

Health Information Strategic Plan

for

Veterans Health Administration Supporting VA Health Care



Fiscal Years 2018 – 2022

Version 6.0

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APPROVAL

The VHA Health Information Strategic Plan (HISP) is a product of the VHA National Leadership Council (NLC) IT Committee (ITC) IT Strategy Sub-Committee (ITSSC). It has been vetted and approved for release by the members of the ITSSC.

This document is effective upon approval and signatures below and shall remain in effect until rescinded or amended.



Co-chair, NLC ITC ITSSC
David Massaro, MD
Deputy Chief Medical Officer
VISN 9
Veterans Health Administration

Date: 6/26/2018



Co-chair, NLC ITC ITSSC
Jim McDearmon, PMP, CEA
Strategic Architect
Business Architecture, Strategic Investment Management
Office of Health Informatics
Veterans Health Administration

Date: 6/22/2018

TABLE OF CONTENTS

1	EXECUTIVE SUMMARY	1
1.1	Veterans Benefit From VHA’s Health Information Technology	1
1.2	HISP Summary Overview.....	2
2	INTRODUCTION	3
2.1	Purpose and Scope.....	3
2.2	VHA HISP Governance.....	4
2.3	Intended Audience.....	4
3	DRIVERS AND STRATEGIES FOR THE FUTURE OF VHA HEALTHCARE.....	5
3.1	VHA Strategic Drivers	5
4	CURRENT STATE OF VHA HIT	11
4.1	Overview of the Current VHA HIT Environment	11
4.2	Strengths in the Current VHA HIT Environment	14
4.3	Improvement Opportunities in the Current VHA HIT Environment	15
5	FUTURE VISION FOR VHA HIT	18
5.1	Overview of the Future Environment	18
5.2	Future Vision from the Provider Perspective.....	21
5.3	Future Vision from the Veteran Perspective	21
6	TRANSITION EFFORTS.....	23
6.1	Transition Efforts Overview	23
6.2	VHA HIT Goals and Objectives	26
6.3	Transition Summary.....	28
APPENDIX A.	VHA IT GOVERNANCE AND PRIORITIZATION	31
A.1	VHA IT Governance	31
A.2	Prioritization.....	33
APPENDIX B.	VHA BUSINESS FUNCTION FRAMEWORK (BFF)	34
APPENDIX C.	MAPPING OF VHA HIT GOALS TO OTHER VA/VHA GOALS AND STRATEGIES	35
C.1	VHA HIT Goals Relationship to Federal Health IT (FHIT) Strategic Plan.....	35
C.2	VHA HIT Goals Relationship to VA Priorities	36
C.3	VHA HIT Goals Relationship to VA Goals and Objectives.....	37

List of Tables

Table 1 – VHA Strategic Drivers	5
Table 2 – Strengths in the Current VHA HIT Environment.....	14
Table 3 – HIT Improvement Opportunities	16
Table 4 – Alignment of IT Programs to HIT Improvement Opportunities.....	29

List of Figures

Figure 1 – VHA HISP Impact on Strategic Planning	3
Figure 2 – VHA HISP Audience	4
Figure 3 – Enrollee Age Migration FY2015-2035	19
Figure 4 – VHA IT Governance Structure	31
Figure 5 – ITC Approved Criteria for Prioritization	33
Figure 6 – VHA BFF.....	34
Figure 7 – HIT Goals Alignment with FHIT Goals and Objectives.....	35
Figure 8 – HIT Goals Alignment with VA Priorities.....	36
Figure 9 – HIT Goals Alignment with VA Goals and Objectives	38

1 EXECUTIVE SUMMARY

1.1 VETERANS BENEFIT FROM VHA'S HEALTH INFORMATION TECHNOLOGY



When Tom first got out of the U.S. Army, he wasn't sure how much of his medical history he would have to write down for the Veterans Health Administration (VHA). When he arrived for his first visit to VHA, Tom discovered that, not only did VHA have his complete medical record from his time in the service, but the doctor immediately had a refill for a prescription he had been taking. The doctor also saw a trend suggesting Tom might be on a path toward developing diabetes. Since Tom lives in an area where there isn't a local Department of Veterans Affairs (VA) outpatient clinic, VHA began to send Tom to a local physician for treatment (community care provider). The physician made notes in the electronic medical record system and Tom has periodic follow-ups with VHA providers. VHA providers have all of those notes thanks to the Nationwide Health Information Network (NwHIN) efforts. This coordinated, integrated medical record from the Department of Defense (DoD) to VHA and

community providers allows Tom and his doctors to manage his health and lower his long-term health risks.

When Mary retired after 22 years in the service, she and her family relocated to a rural area located 200 miles from the nearest VA Medical Center (VAMC). Mary was faced with treacherous weather and dangerous driving conditions to see her provider in the Women's Comprehensive Primary Care Clinic. As a result, she doubted that she would be able to seek care through VHA. After contacting her assigned Women Veterans Program Manager, Mary discovered that her assigned Women Veterans Health Provider would be able to "see" her at a standalone VHA Telehealth Clinic located only 20 minutes from her house.



Mary had some doubts about using telehealth to "see" a provider; however, she thought that she would go for at least one appointment.

After arriving at the Telehealth Clinic, Mary was screened by her assigned Telehealth Technician who walked her through what she could expect from the appointment. She then met with her Women Veterans Health Provider via Total Exam equipment for her comprehensive physical. Mary was amazed that she was able to discuss her medical conditions with her provider as if they were in the same room together. The entire experience provided Mary with a great sense of relief knowing that she could establish comprehensive care without having to travel extremely long distances. Mary now meets with her provider every few months through telehealth, and is thrilled with the outstanding care received using modern technologies.

John suffered traumatic brain injury while serving in Operation Enduring Freedom. After receiving initial rehabilitation, he was allowed to return home outside of Lewiston, MT with his wife, Sally. Rather than constantly driving to the Fort Harrison (MT) VAMC for long-term rehabilitation, they make use of a tablet computer to communicate with the patient care team. The built-in camera allows for face-to-face discussions with his therapists. The team sends visual and fine motor skill practice to the tablet and can



monitor John's long-term progress. Also, with a VHA outpatient clinic in Lewiston, seeing a physician in person is far more convenient, and the clinic has all the telemedicine facilities necessary to work with the Fort Harrison VAMC specialists. Sally wouldn't be able to help John in his recovery without these tools. By being home, and Sally feeling empowered and capable, their marriage is more stable and John doesn't suffer increased stress over the possibility of losing his wife.

The three vignettes you just read are examples of how health information technology (HIT) helps our Nation's Veterans. This Executive Summary, and the complete VHA Health Information Strategic Plan (HISP), defines VHA's goals for the enhancement and use of HIT.

1.2 HISP SUMMARY OVERVIEW

The VHA HISP represents the strategic direction for HIT within VHA and is intended to inform information technology (IT) strategic planning and investment decisions to best meet VHA needs. Oversight of the VHA HISP is included in the VHA National Leadership Council (NLC) IT Committee (ITC) charter. The IT Strategy Sub-Committee (ITSSC) was established by the ITC to provide strategic oversight.

There are numerous VHA strategic business drivers that evolve over time and impact VA's strategy and investments. The VHA HISP describes those drivers (regularly updated as a result of environmental scans) and how VHA strategies align with those drivers. The VHA HISP also provides a characterization of the current VHA IT environment, including HIT-related improvement opportunities. The VHA HISP then describes a future vision for VHA HIT, including four HIT goals, and related objectives, derived from the VA goals and objectives, as well as the VHA strategic drivers and strategies.

Although VHA IT has advanced and matured in many areas, there are numerous improvement opportunities and gaps that will require a significant investment in both dollars and commitment to meet the future vision goals. The VHA HISP describes current IT programs, with respective planning elements, to help VHA effectively align scarce resources with needs. Finally, identified HIT improvement opportunities and gaps are mapped to current IT programs in order to demonstrate which IT programs support VHA's movement toward achieving the HIT goals. For example:

- The Medical Appointment Scheduling System (MASS), when implemented, will help resolve VHA's scheduling and access issues. In the meantime, Veterans Health Information Systems and Technology Architecture (VistA) Scheduling Enhancements (VSE) will make incremental improvements to the current system until MASS is ready for implementation.
- The VHA Electronic Health Record (EHR) Modernization effort supports VHA's adoption of a commercial off-the-shelf (COTS) EHR solution from Cerner to attain the goal of providing seamless care for Veterans, including access to a comprehensive EHR and shared, transparent care pathways.
- Software application user interfaces for both providers and Veterans are being enhanced to help VHA meet its goal of improving IT capabilities and services for Veterans.

The content of this mapping is described in the body of the VHA HISP document.

2 INTRODUCTION

2.1 PURPOSE AND SCOPE

The VHA HISP represents the strategic direction for HIT within VHA. This document describes the IT strategic direction being followed by VHA’s Office of Health Informatics (OHI) Strategic Investment Management (SIM) as it aligns and prioritizes VHA IT investments with VHA business strategies and leads development of IT requirements for IT solutions. This enables VHA’s clinical and business leaders to meet strategic and tactical objectives. VHA OHI is working with leaders, subject matter experts (SMEs), and the IT governance community to define the interconnectivity and characteristics of the various IT programs that are required to achieve strategic objectives. VHA OHI also identifies and documents interdependent business requirements to help ensure interoperability and streamlined process support for workflows that transcend individual work units.

Although written as a separate document, the VHA HISP is best understood when taken in context with the overarching VA and VHA strategic and operating plans. The VHA HISP is leveraged by the VA Strategic Plan and Operations Plans for VHA, VHA Program Offices, and Veterans Integrated Service Networks (VISNs). It also informs the IT Strategic Plan (Information Resources Management [IRM]) and Enterprise Roadmap, which are developed by the Office of Information and Technology (OIT). The VHA HISP is formulated to support the Managing for Results process and the VHA IT Governance process. Additional information on the VHA IT Governance Process can be found in Appendix A. The intended timespan coverage of the VHA HISP is Fiscal Year (FY) 2018 through 2022.

Figure 1 presents a graphical representation of the relationship between the HISP, strategic planning documents, and other strategic elements.

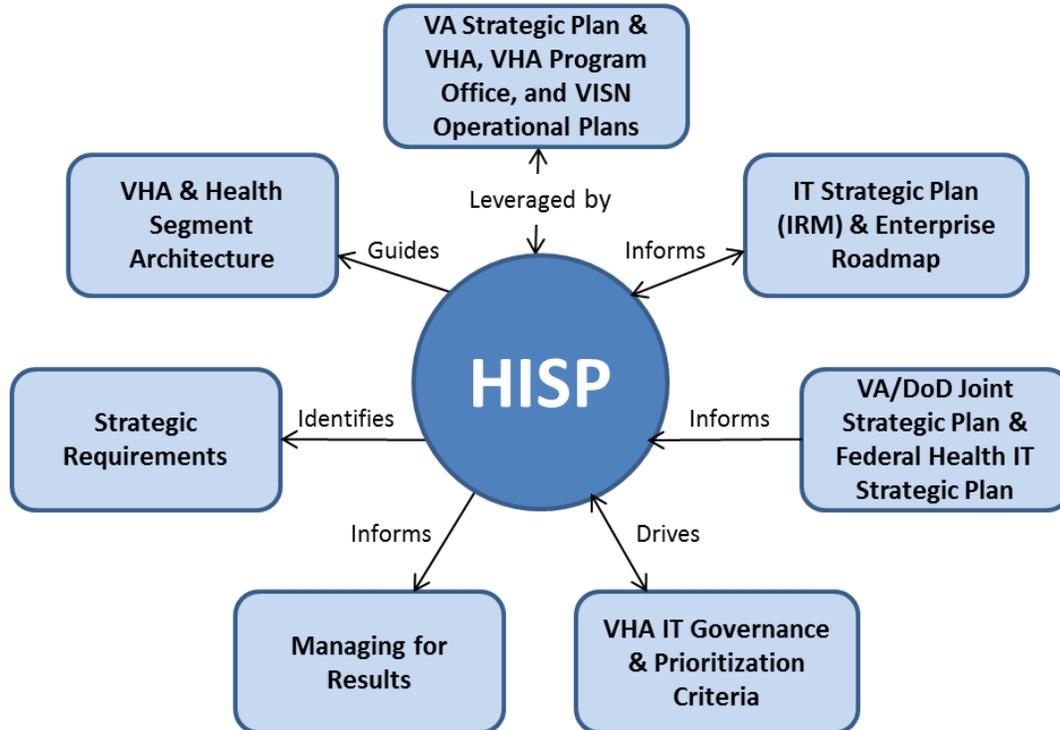


Figure 1 – VHA HISP Impact on Strategic Planning

2.2 VHA HISP GOVERNANCE

Oversight of the VHA HISP is included in the VHA NLC ITC charter. The ITC established the ITSSC to oversee this function. ITSSC membership represents a cross section of VHA field operations and program offices, as well as representatives from OIT. The main objectives of the ITSSC are to develop the VHA HISP and define the prioritization criteria for each multi-year planning cycle. The ITSSC researches, develops, and defines the VHA HIT strategy and mission to include strategic direction, goals, and priorities. Within this scope, the ITSSC is responsible for:

- Deciding the VHA strategic IT priorities, goals, and direction (to be used in evaluating and prioritizing VHA-related budget line items in the VA IT Multi-Year Program [IT MYP]).
- Defining prioritization criteria and policies for IT requirements and ensuring these align with VHA policies, VA/VHA strategic and operational plans, and NLC/Under Secretary for Health (USH) objectives.
- Coordinating with other NLC Committees to ensure the VHA HIT strategy and mission are aligned and consistent with planned VHA funding.
- Recommending VHA IT products that are no longer meeting a strategic need, and therefore possibly eligible for retirement/sunsetting.

The ITSSC meets monthly to review and validate content, and assess VHA’s evolving strategic drivers. Additionally, ITSSC members provide input to the VHA HISP between monthly meetings.

2.3 INTENDED AUDIENCE

Figure 2 shows the entities which comprise the intended audience of the VHA HISP.

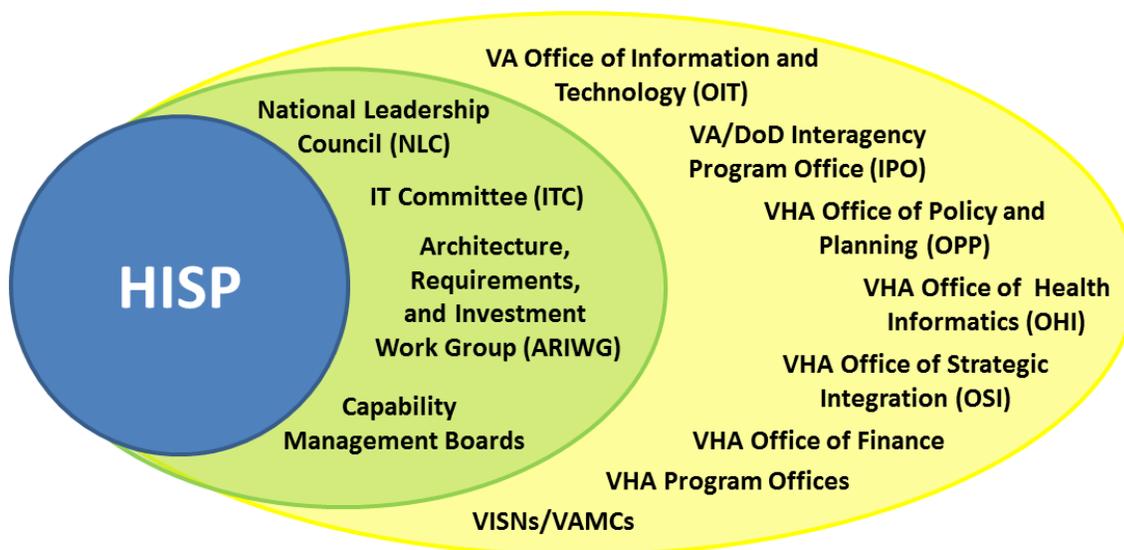


Figure 2 – VHA HISP Audience

3 DRIVERS AND STRATEGIES FOR THE FUTURE OF VHA HEALTHCARE

3.1 VHA STRATEGIC DRIVERS

VHA conducts regular environmental scans of the health information environment to identify specific strategic drivers that impact VHA strategies and used to help prioritize VHA IT investments. The environmental scans look for changes relative to the following categories:

- **Veteran Demographics and Needs** – Demographic trends play an important role in the evolution of HIT in VHA. Predictive analyses of demographics, social factors, and specific healthcare requirements help to anticipate the volume of care needed in certain specialties.
- **Healthcare Industry Business Impacts** – The healthcare industry as a whole faces significant changes in the foreseeable future and VHA must be able to function effectively as a key player in the healthcare industry.
- **VA / Government Legislation and Guidance** – Key changes expected to impact the VA Healthcare System because it is a government department.
- **HIT Impacts** – Expected IT advancements with a potential to disrupt business practices and processes, and contribute to healthcare transformation. These drivers include rapid incorporation and use of emerging health best practices, sharing of clinical knowledge and workflows, accommodation of clinical decision support (CDS) at the point of care, and selected security-related drivers developed by VHA’s Security Architecture team.
- **VHA Performance Gaps / Improvement Opportunities** – Areas where it is critical for VHA to improve its clinical or business performance, as identified through assessment of performance measures, product effectiveness analyses, external and internal inspection, Lean-based continuous improvement projects, and innovation efforts.

The current VHA strategic drivers are listed in Table 1. The table lists each driver, the implications of the driver, and the relative category. Drivers may be related to multiple categories, but only the main category is included in the table.

Table 1 – VHA Strategic Drivers

Driver	Implications	Category
<i>Increased need for EHR exchange with others</i> – Increasing necessity of integrated, cross-provider, health record exchange (VACAA). Expectations continue for VA to be interoperable with DoD and community providers.	The Health Information Technology for Economic and Clinical Health Act (HITECH Act) and the National Defense Authorization Act (NDAA) of 2014 drove the use of EHRs by physicians and hospitals to enable interoperability. VHA now needs to increase its capability and capacity for EHR exchange with other entities as VA shifts to function more as a health plan rather than just a health provider. The use of Open Application Programming Interfaces (APIs) may help facilitate the interoperable exchange of health information with DoD and community partners. VHA also needs to solve information sharing issues, like legislation that restricts sharing sensitive information and lack of Veteran consent, by exploring possible IT solutions that will filter out sensitive information and automate responses to data requests to improve efficiency.	Healthcare Industry Business Impacts

Driver	Implications	Category
<i>Scheduling wait time issue</i> – Long scheduling wait times and related access issues must be resolved to improve service to Veterans (VACAA).	Unacceptable wait times and inappropriate scheduling practices resulted in the passage of H.R. 3230 (VACAA) in 2014, which mandates a focus on scheduling, requires outside assessments, provides funds for healthcare providers, and allows Veterans to go outside the VA Healthcare System for care (Community Care).	VHA Performance Gaps / Improvement Opportunities
<i>Increased use of community providers</i> – VACAA will drive an increase in use of community providers (i.e. Community Care).	The VA Healthcare System will need to increase its capability to coordinate and monitor the quality of care and reimbursement with community providers with increased focus on VA as a health plan. There is a paradigm shift within VHA where it will begin to function more as a health plan rather than just a health provider. Revenue cycle management will become more critical. The launch of VACAA places heightened importance and responsibility on VA to more efficiently and effectively receive, store, and utilize returning consult reports and Veteran EHR data from 3rd party providers. This includes the “Get the Data Back” effort.	VA / Government Legislation and Guidance
<i>Mobile devices for data collection</i> – Emerging technology is enabling consumer engagement and remote monitoring.	The VA Healthcare System needs to support an increasingly mobile, connected, collaborative, and remote healthcare environment. VHA needs to integrate with personal health data collection and interact with Veterans regarding their patient reported outcomes and health status in real-time. Use of personal and mobile devices for medical data collection and interaction with healthcare providers will be rapidly increasing (“bring your own device”).	HIT Impacts
<i>Advanced technology in the EHR Market</i> – The private sector and COTS EHR products have evolved and surpassed VistA/Computerized Patient Record System (CPRS) in functionality.	Gartner states "the COTS EHR market has overtaken VistA in terms of overall functionality and it would not be considered a leading-edge product compared to today's readily available leading COTS EHR products". The VA Healthcare System will transition to a COTS EHR system from Cerner to meet the current expectations of Veterans and take advantage of the advanced functionality found in the private sector.	HIT Impacts
<i>Convenient access</i> – Increased expectations of rural care and convenient access for all Veterans. Consumers have new mindsets around their engagement in and ownership of their care.	The VA Healthcare System will need to increase its capability to provide remote or non-traditional facility treatments for our enrollees.	Veteran Demographics and Needs
<i>Office of the National Coordinator for Health IT (ONC) security standards</i> – ONC is driving standards for healthcare privacy and security, as well as core technical standards.	The VA Healthcare System will need to increase focus on privacy and security and detecting and preventing medical identity theft. Also need to stay informed and adopt core standards (e.g. ICD-10) to support healthcare information sharing. ONC is driving the Standards & Interoperability (S&I) Framework to implement core technical standards as well as Meaningful Use requirements.	Healthcare Industry Business Impacts

Driver	Implications	Category
<p><i>Quality and outcome focus</i> – Quality and outcome focused care becomes the national expectation. This encompasses evidence-based medicine, which involves systematically reviewing clinical data and making treatment decisions based on the best available information, and value-based care, which focuses on patient health outcomes.</p>	<p>The VA Healthcare System will need to continuously build measurability into its systems and facilitate the use of medical knowledge and business intelligence to continuously leverage data about quality, cost, access, and satisfaction to optimize clinical and business processes in real-time. To accomplish this, quality standards must be set and measured, for both VA and community care, and VHA will need to increase the use of CDS and analytics tools – often referred to as Big Data Analytics – to support decisions made at the point-of-care.</p>	<p>Healthcare Industry Business Impacts</p>
<p><i>New business models</i> – New business models will emerge.</p>	<p>The VA Healthcare System will need to adapt to or embrace new business models of healthcare, including patient-centric delivery and service models such as implementation of Patient Aligned Care Teams (PACT) and value-based care. Agility in IT is critical to rapid evolution to support new models.</p>	<p>Healthcare Industry Business Impacts</p>
<p><i>Value-based healthcare</i> – This model of care may have potential benefits in the VA environment.</p>	<p>The principle of value-based healthcare is that value is created in caring for a patient’s medical condition over the full cycle of care. The VA may benefit from some of the facets of value-based care such as: reorganizing care around patient conditions through integrated practice units (IPUs), measuring outcomes and costs for every patient, moving to bundles payments for care cycles, integrating multi-site care delivery systems, expanding geographic reach to drive excellence, and building an enabling IT platform.¹</p>	<p>Healthcare Industry Business Impacts</p>
<p><i>Perception of government services</i> – Potential negative perception of government services, including recent data breaches such as with Office of Personnel Management (OPM).</p>	<p>VA must be seen as a trusted partner to ensure it meets the needs of a customer base with increasing expectations. The VA must be able to manage relationships, safeguard protected health information (PHI), and provide more integrated services for Veterans.</p>	<p>Healthcare Industry Business Impacts</p>
<p><i>Advances in user interface technology</i> – User interface technology is advancing rapidly and can facilitate productivity and quality improvements.</p>	<p>The VA Healthcare System needs to translate advances in user interface technology and natural language processing into improved outcomes and productivity. Providers and Veterans have personal experience with advanced user interfaces on smart phones and other devices.</p>	<p>HIT Impacts</p>
<p><i>Focus on use of SMART performance measurements</i> – Quality measures should have substantial clinical credibility and new IT systems should include the capability to measure and report on performance.</p>	<p>The use of hundreds of measures for judging performance not only encourages gaming but also precludes focusing on, or even knowing, what is truly important. HIT is the tool for capturing data and reporting measures and will be impacted by efforts to develop SMART (Specific, Measurable, Attainable, Relevant, and Time-Bound) performance measures and a measurement system.</p>	<p>VHA Performance Gaps / Improvement Opportunities</p>

¹ Porter, Professor Michael E., Harvard Business School, Health Care Delivery Intensive Seminar, January 4, 2016.

Driver	Implications	Category
<i>Cost pressures and budget constraints</i> – Healthcare is a national economic issue. Federal budgets are under pressure.	VHA faces intense pressure to improve care quality and adapt to new business models (e.g. value-based care), while functioning in a tighter budget environment. For example, VHA expects a budget deficit of about \$12 billion in FY2018. VHA needs to invest in IT that has clear return on investment (ROI), allocate overall resources efficiently, and determine how best to leverage and sustain technologies as funding decreases. By attaining efficiencies through IT and moving away from traditional brick and mortar facilities, VHA should be able to reallocate funding from these areas to be used elsewhere.	Healthcare Industry Business Impacts
<i>Patient-centric privacy (PCP)</i> – PCP refers to the concept that patients have more responsibility and control for their own healthcare, including privacy and healthcare outcomes.	Patients should be seen as a fundamental and integral part of the disclosure, access, and use processes of their Protected Health Information (PHI). PCP is becoming an integral part of a patient’s ability to more directly control their healthcare management and results. Moreover, patients have the ability to control the release of their healthcare information, a process known as Release of Information. Although inextricably linked to PHI security, PCP is gaining traction as the predominant trend that ties together all privacy and security trends. ²	Healthcare Industry Business Impacts
<i>Genomics</i> – Also known as precision medicine, genomics is a way to customize medical care to the body's unique genetic makeup.	VA is actively collecting DNA from Veterans. The future potential of this data is that it may have huge implications for future treatment and diagnosis of diseases like cancer, hypertension, and diabetes.	Healthcare Industry Business Impacts
<i>Legislation driving enrollment in VA Healthcare System</i> – Implications from the Affordable Care Act (ACA).	The ACA has implications for VA, including potential increased enrollment and driving current VHA activities in support of the act. Specific HIT implications are uncertain.	VA / Government Legislation and Guidance
<i>Growth in Cloud Computing</i> – Growth and acceptance of Cloud Computing and Software as a Service (SaaS).	The VA Healthcare System will need to leverage SaaS and Cloud Computing which will free up resources and allow VA to focus efforts and investments on healthcare specific IT. Cloud Computing also provides infrastructure to support mobile applications (apps).	HIT Impacts
<i>Social network growth</i> – Explosive growth in the use of social networks, especially within the younger Veteran demographic.	The VA Healthcare System will need to utilize social media in enhancing transparency and two-way communications with Veterans. It will also need to develop ways to leverage social networks for care and disease surveillance.	HIT Impacts
<i>Growth in telehealth services</i> – The demand for telehealth is expected to increase to improve access to healthcare along with other mobile health technologies.	VHA needs to explore additional ways to leverage telehealth services as more tech savvy Veterans demand a more inclusive healthcare experience. Telehealth is emerging as a tool for disease management and will grow as consumers’ desire more convenient access to health services.	Healthcare Industry Business Impacts

² VHA Security and Privacy Architecture, Megatrends Report Quick Guide, 2016, pg. 6.

Driver	Implications	Category
<p><i>Veteran aging and increased disabilities</i> – Two dynamic demographic enrollment trends are impacting future demand for VA healthcare - Aging of the Vietnam Era enrollee population and an increasing number of enrollees being adjudicated for service-connected disabilities, which increases the number of enrollees in Priorities 1, 2, and 3.</p>	<p>These growth trends will impact home and community based services, short stay and long-term services and support, outpatient mental health services, inpatient acute mental health, medicine, surgery, and prosthetics. Increased use of these services will likely increase the need for telehealth, mobile applications, and the availability of patient data across multiple locations.</p>	<p>Veteran Demographics and Needs</p>
<p><i>Veteran demographics are evolving</i> – Demographic trends of increased women and younger aged Veterans will impact future demand for VA healthcare and services.</p>	<p>Predictive analyses of demographics, social factors, and specific healthcare requirements, such as the Veteran Population Model, VetPop Proxy, and Enrollee Health Care Projection Model, help identify evolving trends in VA demographics. This allows VA to anticipate the volume of care needed in certain specialties. For example, in the next five years, there will be growth in the number of women and younger Veterans. These younger Veterans are more technology savvy and will have different expectations for their healthcare experience. This may drive the use of telehealth, mobile applications, social media, etc.</p>	<p>Veteran Demographics and Needs</p>
<p><i>Health equity</i> – Population health and health equity is an increasing concern.</p>	<p>The VA Healthcare System will need to incorporate core principles of population health and health equity. There is an increasing focus on healthcare paradigms that ensure healthcare is delivered equitably and that entire populations can be addressed in decision-making.</p>	<p>Healthcare Industry Business Impacts</p>
<p><i>New partnerships</i> – Social and economic challenges are driving a focus on new forms of partnerships between the public, nonprofit, and private sectors.</p>	<p>VA must continue to create, strengthen, and expand productive and responsible public/private partnerships. This includes sharing relevant data and encouraging collaboration with research entities to support population health and clinical research. IT solutions must support this.</p>	<p>Healthcare Industry Business Impacts</p>
<p><i>Internet of Things (IoT)</i> – The IoT is a rapidly expanding, complex, global network consisting of billions of devices connected to the internet.</p>	<p>The Gartner Group and Ericsson estimate that by 2020 there will be 26-50 billion devices, including wearable and implantable medical devices (IMD), continuously collecting digitized information for purposes of aggregation and analysis. Health Care IoT (HCloT) will facilitate continuous access to healthcare information, remote expert advice, or therapeutic intervention (telehealth), enabled by real-time connectivity. HCloT devices are continuously gathering, monitoring, transmitting and analyzing healthcare data, enabling precise, individualized health care for optimal results. VHA healthcare applications like EHRM, medication compliance and imaging, asset tracking and inventory control, and remote patient monitoring/medical monitoring (telehealth) will benefit from HCloT.³</p>	<p>HIT Impacts</p>

³ VHA OHI Health Information Governance, Security and Privacy Architecture Megatrends, 2017, pg. 5-7.

Driver	Implications	Category
<p><i>System to System (S2S) communications</i> – Used for automated data transmission and measurement between mechanical or electronic devices.</p>	<p>S2S communications can be used to describe any technology that enables networked devices to exchange information and perform actions without the manual assistance of humans (e.g. remote monitoring). The purpose is to reduce human intervention and achieve improved response time and accuracy. This can benefit VHA through its expansion in mobile devices. For example, by using machine to machine communications, VHA personnel can establish a connection between a heartbeat sensor connected to a patient’s body and the server.⁴</p>	<p>HIT Impacts</p>
<p><i>Security labeling</i> – To enhance security and privacy, security labels are being used increasingly to classify constraints on an actor for accessing and using a resource.</p>	<p>Security labeling is already becoming an integral element in VHA’s efforts to meet stringent privacy and security requirements, such as Health Insurance Portability and Accountability Act (HIPAA). With technology advances and the need for information sharing, security labeling will likely become an even more critical element of VHA solutions and objectives. Security labeling provides a standard, computable, and semantically interoperable means to apply sufficiently descriptive data about healthcare information so that rights of access can be established, and appropriate access control decisions can be made at each layer of security services.⁵</p>	<p>HIT Impacts</p>
<p><i>Access Control</i> – Includes emerging trends like attribute based access control (ABAC) and identify as a service (IDaaS).</p>	<p>ABAC is an advanced access control method for managing access rights for people and systems connecting to networks and assets, offering greater efficiency, flexibility, scalability and security.⁶ IDaaS is the third-party management (predominately cloud-based) of identity and access control functions, and helps ensure consistency in authentication, authorization, administration and auditing -the four central tenets of identity management.⁷</p>	<p>HIT Impacts</p>
<p><i>3D printing</i> – A bevy of enterprises, including VHA, have acquired systems for prototyping and other use cases.</p>	<p>Medical professionals are increasingly exploring 3D printing because it cuts costs and improves healthcare. VHA has employed 3D printers to create one-of-a-kind devices tailored for patients as part of their assistive technology program. Investments in 3D printing should be viewed through a lens of better agility and cost savings, as well as innovation for future products.</p>	<p>HIT Impacts</p>
<p><i>Multifactor Authentication (MFA) in healthcare</i> –MFA is a security system that requires more than one method of authentication from independent categories to verify a person’s identity.</p>	<p>The MFA technology is expected to spread across to all industries because of the growing information technology security concerns. President Obama issued an Executive Order in October 2014 mandating MFA as a requirement across industries ranging from financial services, to healthcare and government sectors. VA/VHA must comply and provide MFA for both internal and remote access to users accessing VA/VHA applications.⁸</p>	<p>HIT Impacts</p>

⁴ VHA Security and Privacy Architecture, Megatrends Report Quick Guide, 2016, pg. 7.

⁵ VHA Security and Privacy Architecture, Megatrends Report Quick Guide, 2016, pg. 5.

⁶ VHA OHI Health Information Governance, Security and Privacy Architecture Megatrends, 2017, pg. 30.

⁷ VHA Security and Privacy Architecture, Megatrends Report Quick Guide, 2016, pg. 8-9.

⁸ VHA OHI Health Information Governance, Security and Privacy Architecture Megatrends, 2017, pg. 37-40.

4 CURRENT STATE OF VHA HIT

4.1 OVERVIEW OF THE CURRENT VHA HIT ENVIRONMENT

VHA continues to maintain its status as the largest integrated healthcare system in the United States. The VHA healthcare system has grown from 54 hospitals in 1930 to 170 VAMCs and more than 1,061 outpatient sites today.⁹ VHA currently serves more than 9.05 million Veteran enrollees and Veteran family members who receive care through VHA healthcare programs (as of FY2016).¹⁰ VHA facilities provide a broad spectrum of medical, surgical, and rehabilitative care. VHA's commitment to delivering timely, high-quality healthcare to America's Veterans, while controlling costs, remains a top priority.

With the understanding that VHA's needs far exceed available resources, its major areas of focus over the past few years have included enhancements to VistA through the VistA Evolution (VE) and EHR Modernization (EHRM) programs, expanding access to care in response to the Veterans Access, Choice and Accountability Act of 2014 (VACAA or VA Choice Act) through the Community Care Program (CCP) (formerly the Veterans Choice Program [VCP]), and providing alternate forms of access through telehealth and mobile care programs.

4.1.1 VistA Evolution and EHR Modernization

VistA is a nationwide information system and EHR developed by the VA. It consists of more than 180 applications for clinical, financial, administrative, and infrastructure needs in VA integrated into a single, common database, permitting all VA applications to share one single, authoritative data source for all Veteran-related care and services. Designed by clinicians for clinicians, VistA is patient-centric as well as facility-centric, and embodies the clinical workflow processes that support VHA's models of care. It enables measurable improvements in health outcomes and is central to VHA's ability to deliver high-quality care to a large and varied Veteran population.

During its early years, VistA provided advanced capabilities compared to what was generally available at that time. Almost 50% of the clinicians (physicians, nurses, etc.) in the United States have worked for the VHA while working towards their degree and have been trained on the VistA system; thus, VistA is one of the most familiar and widely used EHRs in the United States.¹¹ Outside of VHA, VistA has been implemented by dozens of healthcare providers¹² and is supported by multiple companies and organizations. Within government, the Indian Health Service supports a version of VistA called Resource and Patient Management System (RPMS) throughout its entire Indian Health System.

At this time, however, the COTS EHR market has overtaken VistA in terms of overall functionality and VistA would no longer be considered a leading-edge product compared to today's readily available leading COTS EHR products.¹³ Compared to COTS EHR systems, VistA faces many challenges including the following:

- VistA was custom built based on the needs of VHA, however this makes it more difficult to share information or be interoperable with DoD and external partner systems.

⁹ VHA Vitals, VHA Office of the Under Secretary for Health, Issue 21, January 31, 2018.

¹⁰ National Center for Veterans Analysis and Statistics, *Department of Veterans Affairs Statistics at a Glance*, June 2017.

¹¹ Peter Groen, "Emerging GIS Map of Healthcare Sites Using VistA EHR Systems", <http://www.openhealthnews.com/hotnews/emerging-gis-map-healthcare-sites-using-vista-ehr-systems>, April 30, 2013.

¹² http://www.hardhats.org/adopters/vista_adopters.html

¹³ Gartner Consulting, *VistA Comparison to the Commercial Electronic Health Record Marketplace*, February 4, 2011, pg. 25.

- VistA's existing language (Multi-User-Multi-Programming-System [MUMPS]), design, and architecture is costly to maintain and update. Manual restructuring of MUMPS into a modern language and architecture has proven to be very labor-intensive and extremely high risk.
- VistA is lacking or lagging in functionality in many areas, including but not limited to user interface and multi-step clinical workflows. The functionality gap is expected to increase as the COTS market continues to innovate.
- VistA provides limited support for CDS and has limited ability to access and interpret data using different views and analytics. This is exacerbated by a lack of enterprise data standardization.

VHA has made some progress towards addressing these challenges. For example, VHA established the Open Source Electronic Health Record Alliance (OSEHRA), a mechanism to encourage and accept broadly-based public and private sector contributions¹⁴. OSEHRA's mission is to "build and support an open source community of users, developers, service providers, and researchers engaged in advancing EHR software and related HIT."

Additionally, the VE Program was established to oversee the implementation of substantial enhancements and modifications in order to achieve health information sharing with DoD and external partners, enhance capabilities used by providers and patients, and improve efficiency and maintenance. Moving forward, the EHRM effort will involve replacing the EHR portion of VistA with a COTS EHR system from Cerner. On June 5, 2017, VA Secretary Dr. David Shulkin announced the decision for VHA's next generation EHR:

"Having a Veteran's complete and accurate health record in a single common EHR system is critical to that care, and to improving patient safety... our current VistA system is in need of major modernization to keep pace with the improvements in health information technology and cybersecurity, and software development is not a core competency of VA. I said recently to Congress that I was committed to getting VA out of the software business, that I didn't see remaining in that business as benefitting Veterans. And, because of that, we're making a decision to move towards a commercial off-the-shelf product."

Secretary Shulkin's full statement can be found at the following link: <https://www.va.gov/opa/pressrel/pressrelease.cfm?id=2914>. Additional information on the way forward for EHRM is available in Section 6 Transition Efforts.

4.1.2 Veterans Choice Program and Community Care

The VHA's goal is to enhance our healthcare system and improve service delivery to better serve Veterans and set the course for long-term excellence and reform. President Obama signed the VA Choice Act into law (Public Law 113-146) on August 7, 2014 and amendments were made in the Department of Veterans Affairs Expiring Authorities Act of 2014 (Public Law 113-175) on September 26, 2014. The legislation focuses on increasing access and program expansions, as well as additional collaborations and business process improvements. It included requirements to implement 21 program modifications or expansions, one entirely new benefit program, complete three required independent assessments, and to produce 12 reports.¹⁵ The independent assessments, which were conducted by the Centers for Medicare & Medicaid Services (CMS) Alliance to Modernize Healthcare (CAMH) and the MITRE Corporation, provide VA a way to transparently review vital programs, organizations, and business practices to make VA more accountable to Veterans. The Integrated Report and the 12 major assessment reports are available at the following link: http://www.va.gov/opa/choiceact/factsheets_and_details.asp.

¹⁴ <http://osehra.org/content/frequently-asked-questions-0#1.1>

¹⁵ Veterans Day Progress Report: Veterans Access, Choice, and Accountability Act 2014, VA Fact Sheet, November 3, 2014.

The VA Choice Act also called for the creation of a separate Commission on Care. The Commission evaluated the Independent Assessment Reports, held public meetings, listened to a broad range of stakeholders, including Veterans and leaders of Veterans Service Organizations, made site visits to VHA facilities; and exchanged ideas with individual Veterans, VA and VHA leaders, VHA employees and healthcare providers, members of Congress, economists, and healthcare experts. Based on this research, the Commission developed a Final Report that outlines a list of recommendations aimed to enhance VHA's ongoing reform efforts by providing both a systems-oriented framework and vitally needed changes in organizational structure. The full Commission on Care report can be accessed at: <https://commissiononcare.sites.usa.gov>.

At its root, the VA Choice Act is a law that expands the number of options Veterans have for receiving care to ensure Veterans have timely access to high-quality care. VCP was developed to allow eligible Veterans to access primary care, inpatient and outpatient specialty care, and mental health care from community providers when the local VA healthcare facility cannot provide the services due to: lack of available specialists, long wait times, or extraordinary distance from the Veteran's home. Additional information on VCP can be found at: <https://www.va.gov/opa/choiceact/>.

Since VCP is not a permanent program, VA has partnered with Congress to work through the remaining legislative needs to build a single program for community care. On June 6, 2018, President Trump signed the VA Maintaining Systems and Strengthening Integrated Outside Networks (MISSION) Act which replaces the VA Choice Act and consolidates seven different programs offering community care including VA Choice into a single entity called CCP. CCP plans to consolidate existing methods for community care into a single, efficient program integrated into the broader context of VA's healthcare system. A Veteran-centric design is expected to provide straight forward eligibility criteria and a single set of clinical and administrative systems and processes, deliver effectively coordinated care, and allow Veterans to choose their providers. Additional information on CCP can be found in Section 5 Future Vision for VHA HIT and Section 6 Transition Efforts of this document.

4.1.3 Telehealth

VHA has implemented new innovative IT practices to improve Veterans' access to healthcare, such as telemedicine and mobile clinics, to provide care to the more than 6.26 million total unique patients (FY2016) within VHA.¹⁶ Telehealth increases access to high quality health care services by utilizing information and telecommunication technologies to provide health care services when the patient and practitioner are separated by geographical distance. In FY2017, VHA provided care to more than 727,000 unique patients via the three telehealth modalities; home telehealth, clinical video telehealth, and store-and-forward telehealth. This amounted to over 2.18 million telehealth episodes of care. Additionally, 45% of these Veterans lived in rural areas, and may otherwise have had limited access to VA health care.¹⁷

The use of telehealth technologies, including video conferencing, store-and-forward imaging, and home telehealth devices, enables patients with chronic diseases such as diabetes, heart failure, and chronic obstructive pulmonary disease (COPD) to be monitored at home. These advances help reduce hospital admissions, clinic visits, and emergency room visits. Elderly or disabled patients are able to stay in their homes longer and it is possible to provide cutting-edge specialty care even in sparsely populated areas. These types of programs are especially beneficial for the most expensive 5% of the overall patient

¹⁶ U.S. Department of Veterans Affairs, VA Benefits & Health Care Utilization, 2017.

¹⁷ VHA Vitals, VHA Office of the Under Secretary for Health, Issue 24, April 30, 2018.

population who, in part because they frequently visit hospitals and outpatient clinics, account for approximately 50% of healthcare costs.¹⁸

Telehealth aims to improve the health of Veterans by providing technologies that expand clinical care beyond the traditional office visit and improve health care coordination between Veterans and their care teams. VHA is dedicated to providing the most up-to-date technologies to enhance patient experiences and will continue to embrace opportunities to optimize access to care via IT advancements in both telehealth and mobile services. Additional information on the desired future state of VHA HIT related to telehealth can be found in Section 5 of this document and information on planned efforts to attain that vision can be found in Section 6.

4.2 STRENGTHS IN THE CURRENT VHA HIT ENVIRONMENT

VHA was an early adopter of EHR systems, patient-centered IT, and other HIT capabilities. VHA has made enormous strides over many years in the development and enhancement of HIT and VistA. For example, VHA has implemented many successful IT projects to improve the Veteran experience including:

- Bar Code Medication Administration (BCMA) – Prevents medication errors and improves the quality and safety of medication administration.
- VistA Imaging – Helps VA hospitals achieve an enterprise-wide paperless and filmless EHR by capturing 39 million new images each month, displaying 9-11 million images for review each month, and storing a total of more than 2 billion images nationwide as of July 2011.¹⁹
- Big Data analytics via the Corporate Data Warehouse (CDW) – VHA’s CDW has 6.6 billion lab tests, 3.8 billion clinical orders, nearly 2 billion outpatient encounters and 10.5 million inpatient admissions. This data is used to assess Veteran health and can be leveraged by scientists to develop innovative solutions and improve healthcare delivery.²⁰
- VHA Consolidated Mail Outpatient Pharmacy Program (CMOP) – Allows for economies of scale to save money on prescriptions for Veterans. This program has been ranked #1 for customer service by JD Power and Associates for multiple years.

Error! Reference source not found. lists the major strengths of VHA HIT.

Table 2 – Strengths in the Current VHA HIT Environment

Strength	Discussion	Source
VHA was the first major national healthcare system to adopt an EHR.	As the first major national healthcare system to do so, VHA has continued to improve and enhance IT to support clinical care and to collect and use clinical data. VHA has been able to collect electronic data for over 30 years on a unique population. This provides a rich opportunity to support research and to use data to measure and improve performance.	<i>Office of Informatics and Analytics (OIA) Strategic Plan FY2013-2018 (VHA, February 20, 2014, Page 21)</i>

¹⁸ Concentration of Health Expenditures in the U.S. Noninstitutionalized Population – 2014, Agency for Healthcare Research and Quality, Rockville, MD, Statistical Brief #497, November 2016.

¹⁹ <https://www.va.gov/health/imaging/>

²⁰ Conn, Joseph, *VA puts the 'big' in big data predictive analytics*, Modern Healthcare, August 2014.

Strength	Discussion	Source
VHA telehealth services have played a critical role in expanding access to care in more than 45 clinical areas.	In FY2015, 12 percent of all Veterans enrolled for VHA care received telehealth based care. This includes 2.14 million telehealth visits, touching 677,000 Veterans.	<i>Top VA Health Care Official Announces Initiatives and Progress Made to Improve Access to Care (Office of Public and Intergovernmental Affairs, April 8, 2016)</i>
VHA has initiated internal and external collaboration and partnerships.	VHA has set and shaped health information standards and fostered collaborative relationships for health data sharing with other federal and private sector entities. With the VA and DoD interoperability efforts, through Virtual Health Information Exchange (VHIE) and other initiatives in health information exchange, VHA is a trusted partner in the EHR, now part of EHRM, as well as HealtheWay, now the Sequoia Project.	<i>OIA Strategic Plan FY2013-2018 (VHA, February 20, 2014, Page 20)</i>
VHA has implemented IT that delivers significant benefits to Veterans and providers and supports patient-centered care.	VHA was an early adopter of patient-centered IT, allowing Veterans to better understand and manage their health. MyHealtheVet, VHA's patient portal, has provided Veterans and other client users with access to trusted health information, links to federal and VHA benefits and resources, the Personal Health Journal, and an online prescription refill capability for more than 10 years. It also expanded its gateway to allow users to view appointments and laboratory results online.	<i>OIA Strategic Plan FY2013-2018 (VHA, February 20, 2014, Page 20)</i>
VHA has the greatest accumulated experience of any healthcare system with EHRs and health system performance measurement.	VHA retains vast data resources and expertise solving the technical and organizational challenges that surround health informatics from its past informatics successes, exemplified in VHA's longitudinal health records that contain tens of billions of structured data elements and billions of free text clinical notes that are also rich in information. New analytic, text processing, and data mining technologies make this vast data store increasingly useful for clinical, research, public health, and administrative purposes. The data has allowed the VHA to conduct extensive analytics to investigate and report on the efficacy of programs of care. VistA's support has allowed the VHA to consistently report very high conformance with critical performance measures (such as those required by the Joint Commission).	<i>OIA Strategic Plan FY2013-2018 (VHA, February 20, 2014, Page 20); VistA Comparison to the Commercial Electronic Health Record Marketplace (Gartner Consulting, February 4, 2011, Page 5)</i>

4.3 IMPROVEMENT OPPORTUNITIES IN THE CURRENT VHA HIT ENVIRONMENT

While VHA has made advancements in HIT and VistA, there are numerous areas where HIT can continue to improve and evolve. **Error! Reference source not found.** lists the major strategic improvement opportunities for VHA in HIT.

Table 3 – HIT Improvement Opportunities

Improvement Opportunity	Discussion	Source
<i>Scheduling and Access</i> – Long scheduling wait times and related access issues need to be resolved to improve service to Veterans.	Increased demand and complexity have exacerbated scheduling problems, which have garnered national attention. VHA may consider outsourcing scheduling functions for efficiency. Due to access issues, VA is pursuing additional opportunities for providing care, like expanding access to Community Care.	VACAA 2014, VA Inspector General Reports, and numerous media reports
<i>EHR Interoperability</i> – An authoritative, accessible source of health information for the estimated 18 million DoD and VA beneficiaries is needed.	Need an interoperable EHR between VA, DoD, and community providers. The ability to seamlessly share health information no matter where Veterans receive care is imperative to providing high quality care. VHA currently does not have the capacity to respond to the number of information requests they receive and restrictions on sharing sensitive health information further complicate this issue.	VA/DoD Joint Strategic Plan
<i>Data Weaknesses and View Limitations</i> – Currently, VHA’s legacy systems have a multitude of data weaknesses. This includes limited capability to create and display an integrated longitudinal picture.	Maintenance of key enterprise data is widely disparate and inefficient, which limits the ability to link and aggregate data, may create data security challenges and hampers interoperability, reusability, and data sharing. VHA must invest in data quality improvement and data standardization to support enhanced analysis, reporting, and intelligent decision support. Efforts to implement national clinical data standards have borne some fruit but are far from complete and poorly supported. Additionally, data is presented in the same way that it is entered; so there is little ability to provide customized or summary views of clinical documentation. Different views are not presented based on clinician role or care venue.	OIA Strategic Plan FY2013-2018 (VHA, February 20, 2014, Page 21) and VistA Comparison to the Commercial Electronic Health Record Marketplace (Gartner Consulting, February 4, 2011, Page 38)
<i>User Interface</i> – VistA lags COTS EHR solutions in the areas of user interface and clinical display.	While the key clinician facing module, CPRS, provides a GUI, it is not as intuitive or easy to use as those of some leading COTS solutions. Also, other primary VistA modules have a text based ‘scroll and roll’ interface which has a steep learning curve.	VistA Comparison to the Commercial Electronic Health Record Marketplace (Gartner Consulting, February 4, 2011, Pages 5, 7)
<i>Workflow Limitations</i> – VistA does not possess the ability to support multi-step clinical workflow.	Users cannot be led from one action to the next based on the clinical context. Actions or prompts for subsequent care providers in the chain of care cannot be automatically created based on the outcomes of prior activities or outcomes. VistA currently does not have a tool (graphic or otherwise) to define or manage automated workflow logic.	VistA Comparison to the Commercial Electronic Health Record Marketplace (Gartner Consulting, February 4, 2011, Page 35)

Improvement Opportunity	Discussion	Source
<i>Big Data Predictive Analytics</i> – VHA has vast stores of patient data in the CDW that can be leveraged for research to develop innovations and improve patient outcomes.	VHA data systems have the potential to be leveraged to produce predictive modeling, precision medicine, learning health system, etc. New analytic, text processing, and data mining technologies make this vast data store increasingly useful for clinical, research, public health, and administrative purposes.	<i>VISN Chief Health Informatics (VCHI) Sub-Committee briefing to the IT Strategy Sub-Committee, August 2016</i>
<i>CDS Limitations</i> – Implementation of CDS is limited in VistA and VistA lags COTS EHR solutions.	While there is the ability to hard code alerts and to create reminders, there is no knowledge based automated ‘push’ of information to help clinicians make good quality care decisions (or prevent them from making bad ones). In VistA, there is no implementation of automated decision maps, workflow logic, or rules engine utilities. No ability to track a patient against an expected course based on diagnosis.	<i>VistA Comparison to the Commercial Electronic Health Record Marketplace (Gartner Consulting, February 4, 2011, Pages 7, 43)</i>
<i>Integrated Planning</i> – There is a need to improve collaboration between VHA and OIT and develop integrated strategic, capital, and IT plans.	VHA needs to work collaboratively with OIT to streamline the IT investment decision making process and ensure the success of IT projects. Need to synchronize approved VHA capital projects with OIT investment plans to secure necessary IT funding. Align VHA and OIT operational and strategic plans and use that alignment as a framework for prioritizing IT infrastructure and capability development, with the flexibility to adjust priorities as healthcare, technology, and Veteran needs evolve. This will maximize business value and coordinate efforts to better utilize scarce budget and human resources.	<i>VA and VHA Strategic and Operational Plans</i>
<i>Education for Clinical Trainees</i> – Data tracking needed to document individuals receiving training throughout the VA.	Currently, there is no single database that captures essential data on the 120,000 trainees per year that present at VA Medical Centers (VAMCs) for their clinical training experiences, all of whom are appointed under Title-38 Appointment Authority. VA needs to standardize the appointment, on/off boarding, and tracking of clinical trainees across the VA Healthcare system.	<i>Dr. Karen Sanders, Office of Academic Affairs and co-chair of the Research and Education Capability Management Board</i>
<i>Health Research</i> – Management of trials, data management and public access to research data.	Whether thru health services research, clinical trials, biological and laboratory science research, or rehabilitation research, the VHA Research program discovers new knowledge in healthcare, leads to improved outcomes and lower costs, and facilitates the translation of cutting edge research into operations. VHA cannot currently share research information electronically with the public or other research entities. There are data storage and security issues, as well as a need for improved automation.	<i>Dr. Jim Breeling briefing to the IT Strategy Sub-Committee, August 2015</i>

Improvement Opportunity	Discussion	Source
<i>Business Enabling Services</i> – There is a need to maintain and continuously update non-clinical services that support clinical operations.	VHA must improve enabling services and keep them as efficient as possible in order to compete with modern, more streamlined systems. This includes those non-clinical services that “keep the lights on” and help to maintain VHA operations including supply chain, financial management, logistics, human resources, etc.	<i>IT Strategy Sub-Committee HISP discussions, May 2017</i>

5 FUTURE VISION FOR VHA HIT

5.1 OVERVIEW OF THE FUTURE ENVIRONMENT

The VHA aspires to deliver high quality and competitive healthcare that consistently delivers optimal outcomes for its Veterans, in a more efficient and timely manner. Maintaining an environment that systematically delivers excellence in healthcare requires effectively applying all the tools and technical capabilities available, enhancing clinical and business processes, and reimagining the Veteran-provider experience. This means continuously working to improve performance and optimizing the use and implementation of IT to help achieve greater efficiencies for providers and Veterans. Through collaboration with OIT to modernize IT capabilities and processes, VHA will help solidify Veterans' trust and confidence in the services it provides. VHA must be seen as a trusted partner to ensure it meets the needs of a customer base with increasing expectations. VHA providers will be able to leverage new capabilities such as predictive analytics, genomics (i.e. precision medicine) data for personalized medicine and population health, and information generated by medical devices and sensors. Modernization of VHA infrastructure extends beyond IT systems to encompass the very look and feel of VHA. Investments in innovative technology, such as telehealth and mobile health, are fueling a shift away from VHA's aging and capital-intensive brick and mortar footprint to the Veteran's home.

Once this transition is complete, VHA HIT will have the following characteristics:

- Operate as a Learning Health System
- Data-driven CDS, including Veteran genomic data
- Advanced EHR capabilities (i.e. Cerner)
- Enterprise-wide data standardization
- Interoperability between VHA, DoD, and community providers
- Secure information exchange
- Value and outcome driven
- Agile and able to meet the healthcare needs of a diverse Veteran population
- Efficient and cost-effective healthcare delivery that leverages an array of innovative technologies, including telehealth and mobile health services

This shift leads not only to lowering the overall cost of healthcare delivery, but also positive improvements in Veteran and provider experiences with VHA, and outcomes as it reduces the boundaries of where, how, and when care is provided.

5.1.1 Veteran Population Trends

As the Veteran population and demographics shift, so too do the expectations and complexity of healthcare delivery. In the upcoming years, the enrolled Veteran population at the VHA is expected to grow to an estimated peak in FY2022 / FY2023 to about 9.4 million enrolled Veterans²¹. The shifts in demographics among this population will have direct impacts on the operations and services the VHA focuses on in the future. For example, the Veteran population is expected to remain geographically dispersed which causes an inherent challenge in access to VA medical centers. VHA has 2.9 million Veterans living in rural areas which make up 33 percent of the Veteran population enrolled in the VA

²¹ VA Enrollee Health Care Projection Model, Office of the ADUSH for Policy and Planning, October 2017.

health care system²². This means the focus on providing alternative options for accessing healthcare, like community care, will continue. Additionally, women are now the fastest growing cohort within the Veteran community with an expected increase to 16% of the Veteran population by 2040²³. The expected rise in female Veterans means that the VHA will need to improve access to women’s health services. Also, the increase in need for mental health related care (e.g. traumatic brain injury (TBI) and suicide prevention) means VHA must focus on recruitment and retention of additional mental health care providers and services to meet this unique and complex challenge. As shown in Figure 1, over the next 20 years the number of Veterans aged under 45 and 65-84 is expected to increase but then decrease again, with the 65-84 age group remaining the largest percentage of the total population. In contrast, the 45-64 and over 85 age groups are expected to slowly increase over time²⁴. As the older Veteran population continues to age, there will be an increase in the need for services related to primary care, geriatrics, and ambulatory care. Also, the growing Millennial population will have different expectations of care, including when and how they access care and communicate with providers. This translates into the need for improvements to VHA telehealth services and use of mobile devices and applications, as well as an enhanced EHR, online Veteran portal, and information sharing capabilities.

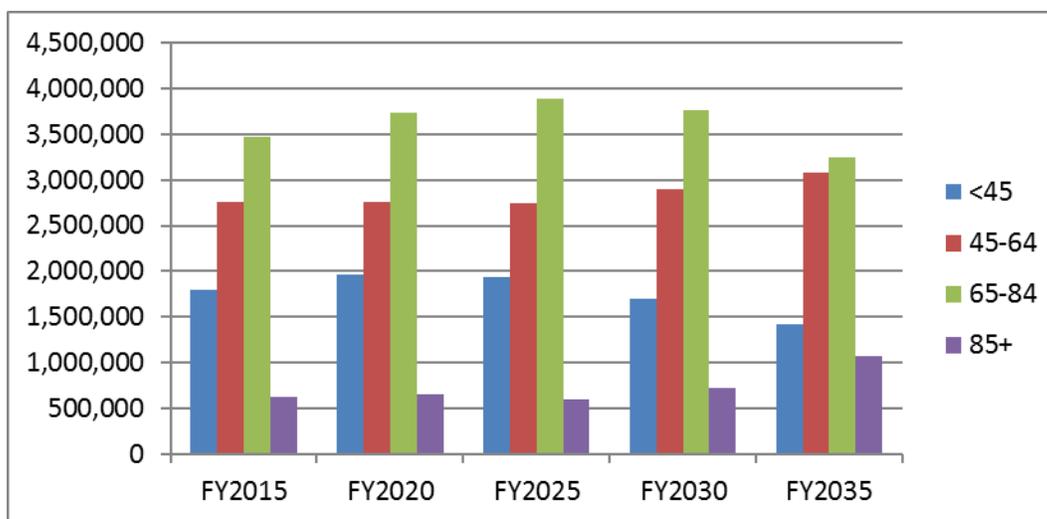


Figure 3 – Enrollee Age Migration FY2015-2035²⁵

5.1.2 Learning Health System

In order to continue to provide exceptional service to Veterans and an engaging environment for employees, VHA will evolve into a Learning Health System. A system in which science, informatics, incentives, and culture are aligned for innovation, with best practices seamlessly embedded in the care process, Veterans and families are active participants in all elements, and new knowledge is captured as an integral by-product of the care experience. VHA will also pursue advanced healthcare research and analysis capabilities, with capacity to channel research-driven innovation into clinical or operational practices (e.g. integrating CDS into clinical processes), and share research information with external partners and the public.

²² <https://www.ruralhealth.va.gov/aboutus/ruralvets.asp>

²³ Women Veterans Report: The Past, Present, and Future of Women Veterans. National Center for Veterans Analysis and Statistics, Department of Veterans Affairs, Washington, DC, February 2017, pg. 11.

²⁴ VA Enrollee Health Care Projection Model, Office of the ADUSH for Policy and Planning, September 2016.

²⁵ VA Enrollee Health Care Projection Model, Office of the ADUSH for Policy and Planning, September 2016.

Complete transition into a Learning Health system means VHA will need to become fully interoperable both within the VHA network and with DoD and community providers. As VHA shifts from primarily delivering healthcare to functioning more as a health plan, it will need to share medical information to enable providers to be fully knowledgeable of a Veteran's medical information regardless of where they receive care. Interoperability will also make it easier to implement and fully utilize services such as telehealth and mobile access. Ensuring efficient and secure information exchange that maintains compliance with privacy and security mandates will continue to be an important part of VHA's health IT environment. Secure information exchange refers to protected, regular medical and health record information exchange both internally and with external partners. Information is protected through encryption and authentication of devices, processes, and people at different levels of authorization.

The aim of VHA is to provide better care, and thus better health outcomes, and an improved, Veteran-centered experience, while identifying cost savings to be conscious of future budget constraints. Becoming a learning health system where advanced, high-quality medical care capabilities are provided in an efficient and cost-effective manner will eventually lead to lower operating costs. Efficiencies may include use of shared services and mobile applications to improve interoperability and accelerate delivery or adoption of technologies that create a scalable infrastructure. Also, continuous, sustained, and measurable process improvement will lead to the realization of additional efficiencies.

5.1.3 Community Care

Community care is a key component of how VHA will deliver care in the future. A Veteran-centric design will provide straightforward eligibility criteria and a single set of clinical and administrative systems and processes, deliver effectively coordinated care, and allow Veterans to choose their providers. The VHA CCP will provide Veterans with increased choice in providers they can see in the community. Veterans will have timely access to care and a clear understanding of when and where they are eligible for care. Billing and co-payment requirements will be easily understood by both providers and Veterans. It also will expand access to community care for emergency treatment and urgent care services. In addition, Veterans will benefit from better care coordination due to the ease of clinical and administrative information flow between VHA and community providers. CCP will simplify and standardize community providers' interaction with VHA. All providers should also be interoperable, meaning that information should be easily accessible and sharable between DoD, VHA and community providers. With Veteran care increasingly being delivered across a broad and dynamic continuum, VHA HIT must embrace and support the free-flow of information, care processes, and clinical quality management across tiers and institutions of care. All Veteran health information shared with partners should also be automatically labeled for attributes such as sensitivity, confidentiality, purpose of use, integrity, handling instructions, etc. Veteran information and medical histories will be available when needed. Finally, consolidating existing community care services into a single program will reduce confusion among VHA providers and staff about when and how to use community care and will improve community care operations.

With initiatives such as CCP and the VA Choice and MISSION Acts opening the options for where Veterans receive healthcare services, VHA will have to compete with other healthcare providers to attract patients. To remain the Veterans' provider of choice, VHA will have to address the perception of quality of care by focusing on the Veteran's overall experience and improving outcomes. The competitive landscape extends to attracting and retaining healthcare providers too. As competition increases, VHA must be able to give its current and future providers the most advanced tools to perform their work effectively. The increase in competition between VHA and external healthcare systems will drive VHA to be agile and innovative in its approach to providing the highest quality of care.

5.2 FUTURE VISION FROM THE PROVIDER PERSPECTIVE

The future state of VHA providers will reflect both a significant change in the specialized services provided (e.g. increase in mental health specialists and women specific services) but also the overall demographics of the providers themselves. VHA mission critical occupations (e.g. physicians, registered nurses, etc.) are projected to net 44,865 additional hires by 2022 (Projected losses are 76,436 with 121,301 in projected hires).²⁶ By 2021, VHA expects to add 3,712 additional outpatient clinical mental health providers to meet current expected staffing gaps.²⁷ To meet these changes in healthcare services, while remaining competitive in the recruitment of mission critical positions, VHA may need to leverage flexible hiring options, such as using contract physicians or affiliate providers. As we add new providers, we expect the majority of these hires to be younger and/or more tech savvy with an expectation of utilizing technology as a key aspect of how they provide care. As VHA modernizes its technical infrastructure and application of innovative technologies, our providers will realize the benefit of this transformation both from an operational stance (e.g. comprehensive and integrated medical records in the Cerner EHR system) as well as how they interact with their Veterans (e.g. leveraging telehealth, mobile applications, and remote health monitoring).

For example, a VHA provider will be able to use a computer or tablet to hold a virtual and secure follow-up appointment with a Veteran suffering from a chronic disease through telehealth services. Prior to initiating the appointment, the provider will be able to access the relevant Veteran's medical record on that same device, which will also contain a comprehensive medical history from VHA and DoD facilities and/or community providers, a listing of all current prescriptions, a record of diagnostic data from a remote monitoring device, and a log of data provided by the Veteran. Once connected with the Veteran, the provider can trust that they have the necessary tools and infrastructure to engage with their patient remotely and still perform an efficient and effective assessment. They will be able to access and use Veteran-specific health data, including genomic data or patient generated data (e.g. heart rate, glucose levels, etc.) to inform clinical decision making. Patient generated data is updated in real-time on the Veteran's record from VHA provided remote monitoring devices, and, when necessary, those devices can be adjusted remotely by the physician. Another example may be a provider using a mobile application on his/her mobile device to test and adjust audio levels of a Veteran's hearing aid during an examination. The provider's notes, recommended treatment, diagnoses, and prescriptions will be updated in the medical record instantly and securely, and the CDS system would generate reminder notifications for follow up appointments, referrals, etc. that would be sent to the Veteran via text or emails. The provider can expect to use remote access, from any location, as an option for performing record keeping functions or follow up appointments rather than having to be at a VHA site.

VHA's future state is one in which our providers' overall experience is enhanced by giving them the innovative tools that allow them to focus on the Veteran and perform their work more effectively, more efficiently, and from any location, while removing obstacles such as cumbersome health IT platforms that require repetitive data entry across multiple systems.

5.3 FUTURE VISION FROM THE VETERAN PERSPECTIVE

As we envision the future state from the Veteran's perspective, we make the assumption that Veterans will expect the following from VHA: ease of use, flexible, and focused on better outcomes. This means easier access to their network of providers and the services covered within their specific eligibility are clearly defined. VHA's focus on community care means that in the future Veterans should be able to

²⁶ VHA 2016 Workforce Succession Strategic Plan, pg. 83.

²⁷ VHA 2016 Workforce Succession Strategic Plan, pg. 34.

seamlessly interact with both community and VHA providers. They should be able to see the doctors they need, in convenient locations, and within a reasonable timeframe. Veterans should be able to easily access their medical information from VHA's healthcare portal (MyHealthVet) via a multitude of devices from any location and at any time. Under HIPAA Patient Right of Access, Veterans should be able to access and transmit their own health information to a recipient of their choice without regard to VA organizational policy. The ability to communicate with providers electronically as well as ancillary services like refilling prescriptions and scheduling appointments will all be available through the portal. This includes being able to access information for community provider networks in addition to VHA providers. The connection between VHA's and community providers' EHRs allows both parties to see in virtually real-time what is documented by the other provider, thereby preventing duplication of testing and services the Veteran receives. Veterans are thus empowered with complete mobile access to health information and services. The future state of VHA creates an environment where the Veteran's role is transitioned into more of an active partner with his/her healthcare delivery team. Veterans will also be able to collect and share dynamic, real-time data with their providers to support clinical decisions and bolster positive outcomes.

For example, an elderly Veteran suffering from Diabetes has a follow up appointment with his endocrinologist. The Veteran has experienced nerve damage in his lower leg due to his chronic condition, which makes walking and driving difficult. For this Veteran, the flexibility to meet virtually with his care provider through telehealth services from the comfort of his own home is imperative. Prior to the appointment, the Veteran can easily access his medical records, determine the expected co-payment amount and/or out of pocket expenses, and check his network of providers for additional needed consultations (e.g. dietician). Once the Veteran logs in to the telehealth appointment, he will not have to provide additional information from previous appointments, historical (or real-time) glucose levels, etc. because that information will already be updated and available within his medical history and viewable by the physician. Another Veteran, who has been identified as a cardiac patient, is provided an FDA approved device by his VHA provider that can monitor him 24/7 and alert the Veteran, his care team, or even an ambulance if he is experiencing medical complications that need immediate treatment. This Veteran is able to use this technology because VHA has supported the development of mobile applications and better algorithms that proactively identify issues.

As VHA accelerates the adoption, utilization, functionality, and interconnectivity of telehealth and mobile applications leveraged across VHA, Veterans will experience greater control and have more choice with how, when, where, and with whom their care is delivered. Engaging Veterans to have a greater role in their own healthcare will lead to better health outcomes and an overall improvement in the Veteran's experience.

6 TRANSITION EFFORTS

6.1 TRANSITION EFFORTS OVERVIEW

VHA has developed a desired future-state for the VHA HIT environment, as described in Section 5. Additionally, VHA has identified several improvement opportunities, as listed and described in Table 4 in Section 4. In order to ultimately attain that desired HIT future-state and address the identified improvement opportunities, VHA must develop a plan of both near-term focus areas and long-term goals to make incremental and achievable improvements in the current HIT environment. The near-term focus areas that VHA must initially pursue include the following:

- Expansion of the CCP and development of supporting plans, programs, and IT initiatives.
- Enterprise-wide implementation of the Cerner EHR system to provide advanced functionality.
- Improvement of interoperability capabilities to ensure secure and accurate information sharing and provide seamless service to Veterans independent of where and how they receive healthcare.

Additional information on these near-term focus areas is provided in the following sub-sections.

6.1.1 Community Care Program (CCP)

As previously mentioned in Section 4.1.2, VHA is designing a consolidated CCP that will expand the availability of community care options to Veterans. The goal of CCP is to deliver a program that is easy to understand, simple to administer, and meets the needs of Veterans and their families, community providers, and VA staff. The program is structured around five functional areas, all supported by cross-cutting customer service, which enable Veterans to receive timely and high-quality healthcare:

- Eligibility – Streamline and consolidate eligibility requirements to provide easy to understand eligibility information to Veterans, community providers, and VA staff.
- Referrals and Authorizations – Optimize existing referral and authorization systems, as well as supporting processes, to provide Veterans timely access to a community provider of their choice.
- Community Care Network – Implement a network of community providers and support staff that provides access to high-quality care inside and outside of the VA.
- Care Coordination – Coordinate care through seamless exchange of health information as well as clinical knowledge, care workflows, and quality management across institutions of care.
- Provider Payment – Improves billing, claims, and reimbursement processes, to support accurate and timely payment to community providers.

A change of this size will take long-term commitment and support from partners. It will affect Veterans, the community, and VHA. Under CCP, the disparate systems and processes to perform clinical and administrative functions for purchasing care will be consolidated and streamlined into an integrated system for a seamless experience for all stakeholders. This will simplify and standardize community providers' interaction with VHA. In addition, Veterans will benefit from better care coordination due to the ease of clinical and administrative information flow between VA and community providers. Finally, consolidating existing community care services into a single program will reduce confusion among VA providers and staff about when and how to use community care and will improve community care operations.

An example of streamlining administrative functions to better support CCP is the VA's adoption of the U.S. Department of Agriculture's (USDA) financial management IT shared services. USDA offers two financial services out of its National Finance Center: the Pegasys Financial Services program, which supports Consultant to Government and Industries (CGI) Federal Inc.'s Momentum product, and the Financial Management Services program, which supports Systems, Applications & Products in Data Processing's (SAP) core financial system. In the past, VHA has had a reputation for delayed payments to community providers. This effort to move to a shared service will increase the transparency, accuracy, timeliness, and reliability of VHA's financial information, and ultimately upgrade the VHA's process for assessing claims and issuing payments to community providers. It is critical that VHA continues to implement solutions that result in improved care and services to our Veterans.

However, with an increase in choice comes an increase in competition for both Veterans and healthcare providers. VHA needs to develop plans for attraction and retention of high-quality healthcare providers and to compete with alternate healthcare systems at the local level to attract Veterans and improve the overarching reputation of VHA as a high-quality healthcare provider. The VA realizes that competition will play a role in its future operations and has begun to transform itself. Unfortunately, official strategic plans have yet to be developed to address this issue but should include strategies such as:

- Adopting IT capabilities perceived as "standard" across the industry. For example, maintaining patient portals (like VHA's MyHealthVet) that allow Veterans to access their health information from multiple devices, locate providers and schedule appointments, and communicate with their specific healthcare providers.
- Providing state-of-the-art equipment, tools, and facilities for use by VHA providers. This may include physical equipment as well as IT capabilities such as advanced CDS.
- Offering a wide variety of services that can be accessed in multiple ways, including telehealth and mobile services to improve the Veteran experience.
- Focusing and leveraging healthcare services where VHA is recognized as an industry leader (such as mental health, TBI, rehabilitation, prosthetics, etc.) to attract specialized patients.

6.1.2 EHR Modernization (EHRM)

VHA is undertaking an EHRM effort, as indicated in Section 4.1.1, which will include replacement of a significant portion of the VistA EHR related applications with the Cerner EHR system. The EHRM effort aims to promote improved outcomes in quality, safety, efficiency, and satisfaction in healthcare, including providing seamless care for Veterans, Service members, and their dependents.

The VA Secretary announced that VHA will adopt the EHR system that is being deployed by DoD (i.e. Cerner Millennium), which will ultimately result in all patient data residing in one common system and enable seamless care for Veterans while obtaining the best value for taxpayer dollars. The EHRM contract was awarded to Cerner on May 17, 2018. The Undersecretary of Health (USH) and Chief Information Officer (CIO) will serve as the Executive Sponsors and will lead the EHRM effort. EHRM has a dedicated Program Executive Office (PEO), which is currently being staffed with VHA's most knowledgeable technical and functional SMEs. The PEO is currently identifying VHA's unique EHR capability requirements, securing funding, and defining a joint governance structure for the Cerner EHR system. VHA will work with DoD, Cerner, and other interested parties in efforts to achieve seamless care across America, ensuring connectivity with VHA's academic affiliates and community care partners.²⁸

²⁸ VA Electronic Health Record Modernization Fact Sheet, vawww.ehrm.va.gov, June 23, 2017.

The decision to adopt the Cerner EHR system will have a significant impact and require an organizational change management plan and continuity of operations plan to identify and mitigate the negative impact to ongoing VHA operations. This plan will be a critical success factor and should consider issues such as training needs and the loss of productivity caused by the learning curve associated with any large IT implementation. It should also provide strategies to alleviate any frustrations that learning a new IT system may cause for VHA providers and clinicians. VHA needs to consider what types of resources are needed to support an enterprise-wide implementation project of this magnitude and if those resources can be provided internally or if external consultative support is required. Given the size, scale, and complexity of VHA, the Cerner EHR implementation process is expected to take an estimated 8 to 10 years. The VistA EHR will not go away immediately and VA will need to maintain the two EHR systems simultaneously, along with supporting IT capabilities such as CPRS, until the transition is complete. IT capabilities that are outside the scope of EHRM but are critical in supporting VHA clinical and business services will also need to be maintained and integrated with the Cerner EHR. Additional information on the on-going EHRM effort will be included in future iterations of the HISP once a capability gap analysis is completed and an implementation approach is established.

6.1.3 Interoperability

VHA is a longtime leader in HIT, but needs to do more to manage Veteran data across IT programs inside and outside VHA. Shifts in how information is accessed and used by providers, processors, and Veterans present VHA with the opportunity to find new ways to improve the experience of Veterans and their families, as well as enhance the value of services and support provided to them. For example, with the expansion of CCP, VHA will need to enhance its data sharing capabilities to create a seamless workflow between VHA, DoD, and community providers.

To facilitate data sharing, VHA will need to focus on implementing enterprise-wide data standardization that consistently aligns with required and emerging health industry standards and best practices for sharing clinical knowledge, clinical workflows, and Veteran data. The ability to ingest and share clinical processes and knowledge not only with other institutions, but with community and contracted care providers is essential in assuring Veterans receive high quality care regardless of their selected caregiver. This allows VHA to keep pace among leading institutions and fosters the rapid, effective, and timely adoption of best practices. VHA will leverage open data, transport, and other standards endorsed by the ONC and adhere to key open architecture tenets, such as open transport formats (e.g. Health Level Seven (HL7) messaging), open interface specifications, and design patterns to enable open and scalable solutions. Care coordination, CDS, quality measurement, quality improvement, research, education, public health and operational planning could all benefit from the adoption of existing high quality national clinical data standards throughout VA and VHA.

Interoperability with internal and external organizations will also increase concerns and issues related to Veteran privacy and security of information. VHA is bound by various laws and regulations that limit the type of information that can be easily transferred to community providers. This is of particular importance when dealing with critical or sensitive clinical data (e.g. sickle cell, AIDS, etc.). For example, VHA requires Veteran consent to share such data but the process for attaining and tracking consent can be difficult and time consuming. These issues have led to a significant backlog in responding to health information requests. In order to make this process more efficient, VHA is currently pursuing changes to legislation that would change the consent process from “opt in” to “opt out” and investing in IT solutions to help automate and speed up the response process. Additionally, VHA is researching the advantages to adopting Fast Healthcare Interoperability Resources (FHIR) standards. FHIR is a draft standard describing data formats and elements and an Application Programming Interface (API) for exchanging electronic health

records. It will enable the integration of mobile applications with EHRs, portals, Health Information Exchanges, and other HIT systems.

Adoption of innovative healthcare technologies that can realistically be executed at VHA, such as those described in this section, will provide measurable benefits to Veterans and/or VHA personnel to improve quality, safety, and/or health outcomes. These innovations will have significant implications for how care is organized and delivered in the future, as well as for the skill sets required to provide care. Additionally, gained IT efficiencies and the shift away from reliance on brick and mortar facilities will result in cost savings that can be leveraged elsewhere in the organization. This is especially important within VHA where continued budget constraints can be expected in the near-term future.

6.2 VHA HIT GOALS AND OBJECTIVES

VHA has developed long-term goals to provide a roadmap to attaining the future vision for VHA HIT as described in Section 5. In FY2018, the ITSSC collaborated with relevant stakeholders in order to refresh the VHA HIT Goals and ensure they reflect the newly revised VA Strategic Goals and Objectives published in the FY2018-2024 [VA Strategic Plan](#).²⁹ The VHA HIT Goals and their related objectives directly align to these and other overarching VA and VHA priorities and goals. Mappings of each VHA HIT Goal to other VA and VHA priorities and goals are included in Appendix C. Additionally, in order to track progress toward achieving the HIT Goals and their related objectives, performance measures have been identified for each objective. The revised HIT Goals, objectives, and performance measures are described in the following sub-sections.

6.2.1 HIT Goal 1

Goal 1	Modernize VHA IT capabilities in order to provide Veterans with easy access, greater choice, and clear information.
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Major objectives and related performance measures for achieving this goal are:

HIT Objectives	Performance Measures
Objective 1.1: Expand telehealth (including telepathology, teledermatology, and telemedicine) and mobile vet center/clinic services to improve Veterans' access to care.	Increase in the percentage of the Veteran population utilizing telehealth services.
Objective 1.2: Utilize Internet of Things (IoT) capabilities (e.g. Veteran personal devices, sensors, or other medical devices) to gather patient generated health data and provide secure, timely exchange of that data between Veterans and providers.	Increase in the percentage of Veterans utilizing IoT capabilities to exchange information.
Objective 1.3: Improve coordination between Veterans and their care teams through the use of mobile health applications to provide secure messaging, online scheduling, and access to patient health records and care/medication instructions.	Increase in the percentage of Veterans utilizing mobile health applications to participate in their care or access information.
Objective 1.4: Enhance VA's public-facing websites to inspire communication and a sense of community among VA, Veterans, and their dependents.	Increase in the percentage of Veterans that feel the VA's public-facing websites support communication and inspire a sense of community.

²⁹ FY2018-2024 VA Strategic Plan, VA Office of Enterprise Integration, February 2018.

6.2.2 HIT Goal 2

Goal 2	Modernize VHA IT capabilities in order to provide timely, integrated care and optimize collaborative, high-performing, and integrated delivery networks.
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Major objectives and related performance measures for achieving this goal are:

HIT Objectives	Performance Measures
Objective 2.1: Enable Coordinated Care through the implementation of VA, DoD, and community provider integration and interoperability efforts (e.g. EHR interoperability, Veteran Health Information Exchange (VHIE), HL7 Fast Healthcare Interoperability Resources (FHIR), and Open Source).	Increase in the percentage of external providers with whom VHA can bi-directionally exchange health records/information.
Objective 2.2: Leverage Big Data and predictive analytics to support reporting and clinical decision support capabilities.	Increase in the number of workflows utilizing predictive analytics for clinical decision support.
Objective 2.3: Support information management and IT capability needs for healthcare research (e.g. registries, databases, and queries) to enhance both Veteran and public health.	Increase in the percentage of research protocols requiring novel IT capabilities that are funded and implemented.
Objective 2.4: Encourage collaborative partnerships for analytics research and enable information sharing with research institutions and other healthcare providers to better understand the value of integrated health data analytics.	Increase in the number of collaborative partnerships for analytics research.
Objective 2.5: Enable the development of genomic (or precision) medicine and bioinformatics to analyze and interpret patient-specific data in order to inform individual clinical care decisions and improve health outcomes.	Percent progress towards the implementation of an IT capability for individualized clinical care decisions based on genomic (or precision) medicine and bioinformatics.

6.2.3 HIT Goal 3

Goal 3	Modernize VHA IT capabilities in order to ensure accountability and transparency and deliver value to Veterans.
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Major objectives and related performance measures for achieving this goal are:

HIT Objectives	Performance Measures
Objective 3.1: Implement a performance measurement capability to monitor and drive a culture of quality and safety and provide an accessible mechanism for accurate internal and public health reporting.	Percent progress towards the implementation of an IT capability and increase in the percentage of performance measures that utilize automated collection and analysis.
Objective 3.2: Enable corporate and regional analytics that further our understanding of utilization, quality of care, and comparative effectiveness, and use that knowledge to support continuous healthcare improvement.	Percent progress towards the implementation of an IT capability for corporate and regional analytics on utilization, quality of care, and comparative effectiveness.

HIT Objectives	Performance Measures
Objective 3.3: Adhere to VA's enterprise privacy, security, and identity management policies to mitigate the risk to data at rest or in transit.	Increase in the rate of compliance with identified VA privacy and security policies.

6.2.4 HIT Goal 4

Goal 4	Modernize VHA IT capabilities in order to improve efficiency and provide world class capabilities to Veterans and VHA employees.
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Major objectives and related performance measures for achieving this goal are:

HIT Objectives	Performance Measures
Objective 4.1: Implement an enhanced electronic health record (EHR) system that is integrated, knowledge driven, and role and context based (i.e. EHR Modernization).	Percent progress towards the implementation of a COTS EHR system (i.e. Cerner) at all VHA facilities.
Objective 4.2: Maintain IT capabilities outside the scope of EHRM that are critical in supporting VHA clinical and business services and/or workflows.	Percent progress towards the completion of an analysis of existing IT capabilities for either decommission/ migration to new EHR system or integration with new EHR system.
Objective 4.3: Support the digitalization of business processes through the use of sensors or other monitoring and automation systems to increase efficiency in business operations.	Percent increase in productivity through use of sensors or other monitoring and automation systems.
Objective 4.4: Align with and actively participate in the development of industry standards (e.g. HL7, SNOMED, Clinical Quality Measures [CQMs], and ICD-10).	Increase in the level of participation in the development of industry standards (i.e. increase in the number of ballots reviewed and commented on).
Objective 4.5: Utilize business intelligence and architected solutions to fully leverage health data in order to enhance the quality of data available to providers, streamline workflows, increase employee and Veteran satisfaction, and improve cost effectiveness.	Increase in the number of business intelligence tools developed and implemented to support continuous improvement projects.
Objective 4.6: Enhance synergy between VHA and OIT in areas such as enterprise architecture, business requirements, system/process interdependency and mission criticality, change management, verification and validation, adoption strategies, product effectiveness, and acquisition.	Percent progress towards the development and implementation of a joint process for IT concept to realization that addresses all VHA and OIT touchpoints.

6.3 TRANSITION SUMMARY

The near-term focus areas described in Section 6.1 and the long-term VHA HIT Goals described in Section 6.2 are intended to move VHA forward in the direction of closing current gaps and achieving the desired VHA HIT environment future-state as described in Section 5. Table 4 is a high-level alignment that brings together major VHA HIT improvement opportunities (as described in Table 3), related current IT programs for each improvement opportunity, and the VHA HIT Goals (as described in Section 6.2) and VA Priorities (as described in Appendix C.2) that best maps to each improvement opportunity. By aligning VHA IT

programs with identified gaps and long-term HIT goals and strategic priorities, VHA will be best positioned to achieve these goals while investing efficiently and effectively for the future.

Table 4 – Alignment of IT Programs to HIT Improvement Opportunities

Major VHA HIT Improvement Opportunities	Related IT Programs to Close Gaps	VA Priority and VHA HIT Goal Fulfillment
Scheduling and Access	MASS, VSE, Telehealth, Community Care	VA Priority 1. Greater Choice; VHA HIT Goal 1. Modernize VHA IT capabilities in order to provide Veterans with easy access, greater choices, and clear information.
EHR Interoperability	EHRM, Telehealth, Mobile Apps, VHIE, CPRS, Community Care	VA Priority 5. Modernize Systems; VHA HIT Goal 2. Modernize VHA IT capabilities in order to provide timely, integrated care and optimize collaborative, high-performing, and integrated delivery networks.
Data Weaknesses and View Limitations	EHRM, Mobile Apps, VHIE, Community Care	VA Priority 5. Modernize Systems; VHA HIT Goal 4. Modernize VHA IT capabilities in order to improve efficiency and provide world class capabilities to Veterans and VHA employees.
User Interface	EHRM, CPRS, Joint Legacy Viewer, Telehealth, Mobile Apps	VA Priority 5. Modernize Systems; VHA HIT Goal 4. Modernize VHA IT capabilities in order to improve efficiency and provide world class capabilities to Veterans and VHA employees.
Workflow Limitations	EHRM, Telehealth, Mobile Apps, Mental Health	VA Priority 2. Improve Timeliness; VHA HIT Goal 4. Modernize VHA IT capabilities in order to improve efficiency and provide world class capabilities to Veterans and VHA employees.
CDS Limitations	EHRM, Telehealth, Mobile Apps	VA Priority 5. Modernize Systems; VHA HIT Goal 4. Modernize VHA IT capabilities in order to improve efficiency and provide world class capabilities to Veterans and VHA employees.
Integrated Planning	VHA IT Governance, Prioritization	VA Priority 4. Focus Resources; VHA HIT Goal 3. Modernize VHA IT capabilities in order to ensure accountability and transparency and deliver value to Veterans.
Education for Clinical Trainees	EHRM, Mobile Apps	VA Priority 4. Focus Resources; VHA HIT Goal 4. Modernize VHA IT capabilities in order to improve efficiency and provide world class capabilities to Veterans and VHA employees.
Health Research	EHRM, VHIE, Community Care	VA Priority 5. Modernize Systems; VHA HIT Goal 2. Modernize VHA IT capabilities in order to provide timely, integrated care and optimize collaborative, high-performing, and integrated delivery networks.

Major VHA HIT Improvement Opportunities	Related IT Programs to Close Gaps	VA Priority and VHA HIT Goal Fulfillment
Big Data Predictive Analytics	EHRM, CPRS, CDS, VHIE, Community Care	VA Priority 5. Modernize Systems; VHA HIT Goal 2. Modernize VHA IT capabilities in order to provide timely, integrated care and optimize collaborative, high-performing, and integrated delivery networks.
Business Enabling Services	EHRM, CPRS, MASS, VSE, Community Care, Telehealth, Mobile Apps	VA Priority 5. Modernize Systems; VHA HIT Goal 4. Modernize VHA IT capabilities in order to improve efficiency and provide world class capabilities to Veterans and VHA employees.

Appendix A. VHA IT GOVERNANCE AND PRIORITIZATION

A.1 VHA IT GOVERNANCE

The VHA IT Governance effort arose from a need for a more deliberate decision-making process for scoping and funding of VHA IT programs. Previously, there was a lack of analytics upon which decisions were based, as well as limited alignment of VHA and IT impacts. Factors identified for these shortcomings centered on the IT appropriation – the lack of key performance indicators or parameters, limited oversight on VHA IT program/projects, and an opaque decision-making process – and contributed to the suboptimal management of the portfolio.

Recognizing that VHA does not control IT funding, a VHA IT Governance process was initiated to enhance VHA’s decision-making regarding IT funding requests. To support this process, a VHA IT Governance organizational structure was created. This structure is shown in Figure 4. The ITC (formerly the IT Sub-Committee) functions as the IT investment review board and leads the governance process. The ITC is responsible for:

- Relating IT enabling support to the goals and objectives through business collaboration
- Prioritizing IT needs
- Advocating for IT funding
- Assessing the business case – understanding strategic goals and objectives
- Oversight of IT program execution through regular IT program/project reviews
- Regular reporting to NLC and VHA leadership³⁰

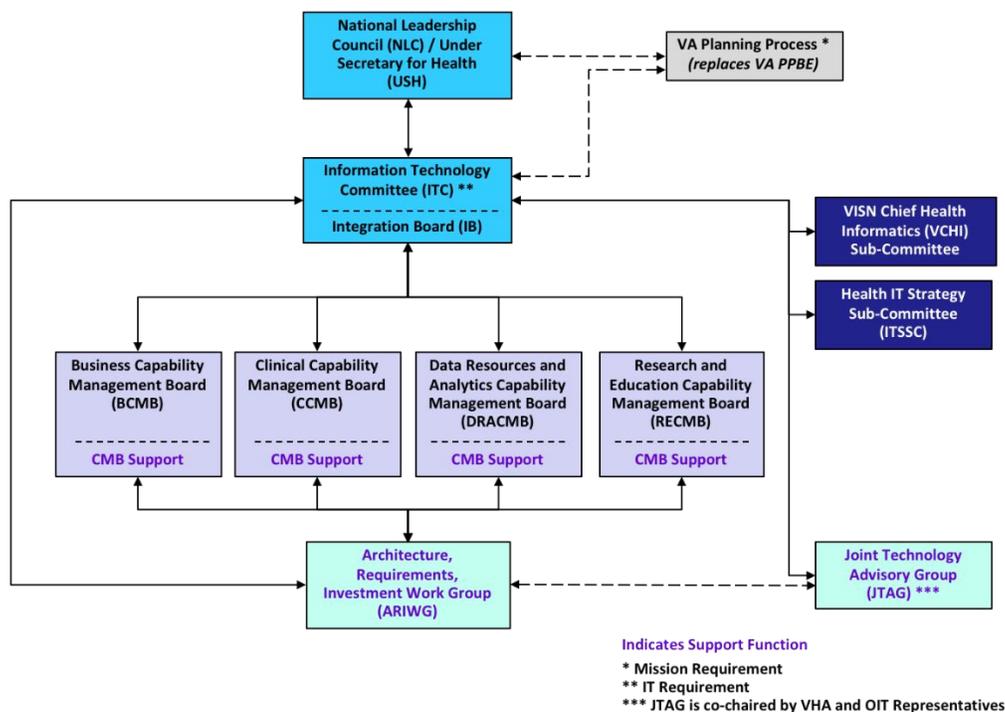


Figure 4 – VHA IT Governance Structure

³⁰ “Intro to VHA Investing,” Handout – Overall IT Governance Understanding, March 1, 2015.

The ITC serves as the driver for the integration of decision-making across all aspects of the governance process. This includes overseeing the Capability Management Boards (CMBs) and the Architecture, Requirements, and Investment Work Group (ARIWG). The ITC is responsible for aligning IT investments to VHA strategic priorities, establishing rules for prioritization, providing IT investment decisions for concurrence by the NLC, and preparing the USH for engagement at the VA department level.

The Integration Board is charged with ensuring the prioritized IT needs submitted by the CMBs are consistent, recognize cross-CMB dependencies, and ensure there are no significant gaps or overlaps. The Integration Board also performs minor necessary adjustments to the CMB-recommended priorities to achieve the overall budget target. The Integration Board supports the ITC by analyzing and de-conflicting proposed IT needs and ensuring that the resulting list of prioritized VHA IT Programs aligns with VHA mission and strategic goals, as well as with VA IT budget constraints.

The VISN Chief Health Informatics (VCHI) Sub-Committee is charged with oversight of efforts and conducting various informatics activities. The responsibilities of the VCHI Sub-Committee are: 1) facilitating national level discussions and communications pertinent to enhancing or improving informatics and information services, 2) functioning as an advocate for and a conduit to and from VISN leaderships involving informatics issues, 3) facilitating the identification and correction of informatics issues, 4) acting as an expert resource on national informatics and field-based informatics issues, and 5) undertaking a leadership role for the informatics and related groups within VA.

The ITSSC is charged with defining the full strategic direction and mission of VHA. The responsibilities of the ITSSC are: 1) developing the VHA HISP, 2) defining the prioritization criteria for each IT MYP cycle, 3) deciding the VHA strategic IT priorities, goals, and direction, 4) deciding the prioritization criteria and policies for IT requirements and ensuring these align with VHA policies, VHA strategic plans, and NLC/USH objectives, 5) coordinating with other NLC Committees to ensure the VHA HIT strategy and mission are aligned and consistent with planned VHA funding, and 6) recommending VHA IT products that are no longer meeting a strategic need, and therefore possibly eligible for retirement.

The ARIWG is charged with both an ITC secretariat function and performing analysis of IT needs. The ARIWG performs scope and investment analysis in support of VHA IT investment decisions and provides the VHA with a broad view of all its IT needs. The ARIWG supports the CMBs by ensuring IT needs are de-conflicted for scope and by performing cost estimations and dependency analysis.

The CMBs recommend priorities for the development and/or enhancement of information system products for VHA. The CMBs are responsible for analyzing the proposed IT needs submitted by Business Owners and submitting prioritized lists. Four CMBs have been established with each handling IT needs related to their specific capability. These CMBs are:

- Business CMB (BCMB) – Addresses VHA IT systems that primarily support the administration, business operation, and national-level support aspects of delivering healthcare.
- Clinical CMB (CCMB) – Addresses VHA IT systems that primarily support clinicians performing clinical duties in direct support of patient care.
- Data Resource and Analytics CMB (DRACMB) – Addresses VHA IT systems primarily used to collect, analyze, assess, manage, and improve the health of Veteran populations and subsets.
- Research and Education CMB (RECMB) – Addresses VHA IT systems that primarily support the conduct of healthcare research, which includes developing new strategies to handle diseases, identifying new means for delivery of services, methods, decision models, and practices, and managing clinical trials and research quality.

The VHA Business Function Framework (BFF) is used to categorize IT needs into each of the CMBs based on related functions. Additional information on the VHA BFF can be found in Appendix B.

The Joint Technology Advisory Group (JTAG), a joint VHA and OIT body, advises the VHA and OIT governance bodies on the highest value IT solutions for VHA needs in support of VHA healthcare delivery and desired operational business outcomes. The JTAG provides recommendations on the optimal allocation of VHA IT needs to IT solutions/platforms and viable sequencing of those needs based on technical analyses of the range of appropriate IT solutions. The technical analyses focus on various aspects including dependencies, cost, possible build versus buy alternatives, sequencing, and system architectures. JTAG co-chairs and members have been identified and regular meetings commenced in September 2017.

A.2 PRIORITIZATION

As part of the VHA IT Governance process, a set of prioritization criteria is used by the ARIWG and CMBs to assess and rank the relative priority of the various IT programs. These criteria are shown in Figure 5 and will be used for ranking of the FY2021-2025 IT MYP development effort.

The prioritization criteria are separated into six components, as shown below. Upon the completion of the architectural and budgetary analysis, these criteria support the scoring and ranking of proposed IT programs. The ITSSC is responsible for reviewing and modifying the VHA IT Prioritization Criteria, as needed, and assigning “weights” to each criterion. The ITC is responsible for providing final approval and endorsement.

FY2021-2025 MYP Prioritization Criteria	
Criterion Name	Weight
Quality of Service	25.52%
Efficiencies	21.46%
Risk Mitigation	16.03%
Strategic Alignment	13.74%
Number of Veterans Affected	11.73%
Number of Staff Affected	11.52%

Figure 5 – ITC Approved Criteria for Prioritization³¹

³¹ FY2020-2024 Prioritization Criteria Final Presentation, July 2017.

Appendix B. VHA BUSINESS FUNCTION FRAMEWORK (BFF)

The VHA BFF is a Business Reference Model (BRM) that represents the VA business functions necessary to carry out the healthcare mission. It describes the operational functions of the VHA, and is a functional model, not organizational, IT-centric, programmatic, or process-oriented. The VHA BFF provides a means to consistently categorize VHA programs and investments to support portfolio analysis, the Managing for Results process, and project prioritization. The VHA BFF v2.14, published in the February 2018 VHA Business Architecture Repository (BAR), is shown down to the second level of decomposition in **Error! Reference source not found.**

The VHA BFF enables a line-of-sight from the VHA strategy layer, through functional operations and down to supporting VHA applications and data. The VHA BFF connects VA, VHA, and other agency artifacts and products such as: VA Strategic Objectives, VHA IT Business Needs, Business Process Model Names, VHA Federal Programs List, Legacy VistA Menu Items, and VSSC Performance Measures.

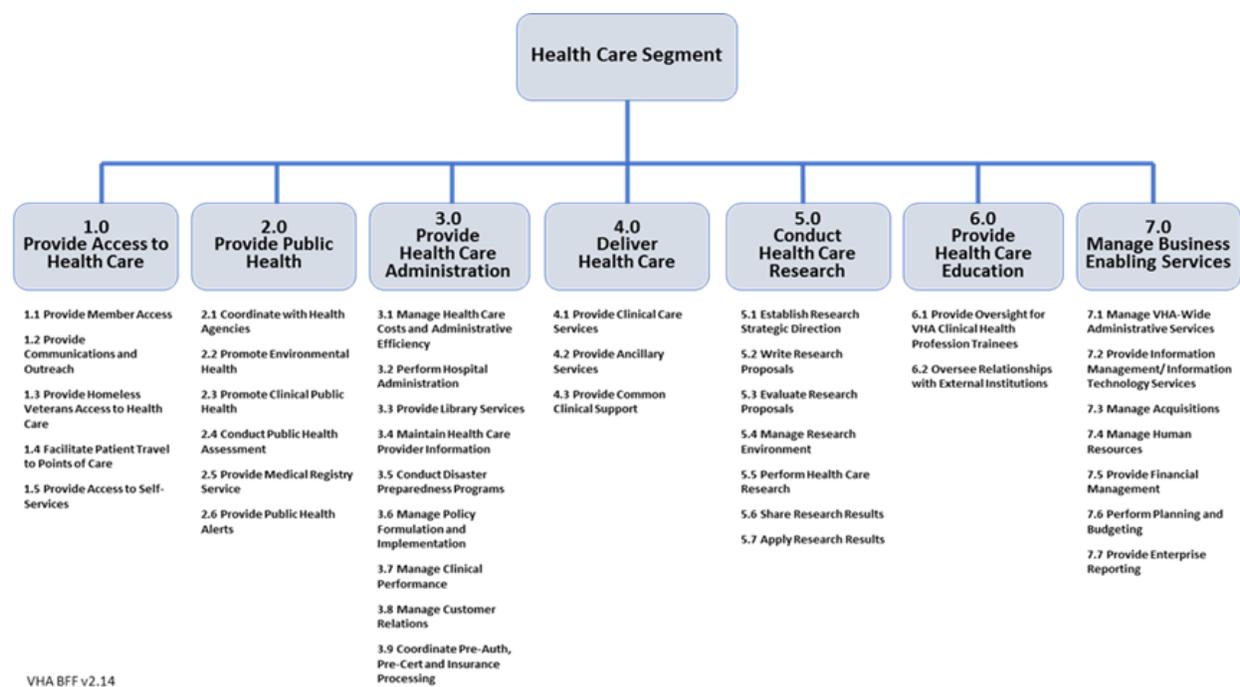


Figure 6 – VHA BFF

The VHA BFF is primarily used for performing analysis through architectural mappings which show linkages between the VHA BFF and other pieces of the VHA business architecture, as well as relationships to other architectures. Mapping components of the VHA business architecture and partner agency architectures supports opportunities for integration and information sharing, analysis of essential business capabilities, and budget forecasting and decision-making. VHA SIM Business Architecture (BA) leverages the VHA BFF to support the VHA IT Governance process for developing a prioritized list of candidate IT projects that would comprise the MYP formulation process. The VHA BFF also supports VHA IT Governance by displaying which of the Capability Management Boards (CMBs) is responsible for governing the IT aspects of each business function. The VHA BFF is a VHA BAR artifact, which also serves as a data source used in developing alignment to the VA Enterprise Capability Model components.

The VHA BFF and supporting information are included in the VHA BAR and can be found at the following link: <https://vaww.vha.esp.va.gov/sites/BA/SitePages/BA%20Products.aspx>.

Appendix C. MAPPING OF VHA HIT GOALS TO OTHER VA/VHA GOALS AND STRATEGIES

C.1 VHA HIT GOALS RELATIONSHIP TO FEDERAL HEALTH IT (FHIT) STRATEGIC PLAN

The FHIT Strategic Plan, published by the Office of Health and Human Services (HHS) Office of the National Coordinator (ONC), explains how the federal government intends to help the nation achieve high-quality care, lower costs, a healthy population, and engaged individuals through the effective use of information and technology. Additionally, successful development and implementation of the infrastructure described in the FHIT Strategic Plan will stimulate the cultural shifts necessary to strengthen the collaborative relationships for improving health, healthcare, research, and innovation. The infrastructure should support dynamic uses of digitized information; uses that facilitate and expedite the transformation of data to information, information to knowledge, and knowledge to informed action. Additional information can be found in the [FHIT Strategic Plan](#).

The FHIT Strategic Plan includes four overarching goals along with their respective objectives. The VHA HIT Goals can be mapped to the FHIT Strategic Plan goals and objectives. Figure 7 depicts the relationship between them.

Federal Health IT Strategic Plan Goals and Objectives	VHA Health IT Goals			
	1. Modernize VHA IT capabilities in order to provide Veterans with easy access, greater choice, and clear information.	2. Modernize VHA IT capabilities in order to provide timely, integrated care and optimize collaborative, high-performing, and integrated delivery networks.	3. Modernize VHA IT capabilities in order to ensure accountability and transparency and deliver value to Veterans.	4. Modernize VHA IT capabilities in order to improve efficiency and provide world class capabilities to Veterans and VHA employees.
1. Advance Person-Centered Health and Self-Management	•	•		
1A. Empower individual, family, and caregiver health management and engagement	•	•		
1B. Foster individual, provider, and community partnerships		•		
2. Transform Health Care Delivery and Community Health	•	•	•	•
2A. Improve health care quality, access, and experience through safe, timely, effective, efficient, equitable, and person-centered care	•	•		•
2B. Support the delivery of high-value health care		•	•	
2C. Protect and promote public health and healthy, resilient communities		•		
3. Foster Research, Scientific Knowledge, and Innovation	•	•		•
3A. Increase access to and usability of high-quality electronic health information and services	•	•		•
3B. Accelerate the development and commercialization of innovative technologies and solutions		•		•
3C. Invest in, disseminate, and translate research on how health IT can improve health and care delivery	•	•		•
4. Enhance Nation's Health IT Infrastructure	•	•	•	•
4A. Implement the Nationwide Interoperability Roadmap		•		
4B. Protect the privacy and security of health and sensitive information		•	•	
4C. Identify, prioritize, and advance technical standards to support secure and interoperable health information	•	•		•
4D. Increase user and market confidence in the safety and safe use of health IT products, systems, and services			•	•
4E. Advance a national communications infrastructure that supports health, safety, and care delivery		•	•	

Figure 7 – HIT Goals Alignment with FHIT Goals and Objectives

C.2 VHA HIT GOALS RELATIONSHIP TO VA PRIORITIES

In 2017, the VA Secretary, Dr. David Shulkin, presented a list of five major strategic priorities for VA to focus on in the upcoming fiscal years. These priorities are:

1. Greater Choice – VA is committed to ensure Veterans can make decisions that work best for them and their families.
2. Improve Timeliness – Veterans must receive the benefits, care, and services they need in a timely manner, no matter where they are.
3. Suicide Prevention – Suicide prevention is VA’s highest clinical priority. Suicide is a national health crisis; it requires all of Government, along with public-private partnerships to address.
4. Focus Resources – Veterans and tax payers deserve to know VA resources are spent on the care and services Veterans need most.
5. Modernize Systems – Veterans and VA employees need systems and technology that enable them to deliver the high-quality care and services Veterans deserve.³²

Error! Reference source not found.Figure 8 depicts the mapping of the VHA HIT Goals to the VA Priorities.

VA Priorities	VHA Health IT Goals			
	1. Modernize VHA IT capabilities in order to provide Veterans with easy access, greater choice, and clear information.	2. Modernize VHA IT capabilities in order to provide timely, integrated care and optimize collaborative, high-performing, and integrated delivery networks.	3. Modernize VHA IT capabilities in order to ensure accountability and transparency and deliver value to Veterans.	4. Modernize VHA IT capabilities in order to improve efficiency and provide "best-in-class" capabilities to Veterans and VHA employees.
1. Greater Choice	●	●		
2. Improve Timeliness	●	●		●
3. Suicide Prevention		●		
4. Focus Resources		●	●	●
5. Modernize Systems	●	●	●	●

Figure 8 – HIT Goals Alignment with VA Priorities

³² FY2018-2024 VA Strategic Plan, VA Office of Enterprise Integration, February 2018.

C.3 VHA HIT GOALS RELATIONSHIP TO VA GOALS AND OBJECTIVES

The FY2018-2024 [VA Strategic Plan](#), published in February 2018 by the VA Office of Enterprise Integration (OEI), included revised VA Goals and Objectives. These goals describe the outcomes Veterans can anticipate from VA. Developing these goals involved assessment of historic and current operations, seeking out leading practices in health care, benefits delivery, and customer service, as well as benchmarking best practices in business operations, including integration of technology into business, human capital management, facilities management, and organizational governance. Additionally, the VA Priorities, described in Appendix C.2, were used to shape the strategic goals.

There are four strategic goals, 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 and is focused on what VA must do internally to achieve the outcomes described in the first three goals.³³

The VA Goals and Objectives are:

1. Veterans choose VA for easy access, greater choices, and clear information to make informed decisions.
 - 1.1. VA anticipates Veterans' changing needs throughout their lives to enhance their choices.
 - 1.2. Veterans are informed of, understand, and can avail themselves of the benefits, care, and services they choose.
2. Veterans receive timely and integrated care and support that emphasizes their well-being and independence throughout their life journey.
 - 2.1. VA has collaborative, high-performing, and integrated delivery networks that enhance Veteran well-being and independence.
 - 2.2. VA ensures at-risk and underserved Veterans receive what they need to eliminate Veteran suicide, homelessness, and poverty.
3. Veterans trust VA to be consistently accountable and transparent.
 - 3.1. VA is always transparent to enhance Veterans' choices, to maintain trust, and to be openly accountable for its actions.
 - 3.2. VA holds its personnel and external service providers accountable for delivering excellent customer service and experiences while eliminating fraud, waste, and abuse.
4. VA will modernize systems and focus resources more efficiently to be competitive and to provide world class capabilities to Veterans and its employees.
 - 4.1. VA's infrastructure improvements, improved decision-making protocols, and streamlined services enable VA to agilely adapt to changing business environments and Veteran needs.
 - 4.2. VA will modernize its human capital management capabilities to empower and enable a diverse, fully staffed, and highly skilled workforce that consistently delivers world class services to Veterans and their families.

³³ FY2018 – 2024 VA Strategic Plan, VA Office of Enterprise Integration, February 2018.

- 4.3. VA IT modernization will quickly deliver effective solutions that will enable VA to provide improved customer service and provide a secure and seamless experience while decreasing its rate of spend.
- 4.4. VA will institutionalize data supported and performance focused decision making that will improve the quality of outcomes.

Error! Reference source not found.Figure 9 depicts the relationship between the VHA HIT Goals and the VA Goals and Objectives.

VA Goals and Objectives	VHA Health IT Goals			
	1. Modernize VHA IT capabilities in order to provide Veterans with easy access, greater choice, and clear information.	2. Modernize VHA IT capabilities in order to provide timely, integrated care and optimize collaborative, high-performing, and integrated delivery networks.	3. Modernize VHA IT capabilities in order to ensure accountability and transparency and deliver value to Veterans.	4. Modernize VHA IT capabilities in order to improve efficiency and provide world class capabilities to Veterans and VHA employees.
1. Veterans choose VA for easy access, greater choice, and clear information to make informed decisions.	•			•
1.1 VA anticipates Veterans' changing needs throughout their lives to enhance their choices.	•			
1.2 Veterans are informed of, understand, and can avail themselves of the benefits, care, and services they choose.	•			•
2. Veterans receive timely and integrated care and support that emphasizes their well-being and independence throughout their life journey.	•	•		•
2.1 VA has collaborative, high-performing, and integrated delivery networks that enhance Veteran well-being and independence.		•		
2.2 VA ensures at-risk and underserved Veterans receive what they need to eliminate Veteran suicide, homelessness, and poverty.	•	•		•
3. Veterans trust VA to be consistently accountable and transparent.			•	•
3.1 VA is always transparent to enhance Veterans' choices, to maintain trust, and to be openly accountable for its actions.			•	
3.2 VA holds its personnel and external service providers accountable for delivering excellent customer service and experiences while eliminating fraud, waste, and abuse.			•	•
4. VA will modernize systems and focus resources more efficiently to be competitive and to provide world class capabilities to Veterans and its employees.	•	•	•	•
4.1 VA's infrastructure improvements, improved decision-making protocols, and streamlined services enable VA to agilely adapt to changing business environments and Veteran needs.	•	•		•
4.2 VA will modernize its human capital management capabilities to empower and enable a diverse, fully staffed, and highly skilled workforce that consistently delivers world class services to Veterans and their families.				•
4.3 VA IT modernization will quickly deliver effective solutions that will enable VA to provide improved customer service and provide a secure and seamless experience while decreasing its rate of spend.	•	•		•
4.4 VA will institutionalize data supported and performance focused decision making that will improve the quality of outcomes.		•	•	•

Figure 9 – HIT Goals Alignment with VA Goals and Objectives