

NHSIA Webinar Series

Systems Viewpoint and Webinar Series

Wrap-up

July 26, 2012

Slide 1 – Systems Viewpoint and Webinar Series Wrap-Up

Good afternoon. This is David Tabler from the Administration for Children and Families. Welcome to the National Human Services Interoperability Architecture (pronounced niss-e-a) webinar series.

To find the link for this session, please go to ACF's new Interoperability website by typing this URL:

<http://transition.acf.hhs.gov/about/interoperability>

Scroll to the bottom of the page and click on the link for today's session. The text says:

“Systems and Infrastructure - Webinar #5 to be presented on July 26, 2012. Use the following link, to access the [July 26 webinar](#).”

If you click on the July 26 webinar link, you should be able to join the webinar.

To avoid hearing background noise from your phones we will mute all your lines now. At the end, we'll open the lines to take questions.

Our other speaker today is Kim Richeson from the Johns Hopkins University Applied Physics Laboratory.

Slide 2 - Webinars will be held Thursdays at 1 PM Eastern

This is the last in series of 5 webinars to introduce the National Human Services Interoperability Architecture (NHSIA).

This series is intended as an overview of the several hundred pages of NHSIA information being made available on the ACF web site. The time in the webinars is limited. But we hope that the webinars will provide sufficient information to allow you to explore the detailed documentation and examine the topics of most interest to you in more detail.

The URL for ACF's new interoperability initiative site is:

<http://transition.acf.hhs.gov/about/interoperability>

(This is a temporary Web site being used until a newly designed site is available. A link to the new site will be provided from this site.)

We will post the webinar files and additional architecture documents on that new ACF website over the coming weeks.

Slide 3 – Webinar Plan

This webinar explains the NHSIA Systems Viewpoint. Then it provides a summary and wrap-up of the whole webinar series.

There will be a question and answer session at the end. In the meantime, please feel free to enter comments or questions using the Chat tool in the lower right section of your screen.

And now, I will turn this over to Kim Richeson to lead us through the Systems Viewpoint.

Slide 4 - This webinar focuses on the Systems Viewpoint artifacts

Recall that in the first webinar in this series we explained that NHSIA is being described from 7 different viewpoints. These are shown in the cube in the lower left corner. Each viewpoint explains a different aspect of the architecture. The viewpoint we are focusing on today is the Systems Viewpoint.

The documents that describe the viewpoint are listed in the figure. Also, several white papers included under the Overview Viewpoint provide additional details relevant to the System viewpoint.

Before we proceed further, let me take this opportunity to repeat the instructions for getting to the Web portion of this webinar in case some of you who just called in are having trouble finding it.

To find the link for this session, please go to ACF's new Interoperability website by typing this URL:

<http://transition.acf.hhs.gov/about/interoperability>

Scroll to the bottom of the page and click on the link for today's session. The text says:

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Slide 5 – Systems Viewpoint

So let's take a look at the Systems Viewpoint ...

Slide 6 - The Systems Viewpoint Comprises 3 Primary Components

The Systems Viewpoint has three primary components.

The first is the systems reference model. This model is the organizing framework for the to-be architecture. It provides a guide for structuring each jurisdiction's architecture around interoperable and reusable elements.

The second component is the Model Layer Descriptions. These explain what is in the top three layers of the model (access, applications, and shared services). In the previous webinar you heard about what is in the infrastructure layer. The Systems Viewpoint identifies several examples of what is in each of the first three layers.

The third major component of the systems viewpoint is concerned with connections and relationships. We will talk about two examples in this webinar:

- First, the relationship between the shared IT services and software applications
- And second, the relationship between the shared IT services and the business activities that the business viewpoint identified.

Slide 7 – Audience for the Systems Viewpoint

As was the case with the other viewpoints, there are several audiences for the Systems Viewpoint.

One audience is the developers of the other NHSIA Viewpoints. The top three layers of the reference model (access, application, IT services) suggest high-level requirements for the infrastructure layer or

viewpoint. The core IT services defined to provide the foundation for NHSIA suggests an initial set of information exchanges useful to the information viewpoint.

A second audience for the Systems Viewpoint is those who are charged with developing strategies and plans for state, local, and private provider architectures and systems. The services and applications identified in this viewpoint are candidates for adoption and implementation in jurisdictions' solution architectures.

The third audience is the federal program managers. The core IT shared services suggest where collaboration and coordination across programs and agencies might be most valuable.

Slide 8 – To-be Architecture Reference Model Layers

Let's take a closer look at the top three layers of the Systems Reference Model.

Slide 9 - NHSIA Reference Model To-Be Architecture Layers

The Systems Viewpoint is organized into a four-layer reference model, shown here. One of the driving principles of NHSIA is that a service-oriented architecture provides opportunities for reduced cost of operations and maintenance through sharing and reuses of services, data, and IT resources. This involves implementing capabilities as shareable assets (i.e., services) and exposing those assets through an interface that any application can invoke. Using shared services reduces redundancy within and across systems. Using shared services makes it easier to maintain, change, and improve systems because parts of the system are loosely coupled and be changed independently.

As I said earlier, you heard about the infrastructure layer in the last webinar, so we won't go into that today. We will step through the other three layers.

Slide 10 - Access Layer Provides Options for Entering the System

The access layer includes components for presenting human services information to people, information technology (IT) services for people, and traditional (non-automated) interactions with people.

People may access human services information and support via electronic devices, such as computers, telephones, or fax machines. They may also interact directly with other people to access human services information.

This slide shows some of the components in the access layer: a kiosk, a telephone, traditional person-to-person interactions, a call center, a browser, and a fax machine.

Regardless of how the information or IT services are accessed, the underlying applications, IT services, and infrastructure are the same for each group of users. So, if a client walks in to an office to inquire about services, the information provided via a kiosk or human services caseworker would be the same as what the client could discover on her own through a browser. The user interface for a software application that supports different access methods may be tailored to suit the protocols and dimensions of the device on which it is used.

Slide 11 – IT Services Support Actions and Stakeholders Use Software Applications

You've seen this diagram before. Today we're using it to illustrate the connections between the Systems Viewpoint and the other viewpoints in NHSIA.

The System Viewpoint (in the peach-colored boxes) identifies software applications and IT services required to support the business activities specified in the business model.

Stakeholders use applications and those applications use shared IT services. The shared IT services support actions from the business model.

Slide 12 – Software Applications

Let's look at the applications layer of the reference model in more detail. The applications layer includes high-level applications that normally support multiple human services domains, agencies, and programs. In this context an "application" is application software - a computer program designed for end users to accomplish specific tasks.

Slide 13 - Software Applications Support Multiple Human Services Programs

The applications chapter in the Systems Viewpoint describes human services applications and program management applications. Supporting applications support both categories. The viewpoint focuses on the human services applications for caseworkers and clients.

Examples of components in the applications layer shown here include human service applications that support multiple domains such as eligibility determination, case management, and others. This layer also includes program management applications that support multiple programs such as: partner management, performance monitoring, and others. This layer may include applications unique to a domain, agency, or program (to meet unique requirements or because they are legacy applications). This layer may also include integrated applications to support multiple activities in one or more domains, agencies or programs. For example, one application that handles eligibility determination and enrollment. Several supporting applications are also shown. These would be used across many different business areas and human services domains.

Jurisdictions may bundle applications any way they like. In a service-oriented architecture, different applications should invoke some of the same shared application and data services. Applications should be interoperable so that users can easily accomplish all their tasks seamlessly.

Slide 14 - Applications Layer Supports the Human Services Cycle for Stakeholders

Human services applications support clients, caseworkers, and their supervisors. The figure illustrates a typical cycle for human service delivery. The boxes also correspond to major applications.

Different human services agencies can use the same applications but still tailor them to meet unique business requirements. Business rules, user interface configurations, domain-specific data access, and other mechanisms are ways to tailor an application to a particular set of users' needs.

In some cases, once eligibility has been determined, the client may be enrolled for selected services. In other cases, a worker collects more detailed information, assesses specific needs, and establishes cases for appropriate agencies; enrollment may occur after this detailed needs assessment. In case management, an agency worker develops a high-level case plan. A worker makes detailed service plans and refers the client to one or more service providers. The workers and providers collaborate to coordinate services. Throughout the cycle, performance indicators mark intended milestones and measure progress. At different stages of the cycle, feedback may restart a segment.

The application descriptions reflect the concepts explained in various NHSIA white papers (for example, white papers have been written on the topics of Client and Case Management, Master Person Index Services, and Eligibility Determination).

Slide 15 - Software Applications Share Information

This slide shows that applications share key information about persons, cases, case persons, and providers. You may recall from earlier webinars that the architecture recommends that access to data about a person can be facilitated through a Master Person Index.

How the information is shared depends on how the applications are built and how the jurisdiction is organized.

If information needs to be shared across IT environments, it might make sense to use standard NIEM transactions to share the information via shared services. If all the applications and data live in the same IT environment, then the applications can access the databases directly.

Slide 16 - Systems Viewpoint Describes Notional Interoperable Human Services Software Applications at a High Level

The Systems Viewpoint gives information about seven key applications; these are:

- Eligibility Determination
- Enrollment/Disenrollment
- Needs Assessment
- Case Management
- Service Planning and Monitoring
- Document Management, and
- Caseload Management.

This slide shows an example of the level of detail provided in these descriptions, in this case, for the Enrollment/Disenrollment software application. The categories of information provided for each application include:

- Description
- Domain Applicability
- Stakeholder Applicability, and
- Major Functions

Slide 17 - Shared IT Services

Now we'll look at the Shared IT Services layer of the reference model.

Slide 18 - Reusable, Shared IT Services Will Support Interoperable Applications

The shared services layer includes components that deliver functionally-oriented IT services and information.

Each service could support multiple interoperable applications within a jurisdiction. Some services may be hosted in a hub to make information available to authorized users inside and outside the jurisdiction once information sharing agreements are in place.

This slide shows several example shared IT services in the toolbox, including: Find Person, Register Person Data, etc.

Each one might be used in a variety of interoperable applications as shown in the lower right, such as Integrated Eligibility, Case Management, and so forth.

Slide 19 - Shared IT Services Align with Business "Actions"

The shared services identified here support the business activities that are detailed in the Business Viewpoint. In the current version of the Systems Viewpoint, the focus is on the business activities in these key business processes:

- Client Management
- Eligibility and Enrollment
- Service Management

Services are grouped according to the action terms from the business model. For each grouping, you will find:

- The action term
- The definition for the action term
- A description of the kind of services associated with that action
- And a list of proposed IT services.

This slide shows an excerpt from the Systems Viewpoint related to the "Enter" action. The "Enter" services allow people to update information in existing records. The "Enter" services should be used in concert with the "Verify" services to ensure data quality. So the "Enter" services could be used to register or update person data, update case information, and so forth.

A separate Systems Viewpoint artifact we call the Service Matrix has additional information about each proposed service. I'll say more about that later.

Slide 20 - Services Classified as Common, Core, or Custom

NHSIA classifies IT services as common, core, or custom.

Common IT services support cross-jurisdiction information sharing (e.g., local-state, state-state, state-federal) and/or cross-program or agency information-sharing (for example, a child support program sharing information with the TANF program, or a child welfare agency sharing information with an income support agency). The concept is that the human services community will agree on naming conventions, functions, and NIEM-based interfaces for the common services. Eventually, those who manage and operate IT environments for human services will implement the common IT services to support their human services programs. In this category, an IT service with the same name in two different IT environments would perform the same functions, use the same input parameters, and return the same information.

Core IT services are a foundational subset of the common IT services that enable a basic level of interoperability. These are discussed in more detail in the “NHSIA Core” Concepts document in the Project Viewpoint.

Custom IT services are the other services that jurisdictions will implement to support their own human services operations. Uniformity of purpose and interfaces across programs and jurisdictions is not necessary for custom IT services.

Slide 21 - Core Capabilities Support All the Business Areas

This slide illustrates that the NHSIA core capabilities support all the business areas involved in human services. So far, NHSIA addresses the green business areas in some detail; yellow areas are defined only at a high level.

The core elements provide functionality upon which end-user capabilities must be built. To see some initial benefits from implementing NHSIA concepts, an agency should implement the NHSIA core and also implement one or more high-priority end-user business capabilities building on these core elements.

Slide 22 - NHSIA Core IT Components

Let’s take a look at the components of the NHSIA Core.

Implementing NHSIA core concepts means that the four core information system elements shown in the slide would be available:

- First: A service-oriented architecture infrastructure would be available in each IT environment that supports human services to provide the foundation for IT service discovery and re-use
- Second: There would be a set of hubs at the local, state, and federal levels to share IT services. These hubs would provide a place to host shared IT services.
- Third: There would be a set of shared Core IT services. Information sharing would use NIEM-based standards in many cases. As an example of the types of services located in a county-level hub: single sign-on and attribute-based access control would be used to streamline the user’s experience and ensure compliance with confidentiality agreements.
- And fourth: A set of information repositories would be used to facilitate selected data aggregation and analysis.

Slide 23 - NHSIA Core IT Services Provide a Solid Foundation for Better Programs and Integrated Human Services

The NHSIA core IT services provide a foundation for interoperability among programs and agencies. Interoperability can be achieved by designing and implementing systems which use these core services.

Basically, the NHSIA core IT services can be used in three ways:

- They support finding and retrieving basic or summary information about key entities (such as a person, case, provider, or program) to improve information sharing and enable improved delivery of human services;
- They enable verifying information against authoritative sources to support eligibility and other program-related rules; and
- They also can be used to collect, aggregate, and analyze key operational performance information across programs and agencies to improve effectiveness and efficiency.

Slide 24 - Connections and Relationships

Next we'll look at a couple examples of the connections and relationships between the systems viewpoint and the business viewpoint.

Slide 25 - Software Applications Are Mapped to Business Processes (partial)

Each **application supports one or more business processes** from the Business Model. The table shown here maps the applications to the business processes. The slide shows an excerpt of the full table.

The rows are the processes specified for the 10 business areas; the columns are human services software applications. The software applications included in this initial mapping are: Eligibility Determination, Enrollment/Disenrollment, Needs Assessment, Case Management, Service Planning and Coordination, and Document Management.

Cells marked with "P" indicate which application provides the primary functionality for a business process. Cells marked with "X" indicate that one or more other applications also provide some supporting functionality for the business process.

So, look at the circled red cell as an example. The "P" under the Eligibility Determination column shows that it provides the primary functionality required by the process named "Establish Shared Client Information". The reasoning is that client information likely to be shared across human services programs is largely collected during eligibility determination.

Slide 26 - Service Matrix Spreadsheet Provides Details

The **Service Matrix spreadsheet** shows additional detail about each proposed shared IT service and how the service relates to other aspects of the architecture.

A section of the spreadsheet is shown in the background of this slide. The spreadsheet:

- Names the service

- Identifies the core information exchange that supports the service
- Maps each service to one or more business activities
- Maps each service to one or more software applications
- Describes the service
- Classifies the service as to whether it is common, core, or custom

Jurisdictions might use this spreadsheet as a starting point for ideas about what shared services would promote interoperability. The spreadsheet currently lists more than 100 IT services. Jurisdictions will develop their own shared IT services based on what makes sense for them.

One of the artifacts from the Information Viewpoint provides additional details about the Information Exchanges. It also maps those exchanges back to the core IT services identified in the Service Matrix. That's another way the NHSIA viewpoints are connected.

Slide 27 - Summary

(No notes.)

Slide 28 - Systems Viewpoint Summary

So, the Systems Viewpoint describes the “to be” information systems in terms of interoperable software applications that use reusable services to share data.

The slide summarizes the key features of the viewpoint:

- It is based on a 4-layer Systems Reference Model
 - The Access layer provides a variety of options to enter the systems.
 - The applications layer contains interoperable software applications which support multiple human services programs
 - The Shared IT Services layer has reusable shared IT services which can support multiple interoperable applications within a jurisdiction. (~ 100 candidate services proposed)
 - Core services lay the foundation for sharing information among to authorized users.
- Various mappings are used to show the relationships among the elements of the Systems Viewpoint and relationships to other viewpoints:
 - For example, the software applications are mapped to business processes.
 - The Service Matrix provides additional details about candidate IT services and links each one to the business model's activities and to notional software applications.

Slide 29 - NHSIA Documents Related To This Webinar

Here are some documents that provide more information about the NHSIA Systems Viewpoint. These will be available soon on the ACF Interoperability Initiative Web site. The URL for the site is

<http://transition.acf.hhs.gov/about/interoperability>

Slide 30 - Webinar Series Wrap-up

That concludes the discussion of the Systems Viewpoint, the last viewpoint to be covered in this series of 5 webinars on NHSIA.

This next section provides a brief recap of the whole webinar series.

Slide 31 - NHSIA Concept

This figure illustrates the NHSIA concept. It presents a simple model of human services at a very high level of abstraction. At its essence, the architecture supports the idea that human services are about people and organizations using systems built with modern technologies to collect and share information to take some action related to administering or delivering human services.

The unique characteristic of NHSIA is that it looks at the human services domain as a system of systems. We have attempted to define an architecture that will lead to coordinating and optimizing across multiple human services programs holistically, rather than developing and optimizing each system independently.

Slide 32 - NHSIA Provides a *Framework and Roadmap* to Achieve Common Goals

Recall that when we started this series of webinars, we said that NHSIA provides a framework or a blueprint for moving from today's (as-is) siloed situation to a future (to-be) state where some significant goals have been achieved.

The intent is that the architecture identifies some business processes that are common across human services. In the context of those processes, the architecture suggests which information exchanges are good candidates for standardization. The architecture points out the benefits of sharing the information technology infrastructure – both in terms of hardware and architectural patterns. The architecture also envisions a comprehensive approach to collecting data to support performance management.

On the right you see a list of goals for the architecture: more efficient and effective processes, better access to information... all leading to improved delivery of human services and better outcomes for clients.

Slide 33 - Summary of NHSIA Features

NHSIA is based on extensive analysis and documented in several hundred pages of text and diagrams. However, this relatively short list of features captures its essence.

- NHSIA is a community architecture to enable sharing:
 - Business processes
 - Information
 - Applications & IT services
 - Infrastructure
- NHSIA builds on prior efforts
 - MITA, NIEM, GRA, GFIPM
 - Thought-leading implementations
- Comprehensive approach to performance management

- Service-oriented architecture
- Identity management and attribute-based access control
- Core services for finding and accessing information about clients, cases, providers, and programs
- Function-oriented applications vs. program-oriented (e.g., integrated eligibility)
- Shared supporting applications (e.g., document management)
- Can be implemented incrementally

The bottom line is that improved information will support improved decision making at all levels.

Slide 34 - NHSIA Core IT Components

We just looked at this slide in the Systems Viewpoint discussion, but we included it again here to emphasize that there are four essential components in what we call the NHSIA Core. These are:

- the service oriented infrastructure;
- local, state, and federal hubs;
- core IT services, and
- performance information repositories at the local, state, and federal levels.

We believe that these are the elements that should be implemented first by state and local jurisdictions to allow evolution to a more comprehensive NHSIA implementation.

Slide 35 - Security Aspects Are Addressed Across the Viewpoints

Security is an essential aspect of NHSIA that runs through all the viewpoints:

- The capability viewpoint defines the high level need for controlling access to information.
- The business viewpoint includes processes for establishing a user's access privileges.
- The information viewpoint defines some of the information needed to permit secure information sharing, such as memoranda of understanding.
- The systems viewpoint defines IT services needed to authorize access. Applications must enforce access controls.
- The infrastructure viewpoint provides the framework for a trusted environment for identity management, single sign-on, and other security features.
- And finally, the project viewpoint recommends leveraging other efforts such as the Global Reference Architecture (GRA) and Global Federated Identity and Privilege Management (GFIPM) framework.

Taken together, these items provide a comprehensive framework for information security.

Slide 36 - Viewpoint Relationships

This final slide is a reminder that all the viewpoints work together to provide a comprehensive description of the National Human Services Interoperability Architecture. Just as the description of an architecture for a house includes views that are specifically used by the owner, the contractor, the carpenter, the electrician, etc., the NHSIA viewpoints are useful to different audiences such as the agency director, the agency CIO, the business process owners, the developers, and so forth.

As shown here, the capabilities viewpoint defines the high level requirements that drive the other viewpoints. The business viewpoint is central – defining the business processes and scenarios. The business viewpoint drives the definition of what information should be shared, as expressed in the information viewpoint. The business viewpoint also drives how IT should be used, as expressed in the systems and infrastructure viewpoints.

Finally, the Project viewpoint defines a strategy for moving from the as-is situation to the to-be situation envisioned by NHSIA.

That concludes our wrap-up of this NHSIA webinar series. With that I will turn it back over to Dave Tabler for any questions.

Slide 37 - Questions and Next Steps

(No notes.)

Slide 38 - Questions?

Now we'll open the phone lines and take your questions. If you aren't speaking, please mute your phone by pressing *6. To speak, press *6 again. Any questions?

Slide 39 – Website Screenshot

This is a screen shot of the top half of the ACF Interoperability web site. The NHSIA documentation is available on this web site. This will include the webinar slides and a transcript of each webinar.

Slide 40 - Thank you for participating

If you scroll down on the ACF Interoperability Initiative site, you will see a list of NHSIA documentation. More documents will be added as time goes on.

Thank you for joining us today. We welcome your feedback about NHSIA.

Slide 41 - Reference Material: Summary of Viewpoints

The following slides are included as reference material.

Slide 42 - Capability Viewpoint Summary

(No notes.)

Slide 43 - The Capability Viewpoint Describes the Envisioned Future (the “To-Be State”)

The Capability Viewpoint provides a high-level, yet specific description of what new or improved capabilities would result from the implementation of the NHSIA.

As we use the term, **a capability is the ability to achieve a desired objective in the human services domain under specified standards and conditions.** Capabilities are defined independently of specific

technology implementation approaches to the extent possible. The Capability Viewpoint defines the new operational capabilities in high-level, user oriented terms.

Capabilities have been grouped into the eight major categories shown in the slide. Several detailed capabilities are defined for each high-level capability. There are a total of ~50 detailed capabilities. An example of one is highlighted in blue in the slide.

Slide 44 - Business Viewpoint Summary

(No notes.)

Slide 45 - The Business Viewpoint Describes the Processes to Be Supported

The Business Viewpoint provides a functional, technology-independent model of the human services “business”. It describes the “who, what, and why” that motivates the “how” examined in the System, Information and Infrastructure Viewpoints. The business model describes business processes and their associated activities. The other viewpoints explore the services, applications, information exchanges, and infrastructure components associated with these business processes.

The NHSIA Business Viewpoint focuses on processes which share common elements across human services programs. It highlights opportunities for information sharing and re-use of components across programs.

Finally, the NHSIA Business Viewpoint is generic in the sense that it is intended to apply across human services programs. Federal programs would apply the NHSIA model to the business operations of their specific program to develop their own business model (e.g., MITA is a business model for Medicaid).

The top level of the NHSIA Business Model comprises 10 business areas. A business area includes a set of business processes that support a major function (e.g., finance) or stakeholder group (e.g., client).

Five business areas are detailed in the current NHSIA documentation – these are highlighted in the red outline in the figure. These business areas appear to be the most common to a wide range of human services programs.

Slide 46 - Information Viewpoint Summary

This slide lists the NHSIA documents that are related to the Information and Infrastructure Viewpoints. They will be available from the ACF Interoperability website.

The URL for the site is <http://transition.acf.hhs.gov/about/interoperability>

Slide 47 - The Information Viewpoint Describes the Information to Be Shared

The Information Viewpoint describes the business information requirements for the NHSIA architecture. The Information Viewpoint leverages existing data standards and ongoing standardization efforts in the area of Health and Human Services.

The Information Viewpoint includes a conceptual data model (CDM) which was derived by analyzing the information needs of the business processes defined by the Business Viewpoint. The CDM provides a vocabulary to be used in the other viewpoints.

The CDM vocabulary is useful at this stage in the evolution of NHSIA and associated NIEM standards. As the NIEM Human Services Domain is developed, NIEM will provide the vocabulary needed to support definition of information exchange standards.

Slide 48 - Infrastructure Viewpoint Summary

(No notes.)

Slide 49 - The Infrastructure Viewpoint Describes a Recommended Technical Foundation

The infrastructure layer includes IT services, systems, and data not unique to human services domains. This layer includes the tools for applications to discover and use the shared services. The elements in this layer include the enterprise service bus. Basic capabilities include mediation, routing, and data and protocol transformation. The layer includes a service registry and service broker functions. Elements in this layer include the commercial off-the-shelf IT services, hardware, and software that support all the upper layers. Examples of components in the infrastructure layer include adapters, application servers, and data integration servers.

Slide 50 - Systems Viewpoint Summary

(No notes.)

Slide 51 - The Systems Viewpoint Describes the “To-Be” IT Systems

The Systems Viewpoint describes the new and legacy system components included in each of the layers of the to-be architecture. The Systems Viewpoint is organized into a four-layer systems reference model as shown in the figure.

Access Layer

The access layer includes components for presenting human services information to people, information technology (IT) services for people, and traditional (non-automated) interactions with people. Examples include kiosks, browsers, call centers, and forms.

Applications Layer

The applications layer includes high-level applications that normally support multiple human services domains, agencies, and programs. In this context an “application” is application software - a computer program designed for end users to accomplish specific tasks. Examples of components in the applications layer include: eligibility determination, case management, partner management, performance monitoring, rules engines, workflow systems, document management systems, analytics packages, etc.

Shared IT Services Layer

The shared services layer includes components that deliver functionally-oriented IT services and information (application services and data services) that are unique to the human services domains. Examples of shared services include updating information about a person or verifying credentials for a service provider. The information and information structures shared by multiple applications (e.g., master person index) also appear in this layer. “Wrappers” to enable legacy systems to discover and use shared services are in the shared services layer.

Infrastructure Layer

This layer includes IT services, systems, and data not unique to human services domains. The Infrastructure Viewpoint discusses this layer and architecture patterns applicable to NHSIA.