services they earned in a timely manner.</p>
<p><b>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.</b></p>	<p>2.1: VA has collaborative, high-performing, and integrated delivery networks that enhance Veteran well-being and independence.</p> <p>2.2: VA ensures at-risk and underserved Veterans receive what they need to end Veteran suicide, homelessness, and poverty.</p>
<p><b>3. Veterans trust VA to be consistently accountable and transparent.</b></p>	<p>3.1: VA is always transparent to enhance Veterans’ choices, to maintain trust, and to be openly accountable for its actions.</p> <p>3.2: VA holds personnel and external service providers accountable for delivering excellent customer service and experiences while eliminating fraud, waste, and abuse.</p>
<p><b>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.</b></p>	<p>4.1: VA’s infrastructure improvements, improved decision-making protocols, and streamlined services enable VA to adapt to changing business environments and Veteran needs.</p> <p>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.</p> <p>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.</p> <p>4.4: VA will institutionalize data supported and performance focused decision making that improve the quality of outcomes.</p>

**Table 3: VA Strategic Goals and Strategic Objectives**

### 6.7 VA Business Reference Model

The VA Business Reference Model (BRM), created by 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 E displays the alignment between the OIT Product Lines and VA’s BRM. This will help ensure the alignment of strategic business requirements to Product Lines and mitigation duplicative investments.

### 6.8 IT (IRM) Strategic Plan

The FY 2020-2022 IT (IRM) Strategic Plan, documents how IT activities across the Department will integrate and accomplish VA’s mission. The Enterprise

Roadmap is Appendix A to the IT (IRM) Strategic Plan. In conjunction, they show how strategic planning, PPBE, performance management, and risk management are integrated to support the execution of VA’s mission. OIT Divisions collaborated through a series of strategic planning off-sites to develop the IT (IRM) Strategic Plan. VA’s CIO, supported by the QPR Enterprise Strategic Planning Directorate and IT Resource Management (ITRM), is responsible for the development and maturation of the IT (IRM) Strategic Plan.

In combination, the IT (IRM) Strategic Plan and Enterprise Roadmap satisfy all of the reporting tasks required by OMB. Together, the IT (IRM) Strategic Plan and Enterprise Roadmap provide an integrated view of the Department’s IT modernization vision and journey. Figure 53 illustrates VA’s IT 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 tools and VA’s PPBE process. Appendix G further demonstrates this relationship by aligning OIT Product Lines in the Enterprise Roadmap to VA’s major IT investments. AXXB DXXA



Figure 53: Strategic Planning Ecosystem

## 6.9 VHA Health Information Strategic Plan

The VHA Health Information Strategic Plan (HISP) defines the strategic direction for health IT within VHA. The HISP informs IT strategic planning and investment decisions to best meet VHA and Veteran medical care needs. The HISP also informs the alignment and prioritization of 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 works with leaders and the IT governance community to define the interconnectivity and characteristics of the various IT programs that are required to achieve strategic objectives. The Office of Health Informatics also identifies interdependent business requirements to help ensure interoperable IT capabilities. The HISP’s depiction of the future VHA health IT environment is depicted within the Health Services Portfolio of the Enterprise Roadmap.

## 6.10 OIT Digital Transformation Strategy

OIT’s vision is to be a world-class IT organization that provides seamless, unified Veteran experience through the delivery of state-of-the-art technology. Digital transformation will enable OIT to digitize VA’s business processes to streamline workflows and automate paper-based work. OIT’s mission is to collaborate with business partners to create the best experience for all Veterans through four Guiding Principles: Transparency, Accountability, Innovation, and Teamwork. OIT’s five Imperatives establish the foundation for VA IT Strategic Goals:

- Exceptional Customer Experience
- IT Modernization
- Strategic Sourcing
- IT Workforce Transformation
- Seamless and Secure Interoperability

Reference the IT (IRM) Strategic Plan for further insight into VA’s IT Strategic Goals.

OIT is changing the way it procures by taking a buy-first approach to COTS products, transitioning away from in-house IT development, and relying more on

Cloud and managed and shared services. This is represented through OIT’s six Focus Areas, which include: Managing Data, Digitizing Business Processes, Migrating to the Cloud, Decommissioning Legacy Systems, Improving Cybersecurity, and Recruiting and Retaining a World-Class IT Workforce.

OIT is harnessing the power of personalization, APIs, and user-centered design. OIT will continue to challenge VA’s industry partners and the community to identify ways of how to improve Veteran and employee experience through digital transformation.

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## 6.11 OIT Joint Business Plans

The OIT Joint Business Plans (JBPs) are developed by AMO in coordination with the Business to determine IT capability needs. AMO develops JBPs for each Portfolio and corresponding Product Lines. AMO develop JBPs to establish a shared understanding with the business about tactical priorities spanning 12-18 months. AMO updates the JBPs on a monthly basis and uses them as a communication tool with the business stakeholders. The Enterprise Roadmap will significantly inform and influence future iterations of the JBPs. This will enable AMO to engage in collaborative discussions with business owners to validate needs and iterate based on business goals, objectives, and priorities.

## 6.12 OIT Division Operations Plans

OIT Division Operations Plans are intended to operationalize and execute IT (IRM) 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.

### 6.13 Legislation and Policy

The legislation and policies identified in Table 4 below are key drivers of VA modernization.

Legislation and Policy	Purpose
<b>Veterans’ Electronic Health Record Modernization Oversight Act of 2017</b>	Improve oversight and reduce programmatic risks for EHRM
<b>Veterans Appeals Improvement and Modernization Act of 2017 (AMA)</b>	Improve appeals turnaround time and quality of appeals decisions
<b>VA’s Federal Rule – Anywhere to Anywhere (ATA)</b>	Expand telehealth by allowing health care providers to treat patients across state lines
<b>VA Maintaining Systems and Strengthening Integrated Outside Networks (MISSION) Act of 2018</b>	Consolidate VA’s community care programs into a new Veterans CCP that will help ensure Veterans choose VA by getting them the right care at the right time from the right provider (Section 132 references information Sharing; Section 151 codifies ATA for telehealth modalities.)
<b>Modernizing Government Technology (MGT) Act</b>	Establish a Working Capital Fund for IT projects, IT modernization, reuse, and cost savings and avoidance
<b>President’s Management Agenda (PMA)</b>	Establish a strategic IT vision, priorities, and the President’s Agenda and enhance CX—all via CAP Goals
<b>Federal Information Technology Acquisition Reform Act (FITARA)</b>	Strengthen CIO authority, increase transparency and improve risk management in IT investments, implement the Federal Data Center Consolidation Initiative, and improve strategic sourcing/purchasing
<b>Data Center Optimization Initiative (DCOI)</b>	Establish policy to support federal agencies in meeting OMB requirements to consolidate data centers as well as modernize and optimize IT infrastructure
<b>Health Insurance Portability and Accountability Act (HIPAA)</b>	Provide guidance on the flow of health care information, especially as it relates to PII to protect from fraud and theft
<b>The Harry W. Colmery Veterans Educational Assistance Act (“Forever GI Bill” or “Colmery Act”)</b>	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
<b>Deborah Sampson Act</b>	Increase capabilities that support women Veterans as they transition out of service
<b>21st Century Cures Act</b>	Confront information blocking, build on the 2015 edition of the ONC’s 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
<b>Foundations for Evidence-Based Policymaking (FEBP) Act of 2018</b>	Require federal agencies to develop and maintain an Open Data Plan, which describes agency efforts to

Legislation and Policy	Purpose
	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 CDO (includes the Open, Public, Electronic, and Necessary [OPEN] Government Data Act)
<b>21st Century Integrated Digital Experience Act (21st Century IDEA)</b>	Digitize government services and modernize federal agencies’ public-facing websites and digital services
<b>VHA Comprehensive Emergency Management Program (CEMP) Procedures</b>	Ensure the continuity of medical and hospital services to Veterans and, during disaster and emergencies, to military personnel, responders, and civilians
<b>Coronavirus Aid, Relief, and Economic Security (CARES) Act</b>	Injects resources in the form of direct payments, loans, and grants to virtually every facet of society to address business tax relief, appropriations for all levels of government, help for severely distressed sectors of the economy, small business assistance, banking relief, and healthcare provisions

**Table 4: Legislation and Policy Driving VA Modernization**

# 7. OIT TRANSFORMATION

OIT is adjusting internal methodologies to improve IT collaboration, development, security, and deployment to more effectively enable VA modernization. Traditionally, interactions between OIT have been complex and inefficient because teams were organized in silos. OIT’s traditional one-team structure does not adequately address the complexity of its system-of-system architecture.

OIT recognizes that in order to enable VA modernization, the organization must transform. By

doing so, OIT will help VA become an organization that Veterans and VA employees want to interact with and rely on. OIT understands the need to enable its business partners to provide timely access to care, benefits, and services. The FY 2018–2024 VA Strategic Plan includes the 2024 Strategic Imperatives, as shown in Figure 54. OIT Transformation is rooted in the FY 2024 Strategic Imperatives to enable VA to operate in a Veteran Network, provide a tailored Veteran Experience, and improve anticipation, flexibility, and scalability.

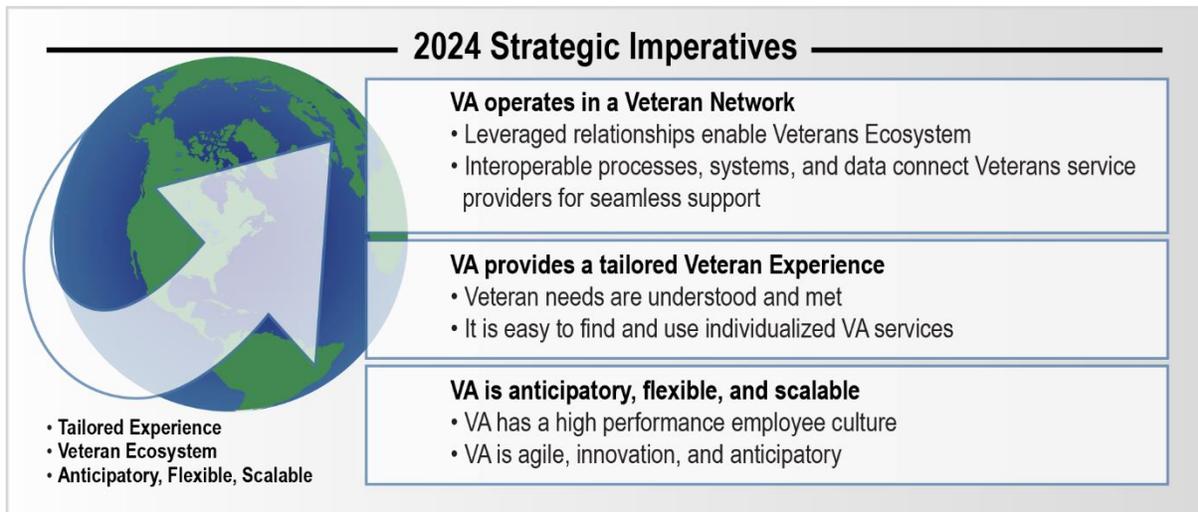


Figure 54: VA 2024 Strategic Imperatives

Key foundational elements of OIT Transformation include:

- |                                    |                                  |
|------------------------------------|----------------------------------|
| 7.1 Product Line Management        | 7.7 Investment Review Process    |
| 7.2 Technology Business Management | 7.8 Enterprise Data Management   |
| 7.3 DevSecOps                      | 7.9 Enterprise Mobility Strategy |
| 7.4 Scaled Agile Framework         | 7.10 Strategic Sourcing          |
| 7.5 IT Service Management          | 7.11 IT Governance               |
| 7.6 Enterprise Interoperability    | 7.12 Risk Profile                |

### 7.1 Product Line Management

OIT currently oversees IT product development in a project-based plan, design, and build model. Each phase occurs in a silo and responsibility transitions between multiple OIT Divisions. This approach has resulted in a lack of transparency 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 model. PLM is an operating model that aligns IT resources and funding to business capabilities to deliver specific business outcomes. Following the success of a Digital Experience Pilot, OIT is adopting PLM across the organization.

PLM implements Lean practices and concepts and has four basic principles: 1) “You build it, you own it” from

initiation to retirement; 2) fund products, not projects; 3) continuously focus on customers’ needs and participation; and 4) use a Lean-Agile approach that optimizes workflow and eliminates waste. OIT is adopting PLM and its Lean-Agile approach because together they make product delivery faster; implement closer and better customer engagement; avoid waste; and deliver measurable value.

OIT’s basic workflow for products consists of customers providing work (described in epics) and then, using DevSecOps practices, OIT creating value with customers within the scope of those epics until there is no longer a need for a product. Figure 55 describes how epics and funding flow to product teams as well as the flow of work, products, and requirements between product owners and product teams. At the product team level, work is continuously elaborated, defined, and turned into value.

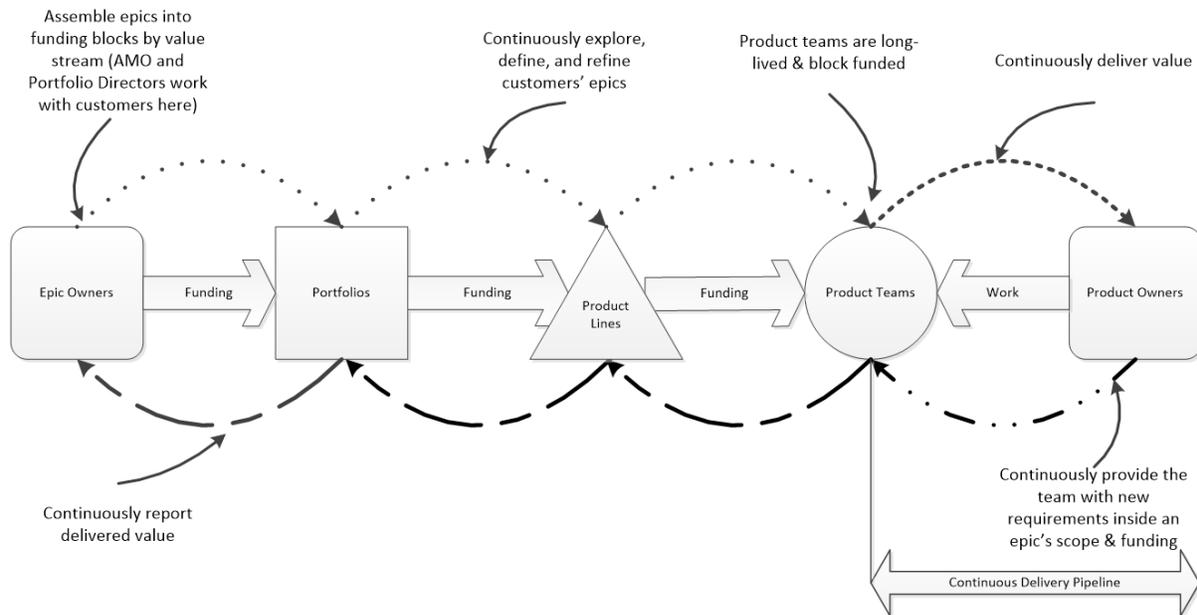


Figure 55: End-to-End Lifecycle PLM Workflow

OIT is organizing systems and products into Product Lines based on business capability. Each Product Line is strategically grouped and managed within one of OIT’s five Portfolios. Each 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 Portfolio level using a framework such as SAFe.

Each team within a Portfolio is responsible for developing and operating the systems and infrastructure. OIT has reformed key processes to become more service oriented. Enduring Product Line teams will be responsible for delivering and managing capabilities from cradle to grave. Instead of developing new systems to support each requirement, the Portfolio’s solution engineers will analyze new requirements and incorporate the feature requests into the Portfolio’s existing Target Systems. Product

Line Managers will be accountable for ensuring the capabilities work in production and will be equipped with the people, processes, and tools to be successful.

OIT is integrating PLM with a number of complementary strategic initiatives including TBM, DevSecOps, SAFe, and IT Service Management. OIT

developed the organization’s PLM model and evaluated roles and responsibilities, processes, and investment and acquisition implications. Figure 56 depicts OIT’s current PLM Operating Model, which includes five Portfolios, 27 Product Lines, and 700+ products (systems/applications). CXXF

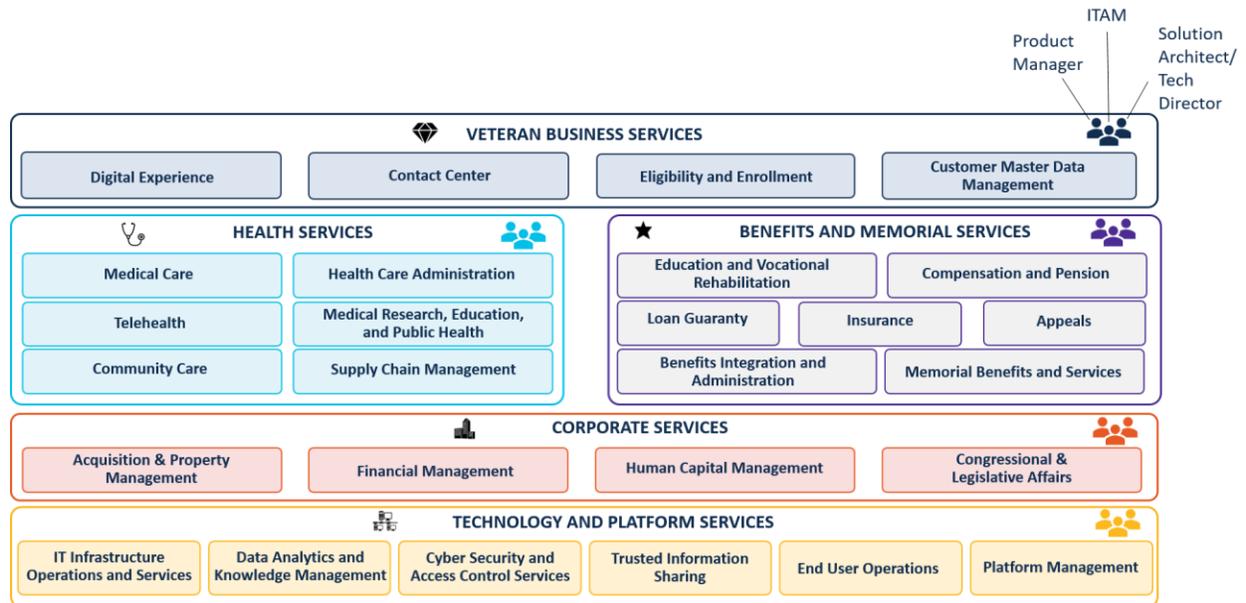


Figure 56: VA PLM Organizing Construct

## 7.2 Technology Business Management

Technology Business Management (TBM) is a value-management framework for IT organizations predicated on transparency of cost, consumption, and performance. As shown in Figure 57, the TBM taxonomy provides a finance view of the organization (Cost Pools), a corresponding IT view, (IT Towers and Services), and a business view (Business Capabilities). The taxonomy is the foundation of TBM as it provides a common nomenclature within and between organizations. Following TBM’s success in the commercial space, OMB recommended that the public sector adopt the TBM framework across the Federal Government in 2017. CAP Goal 10 of the PMA includes the goal of adopting TBM across the Federal Government by FY 2022. BXXC

The TBM framework characteristics are predicated on continuous improvement and positioning for value. Within these two key characteristics, the TBM framework defines disciplines of TBM including:

- **Create Transparency:** Translate spending, consumption, and capacity into meaningful perspectives for decision-makers.
- **Shape Business Demand:** Communicate costs and consumption to business units to drive data-driven trade-off decisions and consumption behavior.
- **Deliver Value for Money:** Maximize value and demonstrate industry-comparable cost-effectiveness for services provided by IT.
- **Plan and Govern:** Collaborate to align annual budgets and resources to business priorities.

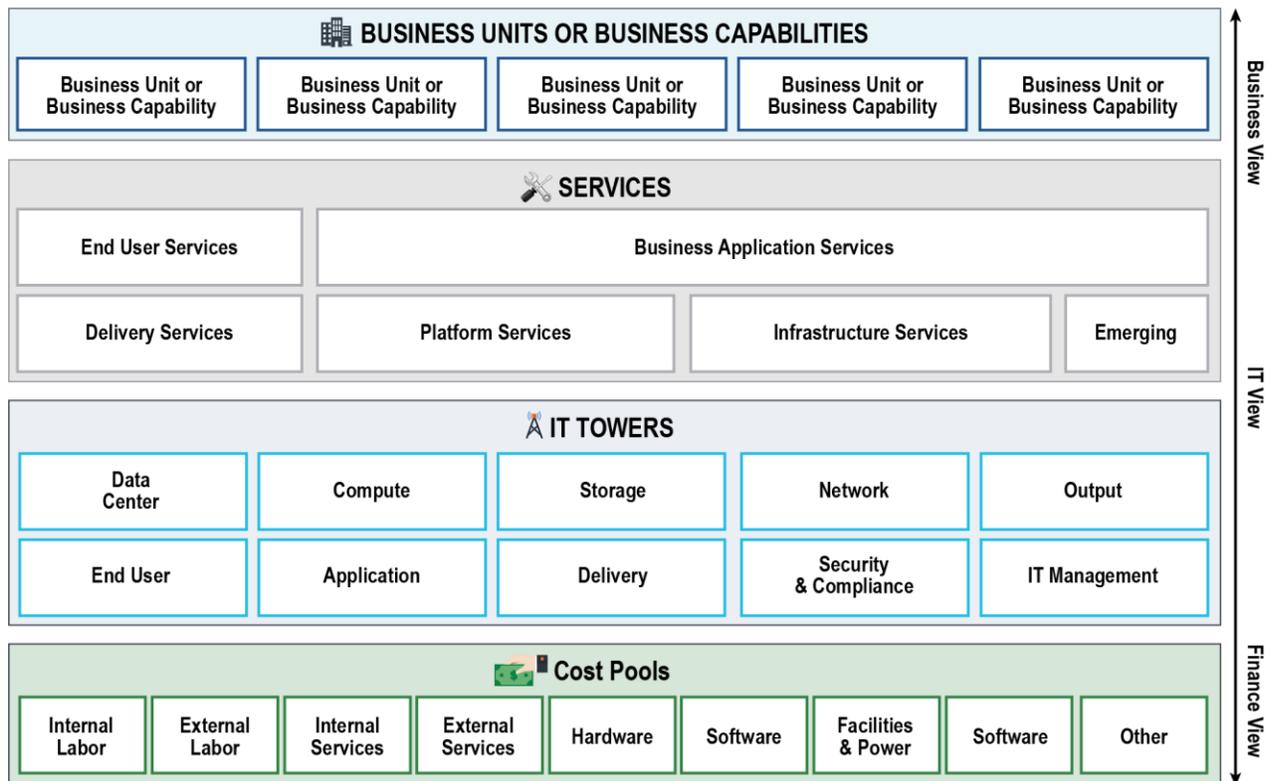


Figure 57: TBM Taxonomy

OIT is currently operating at Level 3 – Service Provider of TBM maturity. OIT is building the TBM Model using Apptio software. VA’s TBM model will be a decision engine for OIT. OIT launched the first version of the TBM Model in 2019. VA will meet the OMB mandate to fully report all IT Towers and Cost Pools in the TBM taxonomy by 2022. Additionally, OIT will operate at TBM Maturity Level 5 – Business

Driver, which will enable integration of TBM into strategic planning and PPBE.

## 7.3 DevSecOps

Development Security Operations (DevSecOps) is a product team level development paradigm that implements an industry-standard “continuous

delivery pipeline,” producing frequent and regular product releases. DevSecOps integrates requirements definition, development, security testing, operations, compliance, other disciplines, and the customer into one product team. These product teams, using DevSecOps practices, are the basic organizational unit for Product Lines and manage releases and production operations. DevSecOps is integral to PLM and SAFe—which are, along with ITSM, all part of a comprehensive modernization effort. OIT is implementing DevSecOps through platforms, tools, and workforce and invested in training 500 VA IT project managers in modern digital product management competency this year. [BXXC](#)

## 7.4 Scaled Agile Framework

OIT has determined a new way of organizing and working is required to efficiently and effectively deliver IT solutions. The industry-standard Scaled Agile Framework (SAFe) enables OIT to aggregate teams into an agile team-of-teams structure, or Agile Release Trains. This larger team structure enables comprehensive management and leadership. SAFe eliminates OIT silos and relies on integrated and persistent teams from the Enterprise Program Management Division, the Demand Management Office, AMO, ITOPS, and the business. SAFe PLM combines the SAFe framework and PLM operating model. SAFe is the target OIT systems development lifecycle.

## 7.5 IT Service Management

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 the IT Infrastructure Library (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, reduce security and risk costs, normalize configurations, improve infrastructure resilience, improve predictability of fault and failure, and reduce organizational complexity.

VA purchased ServiceNow, a Cloud-based ITSM tool to modernize the way customer’s access VA IT support. VA established the Service Management

Office to provide OIT with a common set of validated best practices and principles around the five stages of the ITIL framework. OIT has implemented the ITSM Tool and functionality includes incident management, service request management, KM, self-service, change management, problem management. ITSM 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. By implementing ITSM, VA can reduce development times and total lifecycle cost of IT, improve information security, and advance organizational interoperability and IT capabilities. [GXXA HXXC](#)

## 7.6 Enterprise Interoperability

To achieve improved Veteran experience, VA must not only modernize technology but also build interoperability within and across VA programs. The VA Interoperability Leadership (VAIL) team uses a broad definition of interoperability—going beyond just technology to bring standard practices, policies, and predictability to three key aspects of VA operations: Business, Data and Information, and Systems and Technology. Its purpose is to serve as a coordinated leadership body focused on ensuring all steps of the Veteran’s journey are seamlessly enabled through interoperability. The group has representation from the FEHRM Program Office, OEHRM, OEI, OIT, VEO, OM, VHA, VBA, and NCA.

Working hand in hand with IT as it modernizes and transforms VA’s technology, the VAIL team is able to bring resources and business owners together to focus on aspects of interoperability and VAIL’s shared goal of a unified enterprise that can provide Veterans with a coordinated experience. The VAIL team has created the following interoperability maturity tools, which can be applied to any program or capability to determine where interoperability maturity can be strengthened:

- VA Interoperability Framework – VAIL uses the VA Interoperability Framework to develop a common understanding of what enables or

blocks VA’s ability to share information across the enterprise and with its partners. The framework allows VA to assess the current use of information through organizational and technical perspectives.

- Interoperability Maturity Index Tool – To measure progress, the VAIL team also uses the Interoperability Maturity Index Tool to enable a holistic assessment across business, data, and technical domains. Maturity assessments reveal challenges that impede information sharing across VA and with information sharing partners and inform the development of interoperability roadmaps.

Initial maturity assessments reveal areas for future interoperability improvement, and interoperability maturity re-assessments will reflect the performance of the VAIL in its efforts to improve enterprise interoperability. The VAIL team and VA stakeholders with expertise in the VA Interoperability Framework elements work closely with program teams to develop interoperability roadmaps. Maturity assessments and the development of these roadmaps provide VA with a pragmatic view of current interoperability maturity and a path forward for improvement. BXXC

## 7.7 Investment Review Process

AMO drives VA OIT’s investment review process under the direction of IT Account Managers (ITAMs). AMO’s mission is to collaborate with VA business partners to create the best CX and to ensure that OIT functions as a business enabler. AMO balances the IT Portfolio with the business. 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.

ITAMs manage and oversee OIT’s five portfolios. They provide the critical link between OIT and VA business partners, while maintaining fluidity and flexibility to change with future needs. AMO follows the Business Relationship Maturity Model approach 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. This allows AMO to work with the VA organization to shape business demand for OIT products and services.

ITAMs collaborate with the CIO and OIT leaders to prioritize projects and efficiently allocate resources to VA business partners’ needs. The intake and demand management process facilitated via ITAMs is critical to VA IT Portfolio Management. It has defined criteria to prioritize and aid decision making to fund or decommission legacy IT systems. The intake process serves as an entry point for IT capability requests submitted to OIT for evaluation. The standardized process:

- Evaluates and processes requests from a Portfolio perspective.
- Reduces redundant and outdated capabilities.
- Reviews requirements and informs strategic investments.
- Ensures alignment to VA’s strategic priorities.
- Establishes performance, success, and user experience expectations.
- Provides necessary high-level architecture and related work products to better inform development in VIP.

Through compliance with FITARA and use of the Governance Framework, OIT will provide extensive decision support to foster enterprise business transformation. This includes incorporating Integrated Data Collection, TechStat, and PortfolioStat performance measures to enable data-driven decision making regarding the value of IT investments. TechStat accountability sessions will be employed as a face-to-face, evidence-based accountability review of IT investments. TechStat sessions are triggered when VA determines that projects/investments are failing or underperforming. The CIO and other relevant executives will review briefings that highlight the management of failing projects/investments and consider opportunities for corrective action.

The IT Governance Framework will bring together representatives specific to IT, procurement, finance, and human resources to the right governance bodies, with the right information, at the right time to make the best decisions to provide value, and efficiently and effectively deliver IT programs in support of the Veterans. The governance structure will aid development and implementation of VA’s value realization framework to support outcome and value-based assessments of IT investments.

Additionally, ITRM will define and develop a strategy for reinvestment opportunities. During funding execution in a FY, 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 Requirement (UFR) Process that will capture, prioritize, approve, and track UFRs. BXXC  
CXXB CXXC CXXD CXXE CXXF DXXA

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

## 7.8 Enterprise Data Management

The PMA and 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. EDM embodies VA’s Data Strategy Goals, which 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 is a fundamental resource of the Department. The effective management of VA’s data is integral to the delivery of services to Veterans. Figure 58 displays the framework to transform VA health care data into a national resource, enabling EDM capabilities to benefit Veterans and VA employees. The core EDM architecture will provide key data management and analytics services by integrating and delivering high-quality data.

VA is implementing the FEBP Act. Through this, VA has established a CDO. The CDO will have broader EDM, policy (e.g., an EDM directive), governance, and oversight responsibilities working collaboratively with OIT.

OIT will institutionalize EDM as part of governance through the provision of the Enterprise Logical Data Model and Data Governance Council (DGC) approved

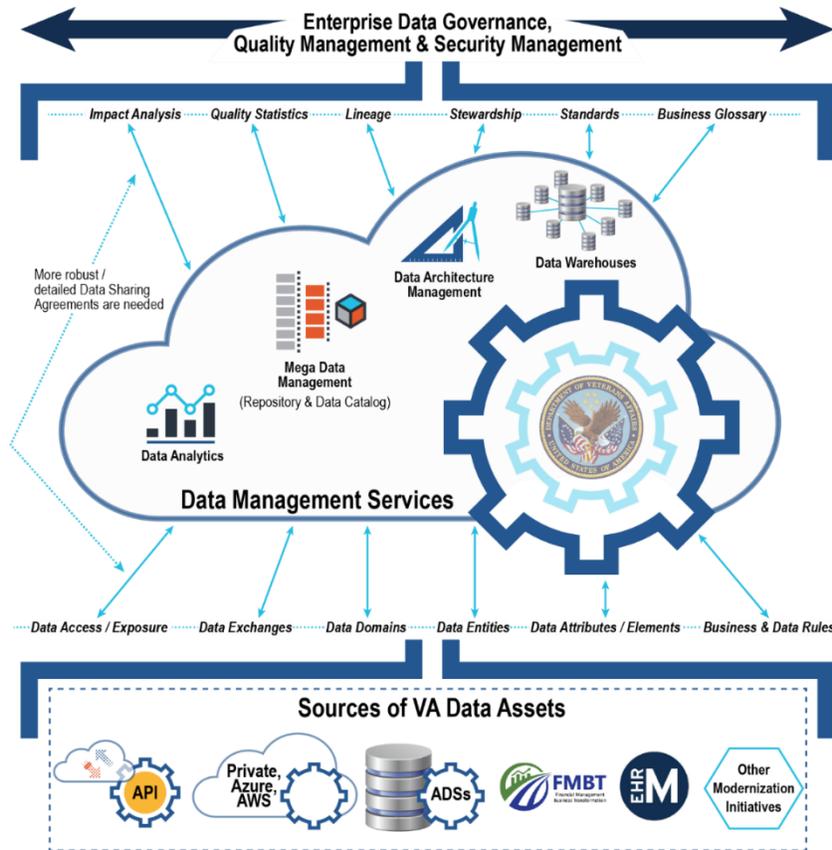


Figure 58: EDM Framework

### 7.9 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. 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. VA is developing new mobile applications and implementing modern connectivity that enable ease of access to services.

VA’s Palo Alto Health Care System became the first 5G-enabled hospital in VA, and among the first in the world in February 2020. VA partnered with Verizon, Medivis, and Microsoft to deliver the 5G-enabled clinical care system at the VA Palo Alto Healthcare System. 5G is the fifth generation of wireless cellular communication and offers premier infrastructure for medical advancements. VA will continue to look for opportunities to improve connectivity in facilities nationwide.

VA will incorporate new federal security requirements for mobile and wireless services into its enterprise mobility policies and procedures. VA will identify the functional and security gaps with the current infrastructure and security policies servicing the mobility functionality to VA employees. VA will establish criteria for IoT technology selection and approval. These criteria will avoid or mitigate risks created by common IoT device and security vulnerabilities and will ensure that devices are adequately maintained and supported by the vendor. 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.

BXXB

## 7.10 Strategic Sourcing

FITARA mandates that public agencies procure through effective strategic sourcing solutions to deliver the latest technology at the best value. 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.

OSS’s work 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.

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. As a result, VA suppliers will focus on providing products and services that drive positive outcomes. OSS processes are aimed at decreasing the cost, improving quality, and reducing the quantity of IT acquisitions through planning for future VA IT needs.

OSS will implement a category management capability that enables VA to deliver more value and savings from its IT acquisitions. Furthermore, OSS is applying innovative strategies in order to procure goods and services for customers in the areas of hardware, software, IT services, and professional services. BXXC CXXG DXXA HXXA HXXB

governance provides critical support for the enterprise-level IT governance that enables efficient investment/portfolio management, material solutions, and technical capabilities necessary for transformation and continuous process improvement across VA. IT governance also supports implementation of regulations and guidance from internal and external government-wide advisory bodies. To accomplish these aims, it collaborates with VHA, OEHRM, FEHRM, and OEI governance structures.

Under the authority provided by FITARA, the IT Governance Framework was established to provide accountability and foster sound IT investment management practices. Specific to IT governance, the VA Executive Board is the Department’s most senior 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 DGC are subordinate to the VA Executive Board and provide decision support. OIT’s IT Governance Board serves as an overarching governance body to the Program and Acquisition Review Council, Standards and Architecture Council, and Organization and Workforce Council. Figure 59 depicts the IT Governance Framework that facilitates decision making and drives continuous improvement.

Governance functions optimally 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. Additionally, VA OIG has made 10 recommendations to VA’s Chief of Staff and CIO to establish controls and develop and implement policy to meet FITARA requirements; both concurred with the recommendations and provided corrective action plans in response. IT governance focuses on effective and efficient decision making and will help support planning as a part of the PPBE process, UFR validation, FITARA compliance, and TBM implementation. BXXC CXXA CXXD CXXF

## 7.11 IT Governance

OIT continually supports VA through IT governance—a subset of overall VA governance. IT

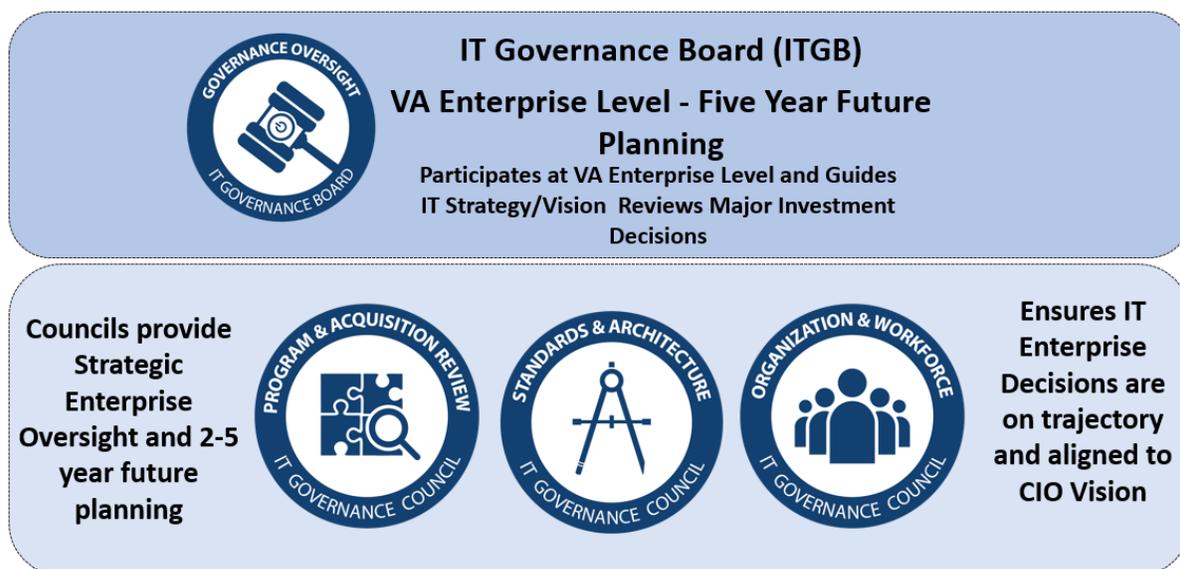


Figure 59: IT Governance Framework

### 7.12 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 enterprise risk management 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 Resource Management) produced more than one risk. Those risks are “bundled,” creating a portfolio of eight risk areas/risk titles that are depicted in Table 5, including risk alignment to OIT’s revised Imperatives/Strategic Goals.

Enterprise Risk Area/Title <sup>5</sup>	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5
Privacy Program Effectiveness (3 risks) <ul style="list-style-type: none"> <li>Privacy Program Effectiveness</li> <li>Lack of Consistent Privacy Collaboration</li> <li>Lack of Consistent Monitoring of PII/PHI on VA Servers</li> </ul>	X				X
Records Management Effectiveness (3 risks) <ul style="list-style-type: none"> <li>Records Management Program Effectiveness</li> <li>Lack of Electronic Information Governance</li> <li>Lack of Plan for Permanent Records Conversion</li> </ul>	X	X			X
IT Modernization (2 risks) <ul style="list-style-type: none"> <li>VA Medical Appointment Scheduling System Modernization</li> <li>Modernizing FMS</li> </ul>	X	X	X		X

<sup>5</sup> Based on Enterprise Risk Profile Dated May 2019

Human Capital/Human Resource Management (2 risks)					
<ul style="list-style-type: none"> <li>• Critical Vacancies in IT Cyber and/or IT Cybersecurity-related Positions</li> <li>• Aging Workforce Including Retirement Eligible</li> </ul>	X			X	
Cybersecurity Program Effectiveness	X	X	X	X	X
Legacy Infrastructure Obsolescence	X	X	X	X	X
Information and Communication Technology Strategic Sourcing	X	X	X		X
Enterprise Infrastructure Solutions Transition and Possible New Providers	X	X	X		X

**Table 5: Enterprise Risk and Alignment to Strategic Goals**

## 8. NEXT STEPS

**OIT anticipates that the 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 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 the 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, and UFR review (e.g., FY 2023–2027 Multi-Year Planning, the AIPG, and AMO’s Joint Business Plans).
- Collaborate with OSS and ITRM to gather data on reinvestment strategies, cost savings, and cost avoidance.
- Define and establish scope for target VA Enterprise, Portfolio, and Product Architecture and digitize EA data by collaborating with EA services.
- Incorporate new guidance from OMB.
- Update the Enterprise Roadmap on an annual basis, ensuring predictability and repeatability through process mapping and VA’s Process Asset Library.
- Establish durable change communications, collaboration, and synchronization among major OIT Divisions.

### Implementation and Utilization

The following activities illustrate the use and value of the 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, integrated master schedules/integrated master plans, dependency analyses, and risk management.
- Identify programmatic, portfolio, integration, and schedule overrun risks by working collaboratively with QPR’s Risk Management Division.
- Incorporate new insights from the PPBE process to drive planning and prioritization activities.
- Engage with OIT Governance through the Strategic Planning Working Group, Investment Review Boards, and Capital Planning and Investment Control to use the Enterprise Roadmap for data-driven investment decisions.
- Assess links to VHA, VBA, NCA, OEHRM, and VA Staff Office Governance Boards.
- Continually integrate insights from OIT Division Operations Plans.
- Assess performance of the Product Lines.
- Correlate the Product Line 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: Bibliography
- Appendix B: OMB Reporting Traceability Matrix
- Appendix C: Architecture Diagrams
- Appendix D: Product Line Alignment with the VA Priorities, OIT Strategic Goals, VA Priority Initiatives, and PMA CAP Goals
- Appendix E: Product Line and VA Business Reference Model Alignment
- Appendix F: Product Line Alignment with the Federal Health IT Strategic Plan Framework
- Appendix G: Product Line Alignment with VA’s Major IT Investments
- Appendix H: Comprehensive IT Plan
- Appendix I: Acronyms and Abbreviations

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### Appendix B: OMB Reporting Traceability Matrix

Code	Description	Enterprise Roadmap Section	IT (IRM) Strategic Plan Section
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.			
<b>Agency Strategic Goals and Objectives</b>			
AXXA	Identify agency strategic goals and objectives supported by the IT strategic plan (AXXA).	6.6 VA Strategic Plan	How OIT Supports the Secretary's Priorities (pg. 9)
AXXB	Describe how activities of the IT Strategic Plan and Enterprise Roadmap advance these goals and objectives (AXXB).	Purpose How to Use the Enterprise Roadmap 6. Strategic Alignment 6.8 IT (IRM) Strategic Plan 6.10 OIT Digital Transformation Strategy	Better Outcomes Start with Integration (pg. 4)  How OIT Supports the Secretary's Priorities (pg. 9)  Goals 1-5 (pg. 10-14)
<b>Improving Services to Customers – Describe how your agency regularly evaluates existing and planned customer-facing services to:</b>			
BXXA	Measure customer use and satisfaction through analytics and other approaches (BXXA).	1.1 Digital Experience 1.2 Contact Center 1.4 Customer Master Data Management	Goal 1, Objective 1 (pg. 10)
BXXB	Improve usability, availability, and accessibility of services, including optimization of services for mobile use (BXXB).	1.1 Digital Experience 1.2 Contact Center 1.3 Eligibility and Enrollment 1.4 Customer Master Data Management 2. Health Services Portfolio 2.1 Medical Care 2.2 Health Care Administration 2.3 Telehealth and Scheduling 2.5 Community Care 2.6 Supply Chain Management 3. Benefits and Memorial Services Portfolio 3.1 Education and Veteran Readiness and Employment 3.2 Compensation and Pension 3.3 Loan Guaranty 3.5 Appeals 3.6 Benefits Integration and Administration 3.7 Memorial Benefits and Services 4. Corporate Services Portfolio 4.4 SecVA/Congressional/Legal Affairs 5.3 Trusted Information Sharing 5.4 Platform Management 7.9 Enterprise Mobility Strategy	Breaking down barriers to integrate care (pg. 6)  Breaking down barriers to integrate new solutions (pg. 7)  Goal 1 and 2 (pg. 10-11)
BXXC	Advance agency performance goals (BXXC).	7.2 Technology Business Management 7.3 DevSecOps 7.6 Enterprise Interoperability 7.7 Investment Review Process 7.10 Strategic Sourcing 7.11 IT Governance	Goals 1, 2, 3 and 5 (pg. 10-12, 14)

<b>Governance and Management Processes</b> – 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).	7.11 IT Governance	PPBE and Governance (pg. 16-17)
CXXB	Which agency stakeholders are engaged, including “C”-level leadership (CXXB).	7.7 Investment Review Process	Better Results Starts with Commitment (pg. 16-17)
CXXC	The valuation methodology used to comparatively evaluate investments, including what criteria and areas are assessed (CXXC).	7.7 Investment Review Process	Better Results Starts with Commitment (pg. 16-17) – Data, Governance, and Risk Management
CXXD	How the agency ensures investment decisions are mapped to agency goals and priorities (CXXD).	7.7 Investment Review Process 7.11 IT Governance	PPBE and Governance (pg. 16-17)
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).	7.7 Investment Review Process	Better Results Starts with Commitment (pg. 16-17) - Data, Governance, and Risk Management
CXXF	How you coordinate between investment decisions, portfolio management, enterprise architecture, procurement, and software development methodologies (CXXF).	7.1 Product Line Management 7.7 Investment Review Process 7.11 IT Governance	
CXXG	Describe the agency’s IT strategic sourcing plan, to include processes for addressing enterprise licenses (CXXG).	7.10 Strategic Sourcing	Goal 3 (pg. 12)
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).	6.8 IT (IRM) Strategic Plan 7.7 Investment Review Process 7.10 Strategic Sourcing	
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).	5. Technology and Platform Services Portfolio 5.2 Cybersecurity and Access Control Services	Goal 5 (pg. 14)
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).	5.2 Cybersecurity and Access Control Services	
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 Capital Management	Goal 4 (pg. 13)

Managing Information as an Asset			
GXAA	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 (GXAA).	2.1 Medical Care 2.2 Health Care Administration 2.3 Telehealth and Scheduling 2.4 Medical Research, Education and Population Health 2.5 Community Care 3.1 Education and Veteran Readiness and Employment 3.2 Compensation and Pension 3.7 Memorial Benefits and Services 4.3 Human Capital Management 5.3 Trusted Information Sharing 6.10 OIT Digital Transformation Strategy 7.5 IT Service Management 7.6 Enterprise Interoperability	Goal 5 (pg. 14)
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).	5.2 Cybersecurity and Access Control Services	
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).	1.2 Contact Center 4. Corporate Services Portfolio 3.3 Loan Guaranty 3.6 Benefits Integration and Administration 5.1 IT Infrastructure 5.4 Platform Management 7.10 Strategic Sourcing	Goal 2 (pg. 11)
HXXB	Describe the agency’s plan to re-invest savings resulting from consolidations of commodity IT resources (including data centers) (HXXB).	7.10 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).	3. Benefits and Memorial Services Portfolio 6.10 OIT Digital Transformation Strategy	Goal 3 (pg. 12)
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 Capital Management	Goal 4 (pg. 13)
IXXB	Integrating accessibility considerations into the processes used in developing, procuring, maintaining, or using IT (IXXB).	4.3 Human Capital Management	
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 Capital Management	Goal 4 (pg. 13)

## Appendix C: Architecture Diagrams

### Veteran Experience Services Portfolio

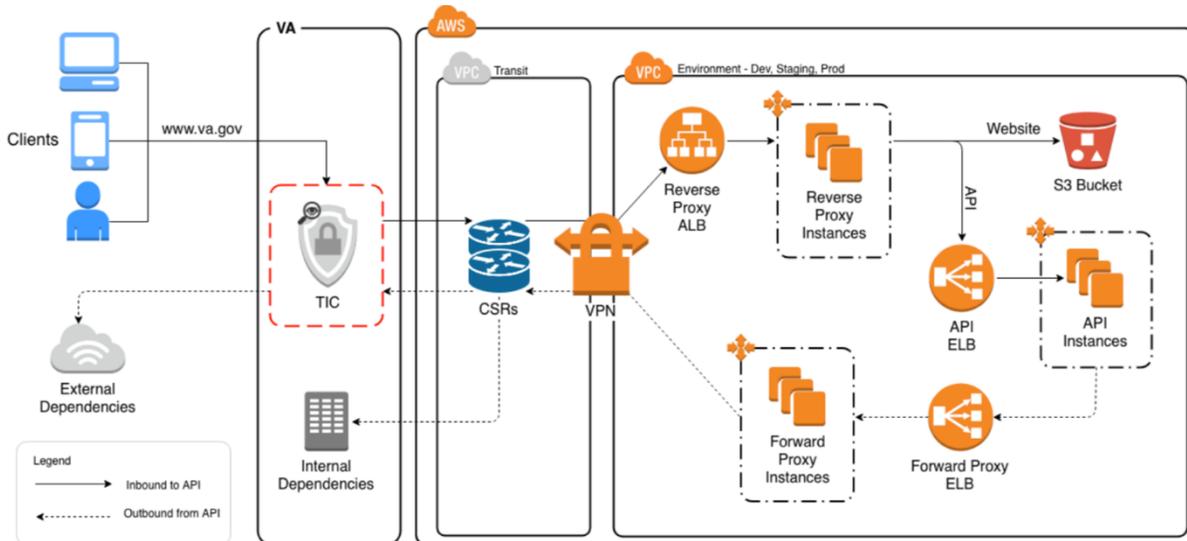
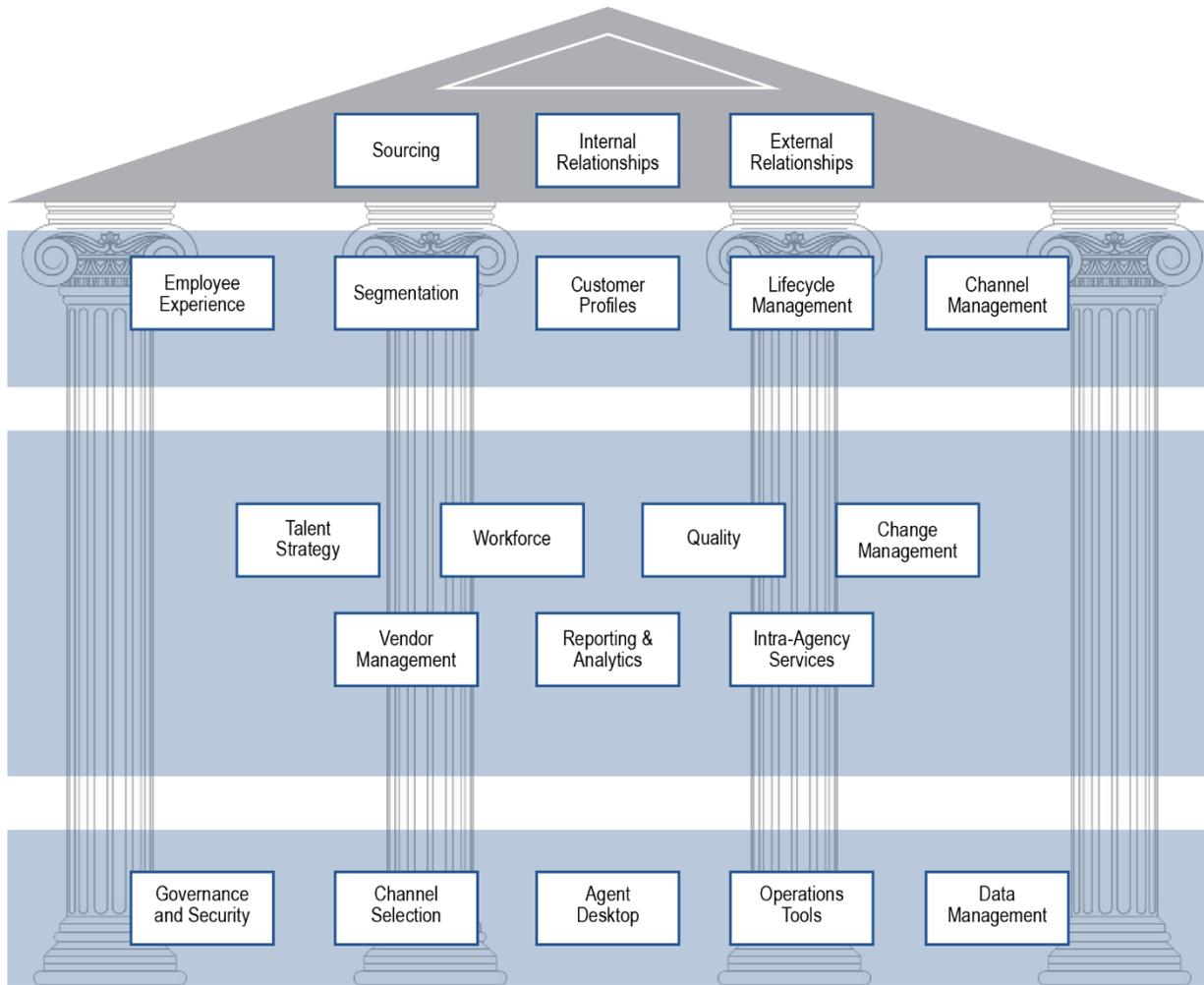


Figure 60: VA.gov Topology Basics

Figure 60 contains a detailed topology of the process of requests to the [www.va.gov](http://www.va.gov) website and API. At the highest level, users make requests to [www.va.gov](http://www.va.gov) and [api.va.gov](http://api.va.gov). These requests are routed to the AWS GovCloud, which can then 1) respond to the requests on its own, such as for static content, or 2) reach into the VA network to call an API to help respond to the request, such as to get a user's prescription information. In order to serve these requests, there are many pieces of infrastructure inside GovCloud. All traffic to and from the AWS environments passes through the VA network. This creates a loop architecture, in which traffic incoming from clients and outgoing from the API goes through the same virtual private network (VPN) tunnels to the internal VA network. Once the request reaches GovCloud, it is first routed to a reverse proxy, which then either sends it to an Amazon Simple Storage Service (Amazon S3) bucket for static content and front-end apps or to a load balancer for API content. The API instances have the ability to connect into the VA network via APIs if necessary. This diagram shows most of the components of the environment and how they fit together. There are three main Amazon Virtual Private Clouds (VPCs), one for each environment: development, staging, and production. Additionally, there is a fourth VPC, utility, which contains monitoring and deployment infrastructure.



**Figure 61: Enterprise Contact Center Logical Structure**

Figure 61 presents the logical structure of VA's Enterprise Contact Center in the future environment.

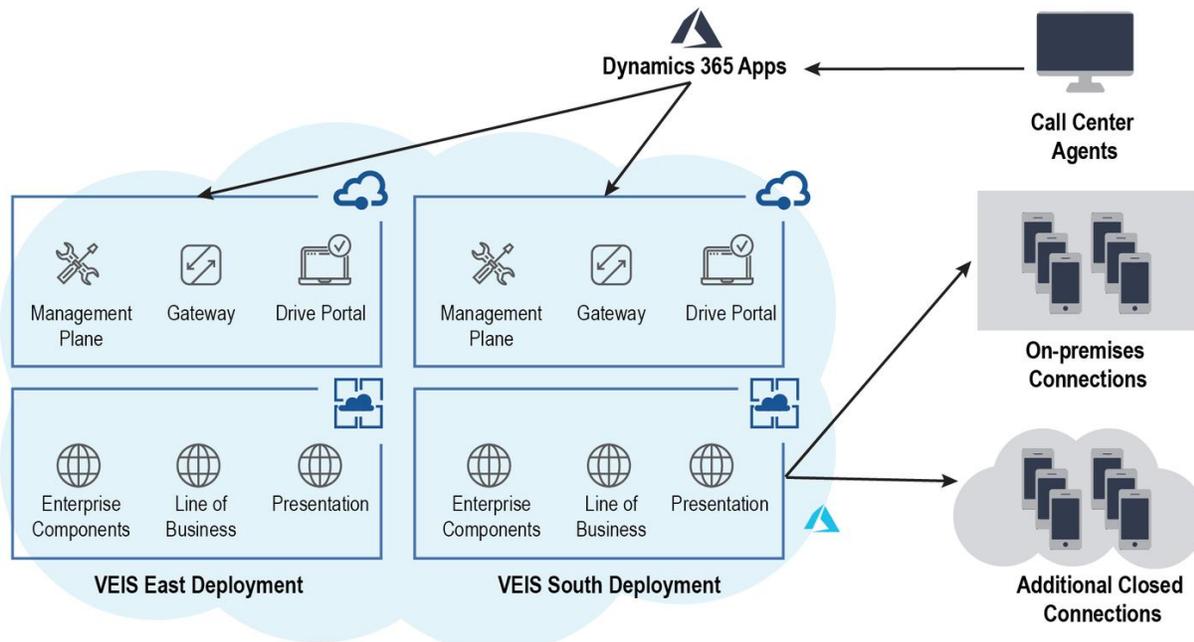
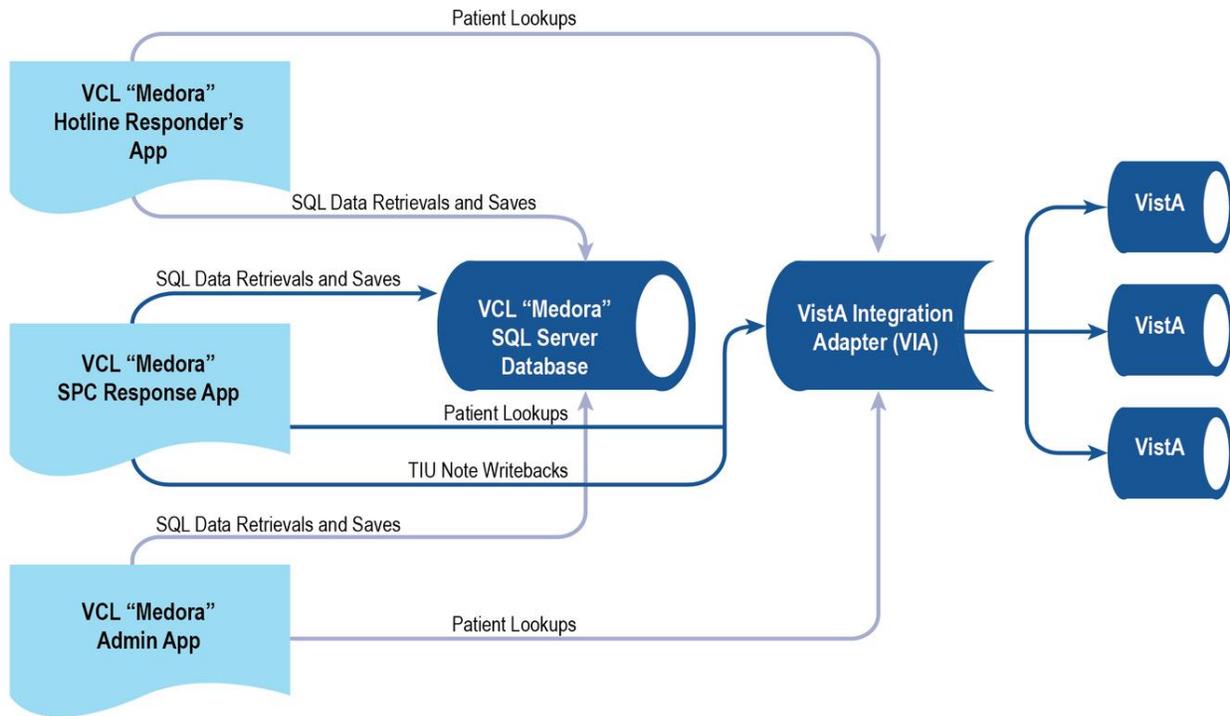


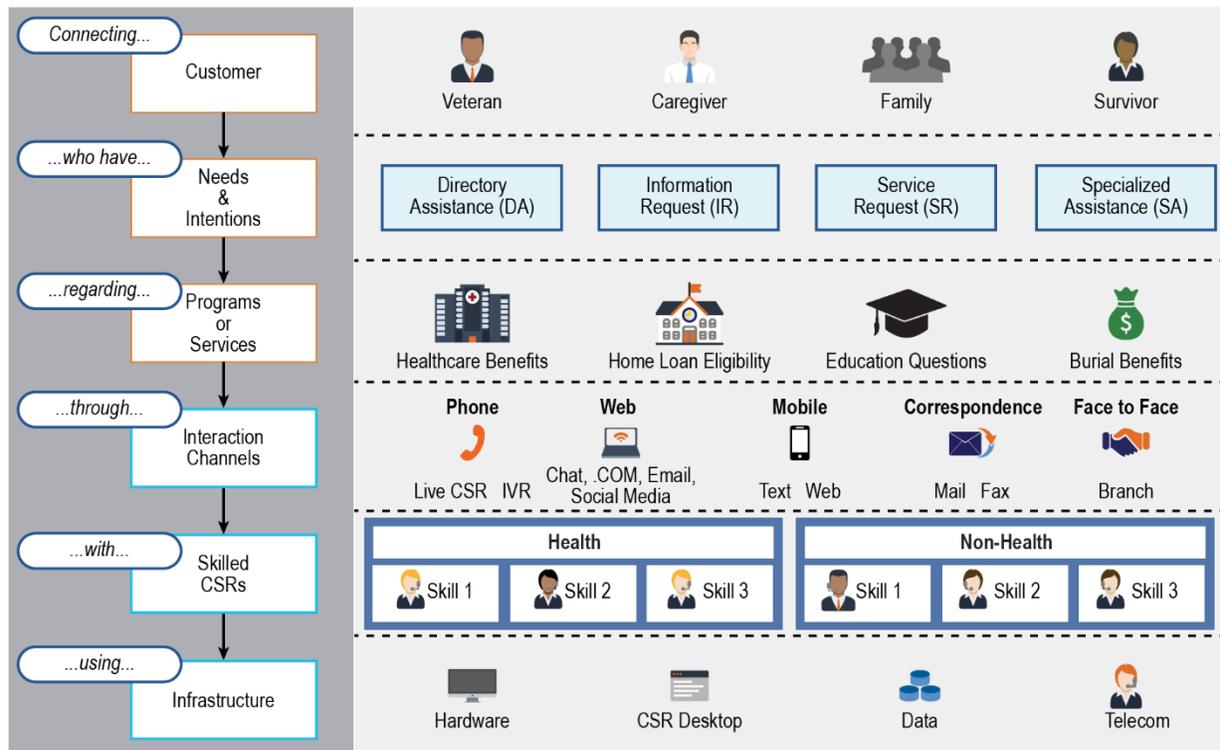
Figure 62: CRM/UD-O Architecture

Veteran Experience Integration Services (VEIS) is an integration framework for VA that provides an API interface to VA Enterprise systems from within their Dynamics 365 LoB applications. Using Dynamics 365 Plug-Ins, Azure App Service Instances, and Azure API Management, VEIS provides an extensible architecture for Dynamics 365 LoB applications to secure, manage, and monitor communications with VA LoB and backend systems. This diagram illustrates the interactions between the VEIS framework and the LoB applications.



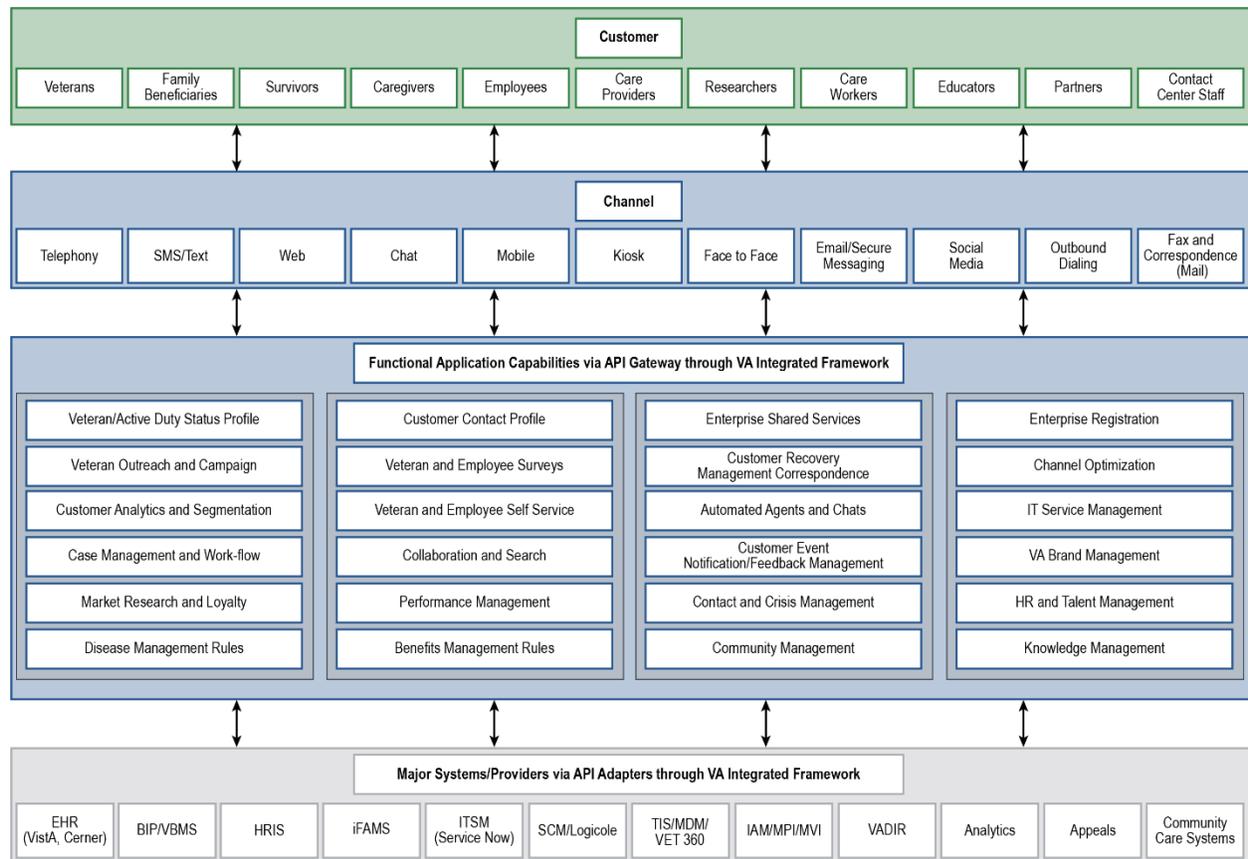
**Figure 63: VCL Architecture**

Figure 63 displays the interaction within the Medora application used for VCL and the external integration with the VA VistA medical system.



**Figure 64: ECCM Veteran-Centric Operating Model**

The design principle of Contact Center Modernization is focused on delivering a unified experience that is consistent and benefits Veterans regardless of how they choose to interact with VA. A Veteran-centric operating model will provide the capabilities and processes necessary to coordinate sharing best practices, information, and data across the public, nonprofit, and private sector resources that provide services to and impact Veterans. ECCM aims 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 implementing emerging technologies including ML, APIs, and common user interfaces.



**Figure 65: CRM Future Environment Reference Architecture**

VEO is pursuing an enterprise-wide, Veteran-centric technology customer service environment, which will provide VA with an integrated customer service delivery platform. As previously discussed, VA will define and implement a unified CRM strategy built on this integrated commercial platform. Enabled by an enterprise platform, these functionalities will provide Veterans with their choice of access methods. The diagram is a CRM reference architecture created based on the future enterprise integration vision. The Department can 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.

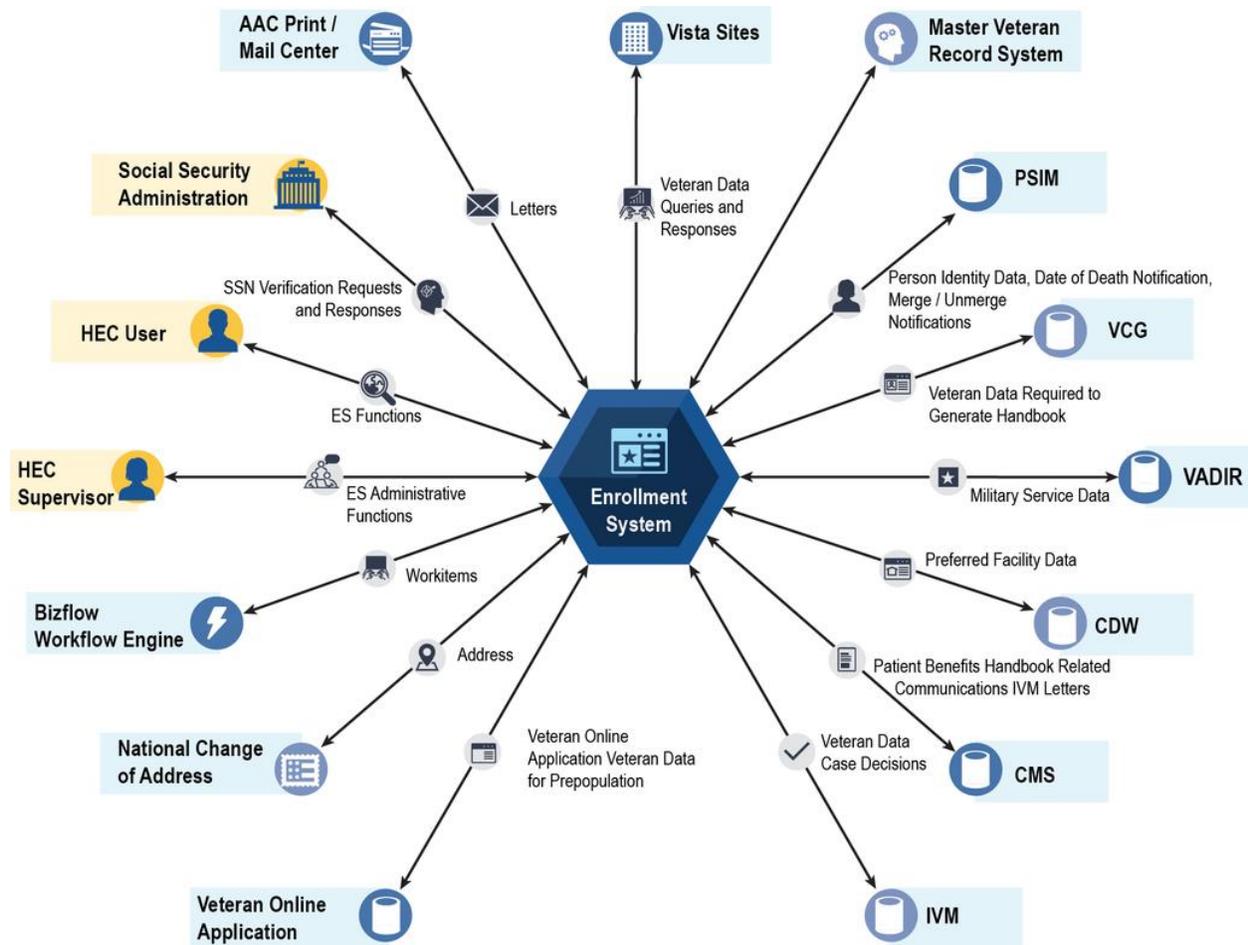
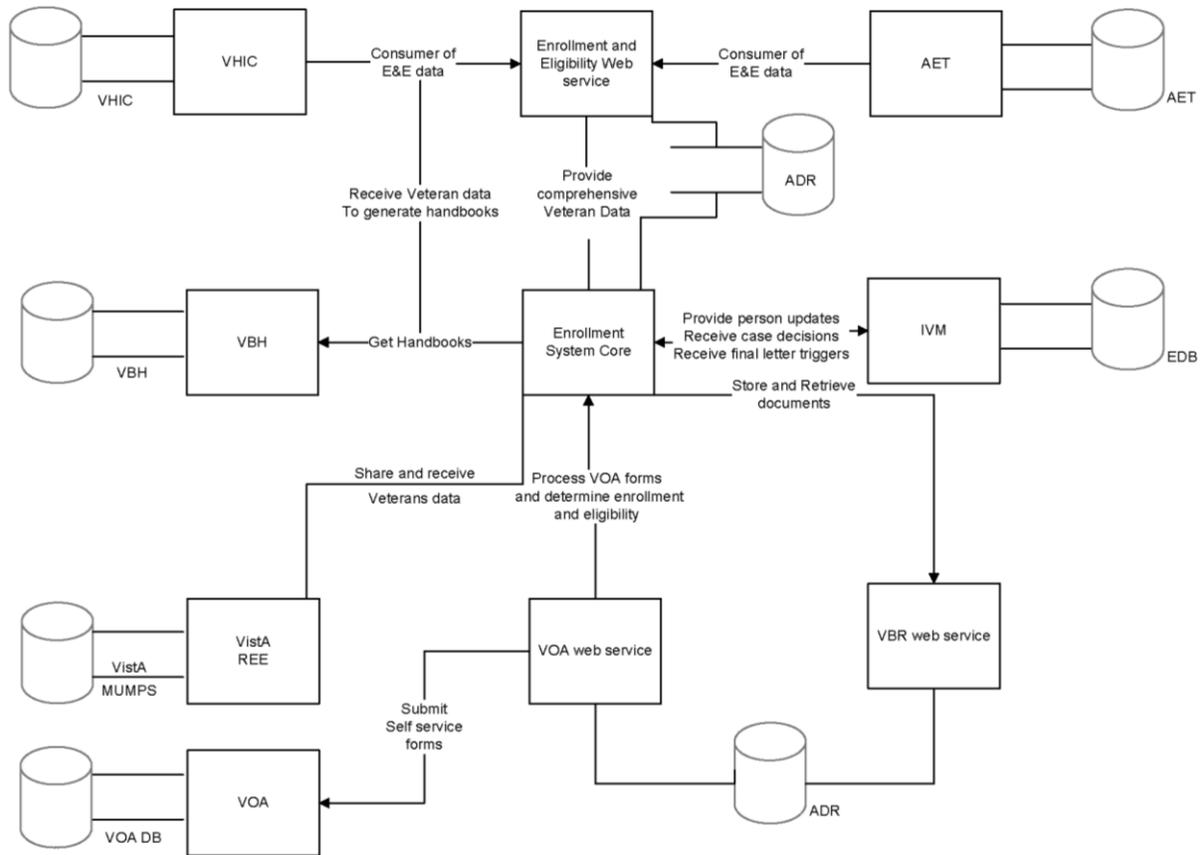


Figure 66: Enrollment System

ES consists of two major sub-systems or modules: 1) messaging and 2) case management. The messaging sub-system provides a seamless bi-directional interface with external VHA and non-VHA systems for data exchange of Veterans information. The case management sub-system is an intranet web-based application that provides authorized VHA case representatives at HEC with a web interface to easily track, maintain, and manage cases associated with Veteran benefits.



**Figure 67: ES Components/Interaction**

The ES application is comprised of four major modules: 1) framework, 2) common, 3) user interface, and 4) messaging. Each of these modules is an independent set of services that are consumed by other external or internal clients. The framework module represents the system plumbing and integration points with other third-party libraries. The common module represents the application layer component that is consumed by the messaging, workflow, communication, user interface modules. The messaging module is the integration point between ES and other external applications. This module allows for asynchronous and synchronous communication protocols. The user interface module is the presentation layer of ES. This module is accessed by end users through a web interface hosted on VHA network.

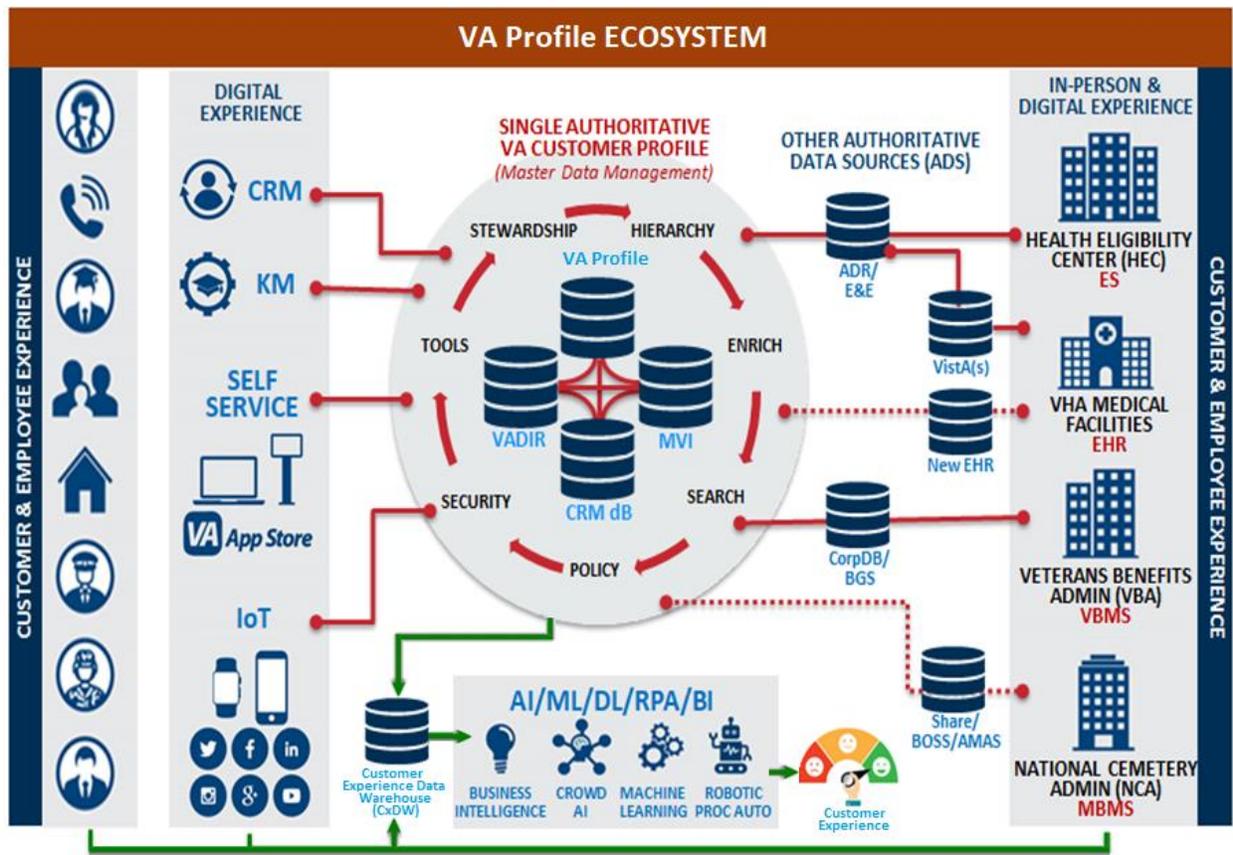


Figure 68: VA Profile Ecosystem

VA Profile will transform the existing cumbersome data process environment into a seamless data sharing architecture by consolidating VA’s current data silos. The foundation for this initiative is the Master Data Management platform (center of diagram), which will deliver a single source of truth for common Veteran data across various channels via phone, online access, walk-in, and mail through CRM, KM, self-service, and IoT channels (left side of the diagram). VA Profile will leverage this common source of Veteran data for all VA ecosystems including Health Eligibility Center systems, EHR systems, VBA systems, and NCA systems (right of diagram). VA will consume the common data via APIs to deliver new technology and services, such as business intelligence, AI, ML, and RPA (bottom of diagram).

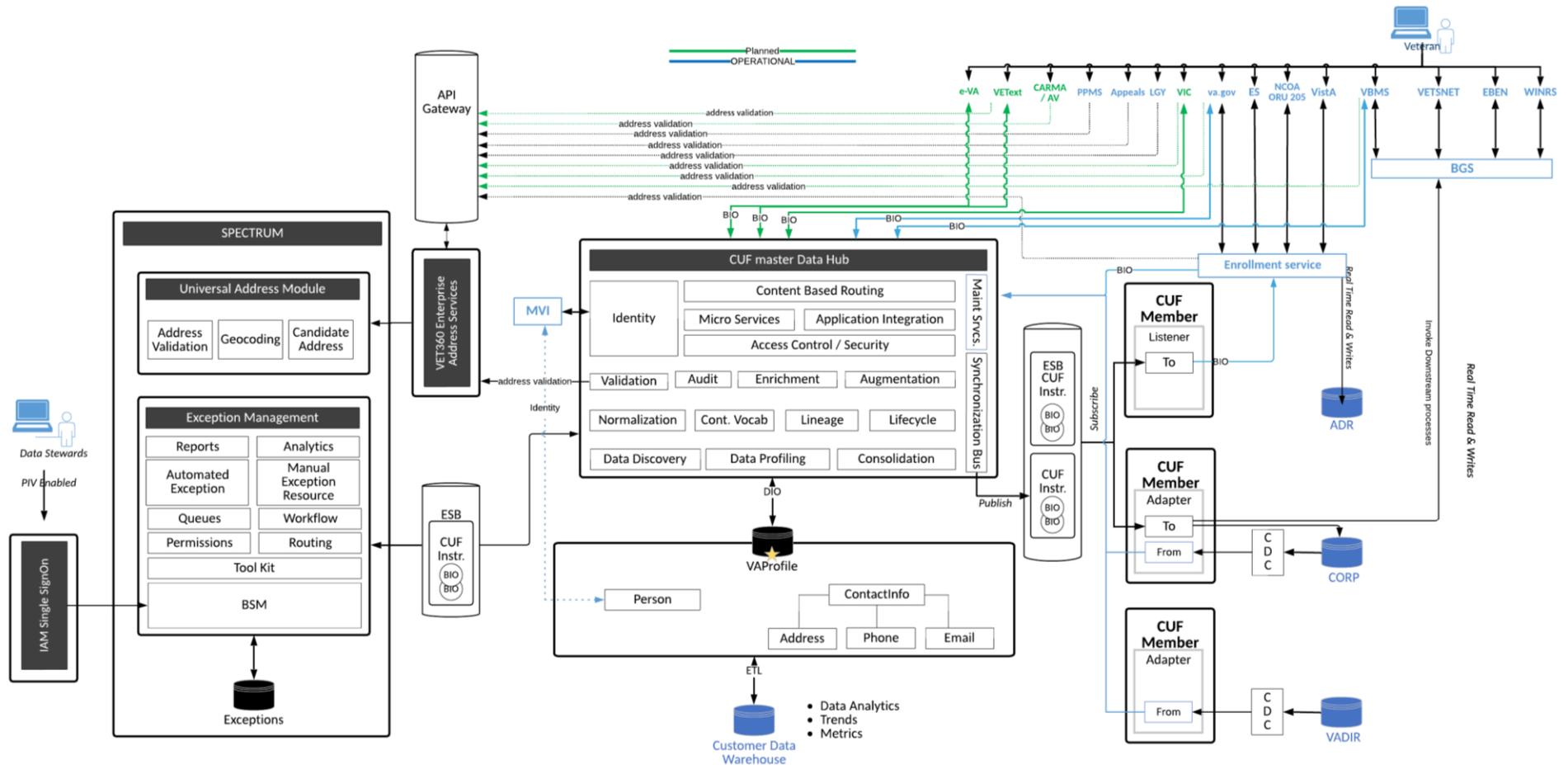


Figure 69: VA Profile Logical Architecture

The approach to building the VA Profile product is based on developing a Common Update Framework (CUF) product that supports all data transformations and all updates back to source systems. The CUF is accessible through micro-services that support both attended (user-initiated) and unattended (system to system initiated) transactions. Data harmonization is based on a hub-based synchronization pattern providing guaranteed integrity and traceability of all transactions and data transformations.

VA Profile clients communicate with the CUF via REST micro-services to push and pull data from the Longitudinal Veteran Record by issuing HTTP requests (e.g., GET and POST). The CUF Master Data Hub integrates with the VA’s MVI to enable identity correlation between the VA Profile authoritative repository and other VA representations, such as the participant identifier and the Internal Control Number that are used in synchronization partners. Within the CUF, each request creates a unique orchestrated transaction

lifecycle as we apply validation and business rules to consolidate, correct, and enrich data in the Longitudinal Veteran Record. The extensible framework enables integration points where third-party applications can be integrated using Java APIs and remote web services (e.g., Pitney Bowes Spectrum integration to support address verification).

The CUF Master Data Hub will also expose and leverage enterprise-controlled vocabularies to establish standardized terminology that can be sourced from a variety of different data sources including lookup tables, files, or enumerated lists. Within each CUF transaction, data that fails validation must be reviewed and resolved by a Data Steward. The Pitney Bowes Business Steward Module is used to provide a web-based portal that will enable Data Stewards to define and manage automated and manual flows for data exceptions that occur within each data domain.

### Health Services Portfolio

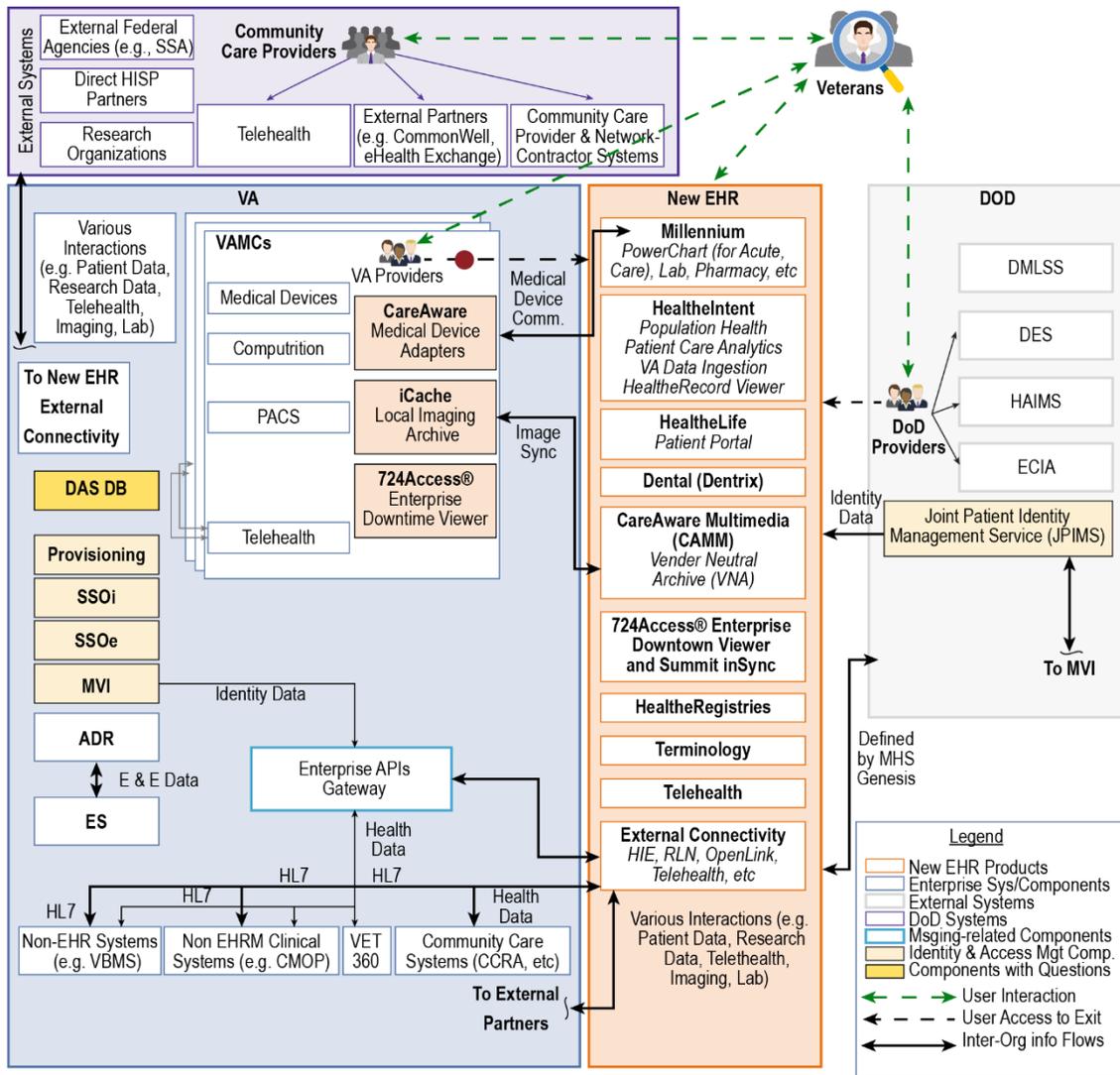


Figure 70: EHRM Future Environment FOC Overview

VA’s highest-profile IT modernization initiative, EHRM, will adopt the same EHR system as DoD. This will ease the transition of patients’ health record data and eliminate the need to reconcile, as well as manually or electronically transfer, clinical data between the two Departments. The EHR’s full operating capacities are expected to provide a seamless platform, enabling interoperability that is better than the industry standard. It follows the defined VDIF architecture, which will provide secure, high-performance, governed access to Cerner EHR data and VistA legacy data, allowing multiple instances and the entire enterprise to access federated data. VDIF will support the integration of VistA data and EHRM data with COTS and non-COTS products.

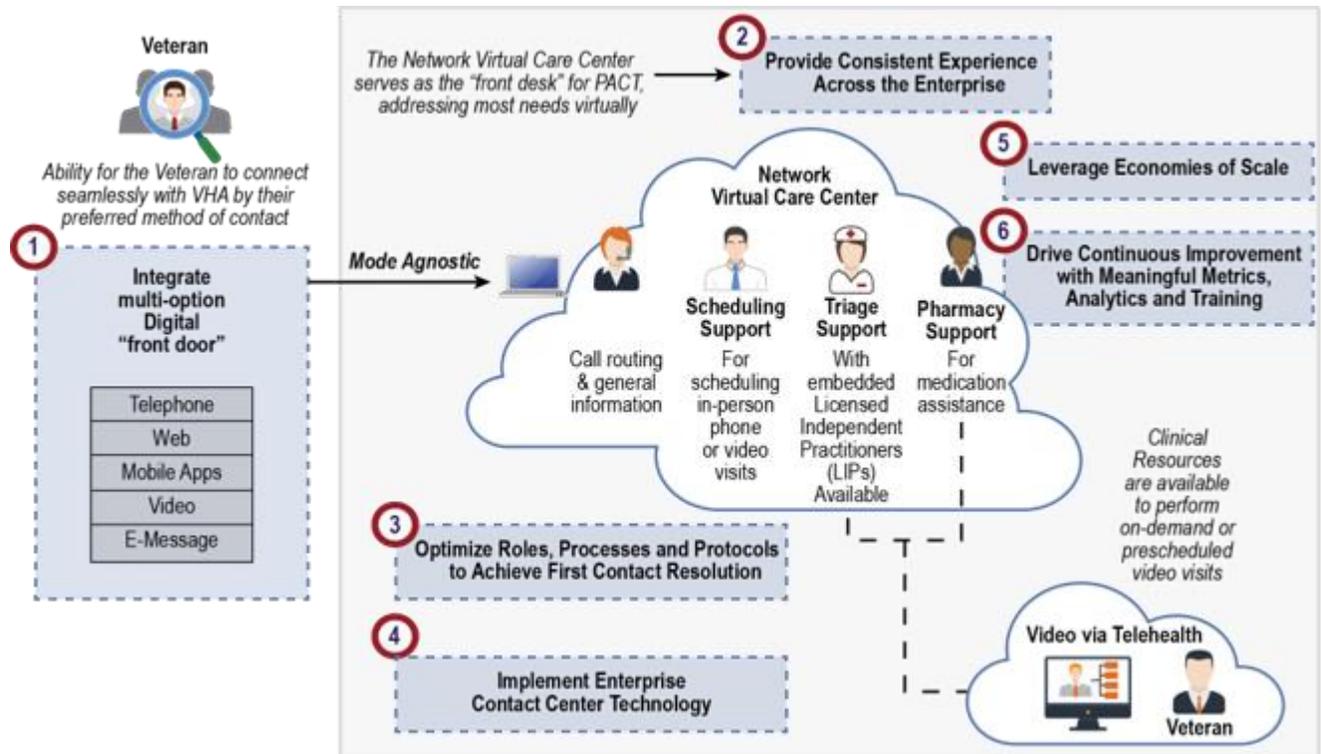


Figure 71: Future Environment of VA's Virtual Care Center Model

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 immensely varied, fragmented, and antiquated call centers into modern, regional virtual care centers available in each VISN. VA will ensure that there is a robust clinical contact center in each VISN and will enhance these centers to improve Veteran and employee experience by further integrating telehealth and licensed independent practitioners 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.

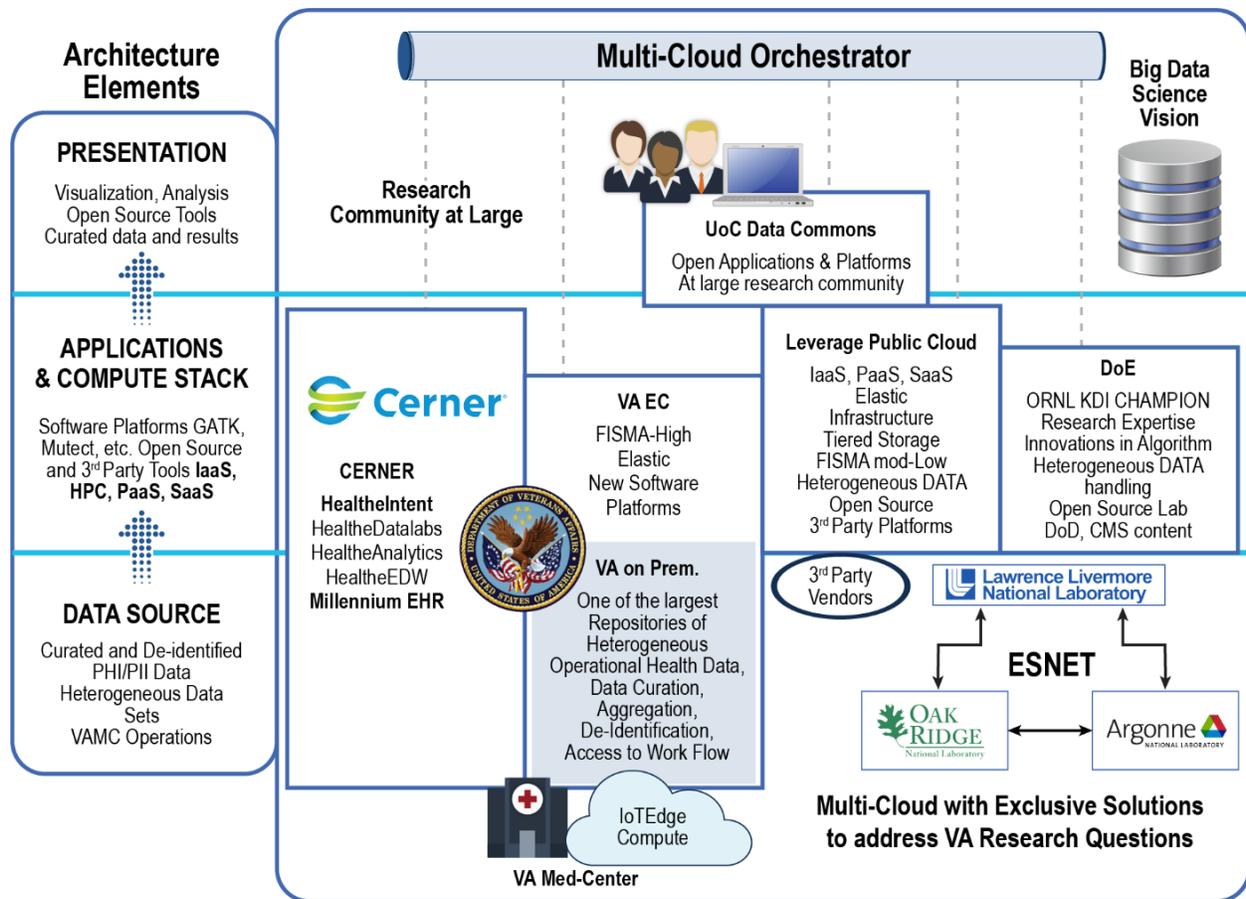
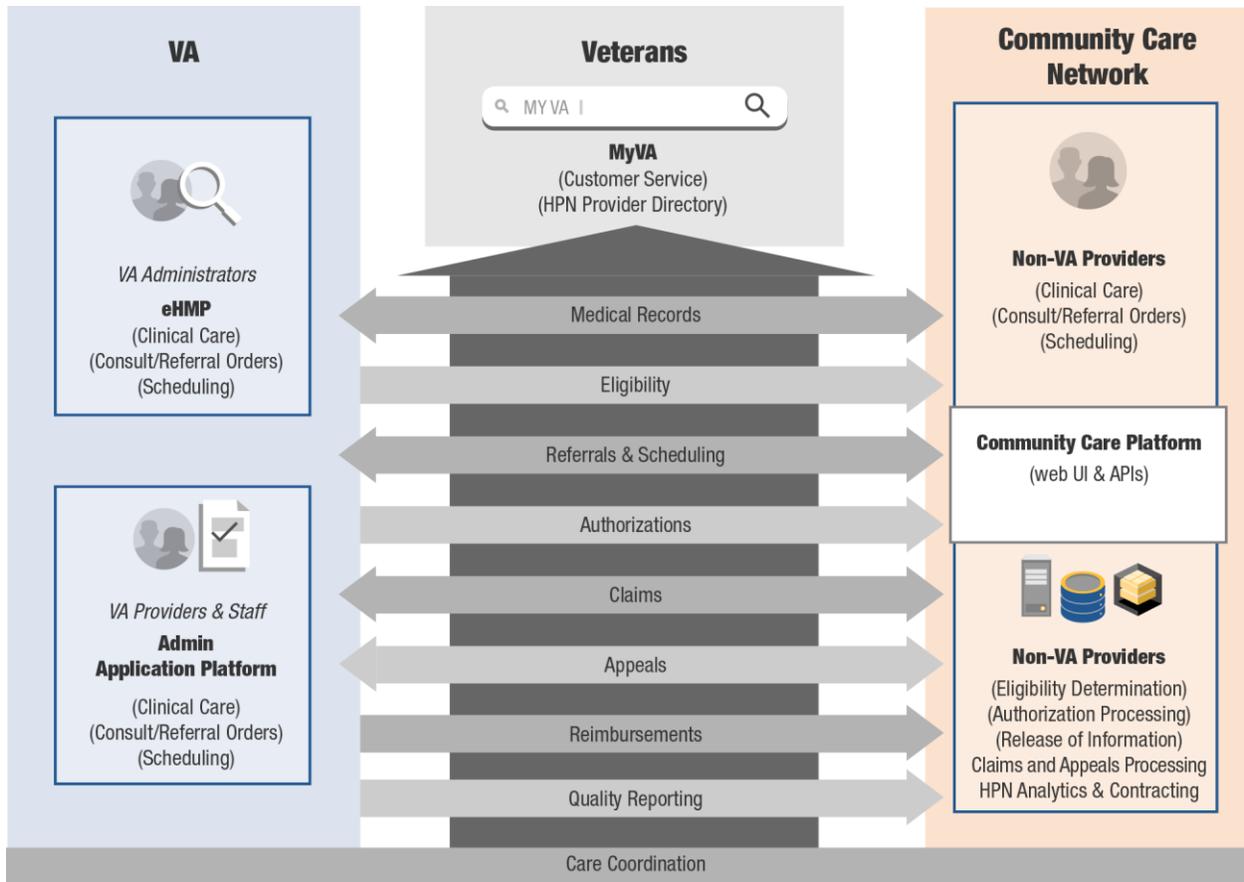


Figure 72: VA's Multi-Cloud Research Environment

VA is developing 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 (i.e., subsets of a data warehouse organized for a specific analysis) designed with the tables and tools required for analysts to do their jobs. The data within the data marts are pulled from multiple sources, processed in a uniformed manner, documented, and optimized. The diagram displays 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).



**Figure 73: Overview of Community Care Services**

Figure 73 provides the overview of community care services and interoperability between VA Providers and Staff and the CCN non-VA providers and non-VA administrators.

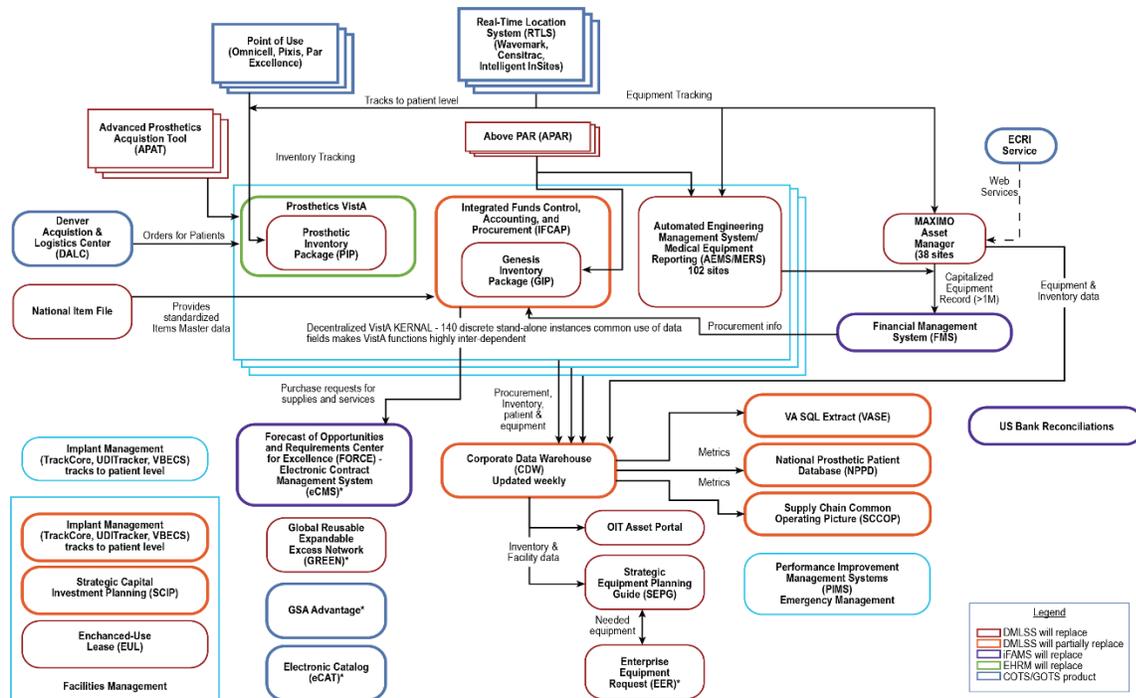


Figure 74: VA Supply Chain Management Systems VISN 20 Systems View Level 1 (SV1)

VA’s implementation of DMLSS as the supply chain management system will facilitate health care logistics modernization and enable VA to decommission legacy systems. VA will migrate to LogiCole—a modern, Cloud-based solution for enterprise-wide deployment—in FY 2023. The deployment of a modern supply chain management solution will also ensure effective management of VA facilities, allow effective analysis of ownership costs, and enable prioritization of investments based on asset condition.

Benefits and Memorials Services Portfolio

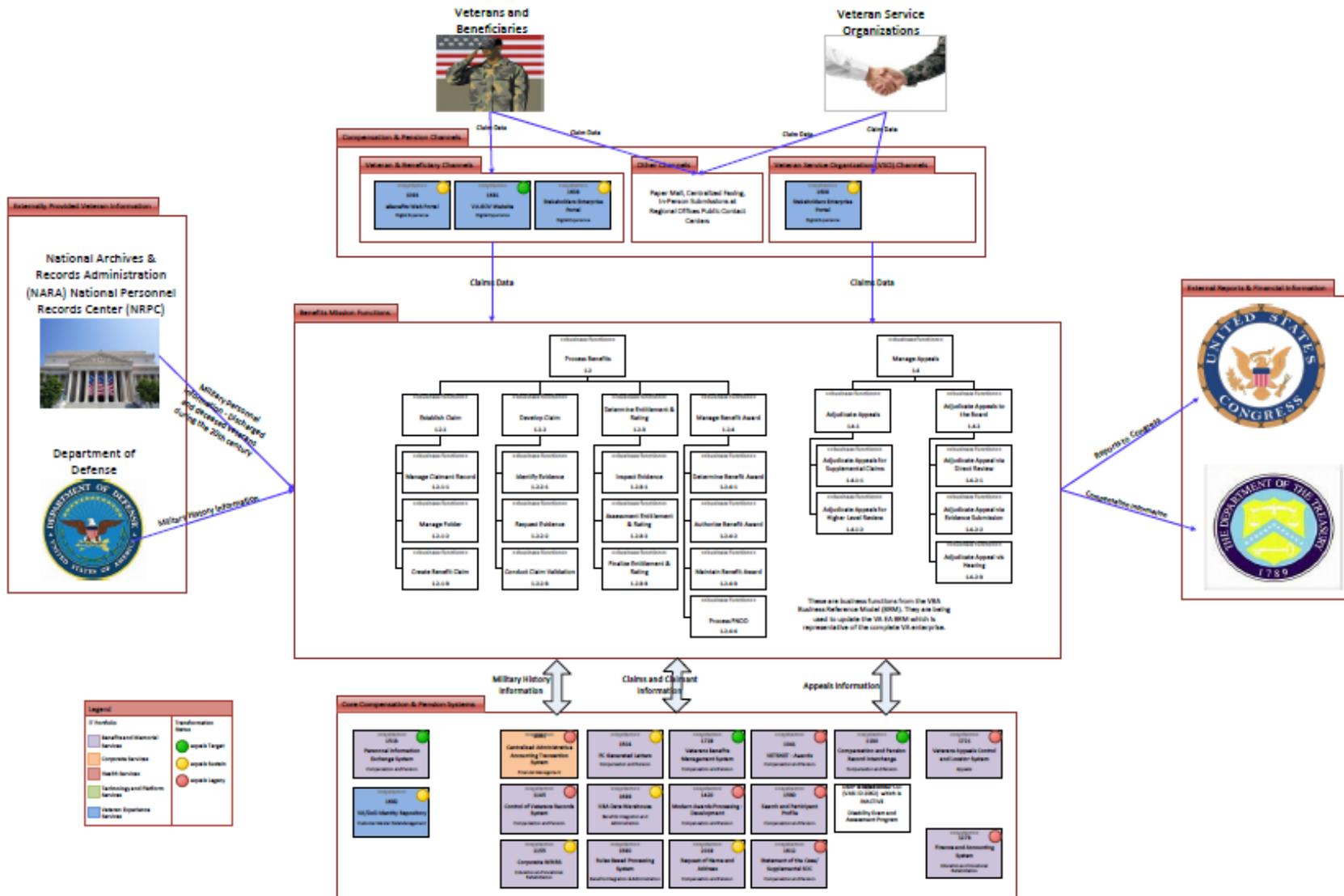


Figure 75: Compensation and Pension Product Line

This template documents the design of each VA system in a standardized manner. This information, when aggregated with other system information, enables:

1. Portfolio and Product Line Managers to plan and execute product enhancements for their products.
2. Development project team members to understand the architectural views of their system upon completion of this template.

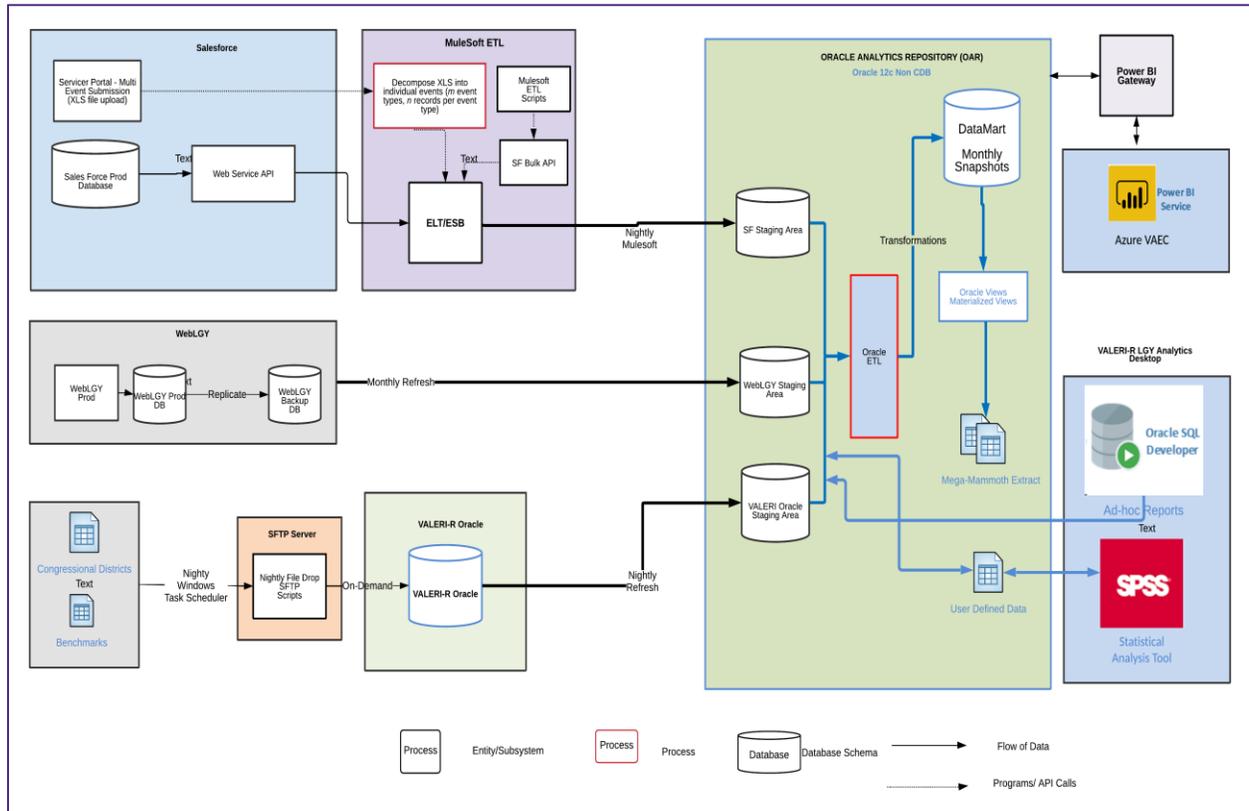
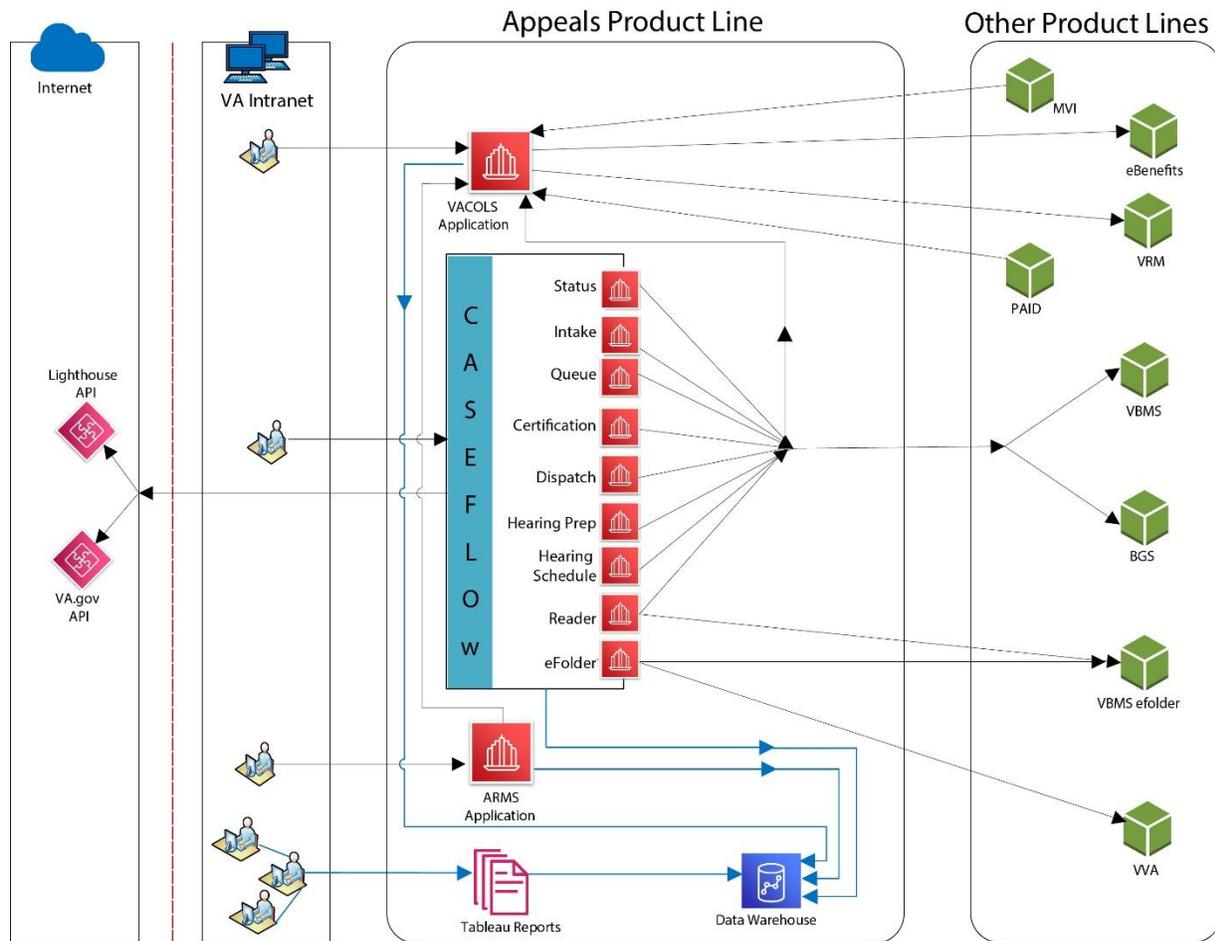


Figure 76: LGY Product Line As-Is Data Architecture - Expanded View

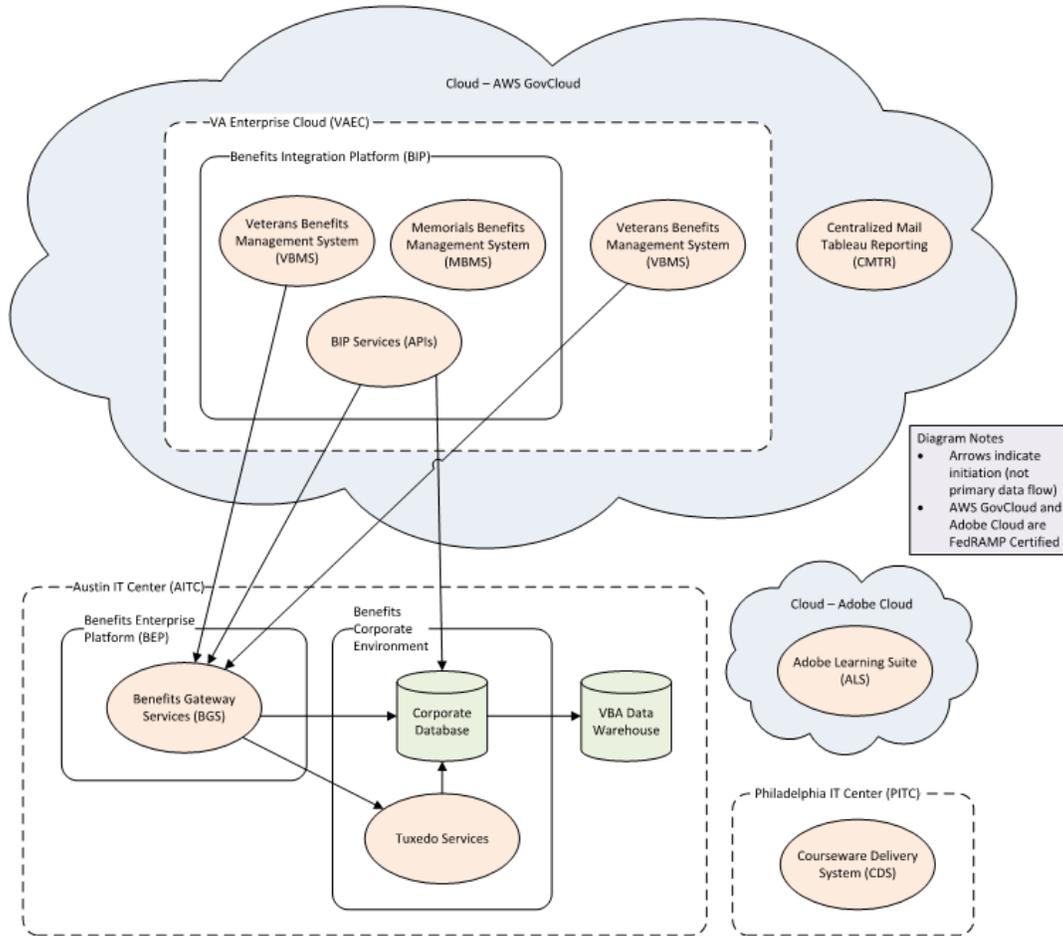
This diagram captures the data flow, data repositories, and reporting engines currently used to meet the reporting needs of LGY. The depiction includes the data flow from Salesforce and Web LGY being ingested via MuleSoft real-time and via SFTP batch into the analytical repository.



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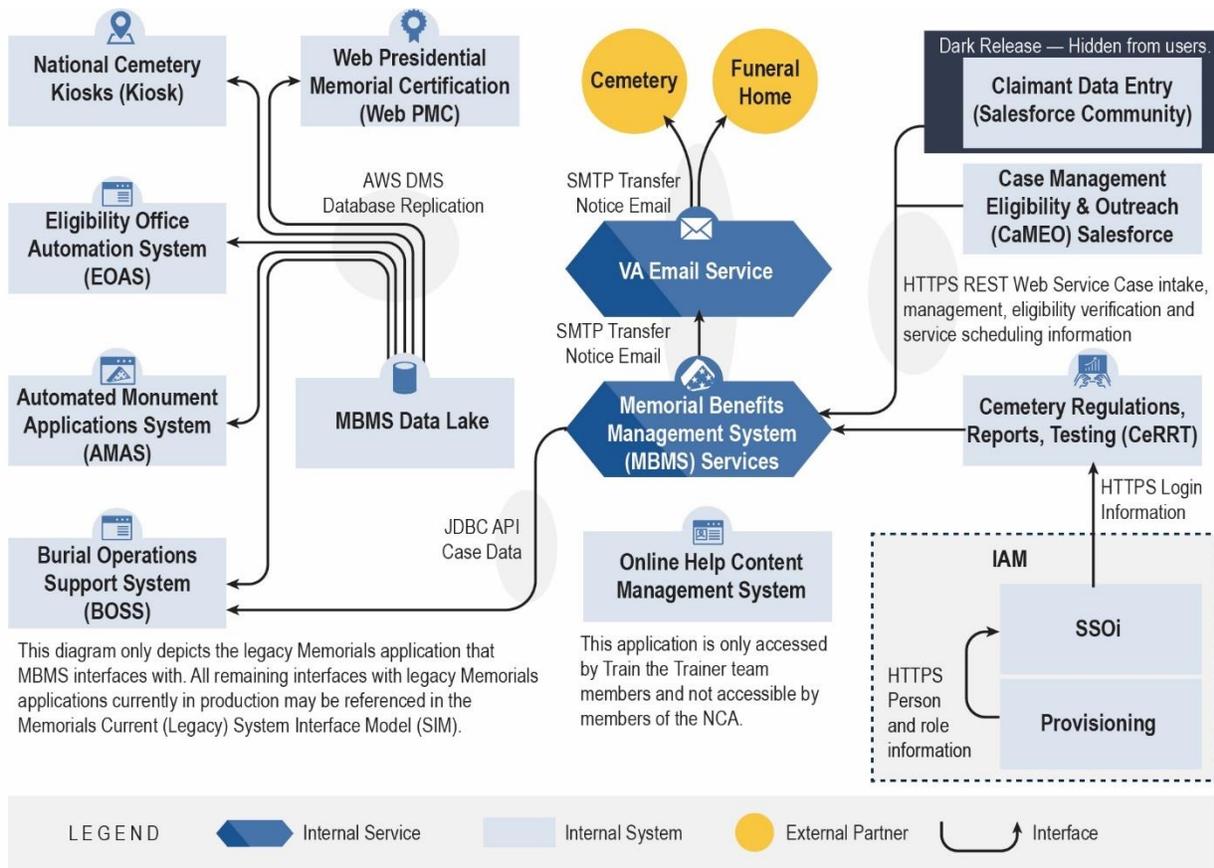
**Figure 77: Board of Veterans' Appeals Products**

Figure 77 depicts the primary products within the Appeals Product Line (VACOLS, Caseflow, and ARMS). VACOLS receives data from MVI and PAID. VACOLS sends data to eBenefits and the Veterans Relationship Management System (VRM). Caseflow connects to VACOLS, VBMS, VVA, and BGS directly, and Lighthouse API (appeals only), through Caseflow, accesses data from VBMS and BGS. The Caseflow team provides the VACOLS and Caseflow data to Tableau. ARMS feeds data to Tableau separately.



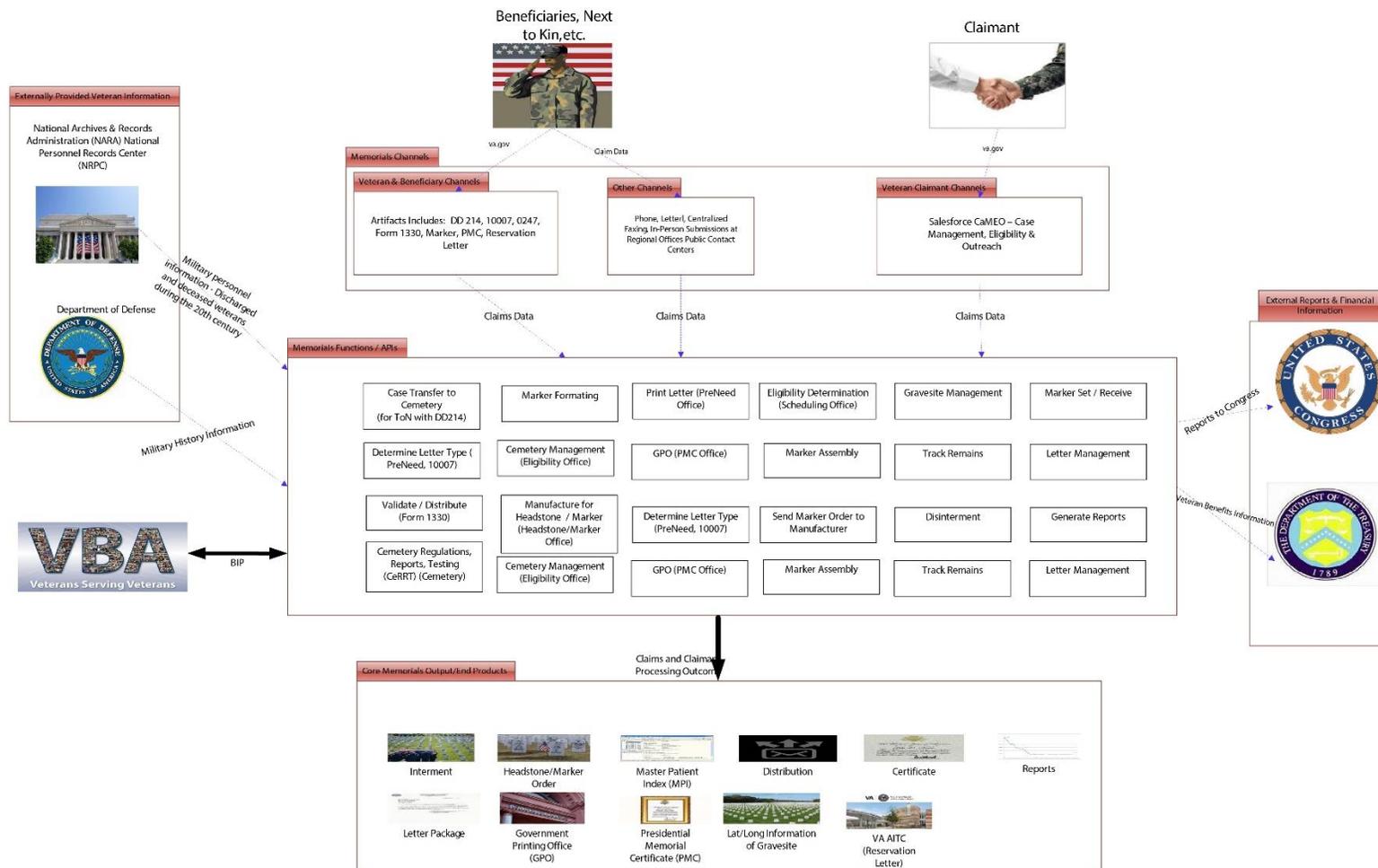
**Figure 78: BIA High-Level Architecture**

Figure 78 depicts the current high-level architecture of the BIA Product Line. Key components include BIP, BEP, the Corporate Database, VBA Data Warehouse, Centralized Mail Tableau Reporting, ALS, and CDS.



**Figure 79: MBMS v2.0 Interim System Interface Model**

Figure 79 represents the interfaces from MBMS as of January 2020 showing the phased approach to the replacement of the legacy Memorial applications. Currently, BOSS-E is the system of record until all functionality and data from BOSS-E applications are migrated to the MBMS platform.



**Figure 80: Target Operational View of the Memorial Benefits and Services Product Line**

The target Memorials High-Level Operations Concept Graphic consists of four major parts, including user access channel and functional processing/API. It provides an overview of the scope of Memorial Benefits Product Line; functions and systems; and the channels Beneficiaries, Next of Kin, Claimants, etc. use to gain access to them. End products or hand-over processes describe the products/outcome achieved by the Product Line or the downstream process to which it hands over the products. The diagram also displays the interaction with external partners in service delivery (e.g., NARA and DoD) and external organizations to whom reporting is provided (e.g., Congress).



Figure 81 is a system network diagram that provides an overview of Acquisition and Property and Management systems and their interactions, which are both internal and external to VA. The diagram displays the systems within the Acquisition and Property Management Product Line (shaded red) and their interfaces within the Product Line, with systems in other Product Lines, and with external systems (shaded gray). Interfaces depicted by arrows indicate the direction that data is flowing while those without arrows indicate an exchange of data between systems. Serving as a main point of interaction, eCMS receives, sends, or exchanges data with the Contact Center, Health Care Administration, Customer Master Data Management, Cybersecurity and Access Control Services, Medical Care, and Financial Management Product Lines as well as external systems. Lastly, the colored dot associated with each internal VA system indicates the system’s transformation status: target (green), sustain (yellow), or legacy (red).

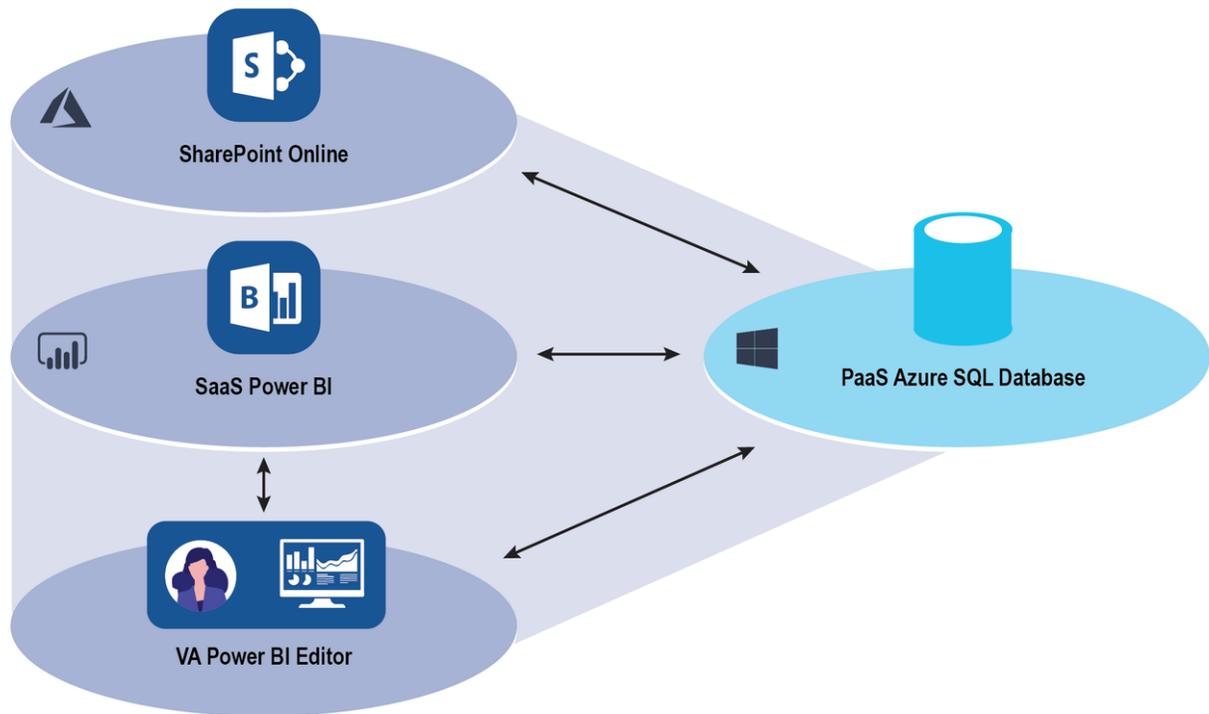


Figure 82: PPMT Technical Architecture

Figure 82 depicts the back-end Cloud architecture for PPMT. PPMT is hosted on a SharePoint platform within the Microsoft Azure Cloud and is accessible via Power BI. PPMT reports can be viewed in the Power BI Editor or stored in SharePoint Online.

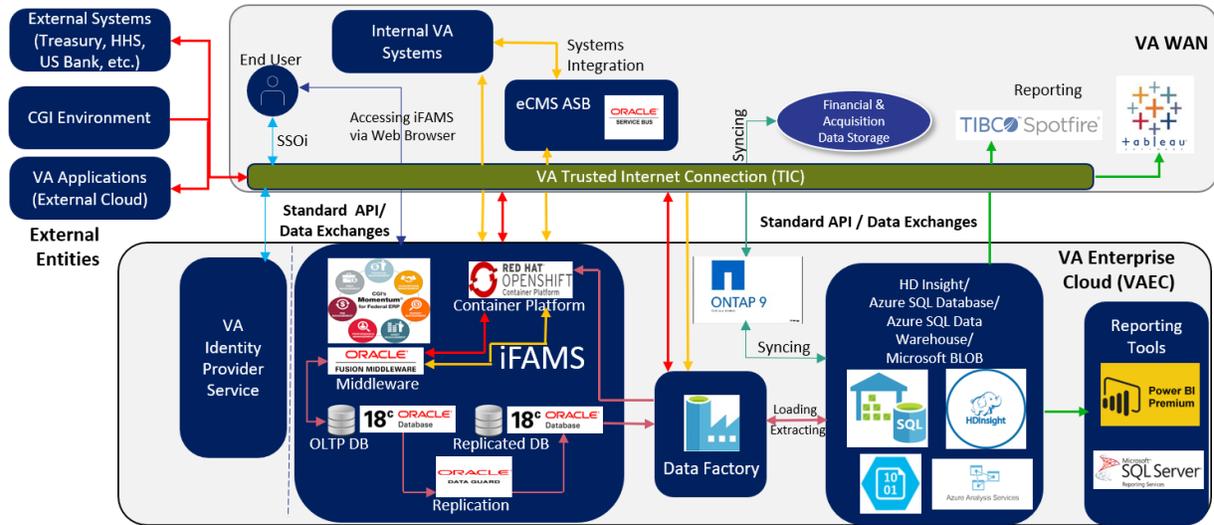


Figure 83: iFAMS High-Level Application and Data View

iFAMS will encompass a number of specialized modules, which will integrate to operate seamlessly throughout the entire lifecycle of VA investments. This includes connecting to Microsoft Azure’s Cloud environment for data storage, reporting, and analytics. VA will leverage the existing high-bandwidth, redundant TIC to connect to its financial and acquisition data storage, its internal systems via the iFAMS ESB, external systems (e.g., Treasury and DoD systems), and other VA applications on external Clouds.

Figure 83 shows iFAMS’ high-level, end-to-end data flow and application relationships related to transaction processing, storage, and analytics. It represents the high-level iFAMS architecture, including internal and external systems, end users, and the iFAMS application hosted in VAEC. The VA TIC is shown to represent the path between the VA WAN and external interfaces. Figure 84 represents ESB detail based on the high-level iFAMS architecture. An ESB is set of rules and principles for integrating numerous applications and typically uses specialized software to implement.

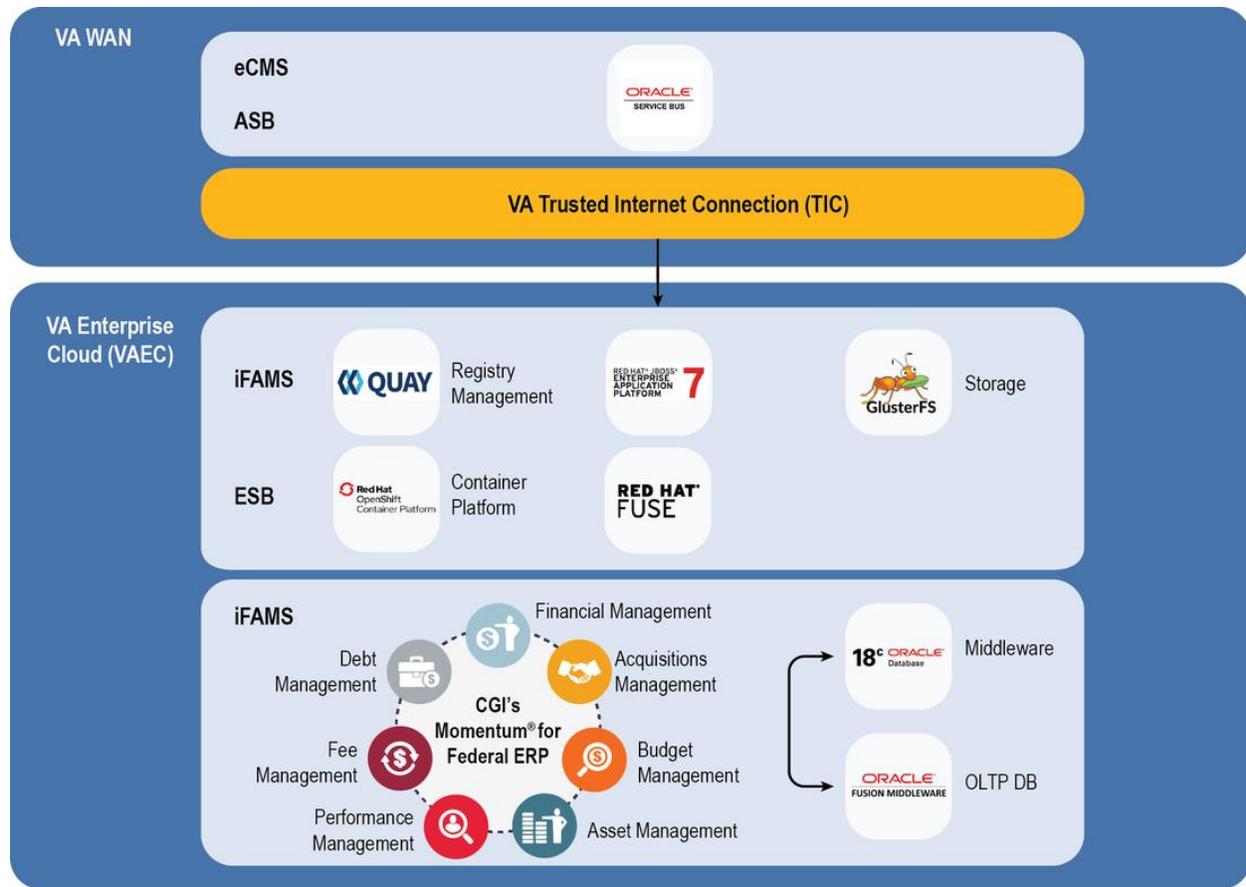


Figure 84: iFAMS Enterprise Service Bus

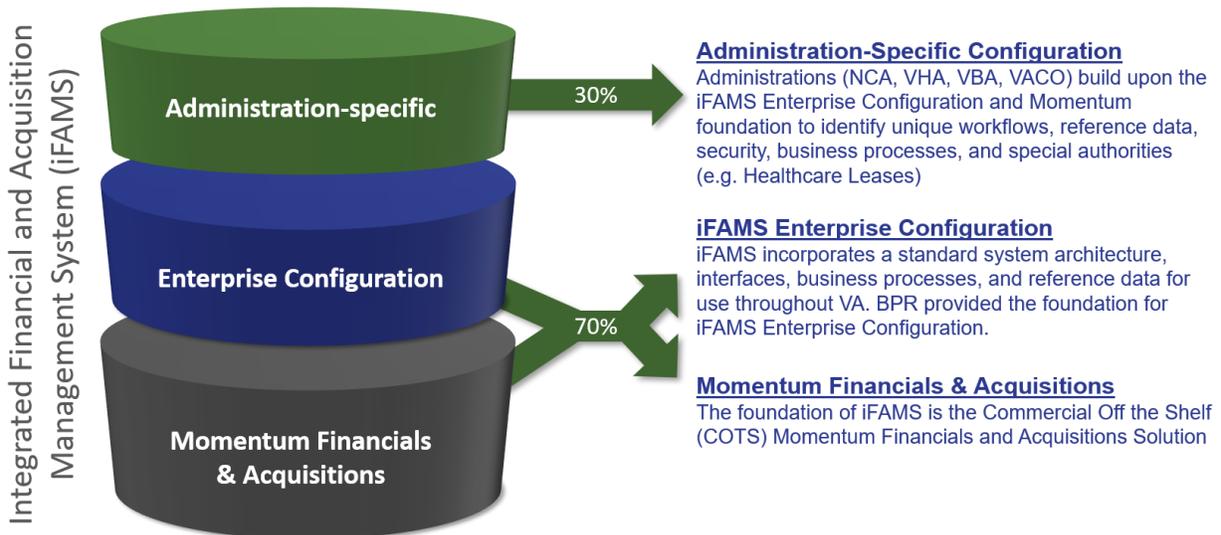
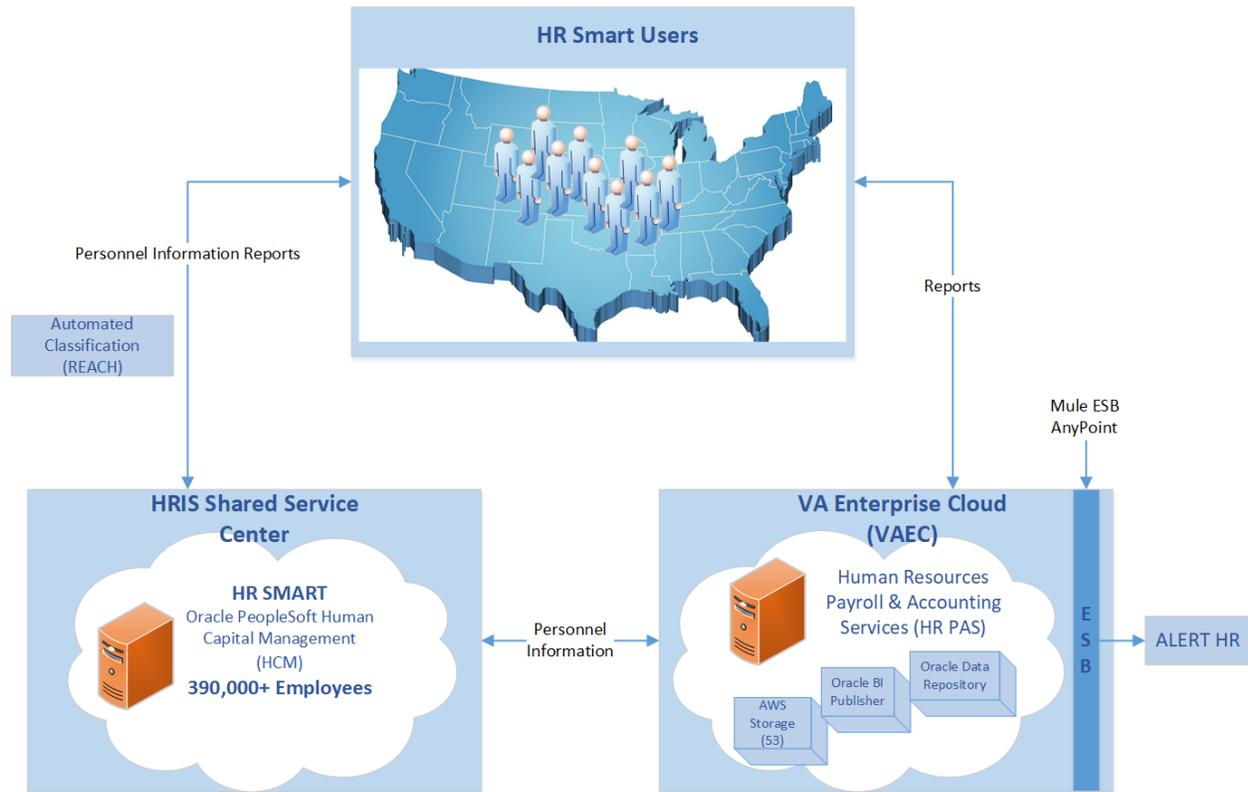


Figure 85: iFAMS Configuration Approach

Figure 85 displays the iFAMS configuration approach. Through the iFAMS implementation, FMBT will increase the transparency, accuracy, timeliness, and reliability of financial information across VA, resulting in improved fiscal accountability to American taxpayers and increased opportunity for improved services to those who serve the

Veteran. iFAMS will have interfaces with VA personnel and internal systems as well as with external resources. Ultimately, iFAMS will modernize VA’s financial and acquisition management and reporting to comply with federal requirements.



**Figure 86: HR and Payroll Future Operational Environment**

HR-Smart is a SaaS provided by and hosted by IBM outside of the VAEC-managed GovCloud, which delivers an Oracle PeopleSoft, COTS HR solution. HR-Smart has been fully deployed and is now used for most HR activities in the areas of Personnel Action Processing, Benefits Management, and Compensation Management. The Human Resources Information System (HRIS) Shared Service Center is built on the top of HR-Smart and aligned with the VA Administrations, Staff Offices, and government agencies. VAEC is a Cloud infrastructure that utilizes AWS and includes technical components such as AWS Storage, Oracle BI Publisher, Oracle Data Repository, and the MuleSoft ESB. This future HR and payroll operational environment diagram also shows the high-level interoperability between these major components. Most importantly, it provides a conceptual view of how HR-Smart users access the internal and external systems via the high-level architecture.

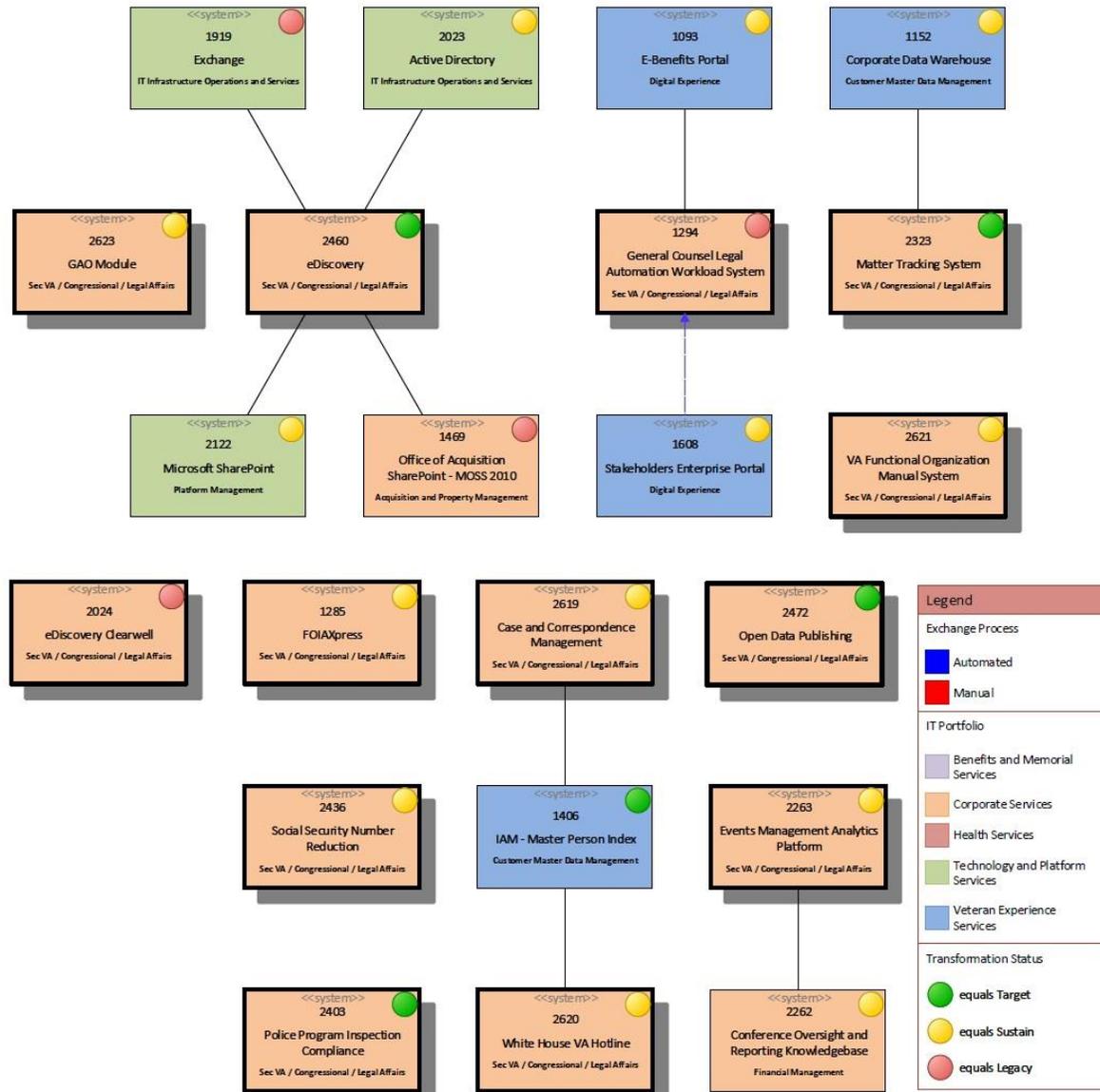
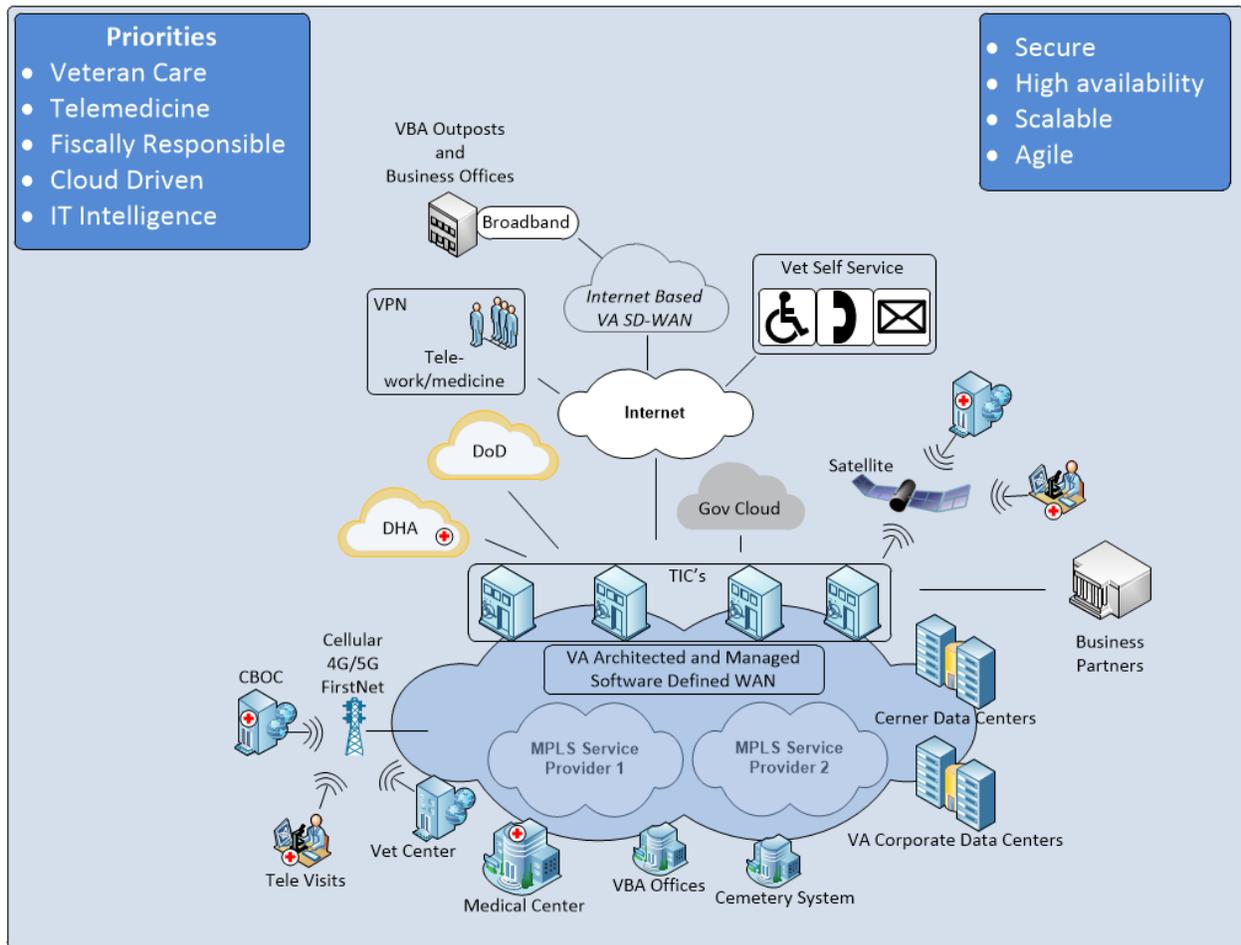


Figure 87: Systems View of the SCLA Product Line

Figure 87 is a system network diagram that provides an overview of SCLA systems (systems with a heavy border and shadow) and their interactions with systems in other Product Lines. The diagram displays systems within the Corporate Services Portfolio (shaded orange), Technology and Platform Services Portfolio (shaded green), and Veteran Experience Services Portfolio (shaded blue). SCLA systems interface with systems in the Acquisition and Property Management, Financial Management, IT Infrastructure Operations and Services, Platform Management, Digital Experience, and Customer Master Data Management Product Lines. As indicated by a blue arrow, the Stakeholders Enterprise Portal automatically sends data to GCLAWS while the remainder of displayed interfaces indicate that there is an exchange of data between the associated systems. Lastly, the colored dot associated with each system indicates the system’s transformation status: target (green), sustain (yellow), or legacy (red).

### Technology and Platform Services Portfolio



**Figure 88: Proposed Future Enterprise Network and Infrastructure**

Figure 88 depicts the ultimate high-level framework of VA’s network and infrastructure landscape. The key future capabilities addressed in this diagram are data center, Cloud-based services, WAN/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. VA will implement predictive and personalized medical practices with robust integration of big data to deliver meaningful outcomes. VA research will improve care by adding data scientists in all research VAMCs. The future environment includes a seamless integration with the 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.

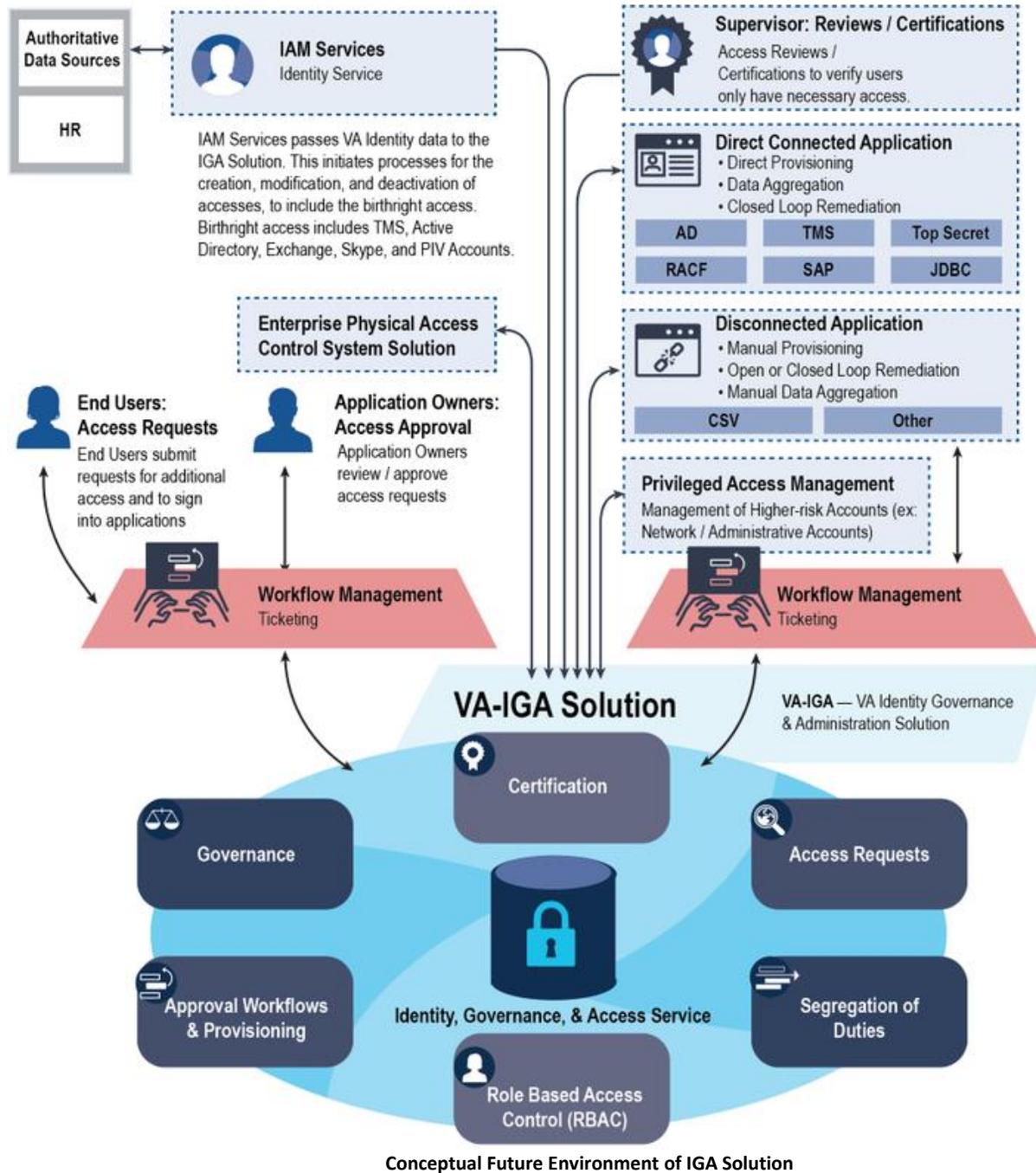


Figure 89 depicts how the IGA solution will integrate into the current environment and use data from multiple authoritative sources to interface and provide appropriate access to downstream applications and systems. The connectors are built as bi-directional data exchanges that allow for accurate and timely access and ensure the IGA solution aggregates and is kept aware of the current accounts and access for each worker.

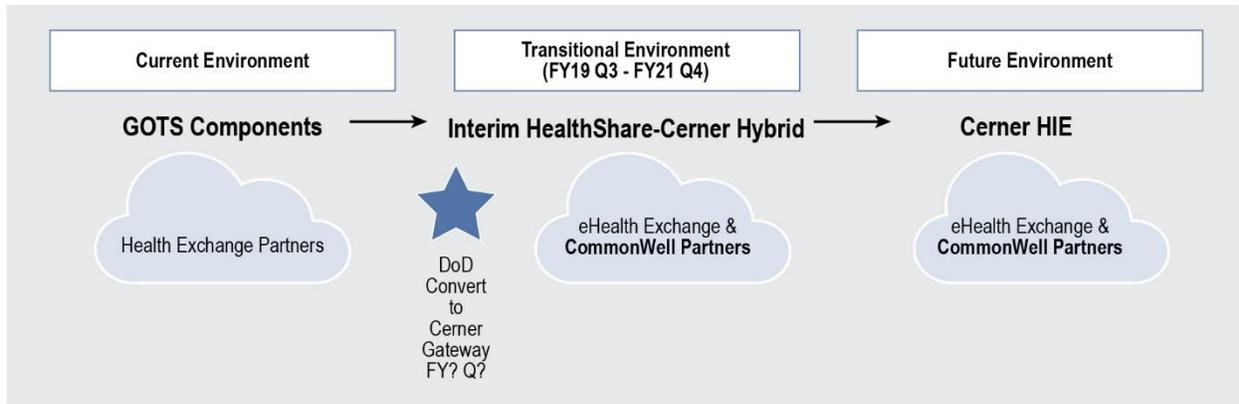


Figure 90: DoD/VA HIE Transition Course of Action

Figure 90 depicts the current environment, transitional environment, and future environment of HIE between DoD and VA.

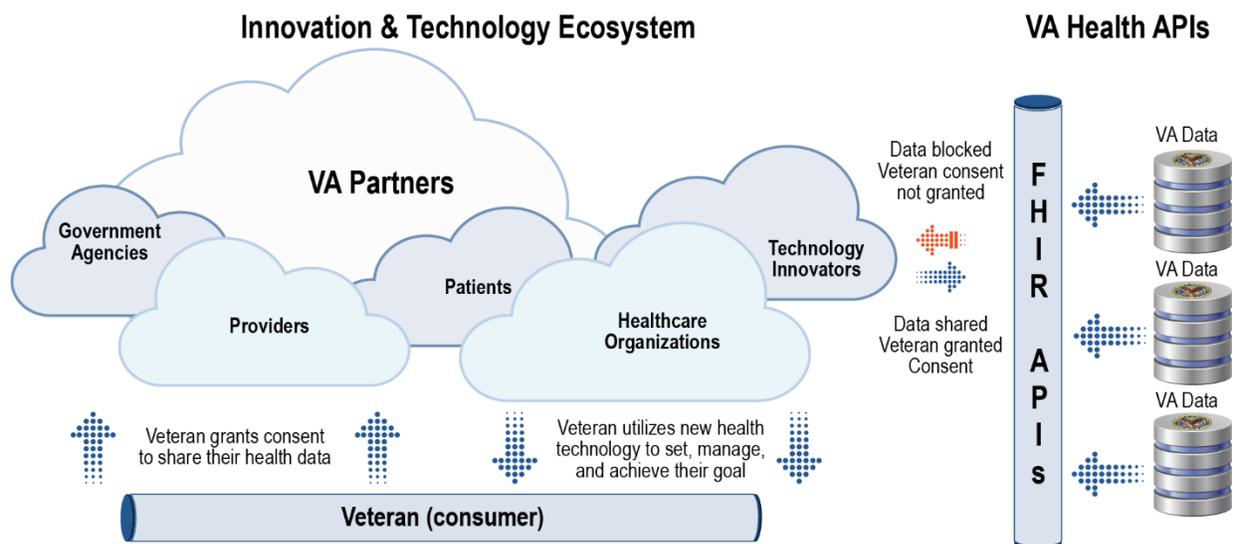
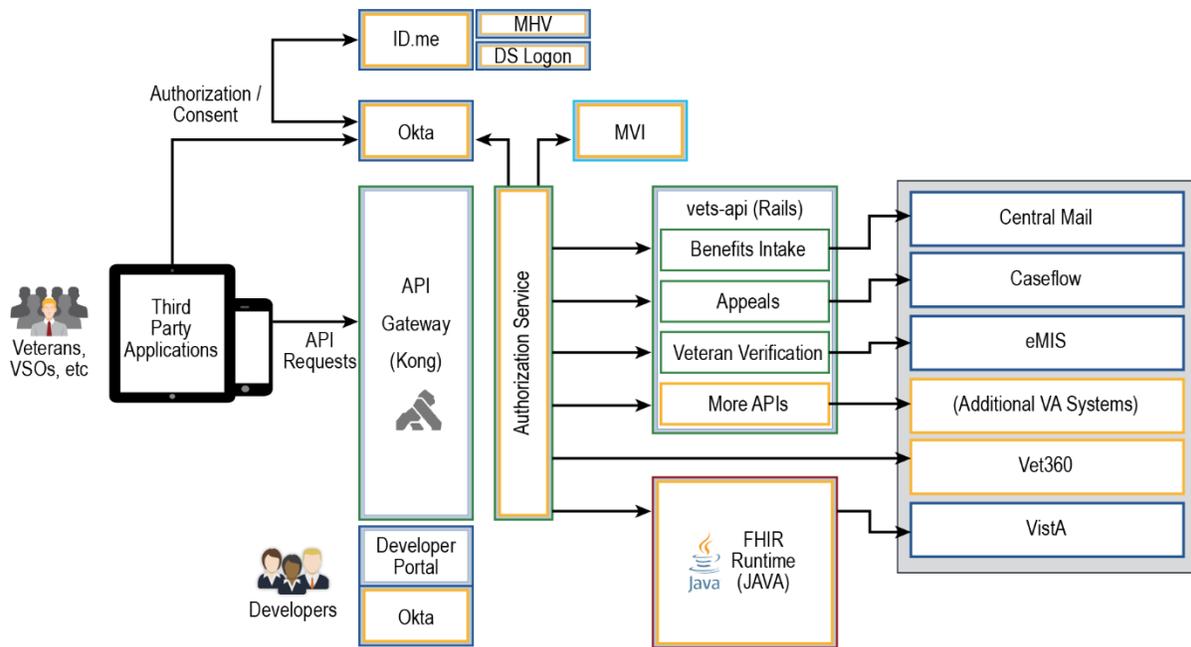


Figure 91: Innovation Ecosystem Powered by VA Health APIs

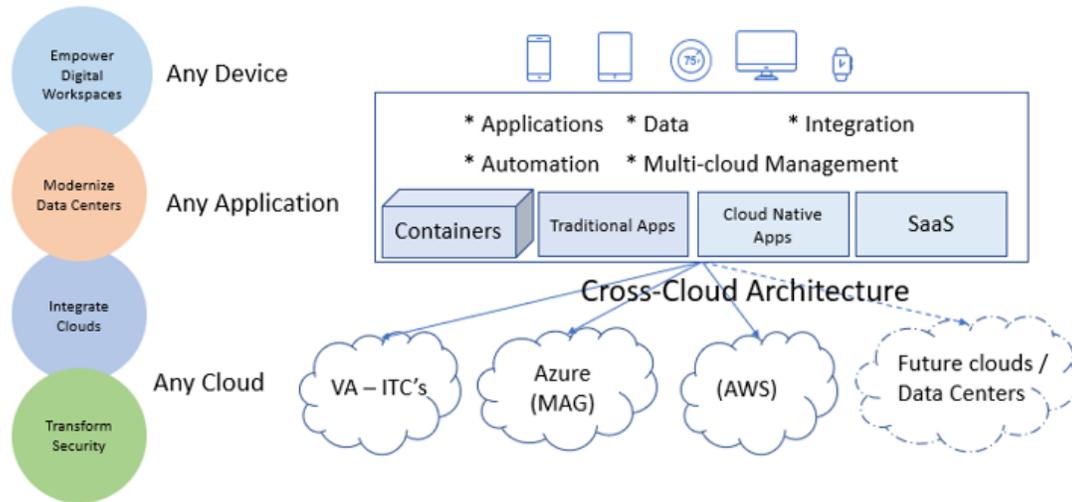
Figure 91 depicts how VA Health APIs will improve internal and external interoperability to create an innovation and technology ecosystem.



**Figure 92: VA’s Future Environment of API Architecture**

VA is advancing its API strategy in 2019 and beyond by treating APIs as products and employing Cloud-native technologies, agile development, and a DevSecOps release process. The mission is to leverage Lighthouse APIs as ADSs to accelerate delivery of other VA products, provide same source of truth to VA and Veterans, and build new and exciting applications. This API architecture 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 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.

# Platforms



**Figure 93: VA Hosting and Provisioning (Integrated Architecture Multi-Cloud Strategies)**

For platforms enabled with Integrated Architecture to be successful, they must address the need of different VA Portfolios and Product Lines while seamlessly providing end-to-end operations. The platform Integrated Architecture enables:

- Integration with DevSecOps pipeline.
- The Platform Engineering team, which operates services in addition to designing them.
- The Platform Engineering team to collaborate with Development teams, which will provide best practices and assistance for application migration of existing applications to either Cloud Infrastructure-Ready, Cloud-Optimized, or Cloud-Native applications.
- Platforms performance services for all consumers (business, IT, and operations).

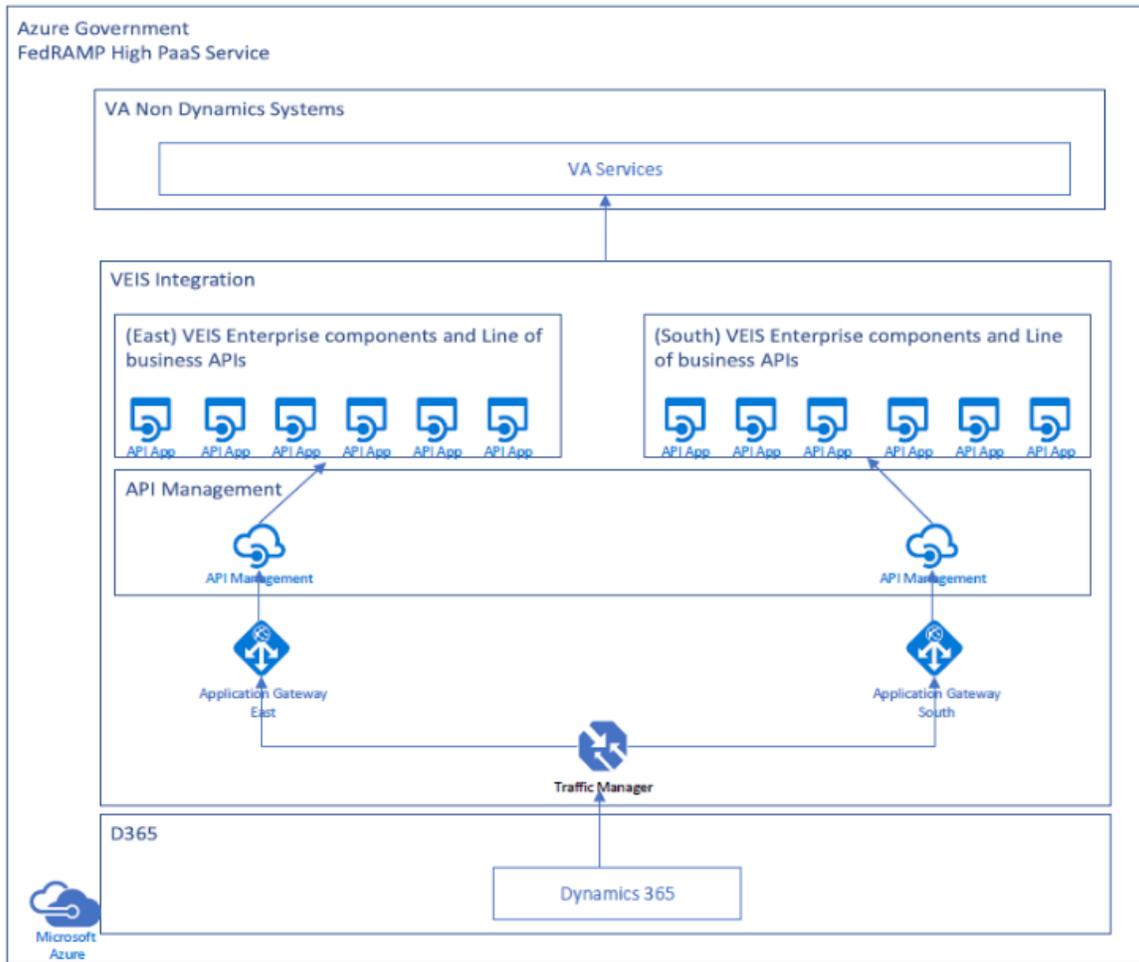


Figure 94: VA Microsoft Dynamics 365 CRM Architecture

Figure 94 represents Microsoft Dynamics 365 CRM for Government (a SaaS solution), shown as Dynamics 365, residing in the Microsoft Azure Government Cloud. Microsoft Dynamics 365 connects to VEIS, which consists of services that are deployed in the Azure Government Cloud and connects with various VA services (represented in the VA Non-Dynamics Systems) and retrieves data. That data is then used by Microsoft Dynamics 365 applications, such as UD-O and CommCare CRM.

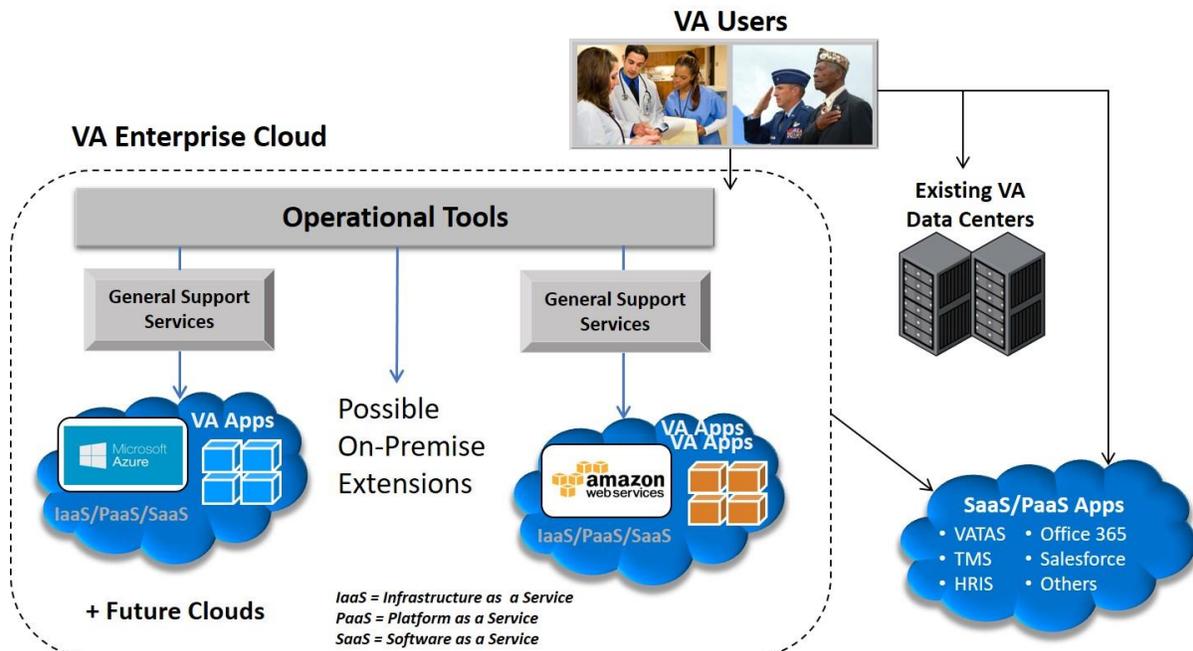


Figure 95: VAEC Future Environment Architecture

VA will migrate to a Cloud computing environment that will allow OIT to better leverage the latest technologies to more rapidly deliver improved services to Veterans. 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. VA will achieve highly reliable and available infrastructure to develop and host Cloud services and applications across the Department. This integration of Cloud will shorten the DevSecOps lifecycle and provide OIT and partners more flexibility to innovate and collaborate.

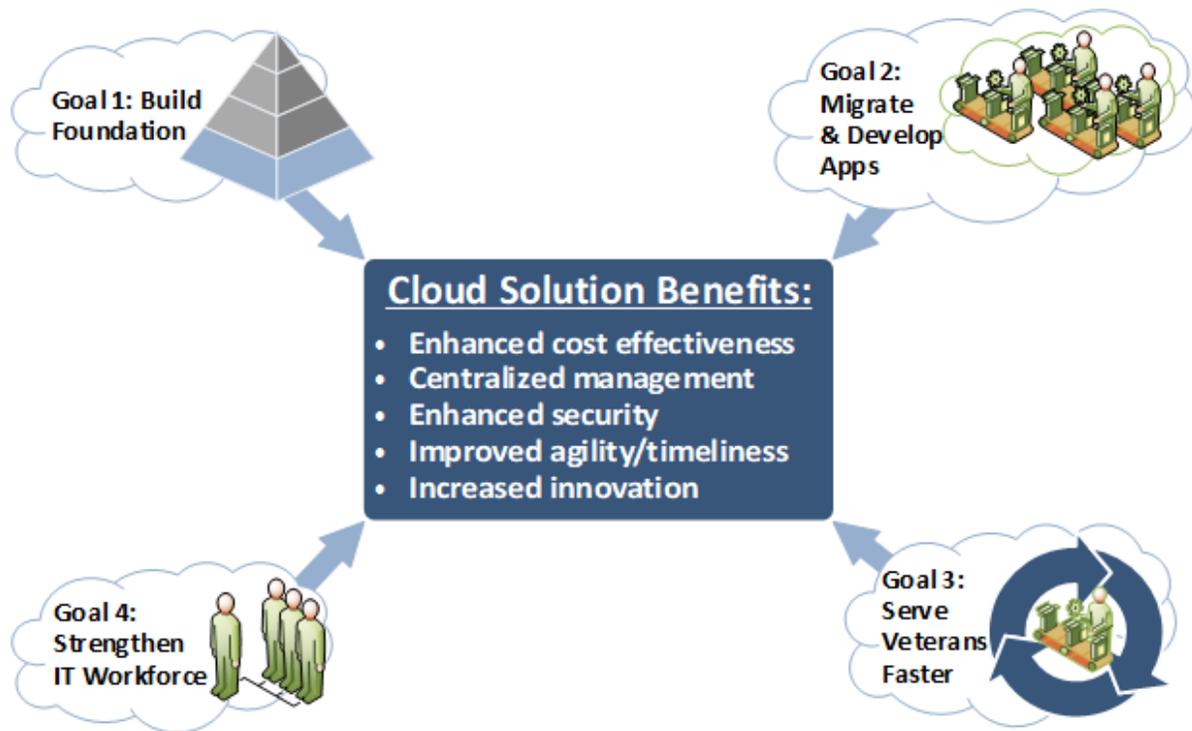


Figure 96: VAEC Strategy

This diagram presents the strategy and identifies the goals, objectives, and actions required to implement and operate VAEC. The core of the VA Cloud Strategy is for the Department to obtain known benefits from the use of Cloud computing technologies, specifically:

- Centralized management: efficiently, reliably control diverse VA computing resources.
- Enhanced security: ensure that VA properly secures Veteran information.
- Improved agility/timeliness: more quickly implement solutions that benefit Veterans.
- Increased innovation: rapidly experiment with new features to better support Veterans.
- Enhanced cost effectiveness: potentially allow VA to do more for the Veteran with less resources.

Achieving the four goals and their associated objectives by implementing related actions will allow VA applications to attain strategic Cloud solution benefits. The four key goals are:

- **Goal 1: Build and Maintain the Foundation for the VAEC Capability.** VAEC and other elements of the VA Cloud ecosystem form the foundation for the VA Cloud Strategy, allowing VA to build systems that take advantage of the known Cloud benefits. The VA Cloud Strategy foundation is supported by ECSO.
- **Goal 2: Migrate and Develop Enterprise Systems into the VA Cloud Ecosystem.** A key element towards achieving the VA Cloud Strategy is to develop and migrate mission and support applications with VAEC in mind. To accomplish this goal, VA must establish development and migration environments, define applications architectures and processes, and actually develop and migrate appropriate systems into the VAEC ecosystem.
- **Goal 3: Introduce New, Innovative Capabilities and Services for Veterans Faster.** To achieve Cloud solution benefits of improved agility and timeliness, the VA Cloud Strategy promotes process optimization and leveraging modern technologies and innovations. Processes to be improved include acquisition, development, and deployment.

- **Goal 4: Transform the IT Workforce.** The most valuable VA resource is its people. This Cloud Strategy will promote the creation of workforce Cloud literacy and the simultaneous development of Cloud-based competency models.

### Appendix D: Product Line Alignment with the VA Priorities, OIT Strategic Goals, VA Priority Initiatives, and PMA CAP Goals

Portfolio	Product Line	VA Priority	OIT Strategic Goal	VA Priority Initiative	PMA CAP Goal(s)
 Veteran Experience Services	Digital Experience	• Customer Service	• Goal 1: Deliver exceptional customer experience	• Navigator	1, 2, 4
	Contact Center	• Customer Service	• Goal 1: Deliver exceptional customer experience	• Navigator	1, 2, 4, 5
	Eligibility & Enrollment	• Customer Service	• Goal 1: Deliver exceptional customer experience	• IT Modernization	1
	Customer Master Data Mgmt.	• Customer Service	• Goal 1: Deliver exceptional customer experience	• IT Modernization	1
 Health Services	Medical Care	• Electronic Health Record	• Goal 5: Achieve seamless & secure data interoperability across VA, DoD & Partners	• EHRM	1, 2, 4
	Telehealth and Scheduling	• 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
	Health Care Administration	• MISSION Act	• Goal 2: Drive IT and VA capability modernization through digital transformation	• Mental Health	2, 4
	Supply Chain Management	• Business Systems Transformation	• Goal 3: Transform procurement and acquisition processes	• Supply Chain Modernization	1, 2, 7, 11
	Medical Research/Pop. Health	• Electronic Health Record	• Goal 5: Achieve seamless & secure data interoperability across VA, DoD & Partners	• EHRM	1, 2, 4
 Benefits and Memorial Services	Education/VR&E	• Business System Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• GI Bill	1, 2, 4, 9
	Loan Guaranty	• Business System Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• GI Bill	1, 2, 4, 9
	Compensation & Pension	• Business System Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• GI Bill	1, 2, 4, 9
	Insurance	• Business System Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• GI Bill	1, 2, 4, 9
	Appeals	• Business System Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• GI Bill	1, 2, 4, 9
	Benefits Integration/Admin.	• Business System Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• GI Bill	1, 2, 4, 9
	Memorials Benefits/Services	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• IT Modernization	1, 4
 Corporate Services	Financial Management	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• FMBT	1, 5, 7, 9, 10, 11, 12
	Human Capital Management	• Business System Transformation	• Goal 4: Inspire a culture of digital transformation, IT modernization, and customer service	• HR Modernization	1, 3, 4, 5, 6, 13
	SecVA/Congressional/Legal	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• IT Modernization	1, 2, 4, 5
	Acquisition & Property Mgmt.	• Business Systems Transformation	• Goal 3: Transform procurement and acquisition processes	• Supply Chain Modernization	1, 2, 7, 11
 Technology and Platform Services	IT Infrastructure	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• IT Modernization	1
	Platform Management	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• IT Modernization	1
	Cyber Security/Access Control	• Customer Service	• 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 & Partners	• IT Modernization	1, 2, 4
	Data Analytics	• Business Systems Transformation	• Goal 2: Drive IT and VA capability modernization through digital transformation	• Stop Fraud, Waste and Abuse	2, 4, 9, 14
	End User Operations	• Customer Service	• Goal 1: Deliver exceptional customer service	• IT Modernization	1

### Appendix E: Product Line and VA Business Reference Model Alignment

BRM Level & Code	Portfolio / BRM Description	Veteran Experience Services				Health Services						Benefits and Memorial Services						Corporate Services				Technology and Platform Services						
		DE	CC	EE	CM DM	MC	TS	CC	HCA	SCM	MRE PH	EVRE	LGY	CP	IN	AS	BIA	MBS	FM	HC	SCLA	APM	ITI	PM	CS	TIS	DA KM	EUO
1 - VET001	Provide Services to Veterans and the Public	●	●	●		●	●	●	●	●		●	●	●	●	●	●	●		●		●						
1.1 - ELG003	Process 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	Coordinate Homeless Veterans Program			●					●				●															
1.8 - BEN013	Administer Benefits											●	●	●	●	●	●	●										
1.9 - ELG016	Manage Appeals	●														●												
1.10 - MEM001	Provide Memorial Benefits and Services																●											
1.11 - EMP001	Promote Veterans Employment and Retention	●										●								●								
1.12 - CRM001	Manage External Veterans Affairs Relationships	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

BRM Level & Code	Portfolio / BRM Description	Veteran Experience Services				Health Services						Benefits and Memorial Services						Corporate Services				Technology and Platform Services						
		DE	CC	EE	CM DM	MC	TS	CC	HCA	SCM	MRE PH	EVRE	LGY	CP	IN	AS	BIA	MBS	FM	HC	SCLA	APM	ITI	PM	CS	TIS	DA KM	EUO
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 Description	Veteran Experience Services				Health Services						Benefits and Memorial Services						Corporate Services				Technology and Platform Services						
		DE	CC	EE	CM DM	MC	TS	CC	HCA	SCM	MRE PH	EVRE	LGY	CP	IN	AS	BIA	MBS	FM	HC	SCLA	APM	ITI	PM	CS	TIS	DA KM	EUO
2.13 - ADM001	Provide Organizational Leadership and Administrative Support	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2.14 - LGL001	Provide Legal Guidance and Representation														●					●								
2.15 - EMR001	Coordinate National Security Operations																								●			
2.16 - SEC001	Manage Physical and Personnel Security																				●							
2.17 - IM001	Manage Information				●																				●			

## Appendix F: Product Line Alignment with the Federal Health IT Strategic Plan Framework

Portfolio	Product Line	Federal Health IT Strategic Plan Goal	Federal Health IT Strategic Plan Objective	Federal Health IT Strategic Plan Strategy
 <b>Veteran Experience Services</b>	Digital Experience	Goal 2: Enhance the Delivery & Experience of Care	Safe, quality care that is optimized through technology	Provider-focused apps to support care
	Contact Center	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Greater development and use of health IT capabilities	Promote user-centered design
	Eligibility & Enrollment	Goal 2: Enhance the Delivery & Experience of Care	Usable health information that is secure and available	Data quality and integrity
	Customer Master Data Mgmt.	Goal 2: Enhance the Delivery & Experience of Care	Usable health information that is secure and available	Data quality and integrity
 <b>Health Services</b>	Medical Care	Goal 2: Enhance the Delivery & Experience of Care	Usable health information that is secure and available	EMS/HIE Integration and Care coordination
	Telehealth and Scheduling	Goal 1: Promote Health & Wellness for Individuals, Families, & Communities	Greater patient access to health information	Mobile applications for health
	Community Care	Goal 2: Enhance the Delivery & Experience of Care	Safe, quality care that is optimized through technology	Patient matching and Provider-focused apps
	Health Care Administration	Goal 2: Enhance the Delivery & Experience of Care	Usable health information that is secure and available	EMS/HIE Integration and Care coordination
	Supply Chain Management	Goal 2: Enhance the Delivery & Experience of Care	Efficient management of resources & workforce confidentially	System integration
	Medical Research/Pop. Health	Goal 3: Build a Data-Driven Culture to Accelerate Research & Improve Health	Evidence-based research using health information	Secondary uses of health information
 <b>Benefits and Memorial Services</b>	Education/VR&E	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Greater development and use of health IT capabilities	Promote user-centered design
	Loan Guaranty	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Greater development and use of health IT capabilities	Promote user-centered design
	Compensation & Pension	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Greater development and use of health IT capabilities	Promote user-centered design
	Insurance	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Greater development and use of health IT capabilities	Promote user-centered design
	Appeals	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Greater development and use of health IT capabilities	Promote user-centered design
	Benefits Integration/Admin.	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Greater development and use of health IT capabilities	Promote user-centered design
	Memorials Benefits/Services	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Greater development and use of health IT capabilities	Promote user-centered design
 <b>Corporate Services</b>	Financial Management	Goal 2: Enhance the Delivery & Experience of Care	Efficient management of resources & workforce confidentially	System integration
	Human Capital Management	Goal 2: Enhance the Delivery & Experience of Care	Efficient management of resources & workforce confidentially	System integration
	SecVA/Congressional/Legal	Goal 2: Enhance the Delivery & Experience of Care	Efficient management of resources & workforce confidentially	System integration
	Acquisition & Property Mgmt.	Goal 2: Enhance the Delivery & Experience of Care	Efficient management of resources & workforce confidentially	System integration
 <b>Technology and Platform Services</b>	IT Infrastructure	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Improved technology and communications infrastructure	Telehealth and broadband infrastructure
	Platform Management	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Improved technology and communications infrastructure	Mobility of providers
	Cyber Security/Access Control	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Secure health information that protects patient privacy	Address cybersecurity risks
	Trusted Information Sharing	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Greater development and use of health IT capabilities	APIs & Interoperability Standards Advisory
	Data Analytics	Goal 3: Build a Data-Driven Culture to Accelerate Research & Improve Health	Evidence-based research using health information	Machine learning, analytics, and big data
	End User Operations	Goal 4: Connect Health Care & Data through an Interoperable HIT Infrastructure	Secure health information that protects patient privacy	HIPAA compliance of HIT

### Appendix G: Product Line Alignment with VA’s Major IT Investments

Portfolio	Unique Item Identifier	Major IT Investment	Owner
 <b>Veteran Experience Services</b>	029-666666404	Customer Relationship Management	EPMO
 <b>Health Services</b>	029-555555300	Access to Care	EPMO
	029-555555301	Health Data & Information	EPMO
	029-555555302	Health Management Platform	EPMO
	029-555555303	Health Research	EPMO
	029-555555305	Electronic Health Record Modernization	IPO
 <b>Benefits and Memorial Services</b>	029-666666400	Benefits Appeals	EPMO
	029-666666401	Benefits Payments	EPMO
	029-666666402	Veterans Benefits Management	EPMO
	029-666666700	Memorials Automation	EPMO
 <b>Corporate Services</b>	029-777777501	Financial Management	EPMO
	029-777777502	Supply Chain Management	EPMO
 <b>Technology and Platform Services</b>	029-888888601	Enterprise Data Services	EPMO

## Appendix H: Comprehensive IT Plan

### Background

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.

### Comprehensive IT Plan Enables VA to Close GAO's Highest Priority IT 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. 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." 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. In September 2020, GAO again affirmed the value of the CIP in the GAO-20-719T Report, "VA Needs to Address Persistent IT Modernization and Cybersecurity Challenges."

OIT incorporated the CIP's content into the FY 2020–2026 VA Enterprise Roadmap and will mature the Enterprise Roadmap to ensure that it provides a comprehensive vision for the future of IT at VA.

## Appendix I: Acronyms and Abbreviations

Acronym/ Abbreviation	Definition
.govCAR	.gov Cybersecurity Architecture Review Program
21st Century IDEA	21st Century Integrated Digital Experience Act
ACOE	Agile Center of Excellence
ACTIV	Advanced Computational and Translational Initiatives for Veterans
ADS	Authoritative Data Source
AI	Artificial Intelligence
AIPG	Annual Integrated Planning Guidance
ALS	Adobe Learning Suite
AMA	Veterans Appeals Improvement and Modernization Act of 2017
AMAS	Automated Monument Application System
Amazon S3	Amazon Simple Storage Service
AMO	Account Management Office
AMS	Appraisal Management Service
AoA	Analysis of Alternatives
API	Application Programming Interface
AQS	Analytical Quality System
ARMS	Appeals Resource Management System
ARS	Attachment Retrieval System
ATA	Anywhere to Anywhere
ATLAS	Advancing Telehealth through Local Access Stations
ATO	Authority to Operate
AVM	Automated Valuation Model
AWS	Amazon Web Services
Azure	Microsoft Azure Government
B2C	Bill to Collect
BDN	Benefits Delivery Network
BEP	Benefits Enterprise Platform
BF2E	Budget Formulation to Execution
BFFS	Beneficiary Fiduciary Field System
BGS	Benefits Gateway Services
BIA	Benefits Integration and Administration
BIP	Benefits Integration Platform
BIRLS	Beneficiary Identification and Record Locator Subsystem
Board	Board of Veterans' Appeals
BOSS	Burial Operations Support System
BOSS-E	Burial Operations Support System – Enterprise
BRM	Business Reference Model
C&P	Compensation and Pension
CAP	Cross-Agency Priority
CARES Act	Coronavirus Aid, Relief, and Economic Security Act
CARMA	Caregiver Record Management Application
CCM	Case and Correspondence Management
CCN	Community Care Network
CCP	Community Care Program
CCRA	Community Care Referral and Authorization
CCRS	Community Care Reimbursement System

Acronym/ Abbreviation	Definition
CD2	Critical Decision 2
CDM	Continuous Diagnostics and Mitigation
CDO	Chief Data Officer
CDS	Courseware Delivery System
CDW	Corporate Data Warehouse
CEM	Customer Experience Management
CEMP	VHA Comprehensive Emergency Management Program
CFM	Office of Construction & Facilities Management
CFR	Code of Federal Regulations
CHAMPION	Computational Health Analytics for Medical Precision to Improve Outcomes Now
CHAMPVA	Civilian Health and Medical Program of the Department of Veterans Affairs
CHDR	Clinical Data Repository/Health Data Repository
CI/CD	Continuous Integration and Continuous Delivery
CIO	Chief Information Officer
CIP	Comprehensive IT Plan
CLE	Continuing Legal Education
CMS	Centers for Medicare & Medicaid Services
COBOL	Common Business-Oriented Language
COE	Center of Excellence
CommCare C3	Community Care Clinical Contact Center
ConOps	Concept of Operations
COTS	Commercial Off-the-Shelf
COVERS	Control of Veterans Records System
CP4	Checkpoint 4
CPAC	Consolidated Patient Account Center
CPRS	Computerized Patient Record System
CRM	Customer Relationship Management
CS	Compensation Service
CSP	Cloud Service Provider
CSS	Centralized Scheduling Solution
CTI	Computer-Telephony Integration
CUF	Common Update Framework
CWINRS	Corporate Waco-Indianapolis-Newark-Roanoke-Seattle
CWVV	Children of Women Vietnam Veterans
CX	Customer Experience
CxDW	Customer Experience Data Warehouse
DART	Data Access Request Tracker
DAS	Data Access Services
DATA Act	Digital Accountability and Transparency Act of 2014
DCCI	Data Center Consolidation Initiative
DCOI	Data Center Optimization Initiative
DD/EFT	Direct Deposit/Electronic Funds Transfer
DEERS	Defense Eligibility Enrollment Reporting System
DevSecOps	Development Security Operations
DFAS	Defense Finance and Accounting Service
DGC	Data Governance Council
DHS	U.S. Department of Homeland Security
DICOM	Digital Imaging and Communications in Medicine

Acronym/ Abbreviation	Definition
DLP	Data Loss Prevention
DMLSS	Defense Medical Logistics Standard Support
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DST	Decision Support Tool
EA	Enterprise Architecture
EAAS	Emergency Alerting and Accountability System
eCAMS	Claims Administration and Management System
ECC	Education Call Center
ECCM	Enterprise Contact Center Modernization
eCMS	Electronic Contract Management System
ECSC	Enterprise Call Session Control
ECISO	Enterprise Cloud Solutions Office
ECSP	Enterprise Cybersecurity Program
ECSS	Enterprise Cybersecurity Strategy
EDI	Electronic Data Interchange
EDIS	Emergency Department Integration Software
EDM	Enterprise Data Management
EDU	Education Service
EDW	Enterprise Data Warehouse
EHR	Electronic Health Record
EHRM	Electronic Health Record Modernization
EIN	Electronic Insurance
eMASS	Enterprise Mission Assurance Support Service
eMPWR-VA	Enterprise Management of Payments, Workload, and Reporting System for VA
ePACS	Physical Access Control System
EPRS	Enterprise Program Reporting System
ER/LR	Employee Relations/Labor Relations
ERM	Enterprise Risk Management
ES	Enrollment System
ESB	Enterprise Service Bus
ESI	Electronically Stored Information
ESM	Enrollment System Modernization
ESS	Enterprise Shared Service
eTEMS	Enterprise Telecommunications Expense Management System
ETL	Extract, Transform, Load
e-VA	Electronic Virtual Assistant
EVVE	Electronic Verification of Vital Events
FAS	Finance and Accounting System
FCCPAC	Florida/Caribbean Consolidated Patient Account Center
FCD-1	Federal Continuity Directive 1
FDA	U.S. Food and Drug Administration
FEBP Act	Foundations for Evidence-Based Policymaking Act of 2018
FedRAMP	Federal Risk and Authorization Management Program
FEHRM	Federal Electronic Health Record Modernization Program Office
FEMA	Federal Emergency Management Agency
FFLR	Full File Loan Review
FFMIA	Federal Financial Management Improvement Act of 1996

Acronym/ Abbreviation	Definition
FHIR	Fast Healthcare Interoperability Resources
FHITSP	Federal Health IT Strategic Plan
FISMA	Federal Information Security Management Act
FITARA	Federal Information Technology Acquisition Reform Act
FMBT	Financial Management Business Transformation
FMS	Financial Management System
FOC	Full Operating Capability
FOIA	Freedom of Information Act
FOM	Functional Organization Manual
FP	First Party
FRCP	Federal Rules of Civil Procedure
FSC	Financial Services Center
FSSP	Federal Shared Service Provider
FTI	Federal Tax Information
FY	Fiscal Year
GAO	U.S. Government Accountability Office
GAR	Gravesite Assessment Reporting
GCLAWS	General Counsel Legal Automation Workload System
GenISIS	Genomic Information System for Integrative Science
GFE	Government Furnished Equipment
GIS	Geographic Information System
GOE	General Operating Expense
GOTS	Government Off-The-Shelf
GPS	Global Position System
GRC	Governance, Risk, and Compliance
GS	General Schedule
GSA	U.S. General Services Administration
H&P	Hosting & Provisioning
HAC	Health Administration Center
HCBRM	Human Capital Business Reference Model
HCSC	Human Capital Services Center
HEC	Health Eligibility Center
HIE	Health Information Exchange
HIPAA	Health Insurance Portability and Accountability Act
HISP	Health Information Strategic Plan
HR	Human Resources
HR&A	Office of Human Resources and Administration
HRC	Health Resource Center
HRIS	Human Resources Information System
HRIT	Human Resources Information Technology
HR-PAS	Human Resources Payroll & Accounting Services
HSRM	HealthShare Referral Manager
IaaS	Infrastructure as a Service
IAM	Identity and Access Management
IC3	Interagency Care Coordination Committee
ICU	Intensive Care Unit
IDT	Interactive Decision Template
iFAMS	Integrated Financial and Acquisition Management System

Acronym/ Abbreviation	Definition
IGA	Identity Governance and Administration
IHP	Informal Hearing Presentation
INS	Insurance Service
IO	Infrastructure Operations
IOC	Initial Operating Capability
IoT	Internet of Things
IPPS	Invoice Payment Processing System
IPS	Insurance Payment System
IRB	Institutional Review Board
IRM	Information Resources Management
IRS	Internal Revenue Service
ISCM	Information Security Continuous Monitoring
IST	Integrated System Testing
IT	Information Technology
ITAM	Information Technology Account Manager
ITIL	Information Technology Infrastructure Library
ITOPS	Information Technology Operations and Services
ITRM	Information Technology Resource Management
ITSM	Information Technology Service Management
IVR	Interactive Voice Response
JALFHCC	Captain James A. Lovell Federal Health Care Center
JBP	Joint Business Plan
JSRRC	Joint Services Records Research Center
KM	Knowledge Management
LAN	Local Area Network
LGY	Loan Guaranty Service
LIPAS	Life Insurance Policy Administration Solution
LoB	Line of Business
LTS	Long-Term Solution
MACPAC	Mid-Atlantic Consolidated Patient Account Center
MADSS	Management and Decision Support System
MAP-D	Modern Award Processing Development
MASS	Monument Application Scanning System
MBMS	Memorial Benefits Management System
MGT Act	Modernizing Government Technology Act
MHA	Mental Health Assistant
MHV	My HealtheVet
MISSION Act	Maintaining Internal Systems and Strengthening Integrated Outside Networks Act
ML	Machine Learning
MPI	Master Person Index
MPI-e	Master Person Index – Enhanced
MPLS	Multi-Protocol Label Switching
MSCPAC	Mid-South Consolidated Patient Account Center
MSD 365	Microsoft Dynamics 365
MSDS	Military Service Data Sharing
MSP	Managed Service Provider
MSS	Manager Self-Service
MVI	Master Veteran Index

Acronym/ Abbreviation	Definition
MVP	Million Veteran Program
MYP	Multi-Year Plan
NARA	National Archives and Records Administration
NCA	National Cemetery Administration
NCCPAC	North Central Consolidated Patient Account Center
NDAA	National Defense Authorization Act
NECPAC	North-East Consolidated Patient Account Center
NextGen PIV	Next Generation Personal Identity Verification
NIH	National Institutes of Health
NIST	National Institute of Standards and Technology
NPL	Non-Performing Loan
NWQ	National Work Queue
OALC	Office of Acquisition, Logistics, and Construction
OAWP	Office of Accountability and Whistleblower Protection
OBIEE	Oracle Business Intelligence Enterprise Edition
OCLA	Office of Congressional and Legislative Affairs
OCM	Organizational Change Management
ODM	Operational Decision Manager
OEHRM	Office of Electronic Health Record Modernization
OEI	Office of Enterprise Integration
OGC	Office of the General Counsel
OIG	Office of Inspector General
OIS	Office of Information Security
OIT	Office of Information and Technology
OM	Office of Management
OMB	Office of Management and Budget
ONC	Office of the National Coordinator for Health Information Technology
OPEN Government Data Act	Open, Public, Electronic, and Necessary Government Data Act
OPIA	Office of Public and Intergovernmental Affairs
OPR	Office of Real Property
ORD	Office of Research and Development
ORM	Office of Resolution Management
OSDBU	Office of Small and Disadvantaged Business Utilization
OSH Act	Occupational Safety and Health Act of 1970
OSP	Office of Operations, Security, and Preparedness
OSS	Office of Strategic Sourcing
OTH	Other-Than-Honorable
P&F	Pension and Fiduciary Service
P2P	Procure to Pay
PaaS	Platform as a Service
PAID	Personnel and Accounting Integrated Data
PATS	Patient Advocate Tracking System
PATS-R	Patient Advocate Tracking System - Replacement
PC	Primary Care
PCGL	Personal Computer Generated Letters
PCMM	Primary Care Management Module
PDMP	Prescription Drug Monitoring Program

Acronym/ Abbreviation	Definition
PHI	Protected Health Information
PII	Personally Identifiable Information
PIV	Personal Identity Verification
PLM	Product Line Management
PMA	President's Management Agenda
PMAS	Project Management and Accountability System
PPBE	Planning, Programming, Budgeting, and Execution
PPMS	Provider Profile Management System
PPMT	Property and Performance Management Tool
PRF	Patient Record Flag
QPR	Office of Quality, Performance, and Risk
R2R	Record to Report
RA	Reimbursable Agreement
REACH VET	Recovery Engagement and Coordination for Health – Veterans Enhanced Treatment
REE	Registration Eligibility and Enrollment
REFDOC	Referral Documentation
REST	Representational State Transfer
RLC	Regional Loan Center
RLS	Regional Local Service
RPA	Robotic Process Automation
RPO	Regional Processing Office
RTM	Requirements Traceability Matrix
SaaS	Software as a Service
SAFe	Scaled Agile Framework
SCLA	SecVA/Congressional/Legal Affairs
SCMC	Supply Chain Master Catalog
SDVI	Service-Disabled Veterans Life Insurance
SDVOSB	Service-Disabled Veteran-Owned Businesses
SecVA	Secretary of Veterans Affairs
SP	SharePoint
SPOL	SharePoint Online Platform
SQUARES	Status Query and Response Exchange System
SSA	U.S. Social Security Administration
SSO	Single Sign-On
SSOe	Single Sign-On External
SSOi	Single Sign-On Internal
SWIMS	Enterprise Safety/Workers' Compensation Information Management System
TAC	Technology Acquisition Center
TAS	Transaction Application Suite
TBM	Technology Business Management
TDM	Time-Division Multiplexing
TED	Office of Transition and Economic Development
TIC	Trusted Internet Connections
TK	Toolkit
TMP	Telehealth Management Platform
TMS	Talent Management System
UAT	User Acceptance Testing
UD-O	Unified Desktop Optimization

Acronym/ Abbreviation	Definition
UFR	Unfunded Requirement
UoC	University of Chicago
USDA	U.S. Department of Agriculture
VA	U.S. Department of Veterans Affairs
VACOLS	Veterans Appeals Control and Locator System
VADIR	VA/DoD Identity Repository
VAEC	VA Enterprise Cloud
VAIL	VA Interoperability Leadership
VALERI	VA Loan Electronic Reporting Interface
VALERI-R	VA Loan Electronic Reporting Interface Re-Design
VAM	Voice Access Modernization
VAMC	VA Medical Center
VAOS	VA Online Scheduling
VASS	VA Solid Start
VBA	Veterans Benefits Administration
VBMS	Veterans Benefits Management System
VCL	Veterans Crisis Line
VDIF	Veterans Data Integration and Federation
VDIF-EP	Veterans Data Integration and Federation Enterprise Platform
VEIS	Veteran Experience Integration Services
VEMS	Veterans Enterprise Management System
VEO	Veterans Experience Office
VETS Act	Veterans E-Health and Telemedicine Support Act of 2017
VETSNET	Veterans Service Network
VHA	Veterans Health Administration
VICTARS	Veterans Insurance Claims Tracking and Response System
VINCI	VA Informatics and Computing Infrastructure
VIP	Veteran-focused Integration Process
VIS	Veterans Information Solution
VISN	Veterans Integrated Service Network
VistA	Veterans Information Systems and Technology Architecture
VLM	Veterans Legacy Memorial
VMLI	Veterans' Mortgage Life Insurance
VOES	Voice of the Employee System
VOSB	Veteran-Owned Small Business
VPC	Virtual Private Cloud
VPN	Virtual Private Network
VR&E	Veteran Readiness and Employment
VRM	Veterans Relationship Management System
VSE	VistA Scheduling Enhancement
VSignals	Veterans Signals
VSO	Veterans Service Organization
VVA	Virtual VA
VVC	VA Video Connect
WAN	Wide Area Network
WHHL	White House VA Hotline
WITS	Washington Interagency Telecommunications System
WOC	Without Compensation

Acronym/ Abbreviation	Definition
WSMS	Work Study Management System