National Human Services Interoperability Architecture (NHSIA)

Information and Infrastructure Viewpoints

July 2012
Webinars will be held Thursdays at 1 PM Eastern

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URL for new ACF Interoperability website: http://transition.acf.hhs.gov/about/interoperability
Outline

- Introduction and welcome by ACF
- Information Viewpoint
  - Conceptual Data Model (CDM)
  - Information Exchanges
  - NHSIA and the National Information Exchange Model (NIEM)
- Infrastructure Viewpoint
  - Fundamental Infrastructure Concepts
  - Architecture Patterns
  - Pattern Use Cases and Implementation Considerations
- Questions and next steps

Learning Objectives for this Webinar

- Understand what information will be shared
- Understand the fundamental principles which underlie the Infrastructure Viewpoint
- Understand the architectural “patterns” that can be used to create an infrastructure necessary to achieve the desired levels of integration and interoperability

Note: Feel free to enter comments or questions in the Chat window throughout the webinar. At the end we will open the phone lines to take questions.
This webinar focuses on the artifacts in the Information and the Infrastructure Viewpoints.

- I-01-Information Viewpoint Description-D0.2
- I-02-Conceptual Data Model-D0.2
- I-03-Information Exchanges-D0.2
- I-04-Data Dictionary and NIEM Mapping-D0.1
- I-05-List of Relevant Standards-D0.1

- F-01-InfrastructureViewpointDescription-D0.1.docx
Information Viewpoint

The Information Viewpoint describes the business information requirements for the NHSIA architecture.
The Information Viewpoint Comprises 3 Primary Components

- **Conceptual Data Model**
  A diagram that identifies classes (persons, places, things, or events), attributes, and associations among classes.

- **List of Information Exchanges**
  List and description of information exchanges between stakeholders.

- **Relationship to NIEM**
  How NHSIA relates to the National Information Exchange Model (NIEM).
Audience for the Information Viewpoint

- Developers of the other NHSIA viewpoints.
- State and local planners and system architects.
- Federal and state program managers.

**Information is any data that may be stored about a person, place, concept, thing or event which has meaning in the context of business.**

*The NHSIA Information Viewpoint defines core data classes, relationships and attributes used by human services programs.*
How NHSIA Information Viewpoint Relates to the Other Architecture Viewpoints

- **Capabilities VP**
  - Capabilities represent high level requirements for business areas

- **Business Areas**

- **Business Processes**

- **Business Activities**

- **Stakeholders**
  - Stakeholders use applications

- **Inputs/Outputs**
  - Activity inputs/output represent potential information exchanges

- **Actions**
  - Services support actions

- **Information VP: Information Exchanges**

- **Systems VP: Applications**

- **Systems VP: Services**

- **Information and Infrastructure Viewpoints**
  - Information Viewpoint
Conceptual Data Model
Information Viewpoint
Classes of Information Related to Stakeholders

Demographics
- Person Address
- Person Name
- Release of Information
- Person Alternate Identifiers
- Person

Person Attachment
- Household
- Person Family & References
- Person Legal/Court History
- Person Finances
- Person Education
- Person Health Status

Case Person
- Application

Access Authorization
- Worker

Case Portfolio
- Case Record
- Case Entry

Program Rules

Managing Agency
- Administrative Agency
- Federal Agency

Contractor
- Facility
- Business Contact
  - Information

Credentials
- Service Provider
- Service
- Referral

Client

Provider

Worker

Agency
NHSIA team used the CDM to identify a common data vocabulary to support the business model.
Conceptual Data Model (CDM) – Person Excerpt

Information and Infrastructure Viewpoints

Conceptual Data Model
Information Exchanges
Information Exchanges Support Operations

A set of data transferred between stakeholders in support of a business process.
(data in motion)
Information Exchange Spreadsheet Provides Details

The Information Exchange Spreadsheet provides details on information exchanges, including:

- **Names the exchange**
- **Maps the exchange to the core concept name and interface designator**
- **Describes the exchange**
- **Lists the contents**
- **Identifies source and destination organizations who would use the exchange**
- **Maps the exchange to one or more IT services from the Systems Viewpoint**

<table>
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<tr>
<th>Information Exchange Name</th>
<th>Core Concept Name</th>
<th>Interface Designator</th>
<th>Description</th>
<th>Contents (audit inputs/outputs from B-VP and primary correlation to S-VP)</th>
<th>Source Organization Type</th>
<th>Destination Organization Type</th>
<th>References/Comments</th>
<th>Service Designator &amp; Name</th>
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<tr>
<td>Person Identification</td>
<td>Master Person Selection</td>
<td>CI-MPI-001</td>
<td>This interface provides one or more entries from the Master Person Index. The interface may</td>
<td>Person identifier; Person information;</td>
<td>Agency, organization, or facility that is</td>
<td>Agency(client point of entry)</td>
<td></td>
<td>CS-MPI-001 Find Person; CS-MPI-002 Identify Available Person Records; Identify Person; Locate Person; Treasury Information Infrastructure Viewpoints</td>
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Information Exchanges Facilitate Information Sharing

VERIFICATION EXAMPLE

Verification

Federal

County

State

Master person selection

Person citizenship status
Person residency status
Social security number
Person income
NIEM enables diverse communities to “speak the same language” as they share, exchange, accept, and translate information efficiently.

from “What is NIEM?”
“We are also developing a National Information Exchange Model (NIEM) that serves as a clearinghouse for commonly used human services terminology and establishes a process to identify and share essential information. The NIEM framework will also provide tools as well as training and technical assistance, and will guide our efforts at implementing information exchange services across the landscape of human services.

We are pleased to note that the Human Services Domain was recently officially recognized and officially established under NIEM. In the next few months, ACF will be posting planning documents on the NIEM website for review and comment. ACF will also establish and operate a NIEM sub-group to provide coordination with the Centers for Medicare & Medicaid Services (CMS), including its Center for Consumer Information and Insurance Oversight (CCIIO), as ACF is committed to supporting these agencies as they implement their own Health Services Domain under NIEM.”
NIEM defines format and content standards for data in motion between systems operated by different agencies or jurisdictions.
A NIEM Example: Define Transaction Once, Use It Often

**NHSIA context for information exchanges**
- Intake
- Needs assessment
- Service history & planning
- ....

**NIEM Tools and Artifacts**

**IEPD for Adoption Case Information Summary**

**Adoption case information summary**

**action ...**
- n, between
- cies
- ns and/or non-
- zations
NHSIA Supports the First Two phases of NIEM IEPD Life Cycle Development

Scenario-related products from NHSIA:
- High-level business case
- Information needed

Requirements-related products from NHSIA:
- Business context
- Information exchange model
- Data requirements (mapping)

PD = Information Exchange package Documentation
NIEM IEPD Develops Artifacts in Every Phase of the Life Cycle (1)

Map and Model:
- Exchange Content Model
- Mapping Document

Build and Validate:
- XML Schema
- XML Wantlist
NIEM IEPD Develops Artifacts in Every Phase of the Life Cycle (2)

**Publish and Implement:**
- Package and Publish completed IEPD
- Implement exchange service

**Assemble and Document:**
- IEPD Master Document
- IEPD Catalog
- IEPD Metadata
- XML Instances
- XML Stylesheet
Information Exchange

Information Exchange Package Documentation (IEPD)
- Business Requirements
- Exchange Content Model
- Mapping Document
- XML Schema
- Catalog of Artifacts
- Metadata
- etc.

Source Database

Populate

Information Exchange Package (IEP)
(XML Exchange Message)

Message Wrapper
(Routing, Security, Authentication, etc.)

Transmit Message

Web Service
Jane Doe: authorizes a state to verify her household income with the IRS.

1. State sends NIEM REQUEST information exchange package to IRS.

2. IRS sends NIEM RESPONSE information exchange package back to the requesting State.
<?xml version="1.0" encoding="iso-8859-1"/>  
<MyPersonalInformation>  
  <FullName>  
    <FirstName>Jane</FirstName>  
    <LastName>Doe</LastName>  
  </FullName>  
  <BirthDate>  
    <Month>May</Month>  
    <Date>17</Date>  
    <Year>1961</Year>  
  </BirthDate>  
  <Address>  
    <Street>10 Mile Road</Street>  
    <County>Saguache</County>  
    <City>Center</City>  
    <State>Colorado</State>  
    <Country>USA</Country>  
    <PostalCode>81125</PostalCode>  
  </Address>  
</MyPersonalInformation>
The Infrastructure Viewpoint describes the information technology components necessary to facilitate interoperability among participants in the health and human services environment.
The Infrastructure Viewpoint: Primary Components

- Fundamental Infrastructure Concepts

- Infrastructure Architecture Patterns

- Pattern Use Cases and Implementation Considerations
Audience for the Infrastructure Viewpoint

- Developers of the other NHSIA Viewpoints
- State, local, and private provider planners and system architects
- Federal Program Managers

Infrastructure is the hardware, networks and software required to deliver information technology applications and services.
Fundamental Infrastructure Concepts
Fundamental Infrastructure Concepts

➤ **Service Oriented Architecture**
  Describes the nature of a service-oriented architecture (SOA) as well as the major components of an SOA such as an enterprise service bus (ESB)

➤ **Shared Infrastructure**
  Describes the concept of a shared infrastructure and its role in achieving interoperability. Also discusses the use of Cloud computing for shared infrastructure

➤ **Security and Privacy**
  Presents an overview of security and privacy aspects of the infrastructure, including the use of federated single sign-on (SSO)
Service-oriented architecture (SOA) is a methodology for systems development and is one of the key features of the MITA 3.0 technical architecture.
Benefits of SOA

- Enables Increased Business Agility
- Allows Business, Not Technology, to Drive the Enterprise
- Facilitates Greater Reuse of Common Services
- Facilitates Insertion of New Technology
Shared Infrastructure

County Human Services (HS) IT Environment
- The collection of all the IT environments supporting the county’s HS
- Includes legacy and new elements
- Includes elements in an SOA environment, not in SOA, isolated systems, etc.

County HS SOA Environment
- Provides the ability to request services from local and distributed components and manage the results
- Includes services, applications, and databases shared within the county

County HS Hub
- A place to host services, applications, and information to be shared externally
- May also contain other elements that are only shared internally

➤ A key aspect of the NHSIA Core is the creation of a shared infrastructure or “hub.”
Benefits Of Shared Infrastructure

- Reduces the need for multiple point-to-point connections between organizations.
- Creates a centralized starting point for access to shared data.
- Provides the infrastructure needed to develop and deploy common applications and services.
- Cloud computing is one option for creating a NHSIA hub.
The NHSIA Security White Paper Topics include:
- Identity Management and Access Control
- Network and Infrastructure Security
- Privacy and Confidentiality
- Contingency Planning and Disaster Recovery
Architecture Patterns
Architectural patterns are generalized descriptions of activities, service functionality and system functionality and their resources, providers and information/data resource flows.

Five categories of patterns are included in the Infrastructure Viewpoint:

- Information Aggregation
- Collaboration
- Self-Service
- Extended Enterprise
- Business Intelligence and Analytics
NHSIA Architecture Pattern Example: Information Aggregation Pattern

Contains sub patterns for Federation, Population, Synchronization and Access
Pattern Use Cases and Implementation Considerations
NHSIA Architecture Pattern Example: Information Aggregation Use Case

A possible implementation scenario for data aggregation.
Summary
Information and Infrastructure Viewpoint Summary

**Information Viewpoint**
- The conceptual data model defines elements in the NHSIA common vocabulary and helped to identify initial requirements for information exchanges.
- Information exchanges are key to interoperability.
- NIEM provides a common vocabulary, process and model for messages exchanged.

**Infrastructure Viewpoint**
- Fundamental infrastructure concepts
  - Service-oriented architecture
  - Shared infrastructure
  - Security and privacy
- Architecture patterns
  - Patterns are types of infrastructure implementations that can provide a starting point for thinking about and planning for interoperability.
  - Identified 5 categories of patterns.
Questions and next steps
Chat window

- If we don’t have time to answer all the questions during the webinar time window, we will post answers on the ACF Interoperability site

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Telephone: Joe Bodmer 202-690-1234

- Note: If you are not speaking, please mute your phones by pressing *6. To speak, press *6 again.
NHSIA Documents Related To This Webinar

**Information Viewpoint**
- Information Viewpoint Description
- Conceptual Data Model (CDM diagram)
- Information Exchanges (spreadsheet)
- Data Dictionary and NIEM Mapping (spreadsheets)
- List of Relevant Standards (spreadsheets)

**Infrastructure Viewpoint**
- Infrastructure Viewpoint Description
- White Paper:
  - Security

These documents will be available on the ACF Interoperability website: http://transition.acf.hhs.gov/about/interoperability
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Next webinar: Systems Viewpoint and Webinar Series Wrap-Up

- Introduction and Welcome by ACF
- Systems viewpoint
  - To-be architecture reference model layers
  - Software applications
  - Shared IT services
- Webinar series wrap-up
- Questions and next steps
Thank you for participating and see you next time!

- Systems Viewpoint and Webinar Series Wrap-Up
- Thursday, July 26 at 1 PM Eastern