

Integrated Electronic Health Record (iEHR)

Executive Summary

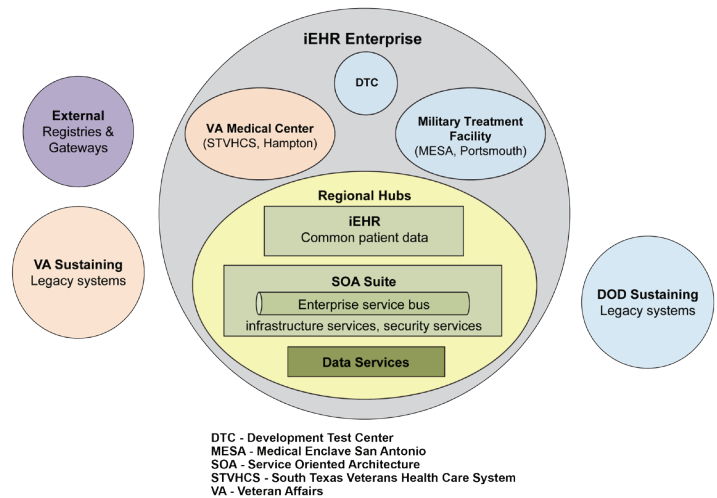
- The Department of Defense (DoD) and Veterans Affairs (VA) will use the Integrated Electronic Health Record (iEHR) program to implement an EHR that both organizations can use to meet the healthcare needs of their beneficiaries and the clinicians providing the healthcare.

iEHR Accelerators

- The iEHR Program Manager is developing the accelerator programs in multiple phases. Only the first phase of each accelerator is to be tested and deployed to meet the December 2013 deadline established in the June 21, 2013, USD(AT&L) Acquisition Decision Memorandum. Subsequent phases of the accelerators will be consolidated under one program for completion by September 30, 2014.
 - DOT&E observed developmental testing (DT), which began November 11, 2013, and is scheduled to complete in December 2013. The Data Federation accelerator is designed to achieve data interoperability within the DoD and VA healthcare systems.
 - The Tricare Online (TOL) Blue Button application Phase I, which converts patient data into a standard format, was completed April 26, 2013. Blue Button Phase II DT, which allows sharing patient data with medical providers, began on November 19, 2013, and is scheduled to complete in December 2013.
 - The Medical Community of Interest (Med-COI) accelerator DT was successfully completed in October 2013. It is intended to create a medical network that meets both DoD and VA security requirements. The Med-COI Interagency Program Office (IPO) recently decoupled Med-COI from other iEHR accelerators and it is not clear how the capability will fit into the larger iEHR architecture.
- An operational assessment (OA) of the iEHR accelerators is scheduled for January 6 – 17, 2014. A second OA will be conducted later in FY14, once the accelerators have completed all phases of development.

iEHR Increment 1 and Other Development

- The Single Sign-on and Context Management (SSO-CM) solution was designed to provide a virtual clinical workspace within which doctors and clinicians can seamlessly transact across multiple applications. SSO-CM underwent development and testing in FY13, but testing revealed a significant number of defects that persisted through multiple DTs. DOT&E rejected the OA plan in July 2013 because it did not demonstrate that the SSO-CM systems would work with, and not interfere with, the IPO's primary deliverables, which are the DoD and VA iEHR accelerators. SSO-CM development will continue with a new completion date of September 2014. DOT&E



will oversee and report on testing of SSO-CM prior to its deployment. DOT&E views it as being essential to perform operational evaluations of all iEHR and DoD Healthcare Management System Modernization (DHMSM) capabilities as they are deployed for use.

- DOT&E has added the DHMSM program to the test and evaluation oversight list to test the full, end-to-end capabilities of the new “core” capability with iEHR architecture, accelerators, and SSO-CM capabilities. DOT&E will ensure adequate plans are developed and integrated between the two programs to assess the required interfaces and interaction between the systems as part of the overall effort to modernize the DoD and VA healthcare systems.
- Development Test Center/Environment (DTC/DTE) was to be used in support of accelerator development and testing; however, technical problems have prevented its use. The IPO anticipates the DTC/DTE will be fully operational in December 2013.
- Service-Oriented Architecture (SOA) Suite/Enterprise Service Bus (ESB) provides the transport for message exchange among the DoD Military Health System (MHS), the VA EHRs, and associated information management systems. The SOA Suite/ESB-combined DT was successfully conducted in FY13 using test tools to simulate operational traffic. SOA Suite/ESB will use adapters to connect to external systems; however, no adapters were planned as part of the initial deployment. Operational testing will be conducted once adapters are available to allow external applications, services, and consumers to connect to the SOA Suite/ESB. The Program Executive Officer (PEO) for the DoD Healthcare Management

Systems (DHMS) is currently uncertain if the SOA Suite/ESB will be part of the objective Data Federation accelerator design.

System

- The iEHR program represents the collective DoD and VA effort to implement an EHR system that both organizations can use to meet the healthcare needs of their beneficiaries. The iEHR program is developing accelerators and plans to deliver capabilities in phases.

iEHR Accelerators

- The DoD and VA established the iEHR Data Federation accelerators to execute federation of clinical health data to improve efficiency and accuracy of communication between both departments.
 - The Data Federation accelerator is designed to achieve data interoperability within the DoD and VA healthcare systems and present patient data to doctors and clinicians using an enhanced Joint Legacy Viewer (JLV) web presentation system to retrieve information from disparate healthcare systems in real time for presentation in a web browser. The iEHR program has developed threshold and objective designs for data federation in parallel.
 - The threshold solution utilizes the jMeadows web service and a Common Information Infrastructure Framework (CIIF) Terminology Service to map DoD and VA terminology to a common set of terms. Doctors and clinicians, using JLV, will view aggregated DoD and VA patient data presented with common terms. The threshold solution is designed for a limited set of users and provides the initial capability for data interoperability.
 - The objective solution will provide enterprise-scalable Data Management Services (DMS) of which jMeadows will be a part, a data caching system to improve CIIF performance, and enhancements to existing access and identity management services.
 - TOL Blue Button application uses the TOL enterprise architecture, which is comprised of a web-based application and Oracle database server system. Blue Button will enable authorized beneficiaries to download their DoD medical record in Healthcare Information

Technology Standard Panel (HITSP) C32 format to a device of their choosing, such as a thumb drive or mobile phone.

- The IPO is developing a Med-COI accelerator to create a medical network that meets both DoD and VA security requirements. Med-COI will permit connected facilities to simultaneously connect to both the medical enclave and to external sites using a secure virtual private network over the Non-secure Internet Protocol Network.

iEHR Increment 1 and Other Development

- SSO-CM is intended to provide a Single Sign-on capability for multiple applications via the users' Common Access Card and allow fast user switching between applications while keeping the patient and associated clinical information in context. The IPO designed and developed SSO-CM using the capabilities of the following commercial off-the-shelf (COTS) products:
 - Citrix Password Manager for SSO
 - Carefx Fusionfx for CM
- DTC/DTE is intended to provide a federated testing environment to support software development and testing. Firewalls are utilized to create required separation between the .com and .mil environments. Both environments will be connected to external systems through gateways.
- SOA Suite/ESB implements the International Business Machines WebSphere Message Broker, a COTS product, which provides SOA enabling capabilities. It is intended to provide the transport for message exchange among the DoD MHS, the VA EHR, and associated information management systems.

Mission

The DoD and VA will use the iEHR program to implement an EHR that both organizations can use to meet the healthcare needs of their beneficiaries and the clinicians providing the healthcare.

Major Contractors

- Hawaii Resource Group – Honolulu, Hawaii
- Harris – Leesburg, Virginia
- General Dynamics Information Technology – Fairfax, Virginia
- Technatomy – Fairfax, Virginia
- MITRE – McLean, Virginia
- Deloitte – Alexandria, Virginia

Activity

iEHR Accelerators

- The IPO has defined a threshold and objective Data Federation accelerator architecture to be delivered in December 2013 and June 2014, respectively.
 - For the threshold architecture, the iEHR program plans to deliver seven normalized data domains (medication, laboratory, immunization, vitals, documentation/notes, allergies, and problem lists) via JLV, using jMeadows, in December 2013.
 - The objective architecture will add the DMS and implement the remaining translation service capabilities. As more data domains are normalized using industry standards, they will be moved out of jMeadows and into the DMS. The IPO is also enhancing the JLV to provide users a graphic user interface to view normalized data provided by the Data Federation accelerator.
 - DT began on November 11 and is scheduled to complete in December 2013.

- The iEHR Program Office conducted Blue Button Phase I DT in April 2013. Blue Button Phase II DT began on November 19 and is scheduled to be completed in December 2013
- Med-COI DT completed in October 2013.
- An OA of the iEHR accelerators is currently scheduled for January 6 – 17, 2014. A second OA will be conducted later in FY14, once the accelerators have completed all phases of development.

iEHR Increment 1 and Other Development

- The U.S. Army Medical Department Board planned to conduct an SSO-CM OA in November 2012, but testing was delayed due to system defects and site configuration problems.
 - The Joint Medical Information Systems DT team conducted four DT events to verify the correction of defects found in November 2012.
 - SSO-CM development will continue with a new completion date of September 2014.
- DOT&E has added DHMSM to the test and evaluation oversight list to test the full, end-to-end capabilities of the new “core” capability with iEHR architecture, accelerators, and SSO-CM capabilities.
- The IPO conducted an SOA Suite/ESB combined contractor/government DT from February 21 through March 8, 2013.
- The SOA Suite/ESB was deployed to San Antonio and Hampton Roads areas and a regional deployment at the Defense Enterprise Computing Center Montgomery.

Assessment

iEHR Accelerators

- Blue Button, Data Federation, and Med-COI are being developed in multiple phases. Only the first phase of each accelerator is to be tested and deployed to meet the December 2013 deadline. Subsequent phases of the accelerators will be consolidated under one program for completion by September 30, 2014.
- Data Federation accelerator DT of the threshold architecture identified a number of problems with terminology mapping and data normalization, which are in the process of being corrected and patched. The OA planned for January 2014 will assess these areas with doctors and clinicians in an operational environment.
- Blue Button Phase I successfully completed testing in April 2013 and was deployed. Blue Button Phase II DT results were not available to include in this report.
- Med-COI DT was successfully completed in October 2013. The Program Executive Officer for the DoD Healthcare

Management System recently decoupled Med-COI from other iEHR accelerators and it is not clear how this capability will fit into the larger iEHR architecture.

iEHR Increment 1 and Other Development

- SSO-CM underwent development and testing in FY13, but testing revealed a significant number of defects that persisted over the reporting period. An OA was attempted in November 2012; however, during site setup, the program manager delayed testing citing numerous network challenges, clinical application problems, incompatible virtual architectures, and content management defects as the cause of the delay.
 - Four DT events identified a total of 32 defects: 14 in the initial test, 7 in the first System Integration Test (SIT-1), 7 in SIT-2, and 4 in SIT-3. At the end of SIT-3, 13 defects remained open. Following SIT-3, the program manager further delayed the OA.
 - DOT&E rejected the OA plan because it did not demonstrate that the SSO-CM systems would work with, and not interfere with, the IPO's primary deliverables, which are the DoD and VA iEHR accelerators.
- The DTC/DTE was to be used in support of accelerator development and testing; however, technical problems with IP addresses, ports, and external interfaces have prevented its use. The IPO plans to continue DTC/DTE development until full deployment in December 2013.
- SOA Suite/ESB combined DT was successfully conducted using test tools to simulate operational traffic. SOA Suite/ESB will use adapters to connect to external systems; however, no adapters were planned as part of the initial deployment. Operational testing will be conducted once adapters are available to allow external applications, services, and consumers to connect to the SOA Suite/ESB.

Recommendations

- Status of Previous Recommendations. This is the first annual report for this program.
- FY13 Recommendations.
 1. The January 2014 OA should include VA, DoD, and Private Doctor and Clinician ratings of normalized patient data in cases for which VA and DoD use different terms.
 2. The Program Executive Officer for the DoD Healthcare Management System should work with DOT&E to develop an adequate plan for an operational assessment of the SSO-CM functionality and the impact on Health Data Sharing and Interoperability.

DOD PROGRAMS