

Office of Technology Strategies (TS), Architecture, Strategy & Design (ASD)

A VA Executive's Guide to Health Interoperability

INTRODUCTION

In previous TS Notes, we reviewed some technologies and topics around electronic health records (EHRs), including health informatics and open source technologies. This TS Note will discuss health interoperability, which is one of the important underlying features of current and future innovations in EHRs and health technology. We will take a broad look at health interoperability, common health and information sharing standards, and how interoperability will help VA meet the challenges the health care industry faces today and tomorrow.

OVERVIEW

In today's patient-centered healthcare environment, medical data comes from multiple sources and must be accessed by multiple systems across multiple providers. One of the key technical issues in this environment is interoperability, which is the ability of two or more systems or devices to exchange information and use that information (by automating

processes or displaying it to users).

VA's health care environment provides a perfect example of the challenges faced by healthcare providers. A Servicemember transitions to civilian life with her Department of Defense (DoD) health record, and begins generating medical data in her VA health record. VA clinicians need to access medical data residing in the DoD system in order to provide care to the Veteran. Further, that Veteran may seek care outside VA or DoD, and her private healthcare provider will need to view the electronic records in their own system. In order to provide seamless care to a Veteran, each of these health record systems must be interoperable, providing information to the clinician at the point of care. Interoperability also extends beyond point of care to other aspects of healthcare such as public health and medical billing.

Each system and electronic record in these environments is owned, operated, and maintained by organizations with differing IT strategies, budgets and

Technology Strategies

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This newly established office within OI&T's Architecture, Strategy & Design (ASD) interacts not only with the ASD pillar offices, but also with multiple stakeholders within OI&T and with strategic offices across the enterprise. TS works closely with IT and business owners to capture business rules and provide technical guidance as it relates to Data Sharing across the enterprise, specifically for inter-agency operability.

requirements. In order to build systems that can communicate with each other, organizations must rely on a set of common tools, languages, technologies and protocols for sharing health information.

INTEROPERABILITY STANDARDS

Health standards have helped unify the way computers codify health information which was traditionally paper-based or stored in proprietary systems. These standards can take many forms, describing standard functions, codes, technologies, or more complex syntactical and contextual operations. Health systems also use non-health-specific standards that have been defined for general computing purposes (e.g., messaging standards like Simple Object Access Protocol [SOAP]). Some of the common health standards in use include:

- **SNOMED** – Systemized Nomenclature of Medicine is a collection of computable medical terms that provides a standardized way of storing, retrieving and indexing medical data.
- **ICD-10** – The International Classification of Diseases is a standard diagnostic tool for epidemiology, health management and clinical purposes; ICD classifies a variety of causes,

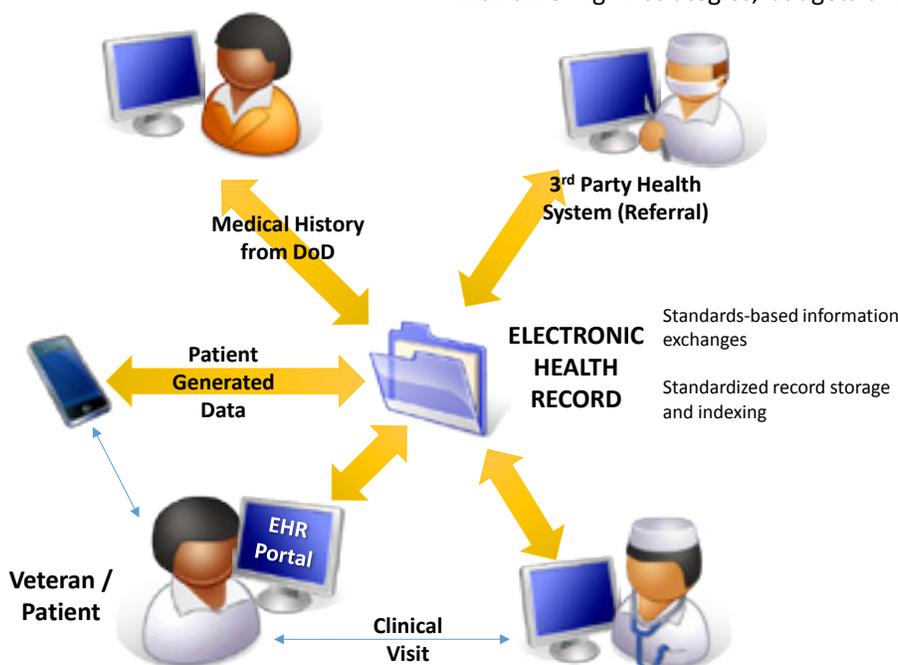


Figure: An Interoperable EHR in Action

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symptoms and other observations about diseases.

- **HL7** – Health Level-7 refers to a set of standards specifically for how health systems at the application level exchange and use clinical and administration health data.
- **LOINC** – Logical Observation Identifiers Names and Codes is a database that defines standard codes or identifiers to medical terms used in clinical observations or laboratory tests.
- **FHIR** – Fast Healthcare Interoperability Resources is a next generation standards framework designed by HL7 for web-based health information exchanges. It is particularly relevant for interoperability between legacy systems as well as integrating mobile apps into electronic health records.

These and other standards are not simply useful for defining medical data in computable terms, but also for building interoperability between systems. For instance, if two systems store lab results using LOINC, and use compatible messaging standards, they can share and use the lab information seamlessly. Interoperability between two systems can consist of point-to-point interfaces, but these can be costly, especially as the number of systems in a health exchange grows beyond the initial two. The growth of health information sharing standards allows systems to share information seamlessly with multiple systems via a single interface or through shared messaging standards. On the front end, adopting certain standards allows users and customers to access information through a single user interface or portal.

In addition, the past decade has seen the increased need for interoperability between health and non-health systems. Patients are increasingly adopting consumer applications, such as mobile fitness apps, to generate data about their own medical or general physical conditions. Interoperability between apps and EHRs will allow health care providers to use patient-generated data that may come from systems using general open source standards.

CURRENT CHALLENGES

The Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 has been the key policy driver behind the adoption of EHRs and health standards, especially regarding their meaningful use in patient care. However, meaningful use is more complex than simply adopting an EHR system. It requires adopting interoperability standards between EHRs and this remains a significant challenge for the future of health technology where many EHR systems are proprietary or contain insufficient computable medical data.

One of the ways VA is meeting and can meet the interoper-

ability challenge is through robust technical planning. Such planning incorporates high-level functionality, technical components and implementation guidance (i.e., how it all fits in a final product).

VA IT VISION AND ENTERPRISE DESIGN PATTERNS

The to-be vision of VA's IT environment focuses on investing in some of the technologies and trends discussed in previous TS Notes, such as web service-enabled applications and open source development, to enhance interoperability with external systems. Additionally, VA's OneVA Enterprise Architecture (EA) lists two key areas for interoperability in its list of global principles:

- **Data Interoperability** - All VA information shall be made interoperable through data standardization and use of web services to access enterprise data.
- **Infrastructure Interoperability** – IT infrastructure shall be made interoperable through definition and enforcement of standards, interface profiles, and implementation guidance.

These principles are applied across business and technical architectures, which ensures interoperability across VA applications and provides internal users and external partners with a robust and agile infrastructure. Health interoperability is the key to VA meeting many of the challenges in healthcare today, from greater patient engagement to meaningful use of health data to improve outcomes.

If you have any questions about health interoperability, don't hesitate to ask TS (askTS@va.gov) for assistance or more information.

Check out earlier TS Note editions [here](#)

(http://www.techstrategies.oit.va.gov/docs_ctsnotes.asp).

HEALTH INTEROPERABILITY AT TS

To support the OneVA EA, TS has developed enterprise design patterns for capabilities which support this vision, specifically for VistA Evolution. The SOA design pattern focuses on building a single interface to health data in VistA for all new health applications, and utilizing the enterprise messaging infrastructure (eMI) for making data calls. Increments in this design pattern describe capabilities for commercial-off-the-shelf (COTS) applications, non-COTS applications and data-as-a-service (DaaS).

For more information on these enterprise design patterns, contact Joe Brooks at joseph.brooks2@va.gov.