Transforming VistA Evolution Through Collaboration

Healthcare Services Platform Consortium

Stanley M. Huff, MD, CMIO, Intermountain Healthcare
Oscar Diaz, CEO, Health Services Platform Consortium
Jonathan R. Nebeker MS MD, Deputy CMIO, Veterans Health Administration

DISCLAIMER: The views and opinions expressed in this presentation are those of the author and do not necessarily represent official policy or position of HIMSS.

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Conflicts of Interest

Stanley M. Huff, MD, CMIO; Oscar Diaz, CEO; and Jonathan R. Nebeker, MS, MD, have no conflicts of interest regarding the material presented herein.

Learning Objectives

1. Identify the VA’s priorities and critical requirements for its health services platform
2. Articulate the vision for a portable notation for content for process-based Clinical Decision Support
3. Outline opportunities for public and private sector collaboration and partnerships
4. Share HSPC’s standards work for FHIR resources tooling and knowledge authoring to facilitate a new market for knowledge-driven content
Agenda

• Vision of Interoperability and Introduction to CIMI
  – Stan Huff
• Healthcare Services Platform Consortium
  – Oscar Diaz
• VA’s EHR modernization and Healthcare Services Platform Consortium
  – Jonathan Nebeker
A Vision of the Future
Why?

“To help people live the healthiest lives possible.”
Current Situation

• Each EHR vendor uses a proprietary database schema, proprietary models and unique terminology to represent clinical data
  – Some standardization of codes is now occurring, but
  – Data is not consistent between vendors, between organizations with same vendor, or even within the same organization and multiple instances of the same vendor

• This means that:
  – Sharing of data, knowledge, and applications is difficult to impossible
  – Costs are high from replicated or conflicting care or recreation of knowledge content or applications to support workflows.
  – There are unmet needs for health care applications and decision support
The Future Ecosystem

- Industry defines standards that enable “truly” interoperable systems (FHIR, SMART, etc.)
- Providers buy a health management platform certified to comply with reference architecture and standards for data and APIs
  - Includes auditing, security, authorization, patient selection, etc.
  - May include some core apps: order entry, results review, notification, etc.
- Providers buy the apps and knowledge content they need to support workflows from a robust marketplace.
- Patients receive better care at a lower cost because lower cost higher quality apps are available as driven by market forces
EHR as Platform: Market Forces

“EHRs are becoming commodity platforms. The winner will be the EHR vendor that provides the best platform for innovation – the most open and most extensible platform.”

--- CEO of a major IDN

“The health IT market will transition from being technology driven to being content driven. Dominant EHR and analytical systems will use portable, computable knowledge for seamless, high-quality healthcare delivery.”

--- DCMIO of America’s largest IDN
The Value of “Truly” Interoperable Systems
What if there is no model?

Site #1
Dry Weight: 70 kg

Site #2
Weight: 70 kg

- Dry
- Wet
- Ideal
### Relational database implications

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<th>Date and Time</th>
<th>Observation Type</th>
<th>Observation Value</th>
<th>Units</th>
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<td>Dry Weight</td>
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<td>7/19/2005</td>
<td>Current Weight</td>
<td>73</td>
<td>kg</td>
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</table>

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</tbody>
</table>

**How would you calculate the desired weight loss during the hospital stay?**
Clinical Information Modeling Initiative

• CIMI Mission
  – Improve the interoperability of healthcare systems through shared implementable clinical information models.

• CIMI models
  – http://www.clinicalelement.com/cimi-browser/#/
  – http://www.opencem.org/#/
Oscar Diaz, CEO, HSPC

HSPC is about more than just data virtualization

THE FUTURE SYSTEMS MODEL
MISSION

Improve health by catalyzing vibrant markets for interoperable software, content, and data.
**Essential Functions of the Consortium**

- Select the standards for interoperable services
  - Standards for models, terminology, security, authorization, context sharing, transport protocols, etc.
  - Modeling: SNOMED, LOINC, RxNorm – FHIR Profiles – do it together
- Provide testing, conformance evaluation, and certification of software
  - Gold Standard Reference Architecture and its Implementation
  - We will work with an established company to provide this service
- Facilitate vendors’ implementation of the standard services against their database and infrastructure
  - Everyone does not have to do every service
  - There must be a core set of services that enable a marketplace
Functions of the Consortium under consideration

• Enable development “sandboxes”
• Manage a vendor neutral and provider neutral “App Store”
• Facilitate collaborative development
• Facilitate investment in technologies and content
Accomplishments Highlights

• SMART on FHIR at HIMSS
  – Intermountain, Cerner, Harvard Medical School, Epic, Hewlett Packard-VA

• Healthe Decisions (HED), FHIR-based CDS & Order sets
  – Cognitive Medical Systems, Motive Medical

• Standards
  – FHIR implementations
  – HL7 (VA & Cognitive Medical Systems)
    • Event Publish and Subscribe
    • Unified Communication Service
    • Order Service
  – OMG (Allscripts, Cognitive Medical Systems, VA, many others)
    • Order Service RFP approved in September by the OMG
SMART on FHIR® – Open Platform Architecture

SOA Orchestration

mHealth

OAuth

FHIR REST API

FHIR Profiles from CIMI Models (using standard terminology)

Heterogeneous Systems

Commercial EHR

Home Grown System

System Integrator

Others…

http://smartplatforms.org/smart-on-fhir/
Use-Case Driven Approach

- Care Coordination and Clinical Pathways
  - LSU Health and LSU Healthcare Services Division
- Registry Architecture and Standards
  - American College of Surgeons, VA, many others
- Perioperative and Surgical Use Case
  - American College of Surgeons
- Perinatal and Maternal Health
  - American College of Obstetricians and Gynecologists
SOA Services Layers

UI

- Support common UI Standards
- Provide services for imbedding application in existing EMR/EHR frameworks

Orchestration of Services and Business Layer

- Implement a multi-layered services architecture (SOA)
- Support common Decision Support models (BPMN2/Drools)
- Support common workflow models (BPMN2)
- Data and vocabulary transformation Services
- Context management services
- Master Data Management Services
- Identity Management Services

Data Virtualization

- Support FHIR/Restful Services models that support launch and forget applications and applications that support a full SOA services stack
- Deploy FHIR profiles in collaboration with Argonauts, the VA, Intermountain, Regenstrief, Mayo/ASU and LSU
SOA Foundation Data Governance and Model Driven Development

Clean hand-off to IT with Business Models, Metrics

Business Modeling and Simulation

Govern services throughout the SOA lifecycle, find and reuse for IT flexibility

Integrated deployment of policies, rules, and services based on an SOA platform

Real time collaboration and management of business processes

Workflow and Choreography

Feedback for continuous improvement and optimization

Business Monitoring, Dashboards, Analytics
Integrated Notification, Review and Entry
Idea to apply Care Path Evolution and Process Flow

On Board to Pathway
- CHFs
- CHCs

Status and management
- Navigator

Visit outcome and Progress
- Specialty Clinic

Report back to Referring Physician/Clinic

Patient Referral Summary
- CHCs

Referral List
- Referral Coordinators

Schedule Visit
- Specialty Clinic

Report back to Referring Physician

Visit Management
- Reconciliation
  - Allergy
  - Problems
  - Meds

User Interface (Portal)

Process Management

Application & Data WebServices

Reconciliation Workflows

Insurance Verification Scheduling Visit Management

External
VA and HSPC
Jonathan Nebeker

HSPC Helps VA modernize its EHR systems and share in markets
VistA Evolution and eHMP

• Veterans Health Information Systems and Technology Architecture (VistA) is an enterprise-wide information system with software modules for financial functions, infrastructure functions, and clinical care.

• VistA Evolution is the program for modernizing clinical and ancillary information management systems

• Enterprise Health Management Platform (eHMP) is the core clinical system for supporting point-of-care functions and some registry and population management functions.
eHMP Challenge and USH Priorities

- Provide Veteran-centric, team-based, quality-driven healthcare
- Undersecretary Priorities: How eHMP will help
  - Access: dynamic management of clinical need with services in and outside VA
  - Provider satisfaction: better, faster, less annoying UX
  - Standardized best practices: Nationally standardized clinical pathways and CDS
  - High-performing networks: Data aggregation, care-plan sharing, and quality monitoring
  - Restoration of trust: Provide reporting and management based on clinical not abstracted administrated events.
Highlights of Open eHMP

• Development Kits
  – Resources (RDK)
  – UX applets (SDK)
  – Available through Future Technologies Lab (FTL) (previously known as VHA Innovations VACI Sandbox)

• APIs
  – Representational State Transfer (REST)
  – Virtual Patient Record (VPR)
  – Fast Healthcare Interoperability Resources (FHIR) Draft Standard for Trial Use (DSTU)2 APIs
  – Working with standards development organizations and Health Services Platform Consortium on more
Activity Management

• Key Characteristics
  – Closed loop tracked state including fail
  – Feedback to learning healthcare system
  – Used with scheduling systems to provide dynamic management of access to care based on clinical need

• Ordering Overlay
  – Intention & Request
  – Accept and Define
  – Execute
Need for functional service standards with implementation standards

- Human notification service
  - HSPC
  - UX
- Activity management service
  - Portable/Computable plan of care
  - Clinical Process Notation
    - BPEL/BPMN, CDS, State
    - Care Coordination
- Team management service
- Ordering Service
- Registry reference architecture and standards
- Dynamic quality and safety monitoring
Interested in changing the world?

• Wiki
  https://healthservices.atlassian.net/wiki/display/HSPC/Healthcare+Services+Platform+Consortium

• Website
  http://hspconsortium.org/#/
Questions

• Dr. Jonathan Nebeker  Jonathan.Nebeker@va.gov
• Dr. Stanley Huff  Stan.Huff@imail.org
• Oscar Diaz  odiaz@ngenex7.com

Other VA Sessions at HIMSS:

**Wednesday, March 2:**
Enhanced Home Healthcare Coordination for Veterans: 1:00–2:00 PM  
VA's Data Sharing & Interoperability Strategies: 2:30–3:30 PM  
Evaluating Semantic Technology to Enhance EHR Visualization: 4:00–5:00 PM

**Thursday, March 3:**
VistA Evolution EHR Initiatives in 2016-2018: 8:30–9:30 AM  
Achieving Interoperability with VA & Private Sector Partners: 2:30–3:30 PM *

* This is a DOD session on joint work.