Fact Sheet

**Veteran Integrated Systems Technology and Architecture (VistA)**

Rafael Richards MD MS FAMIA

VistA SME | Anesthesia and Critical Care | Veterans Health Administration

December 8, 2022

**Summary**

The Veteran Integrated Systems Technology and Architecture (VistA) is the VA’s system of record for all veteran care. VistA is a technology and architecture that integrates all applications, all data, and all workflows within a single shared transactional database. VistA contains 400 million veteran-years of data from 30 million patients integrated with 198 applications delivering 200 million transactions each day enabling VA’s 371,000 healthcare professionals at 1298 medical facilities to provide 108 million veteran care encounters each year across the United States.

Chart, sunburst chart

Description automatically generated

Overview of the Veteran Integrated Systems Technology and Architecture (VistA). VistA integrates all veteran health data, all applications, all workflows, and all transactions into an integrated lifelong healthcare delivery system across all care sites. VistA supports a staff of 371,000 healthcare professionals providing care for 9 million enrolled veterans at 1298 hospitals and clinics across the United States. In FY22, VA provided over 108 million veteran care encounters using VistA.

# **VistA Applications**

VistA comprises 198 clinical, administrative, financial, infrastructure, and veteran-specific applications integrated within a single shared transactional database. Documentation of all VistA applications are in the VA VistA Document Library (<https://www.va.gov/vdl>).

A picture containing text, electronics

Description automatically generated

***VistA Clients***

VistA has over 70 end-user clients. The most important client used by all VA clinical staff is the Computerized Patient Record System (CPRS). CPRS consistently ranks the highest in national EHR surveys by physicians for ease of use, connectivity, usefulness as a clinical tool, and overall user satisfaction.

**Graphical user interface, text

Description automatically generated**

**Vista Definition and Scope**

VistA is the system of record of all veteran care. VistA is a technology and architecture that integrates all applications, all data, all workflows, and all interfaces within a single shared transactional database. VistA is built on a data-integrated language and environment widely used throughout the healthcare and finance industry called M technology. The largest commercial EHR systems (Epic, Meditech) and real-time trading systems (Fidelity, TD Ameritrade) are also built on M technology because of its proven reliability and performance in high-volume transaction-intensive applications. Over 50 billion patient records each month are exchanged across the U.S. on M technology-based healthcare systems. All VistA applications, business logic, workflows, and data are created, managed, stored, and processed within the same single M technology environment. The VistA Documentation Library provides documentation of each of the 198 integrated applications of VistA (https://www.va.gov/vdl).

**VistA Boundary**

The boundary of VistA is defined by its interfaces. VistA has two main interfaces. The first is the ***Client Interface*** that enables end-user clients (CPRS, JLV, and over 70 others) to perform interactive transactions on VistA. The second is the ***Systems Interface*** which allows system-to-system exchange of data between VistA and non-VistA systems (such as commercial applications and DoD and Community Care systems). If a client, system, or application is connected to VistA via either interface the application is by definition outside the boundary of VistA and not VistA. VA’s catalog of approved non-VistA applications is called the VA Technical Reference Model (https://www.oit.va.gov/Services/TRM).

**Chart, diagram

Description automatically generated**

VistA scope, boundaries, and interfaces. Blue dotted line outlines VistA’s boundary, which contains all VistA applications, data, business logic, and interfaces. The Client Interface (technically called the RPC interface) enables end-user clients to perform interactive transactions on VistA. The Systems Interface (technically called the HL7 interface) enables system-to-system exchange of data between VistA and non-VA/non-VistA systems and applications.

**VistA Development**

VistA began development in 1978 at VA clinical field offices. In 1982 it was operational at many VA medical centers and demonstrated to the VA congressional staff, who approved it for national deployment and certified it as VA’s healthcare system of record. By 1985 VistA was operational nationwide. Most major electronic health record systems in operation today in the U.S. were developed at the same time as VistA (Epic 1979; Cerner 1979, Meditech 1976). Epic and Meditech are also built on the same M technology as VistA.

**Evolutionary Strategy**

From 1985 until 2000, VA took an evolutionary approach of improving VistA via continuously updating its built-in applications, which are fully integrated with each other and within the integrated database. This is a time-tested, proven, reliable, cost-effective way to incrementally modernize VA’s healthcare information system.

This evolutionary approach is very highly leveraged: updating one application improves all 198 applications across all 130 VistA systems (1:25,000). This is because all applications share the same single database and logic, and that all VistA improvements are propagated across all VistA systems. VA continues to innovate in best practices and tooling in the development and operations (DevOps), which brings a high level of automation and reliability to the development, testing, integration, and deployment of applications. The world’s largest software companies use this modern distributed DevOps approach to continuously evolve their software serving billions of customers.

Note the “VistA Evolution” program of 2013-2017 had had nothing to do with VistA; none of VistA’s 198 applications were updated in this program. It was a program that aimed to replace the Joint Longitudinal Viewer (JLV) with a different VA-DoD information exchange called Electronic Health Management Platform (eHMP). See table below regarding this program. VA continues to use JLV for VA-DoD exchange today.

**Replacement Strategy**

After 2000, VA adopted a different strategy and engaged in several VistA modernization programs via replacement of one or more components of VistA with third-party applications or middleware rather than improvements of VistA itself. Above and beyond the management issues these programs had, a recurring technical challenge with these “modernization-via-replacement” approaches was the high level of complexity, redundancy, moving parts, and interfaces that were introduced making the system unstable and unmaintainable, causing loss of data integrity and degradation of system performance. A few modernization-by-replacement programs are listed below. Over $2 billion has been spent on VistA component replacement programs that were unsuccessful for the above reasons.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year started (canceled) | VistA component | Replacement Program | Software Type | Reason for replacement | Program cost | Spent (before cancellation) |
| 2002 - (2008) | VistA system | HealtheVet | middleware | Technology refresh | $ 11 B | $650 M |
| 2000 - (2009) | Vista Scheduling | RSA | COTS application | new scheduling features | $650 M | $75 M |
| 2004 - (2008) | Vista Lab | LIS-PathNet | COTS application | new lab features | $ 950 M | $90 M |
| 2011 - (2013) | VistA system | iEHR | middleware | VA-DOD interoperability | $ 11 B | $1000 M |
| 2014 - (2017) | (JLV) | eHMP | middleware | VA-DoD interoperability | $350 M | $350 M |

**VistA Cloud Migration**

The next phase of VistA’s journey is in the Cloud. VA is currently migrating all VistA systems to the VA Enterprise Cloud (VAEC), a federally certified commercial cloud operated by Amazon (AWS) and Microsoft (Azure). VAEC meets the highest standards of security as required by VA, DOD, FISMA, NIST, and HIPAA.

The VAEC provides comprehensive modernization of VistA’s infrastructure and makes available hundreds of new cloud-based capabilities such as AI, machine learning, and streaming analytics that can be brought to bear on all cloud-based VistA systems to improve quality, safety, and access to care.

Currently 17 VistA systems are in full operation in VAEC. During the next year over 70 more VistA systems will be migrated. All VistA systems will be fully operational in VAEC by late 2024. **The total cost of hosting all VistA systems in VAEC is under $9.5 M/ year, based on actual costs of hosting the current VistA systems in VAEC.**

**Diagram

Description automatically generated**

**VistA Budgeting**

One of the challenges in budgeting for VistA are related to lack of definition of the scope and boundaries of VistA. These boundaries are defined and described in this document.

# **GAO: VA isn’t properly tracking maintenance costs of VistA**

# <https://www.fedscoop.com/gao-vista-report-va-cost-tracking/>

# “The VA doesn’t have an accurate price tag [for VistA] … because it doesn’t know where the functions of VistA begin and end, Carol Harris, director of information technology acquisition management at the Government Accountability Office”

# **VA Doesn’t Really Know What It Costs to Run VistA**

# <https://www.nextgov.com/it-modernization/2019/07/va-doesnt-really-know-what-it-costs-run-vista/158701/>

# *“Until VA can fully define VistA, they will not be able to accurately report the costs. The two go hand-in-hand and the definition of VistA is foundational,”* she said. “Whether they use TBM or another methodology, the core issue remains that the definition of VistA is not fully defined, and that’s the problem.”

# **Electronic Health Records: VA Needs to Identify and Report System Costs**

# <https://www.gao.gov/products/gao-19-125>

# *“The Department of Veterans Affairs (VA) … does not have a comprehensive definition for the system. For* example, VA has identified components that comprise VistA, identified interfaces related to the system, and collected system user guides and installation manuals. “

# **Electronic Health Records: VA Needs to Identify and Report System Costs**

# <https://www.gao.gov/products/gao-19-125>

# “VA identified costs for VistA and its related activities adding up to approximately $913.7 million, $664.3 million, and $711.1 million in fiscal years 2015, 2016, and 2017, respectively—for a total of about $2.3 billion over the 3 years. *However, of the $2.3 billion, the department was only able to demonstrate that [only] approximately $1 billion of these costs were sufficiently reliable.”*

# ***VA to spend $4.9B maintaining EHR over next decade***

# <https://www.fiercehealthcare.com/tech/va-to-spend-4-9b-maintaining-current-ehr-over-10-years-while-it-rolls-out-cerner-system>

# “The Department of Veterans Affairs (VA) doesn't have a firm grasp on how much it is going to cost to maintain its current electronic health record system over the next 10 years… The VA pegs the price for keeping its current EHR VistA system running over the next 10 years at $5 billion.”

# ***VistA Cost and Migration Concerns Emerge***

# <https://www.meritalk.com/articles/as-va-retires-vista-cost-and-migration-concerns-emerge>

# While VA estimates it will spend $4.8 billion on maintaining VistA for the 10-year period, testimony from the Government Accountability Office (GAO) highlighted uncertainties in that estimate.

“VA believes VISTA has cost $2.3 billion between 2015 and 2017, but this figure is neither reliable nor comprehensive. VA can only reliably account for $1 billion of the $2.3 billion total. The source data for the remaining $1.3 billion, which largely accounted for VistA’s infrastructure, related software, and personnel costs, were not well documented,” said Carol Harris, director of IT acquisition issues at GAO.

“VA cannot fully define VistA, and that’s the problem,” she added. Harris also noted that VA had not submitted its 10-year cost estimate to GAO, and that she expected true costs would likely be higher.

“…You have a cost estimate of $4.8 billion to maintain VistA, but we don’t have any confidence in what VistA actually entails, so I don’t think we have any confidence in that $4.8 billion dollars.” said Rep. Susie Lee, D-Nev.

**VistA Budgeting: Summary**

The challenges in estimating the budget for developing and maintaining VistA are related to lack of definition of the scope and boundaries of VistA. The scope and boundaries of VistA have been clarified in this document. With these boundaries defined, and with all VistA systems migrating to the VA Enterprise Cloud, budgeting for VistA can be reliability estimated as follows:

**VistA Upgrade**: $200M/yr.

Cloud-native optimization of the VistA infrastructure and applications

**VistA Maintenance**: $650M/yr.

Updates to VistA’s 198 application and infrastructure packages

**Total**: $850M/yr.

**References**

<https://www.openhealthnews.com/story/2014-07-27/vista-evolution-whats-wrong-picture>

<https://en.wikipedia.org/wiki/VistA#History>

<https://www.worldvista.org/AboutVistA/VistA_History>

<https://www.oit.va.gov/about/history.cfm>

<https://www.politico.com/agenda/story/2017/03/vista-computer-history-va-conspiracy-000367/>

<https://www.voa.va.gov/DocumentView.aspx?DocumentID=3142>

CoreFLS: Core Financial and Logistics System

<https://gcn.com/2004/08/va-ig-corefls-failed-on-inadequate-expertise-oversight/314397/>

(noncompetitive award of 22 task orders)

DMLSS Supply Chain Management System

<https://www.oversight.gov/report/VA/DMLSS-Supply-Chain-Management-System-Deployed-Operational-Gaps-Risk-National-Delays>

<https://www.meritalk.com/articles/va-reevaluating-its-supply-chain-management-system-looking-at-other-options/>

<https://www.fedhealthit.com/2022/02/meritalk-va-reevaluating-its-supply-chain-management-system-looking-at-other-options/>

<https://www.oit.va.gov/Services/TRM/ToolPage.aspx?tid=14304>

RSA: Replacement Scheduling Application

<https://www.openhealthnews.com/news-clipping/2014-09-01/sharing-records-called-key-va-health-care>

<https://www.azcentral.com/story/news/politics/investigations/2014/09/01/sharing-records-called-key-va-health-care/14950011/>

LIS: Lab Information Systems (Cerner Pathnet)

<https://groups.google.com/g/hardhats/c/BLywWecjGl8/m/8-b7uDYsvowJ>

HealtheVet

<https://www.gao.gov/products/gao-08-805>

iEHR: integrated Electronic Health Record (joint VA-DoD system based on VistA)

<https://www.gao.gov/products/gao-14-302>

<https://www.healthcareitnews.com/news/va-dod-get-closer-watch-iehr-cash>

<https://www.healthcareitnews.com/news/iehr-redefined-dods-top-3-programs-turf-war-against-va>

<https://www.ehrintelligence.com/news/gao-poor-project-planning-management-doomed-va-dod-iehr>

**HealtheVet**

The complexity of this middleware shows why it did not succeed. Extra credit if you can find where the Vista database is hidden in this figure.

A picture containing text, parking, lined, several

Description automatically generated

**VistA is not only an EHR**

VistA is an integrated enterprise healthcare, finance, and administration system that drives the clinical (VHA) and business (VBA) operations of the VA. It is not just an EHR.