Health Management Platform (HMP)

Presentation for OSEHRA 2nd Annual Summit
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Agenda

• Introduction
  • Health Informatics Initiative (hi²)
  • Health Management Platform (HMP)
• HMP Closer Look
  • Development Partners and Partnerships
  • IT Development and Support
• HMP and OSEHRA
• Q&A
“Transform Healthcare Delivery through Health Informatics” (Health Informatics Initiative or hi²) was created by Secretary Shinseki in May 2010 with these missions:

- Provide foundational Information Technology (IT) and Informatics components for Veterans Health Administration (VHA)’s transition from a medical model to a patient-centered model of care.

- Build a sustainable collaborative approach, capacity, and tools to deliver informatics solutions to transform health care delivery to Veterans through three major projects or Workstreams.

- Build a platform and functionality to support collaboration with iEHR and Computerized Patient Record System (CPRS).
**WORKSTREAMS**

**Workstream A**
- ADOPTING a Health/IT Collaborative
  - Rapid Product Development and Delivery Methods
  - Piloting Development Partnership Models

**Workstream B**
- BUILDING the HMP to Transform Patient Care
  - Transitioning CPRS to Next-Generation Browser-Based EHR
  - Pioneering Software Solutions

**Workstream C**
- CREATING Health Informatics Capacity
  - Stakeholder Collaboration, Education and Knowledge-Based Initiatives
  - Defining/Championing the Role of Informatics

**Workstream D:** DELIVERING All hi2 Marketing and Communications
The Health Management Platform (HMP)

- The HMP is a collection of transformative, foundational IT products that support the desired changes in health care delivery tools.
- The HMP is a modern, web-based, tiered and open architectural framework based upon industry standards and best practices that is compatible with Service Oriented Architecture (SOA).
- The HMP enables incremental transition from legacy technology to new technology, contributing to modernization of VA’s CPRS and VistA and collaboration with iEHR.
- The HMP provides reusable services and integration points for new systems.
Transition the healthcare team experience to a patient-centered model.
Address population-based and healthcare system aspects of care.
Increase patient engagement and satisfaction at the point of care.
Advance opportunities for system integration, development partnerships and open source development.
Team Based, Multi-Patient Care

- Team lists
  - Patient lists
  - Healthcare team lists
  - Configuration/Management tools

- Team communication
  - Tasks
  - Messaging/Ping!

- Workflow
  - Multi-patient boards
  - Condition based worksheets that allow actions such as ordering and documentation as integral part of workflow
HMP for Healthcare Teams

Objectives

- Transition VHA from a medical model of care to a team-based, patient-centered model of care through the development of advanced clinical software
- Reestablish the close clinician-IT collaborative relationship
- Build user-driven, configurable modules based upon core concepts:
  - Comprehensive, coded data
  - Workflow driven, role-based activity systems
  - Knowledge driven, context-based decision support
  - Team-based, multi patient care environment
Development Partners & Partnerships

- What is a Development Partner?
- What is a Development Partnership?
- Why are Partnerships Important?
- Partners and Partnerships
  - Clinical Assessment Reporting and Tracking (CART)
  - Massachusetts Veterans Epidemiology Research and Information Center (MAVERIC)
  - VA Informatics and Computing Infrastructure (VINCI)
Development Partners & Partnerships

Criteria for Development Partner Selection & Support

- Commit to HMP architecture and agile principles
- Develop modules compatible with HMP priorities
- Agree on deliverables, timelines and commitment of resources
- Establish compatible development environment and testing approach
- Comply with VA development standards and policies
Development Partners & Partnerships

Governance, Policy and Process for Implementing Development Partnerships

- Governance, policy and processes for establishment and implementation varies
- Approach evolves through the experience gained via new and continuing partnerships.
- Nature of each Development Partnership will differ based on agreed upon goals, timelines and resource commitments
- Governing baseline policy will be used to establish a specific Development Partnership Agreement
Development Partners & Partnerships

Accomplishments and Success

- HMP ↔ CART
- HMP ↔ MAVERIC
- HMP ↔ VINCI
Development Partners & Partnerships

Lessons Learned

- Proactively research partnership candidates
- Clearly identify and document mutual benefits and impacts
- Strongly promote transparency and information sharing to support mission and business operations across organizational lines
- Ensure technical compatibility before partnership is formed
- Remain flexible when setting the goals, timelines and resource commitments
- A mutually developed and signed Development Partnership Agreement establishes expectations and accountability
IT Development and Support

IT Role in HMP

- Strategic Partner with VHA
- Shared Vision and Responsibility
- Architecture, Infrastructure and Functionality
  - Multi-tiered framework
  - Hardware profile
  - Reusable Services
  - Modular functionality
  - Intersection of Internal and External Partners
# HMP Problem Space

Create a health management platform that migrates the Computerized Patient Record System (CPRS) to a robust clinical practice environment (CPE).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Examples (not inclusive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stakeholders</td>
<td>Front-line healthcare team members providing direct patient care, facility leadership, CACs, patients, stewards, clinical ancillary services</td>
</tr>
<tr>
<td>Functionality</td>
<td>CPRS + 4 Key Clinical Concepts: 1) comprehensive, integrated, coded data; 2) team-based, multi-patient care; 3) Workflow-driven, role-based activities; 4) knowledge-driven, context-based decision support</td>
</tr>
<tr>
<td>Vista Business Logic</td>
<td>EMR, Clinical ancillary, administrative</td>
</tr>
<tr>
<td>Data</td>
<td>Health, patient, operational, reference, administrative</td>
</tr>
<tr>
<td>Technical Environment</td>
<td>VistA, Cache`, Java, web, open source, VA infrastructure</td>
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## Architectural Drivers

<table>
<thead>
<tr>
<th>Stakeholder Problem Space Requirements</th>
<th>Architectural Driver</th>
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<tbody>
<tr>
<td>Maintain current UI experience</td>
<td>Highly-interactive, rich internet application (RIA)</td>
</tr>
<tr>
<td>Clinicians require FAST, FAST, FAST</td>
<td>Performance: Coversheet loads in &lt;2 sec; Views load &lt; 1/2 sec (imperceptible)</td>
</tr>
<tr>
<td>Health team members are interrupt driven</td>
<td>Presentation layer must maintain current work state</td>
</tr>
<tr>
<td>1400 sites, 15K MDs, 44K nurses, 33K AHP, 1.2M orders &amp; 940K docs/day</td>
<td>Maintain high bar for quality, reliability, uptime, scalability, etc.</td>
</tr>
<tr>
<td>Interface with hospital’s clinical ancillary services</td>
<td>Integrator of systems, not just data integration</td>
</tr>
<tr>
<td>Respect EMR, ancillary and administrative package business rules</td>
<td>Packages own their data and business rules</td>
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<td>Numerous clinical specialties; Must be serviced by HMP</td>
<td>A modular system and services are required</td>
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<tr>
<td>Independent, module developers possess various levels of expertise</td>
<td>Support varied technical entry points (application, page, plug-in, server)</td>
</tr>
<tr>
<td>Facilities desire to share modules and sharing must not cause system crashes</td>
<td>Modularity must support plugin registration and verification</td>
</tr>
<tr>
<td>Views auto refresh and modules reflect current patient updates</td>
<td>Auto refresh as well as shared clinician, patient, and clinical object context</td>
</tr>
<tr>
<td>Current CPRS downtime target is 15 minutes per year</td>
<td>Server remains live during deployment and module updates</td>
</tr>
<tr>
<td>Work with selected VA software ecosystem</td>
<td>Open source, web deploy, 508, Java, Vista</td>
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Implementation Server Technologies

- Apache Tomcat – a Java-centric web server
- MAVEN – the industry standard build automation system for Java
- Jenkins – provides continuous integration services for Java software development (used with MAVEN)
- Java – the chosen version of the Java Development Kit.
- Spring – framework for automatic POJO/class “plumbing,” security, authentication, and sessioning
- Apache Commons – the purpose of the Commons is to provide reusable, open source Java software
- Log4j – a standard logging facility.
- Activemq – use for JMS Messaging
- JUnit, jasmine – for Java and JavaScript unit testing
- ehCache – a widely-used cache for boosting performance, offloading your database, scalability
- Joda-time – health time libraries for timezone, imprecise time (today, last year), time calculations
- PERF4J – used for performance testing
- SOLR – open source Lucene search service
- DROOLS – exploring for open source rules-engine potential
- Caché – Non SQL JSON data store
Implementation UI Technologies

- HTML5
- CSS3
  - Twitter bootstrap styles starting point for theming
  - Font-Awesome
- JavaScript
  - JavaScript – On top of libraries we have our own custom pieces
  - JSON – Take advantage of object based notation directly
  - ExtJS - component based, object-oriented desktop app features
  - jQuery supplemental components
    - JCrop - Image cropping, patient/provider pictures
    - High Charts - Interactive graphing
    - SIMILE Timeline - interactive timeline
# Accomplishments

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<tr>
<td>1. Nationally released and implemented the Virtual Patient Record (VPR) version VPR<em>1.0 and VPR</em>1.0<em>1. Targeting release of VPR</em>1.0*2 by October 2013.</td>
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| 2. Completed 5 PMAS iterations on schedule  
  • Completed 4 Team-facing HMP software modules for healthcare team (including infrastructure and clinical capabilities) |
| 3. Engaged 4 HMP pilot sites—San Diego, Loma Linda, Portland and Indianapolis |
| 3. Tested and Expanded HMP Hardware Set-up to accommodate a Single Facility Configuration or a Regional multi-facility Configuration. Considering a Cloud Environment |
| 5. Implemented a Collaborative Development Environment (CDE) that engages VHA stakeholders and development partners |
| 6. Secured Temporary Authority to Operate (TATO) |
HMP and OSEHRA

- 2012– Initial submission of VPR and HMP software to OSEHRA repository
- Ongoing—Continual submissions of code-in-flight
- Participate in regular meetings related to future strategies, architecture and VistA code standardization
- Contribute to annual OSEHRA Summit
- Share lessons learned related to VA internal partnerships
- Foster integration and innovation
HMP and VistA Evolution (VE)

- iEHR Initial Operating Capabilities (IOC) 2014 Commitment
  - Search
  - Medication Review
  - Infobutton
- Reusable services for data acquisition from multiple sources
- Reusable write-back services (e.g. to support ordering and documentation)
- Virtual Patient Record (VPR) to aggregate and transform data from multiple sources to meet desired standards
- Multiple integration points with VistA systems for introduction of new applications
- Opportunities for open source collaboration
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