Prepared for the:

Administration for Children and Families (ACF)

National Human Services Interoperability Architecture

Systems Viewpoint Description

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Draft Issue

It is important to note that this is a draft document. The document is incomplete and may contain sections that have not been completely reviewed internally. The material presented herein will undergo several iterations of review and comment before a baseline version is published.

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Review and comments to this document are welcome. To comment, either post your feedback in the NHSIA_Drafts_Comments library or send comments to NHSIAArchitectureTeam@jhuapl.edu.

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1 Introduction

1.1 NHSIA Overview and Objectives

The National Human Services Interoperability Architecture is being developed for the Administration for Children and Families (ACF) as a framework to support integrated eligibility determination and information sharing across programs and agencies, improved delivery of services, prevention of fraud, and better outcomes for children and families. It consists of business, information, and technology models to guide programs and states in improving human service administration and delivery through improved interoperability of business processes and information technology (IT).

The primary goal of the NHSIA Project is to develop a national architecture to enable information exchange and sharing IT services across currently siloed federal, state, local, and private human service information systems. It is envisioned that the ultimate outcome for stakeholders following NHSIA guidance will be:

- Interoperability of IT elements and associated business processes
- Improved care provided to clients by holistically addressing their needs - e.g., "no wrong door"
- Comprehensive, integrated support for client-oriented case workers at point of service
- Incremental insertion of new services and technology
- More flexible, adaptive systems
- Reduced cost of operation and maintenance for all levels of government and the private sector through sharing and reuse of services, data, and IT resources
- Reduced fraud through automated and coordinated enrollment, verification and eligibility determination
- Greater availability of timely program data for evaluating program performance
- Better connections between human services and health and education services, and able to leverage advances made in those areas

1.2 Architecture Framework and Viewpoints

An **architecture** is a description of the components, structure, and unifying characteristics of a system. An enterprise architecture is a rigorous, comprehensive description of an enterprise, including mission and goals; organizational structures, functions, and processes; and information technology including software, hardware, networks, and external interfaces. NHSIA can be thought of as a multi-enterprise, or **community architecture.**

An **architectural framework** is a structure for describing an architecture. The NHSIA project has adapted the frameworks defined by the Federal Enterprise Architecture (FEA)[1] and the DoD Architectural Framework (DoDAF)[2], and has incorporated applicable features of the Medicaid IT Architecture (MITA) Framework[3]. DODAF has evolved over a decade to include multiple viewpoints. NHSIA has adapted DODAF to include the viewpoints shown in Figure 1–1. The adaptations include merging the DODAF Systems and Services viewpoints into a single Systems Viewpoint and pulling out an Infrastructure Viewpoint as a separate item from the systems viewpoint.

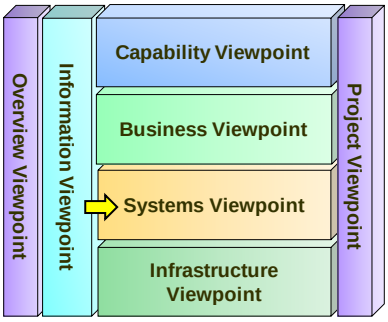

Figure 1–1. NHSIA Viewpoints

1.3 Architecture Documentation

NHSIA is documented by a viewpoint description for each viewpoint. Each of these viewpoint descriptions is supported by more detailed documents including white papers, spreadsheets, diagrams, presentations, and products of specialized architectural tools. The viewpoint descriptions and associated products are referred to as architectural artifacts. This viewpoint description document addresses the Systems Viewpoint.

This D0.2 version includes modest revisions to reflect alignment with the draft NHSIA Project Viewpoint[4] documents released in early 2012 and to align with D0.2 versions of NHSIA white papers and other viewpoints. This version does not identify all potential shared IT services or applications that would support the entire realm of business processes associated with managing, administering, and delivering human services. The IT services and applications described in this version of the Systems Viewpoint are representative of the full suite.

[1] http://www.whitehouse.gov/omb/e-gov/fea/
[2] DoD Architecture Framework, version 2.0, Volume 1: Introduction, Overview and Concepts, Manager's Guide, 28 May 2009.
[3] https://www.cms.gov/MedicaidInfoTechArch/
[4] NHSIA Project Viewpoint, version D0.2, March 2012. Available on the NHSIA SharePoint site. Access to the site requires a username and password; please contact NHSIASharePointAdministrator@jhuapl.edu for access.

2 Systems Viewpoint Summary

The Systems Viewpoint describes new and legacy system components in the layers of the to-be architecture. The focus is on the desired end-state functionality of human services systems to improve the outcomes for clients and streamline operations for staff.

The primary audience for this viewpoint is those who are charged with improving existing architectures and systems to accomplish the goals of NHSIA. This viewpoint establishes a common vocabulary for discussing desired end state enterprise architecture components and how they will interact with each other and with stakeholders. The viewpoint should also be useful to those who build and integrate systems that support health and human services. Interoperability and reusability are key to NHSIA success and this viewpoint illustrates both aspects of the to-be architecture.

2.1 Systems Viewpoint Description

The Systems Viewpoint is organized into a four-layer reference model. 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 reuse 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.

Services can be built from the top down (based on business processes) or from the bottom up (based on existing transactions and applications). In identifying potential shared services, NHSIA used a top down approach to identify common IT services to meet the needs of the business processes and activities as described in the Business Viewpoint.

Figure 2–1 summarizes the capabilities envisioned for NHSIA.

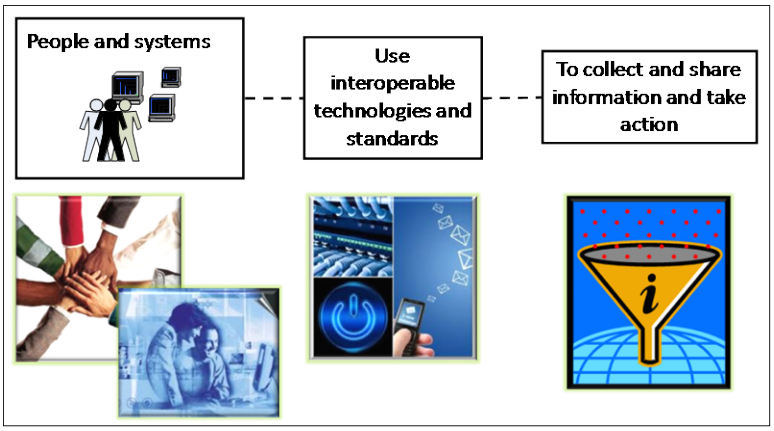

Figure 2–1. NHSIA Capabilities Summary

People and systems use interoperable technologies and standards to collect and share information to take action in support of delivering health and human services and effectively managing program performance.

Figure 2–2 shows the layers in the NHSIA systems reference model. Chapter 3 explains the systems reference model at a high level. Chapter 4 identifies architecture drivers. The remaining chapters provide additional information about each layer and interconnections and relationships.

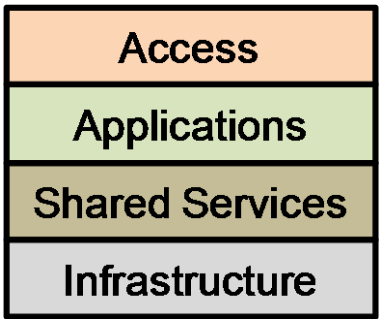

Figure 2–2. Layers in the NHSIA Systems Reference Model

To establish a common frame of reference, the NHSIA Business Viewpoint defines some of the key terms used in this and other architecture documents for information, actions, and stakeholders.

The NHSIA system components support the business processes and activities described in the Business Viewpoint. This version of the Systems Viewpoint focuses on three key business areas:

- Client management
- Eligibility and enrollment (processes EE1-EE5)
- Service management (a subset of the details provided in the corresponding version of the Business Viewpoint).

In Figure 2–3 the green box lists the people and organizations typically associated with delivering, supporting, and receiving health and human services. See the NHSIA Business Viewpoint for definitions of many of the terms used on these diagrams.

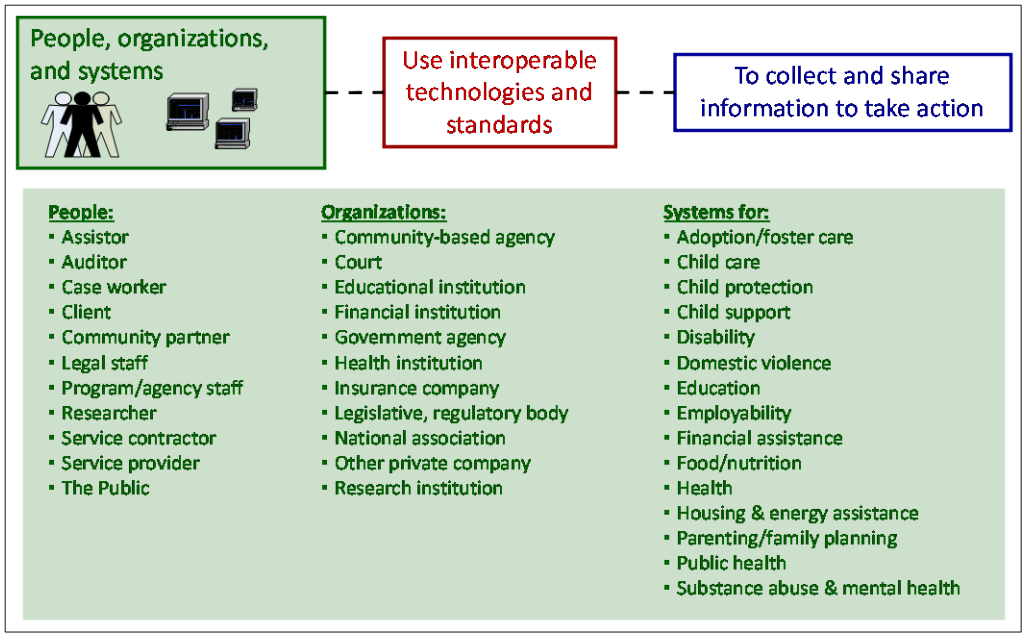

Figure 2–3. NHSIA Supports People, Organizations, and Systems

In Figure 2–4 the pink box identifies the kinds of technologies and standards, access points, and structures likely to be involved in supporting interoperable processes and information sharing across human services domains. The Infrastructure Viewpoint addresses many foundational concepts, architecture patterns, and components to provide interoperability.

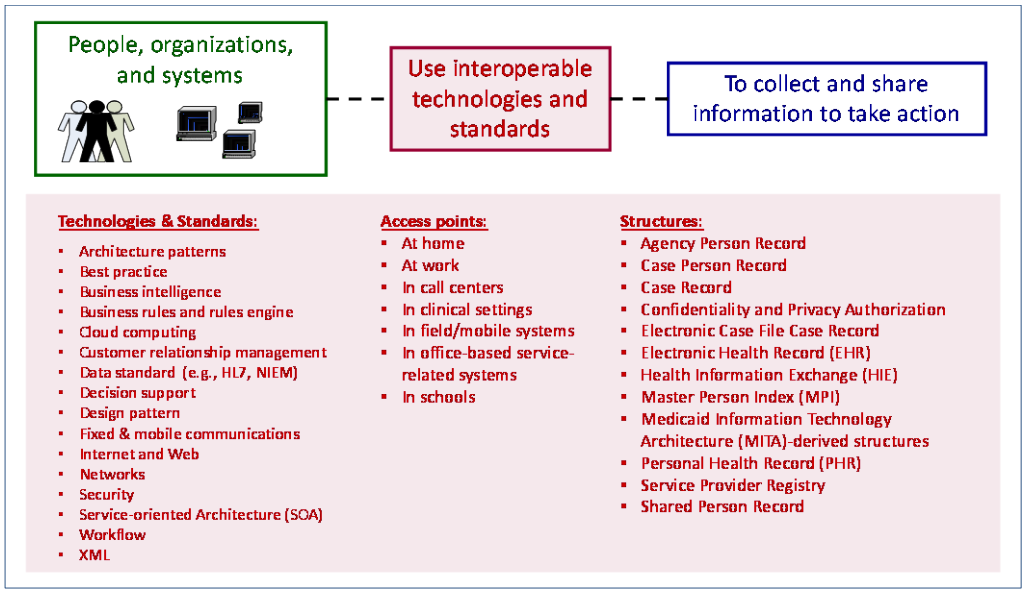

Figure 2–4. NHSIA Identifies Technologies and Standards for Interoperability

In Figure 2–5 the blue box identifies the kind of information likely to be collected and shared as well as the purposes for the information.

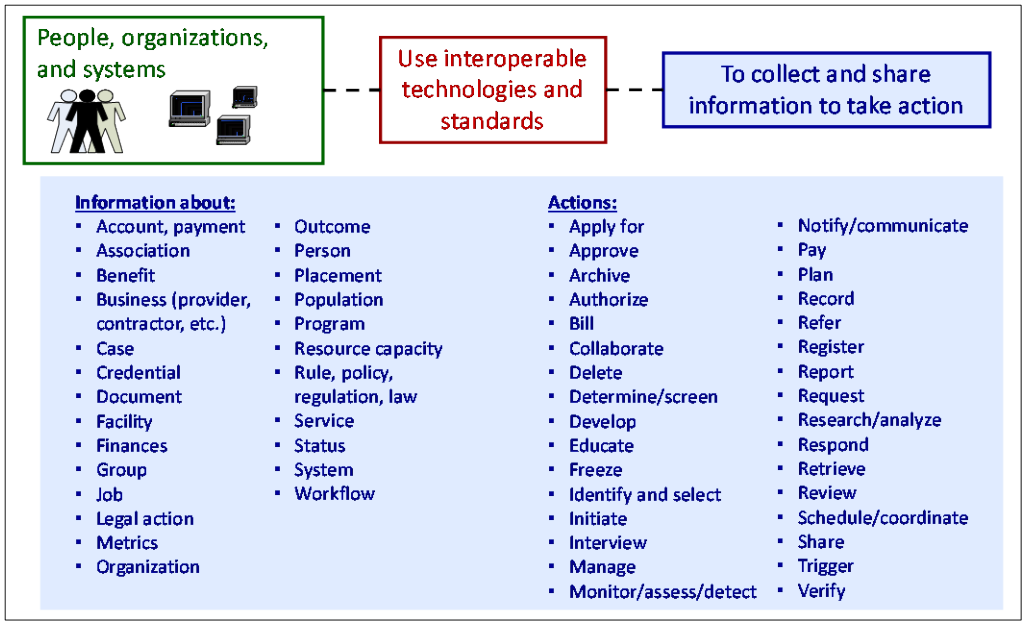

Figure 2–5. NHSIA Describes Sharing Information to Support Human Services Actions

Figure 2–6 illustrates that health and human services involve staff members at different levels of government and the private sector. Recipients of the services include clients and people in the general public.

In this context, the government boxes include the staff directly involved in delivering or supporting the delivery of health and human services. In some jurisdictions, government staff members may interact directly with clients as caseworkers. Typically, government staff members may be administrators, analysts, auditors, information technology (IT) staff, managers, planners, supervisors, and other agency workers. Staff members may be in federal, regional, state, local, or tribal agencies; be part of national associations; be affiliated with educational institutions; or support legislative or regulatory bodies. Typically federal government agencies provide guidelines and criteria for federal programs, support standards development, monitor programs, and check for compliance. Federal agencies also provide funding and educational information. Federal programs require reporting. Systems at the federal level support the federal government's requirements. Regions (often states, counties, townships, or other jurisdictional groupings) sometimes establish coalitions to share resources, information, and responsibilities related to delivery of human services. State government agencies typically manage regional or statewide programs. State agencies often provide services not related to the direct delivery of care (e.g., payment processing and reporting). State agencies also provide funding and educational information. State programs support reporting to the federal level and require their own reporting. Systems at the state or regional level support the state government's requirements. State, regional, local, and tribal government agencies may administer programs and pay for services.

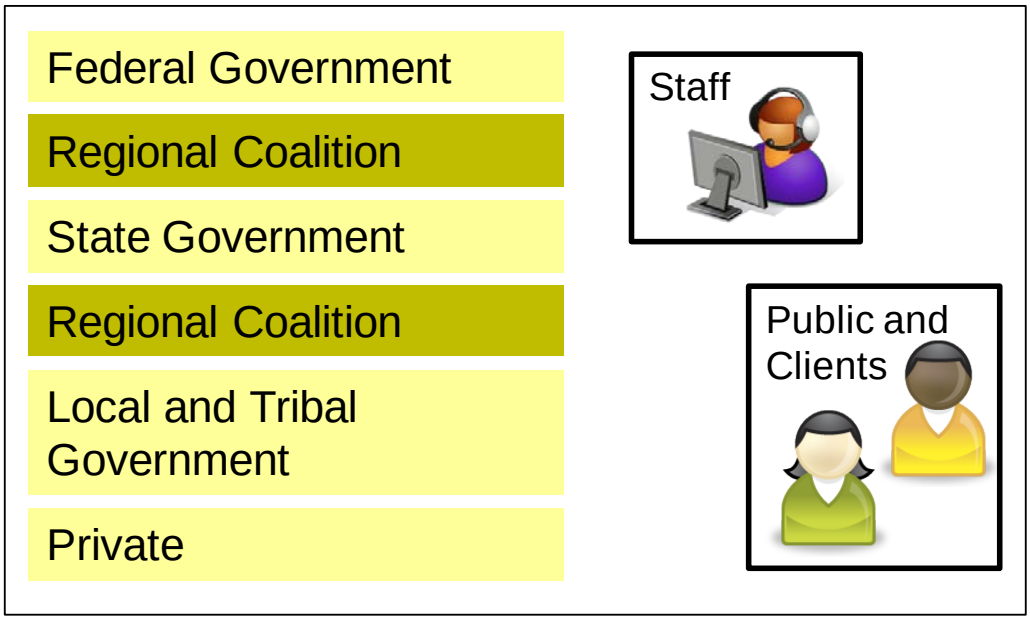

Figure 2–6. Different Levels of Government and the Private Sector Support Human Service Delivery

The private sector also interacts directly with clients as caseworkers. The private sector also includes administrators, analysts, auditors, IT staff, managers, planners, and supervisors. Service

providers, service contractors, and other community partners fall into the private sector. Organizations in the private sector include private organizations, national associations, insurance companies, educational institutions, health institutions, financial institutions, and other private companies. At the community level, regional, local/tribal government and private organizations provide care and services in a holistic manner, assist clients in navigating the services, and collect data at the point of care or service.

The public may access information about available services. Clients typically receive services.

See the Business Viewpoint for more information about the roles of stakeholders.

This architecture addresses various domains of human services. The domains include:

- ⇨ Adoption/foster care
- ⇨ Child care
- ⇨ Child protection
- ⇨ Child support
- Disability
- Domestic violence
- Education (lifetime scope)
- ⇨ Employability
- ⇨ Financial assistance
- ⇨ Food/nutrition
- Health
- ⇨ Housing and energy assistance
- Parenting/family planning
- Public health
- Substance abuse and mental health

This is an incomplete draft of the intended document. In this version of the Systems Viewpoint, the focus is on the blue domains marked with an arrow (⇨).

2.2 Systems Viewpoint Artifacts

Table 2-1 summarizes the major artifacts currently included in the Systems Viewpoint. Several of the major artifacts comprise additional artifacts. Chapters of this document contain the text about the artifacts and point to separate files that provide additional information.

Table 2-1. Systems Viewpoint Artifacts

Artifact	Form & Description
Systems Reference Model	Form: Illustration and descriptive text
	Description: For system architects. Provide a guide for structuring each jurisdiction's architecture around interoperable and reusable elements rather than stove-piping systems by program or agency.
Access Layer	Form: Text
	Description: For system architects. Describe, at a high level, different elements of the access layer. Identify the stakeholders likely to use each approach.
Applications Layer	Form: Illustrations and text
	Description: For system architects. Identify and describe, at a high level, representative interoperable applications to support human services. Tie to related key concepts in NHSIA. List major functions.
Shared Services Layer	Form: Text and matrix.
	Description: For system architects. Describe, at a high level, representative interoperable shared IT services. Explain how they support the NHSIA business model.
Connections & Relationships	Form: Text and matrices.
	Description: For all readers. Map applications to business processes. Map shared services to business activities and applications. Describe candidate data structures.

3 Systems Reference Model Layers: Overview

The NHSIA systems reference model provides a framework for understanding relationships among the components in the stakeholder IT environment. The systems reference model is comprised of four layers:

- Access
- Applications
- Shared Services
- Infrastructure

3.1 Access

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 of components in the access layer include kiosks, browsers, call centers, and forms.

3.2 Applications

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. What constitutes a “domain” depends on how the jurisdiction organizes its services. Examples of components in the applications layer include human service applications that support multiple domains: eligibility determination, case management, and others. This layer also includes program management applications that support multiple programs: 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 (e.g., one application that handles eligibility determination and enrollment) to support multiple activities in one or more domains, agencies or programs. Finally, this layer includes supporting applications such as rules engines, workflow systems, document management systems, and analytics packages. Applications should be interoperable so that users can easily accomplish all their tasks seamlessly.

3.3 Shared Services

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.

3.4 Infrastructure

The infrastructure layer includes IT services, systems, and data not unique to human service 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. Please see the Infrastructure Viewpoint for a discussion of this layer and architecture patterns applicable to NHSIA.

4 Architecture Drivers

Architectural drivers are externally imposed authoritative mandates, policies, or conditions that strongly influence the development of NHSIA. These include:

- Achieve interoperability across programs and jurisdictions
- Architectural scalability to allow easy and rapid expansion to more jurisdictions and clients
- Reuse processes, infrastructure, and systems by multiple programs and jurisdictions to reduce life cycle costs and share best practices
- Use commercial-off-the-shelf (COTS) software to reduce life cycle costs
- Minimize life cycle cost, achieve a demonstrable return on investment (ROI)
- Information is maintained in multiple, geographically distributed, heterogeneous data structures
- Assure data privacy and confidentiality in compliance with government policies (e.g., Health Insurance Portability and Accountability Act of 1996 (HIPAA))
- Leverage Federal investments in health care (e.g., as a result of the Patient Protection and Affordable Care Act (ACA))

These drivers influenced the development of the systems reference model and the identification of proposed applications and shared services described in this document.

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5 Access Layer

The access layer (Figure 5–1) includes components for presenting human services information and services to people, information technology (IT) services for people, and traditional (non-automated) interactions with people. People may access human services (HS) information and services via electronic devices (computers, telephones, fax machines, or other). People may also interact directly with other people to access HS information and services.

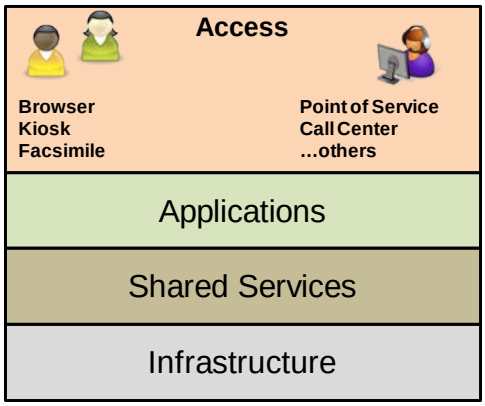

Figure 5–1. Access Layer

Sections in this chapter describe different access layer components. The components in this layer include:

- Browser
  - Web portal
  - Web site
  - Interactive forms
- Walk-up self-service kiosk
- Telephone-based access
  - Voice mail system
  - Automated call center
  - Facsimile
- Traditional person-to-person interactions
  - Point of service
  - Staffed call center

Most sections describe access via electronic devices. Section 5.4 summarizes person-to-person interactions that provide support via electronic device for at least one of the participants in the interaction. All access methods are applicable to any human services domain.

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.

5.1 Browser

People use a commercial browser (e.g., Internet Explorer, Firefox, or Safari) to locate and display pages on the World Wide Web (WWW) or local intranet sites. In this document we use the label "Web" to refer to either the WWW or a local intranet.

5.1.1 Web portal

Description
A Web portal is a Web-based interface that provides access to a collection of information and services. Portals, also called "one-stop shops", typically enable users to perform several functions to meet many of their requirements from a single starting point. A portal may provide particular information and entrée for human services. A portal may also provide more generic capabilities such as sending e-mail, searching for information, etc.

Stakeholder Applicability

- All.
- May not be necessary at a private organization that provides a small set of human services.
- Used by public (for access to services and information) and staff (for access to intranet).

Business Processes Supported
Most

5.1.2 Web site

Description
A collection of related Web pages. May include text, images, forms, videos, or other digital assets. Access to a site or sub-site may be open to all or restricted to only authorized users.

Stakeholder Applicability
All

Business Processes Supported
Most. External Web sites will support the public. Internal Web sites will support agency staff.

5.1.3 Interactive forms

Description
Electronic fill-in-the-blank equivalents of paper forms. Information collected is saved for future retrieval. Ideally, the form could be pre-populated from existing electronic information.

Stakeholder Applicability
Most likely to be provided by agencies that interact with the public.

Business Processes Supported

Client Management, Eligibility and Enrollment Management, Provider Management, Contractor Management, Financial Management, Service Management.

5.2 Walk-up self-service kiosk

The public uses a self-service kiosk to access information and provide information. Installed in a public place. Substitutes for a personal computer.

Stakeholder Applicability
Provided by agencies that interact with the public.

Business Processes Supported
Client Management, Eligibility and Enrollment, Service Management

5.3 Telephone-based access

People use the telephone to access information. Automated phone systems may be used to receive a limited set of inputs from the caller. Staffed call centers or agencies may receive more extensive information from the caller.

5.3.1 Voice mail system

Description
A telephone system that is usually menu-based. Allows users to exchange personal voice messages, to select and deliver verbal information, and/or to process selected transactions.

Stakeholder Applicability
All

Business Processes Supported
All

5.3.2 Automated call center

Description
A telephone system that is menu-based; a special version of the voice mail system described above. Allows callers to listen to information about specific topics and complete selected transactions. Considered an automated way to deliver some customer service.

Stakeholder Applicability
Wherever “help” functions are provided to the public, clients, or other stakeholders.
May be used by the end-users or by people who support a staffed call center.

Business Processes Supported
Most likely: Client Management, Eligibility and Enrollment, Service Management
Also may support any other business area.

5.3.3 Facsimile

Description
In this context, a phone-based system to scan and send information from a page (e.g., printed document or image) to a receiving fax machine (or computer).

Stakeholder Applicability
Wherever paper-based information must be shared.

Business Processes Supported
All

5.4 Traditional person-to-person interactions

Traditional person-to-person (e.g., prospective client-to-worker) interactions will remain a key element of access to human services. Those interactions should use the applications, shared IT services, and infrastructure that support other (electronic) access methods.

5.4.1 Point of Service

Description
Typically a fixed location where “customers” can meet with agency staff about human services. The staff will have access to computer-based tools to support the interaction with the customer. The meeting may be in person, via telephone, or via computer-based collaboration tools.

Stakeholder Applicability
All

Business Processes Supported
All

5.4.2 Staffed call center

Description
Handle telephone interactions with the public. Respond to requests from callers. Provide information about specific topics and complete transactions. Some staffed call centers handle both general requests and those that are specific to a person. The call center staff uses online tools to retrieve information and record information.

Stakeholder Applicability
All

Business Processes Supported
Most likely: Client Management, Eligibility and Enrollment, Service Management
Also may support any other business area.

6 Applications Layer

The applications layer (Figure 6–1) 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. What constitutes a "domain" depends on how the jurisdiction organizes its services. Examples of components in the applications layer include human service applications that support multiple domains: eligibility determination, case management, and others. This layer also includes program management applications that support multiple programs: 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 (e.g., one application that handles eligibility determination and enrollment) to support multiple activities in one or more domains, agencies or programs. This layer may also include supporting applications (e.g., document management) that are used across many different business areas and human services domains.

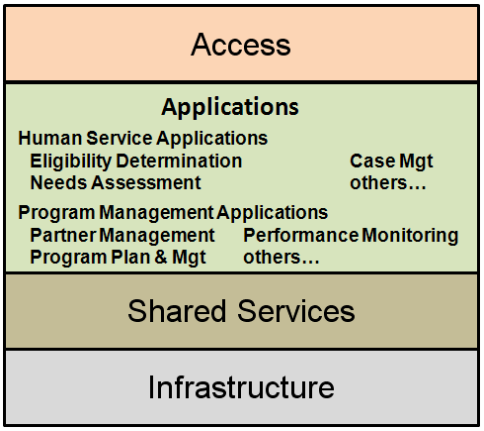

Figure 6–1. Applications Layer

An application is likely to apply to more than one domain. 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.

Different human services domains 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.

Each domain may continue to use one or more unique applications. For instance, AFCARS (Adoption and Foster Care Analysis and Reporting System) and NCANDS (National Child Abuse and Neglect Data System) are likely to continue to be used for managing state inputs and providing information access. Policy and/or regulatory changes may be required to reshape or retire government systems.

6.1 Human services applications

Human services applications support clients, caseworkers, and their supervisors. Figure 6–2 illustrates a typical cycle for human service delivery. The boxes also correspond to major applications described in this section. Additional elements of the human services delivery cycle may be defined in future versions of this document. As the NHSIA Business Model evolves, the list and descriptions of human services applications will also evolve.

A member of the public expresses interest in receiving services. To determine eligibility for different programs the person provides basic information (name, income, situation, etc.).

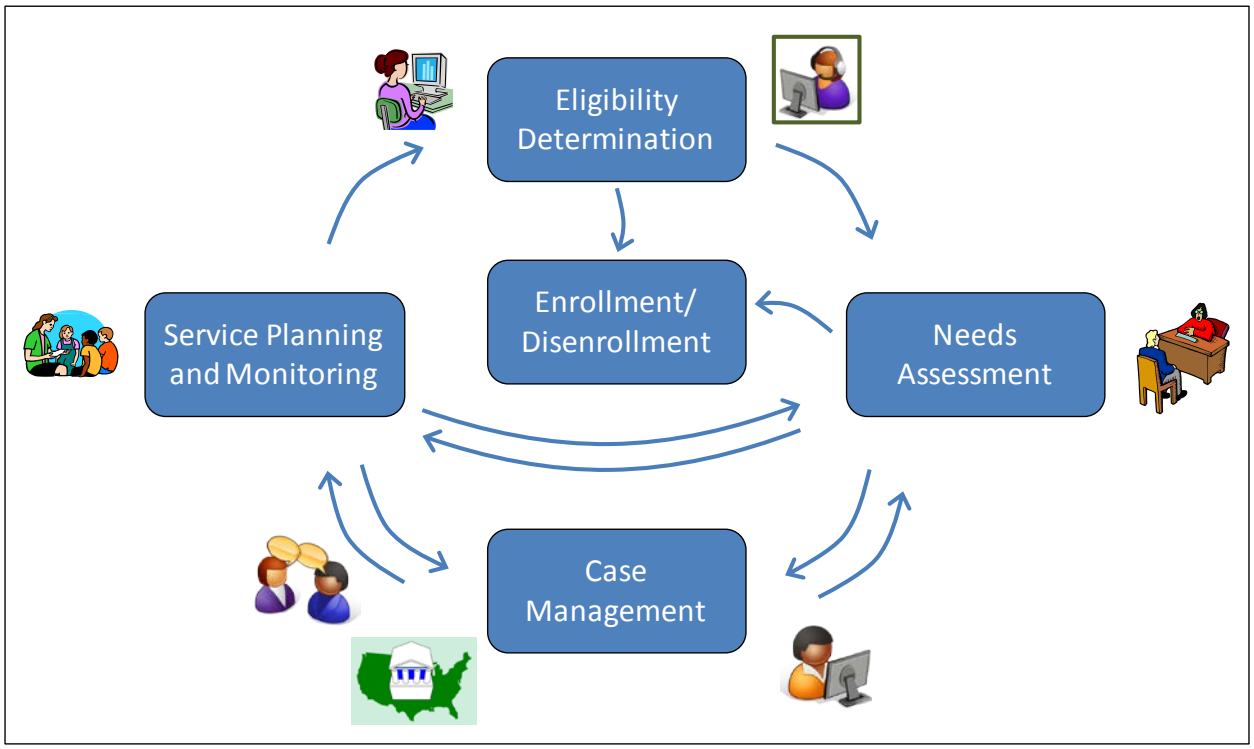

Figure 6–2 Human Services Cycle

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. Agency supervisors manage caseloads and assign a worker to each case (not shown on the diagram). 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 applications described in this chapter may be distinct or partially integrated. Because a single application that supports all tasks is not affordable or feasible for practical reasons (e.g., risk management), jurisdictions are likely to choose to implement the applications as several separate applications. 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.

The application descriptions reflect the concepts explained in various NHSIA white papers (see How the Client and Case Management are Addressed in NHSIA, Master Person Index Services, and Eligibility White Papers). Some of those key concepts include:

- A client is a person, small group, or larger population that is receiving or may receive human services.
- The NHSIA perspective is that services provided to a client are part of the overarching "case" managed for that client by a caseworker, program/agency, or service provider. Case documentation includes client needs, plans developed to address the needs, the services provided, and the outcomes of those services. Each agency has a case related to the services they provide to a client. NHSIA uses these definitions for the information structures associated with a case:
  - Case Entry - The smallest unit of information entered on a case record. This may include situational information, service plan(s), enrollment status, case notes, client notifications, records of client contact, residence validation record, authorization for release of information, etc. May include pointers to documentation about the case.
  - Case Record - Collection of case entries held by a caseworker, service provider, or program/agency staff system. A case is associated with a client and may address one or more services.
  - Case Portfolio - Grouping of multiple Case Records aggregated to reflect a client's service history and status. Includes both active and inactive Case Records. Represents service history over the client's lifetime.
- Each member of a client group is a "person". NHSIA uses this definition for the information structure associated with a person:
  - Person Record - Captures information about an individual person that applies to any case with which the person is associated. NHSIA includes the notion of a "Shared Person Record" that is accessible to more than one agency, based on permissions and role. This contrasts with an "Agency Person Record" that is used by a specific agency. "Person information" is generic term for all or part of the information in a Person Record (person identifier, contact information, demographics, education, employment, family and references, finances, health, legal/ court history, name, other identifiers).
- To refer to someone who is a client of a case, NHSIA has adopted the term "case person". NHSIA uses this definition for the information structure associated with a case person:
  - Case Person Record - Captures information about the association of a person with a case. "Case person information" is a generic term for all or part of the information in a Case Person Record (case person identifier, case identifier, person identifier, case member status within the case, client group head flag, dates into and out of the case, relationship information for the case). Each agency has a case person record for every person who is a client of a case. There may be multiple entries per record to show changes in status, entry and departure, and relationships.
- For every case, there is at least a Case Record, a Person Record, and a Case Person Record. The Case Record includes
  - Case identifier
  - The person identifier who is the head of the client group (e.g., head of household)

  - The client group size
  - Summary information about the case
  - Case entries.

  To find the all the members of the client group for the case, applications will look for Case Person Records that contain the case identifier. The client group size indicates how many case person records to look for.

- Ready access to Person Records is facilitated by a Master Person Index (MPI) and related information technology services. An MPI is a structure of identifying information about persons. It may be a physical or virtual structure. The MPI also shows how to link to information about the person in difference source systems. NHSIA expects each jurisdiction or coalition of jurisdictions to maintain its own MPI and make their MPI discoverable to all authorized users. A person should be active in only one MPI at a time. See the Master Person Index Services white paper for additional discussion of this concept.
- A Service Provider Registry captures key information about each provider that jurisdictions and agencies to share.
- Service providers maintain records about the services they provide to clients.

Figure 6–3 shows that applications share key information about persons, cases, case persons, and providers.

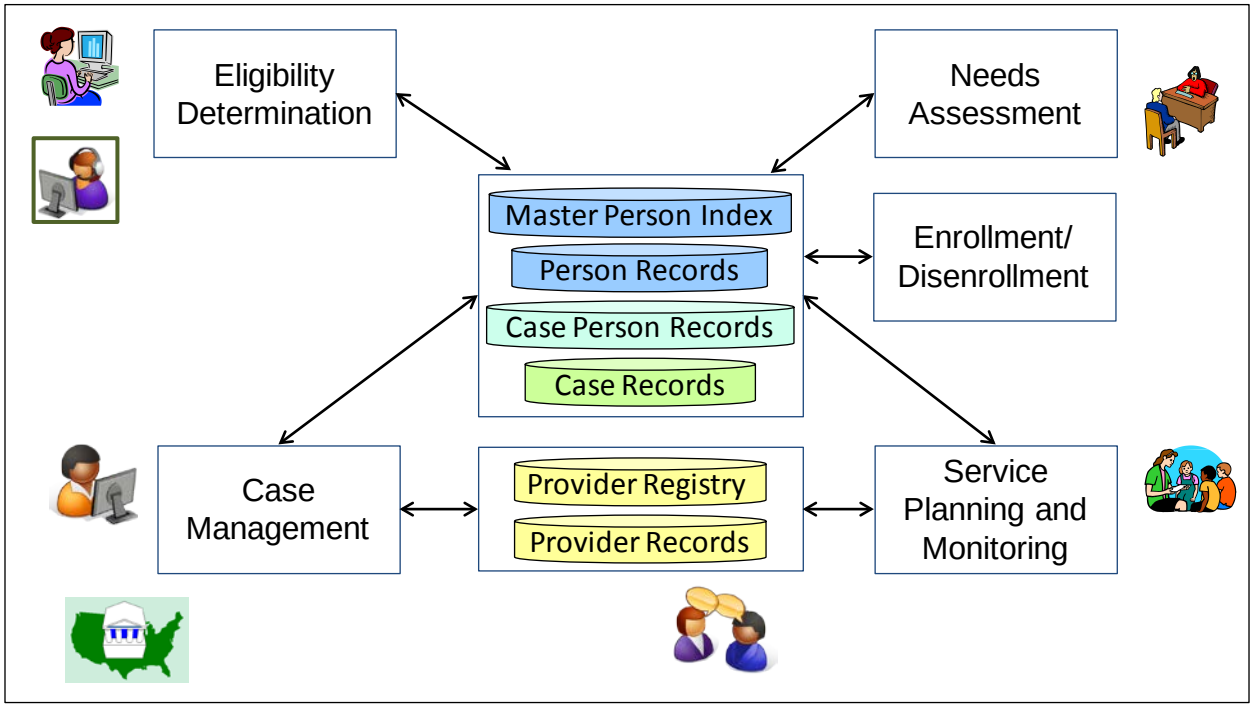

Figure 6–3 Applications Share Key Information

Common IT services (see 7 Shared Services Layer) provide access to shared information. See the separate Systems Viewpoint artifact Services Mapped to Applications for a list of IT services

that each application identified in 6.1.2 through 6.1.7 would invoke. NHSIA supports the definition of critical information exchanges (see the Information Viewpoint) to enable interoperability across agencies and human service domains.

Note that the applications do not include all functions associated with collecting and reviewing performance data to support performance management functions. When the business model is updated to explicitly identify the metrics to be collected, the applications and services will be expanded accordingly.

6.1.1 Interoperable human services applications

Ideally, caseworkers across agencies within a jurisdiction would be able to use a single portal to access an interoperable set of application to perform their tasks. This interoperable window into the applications would support eligibility determination, enrollment, intake and needs assessment, case management, service planning and monitoring. Each application would collect performance indicators for each human service and report the metrics as required. Each worker would be able to tailor his/her view of the applications to best meet their needs.

Figure 6–4 shows a typical sequence of activities that an interoperable approach would support.

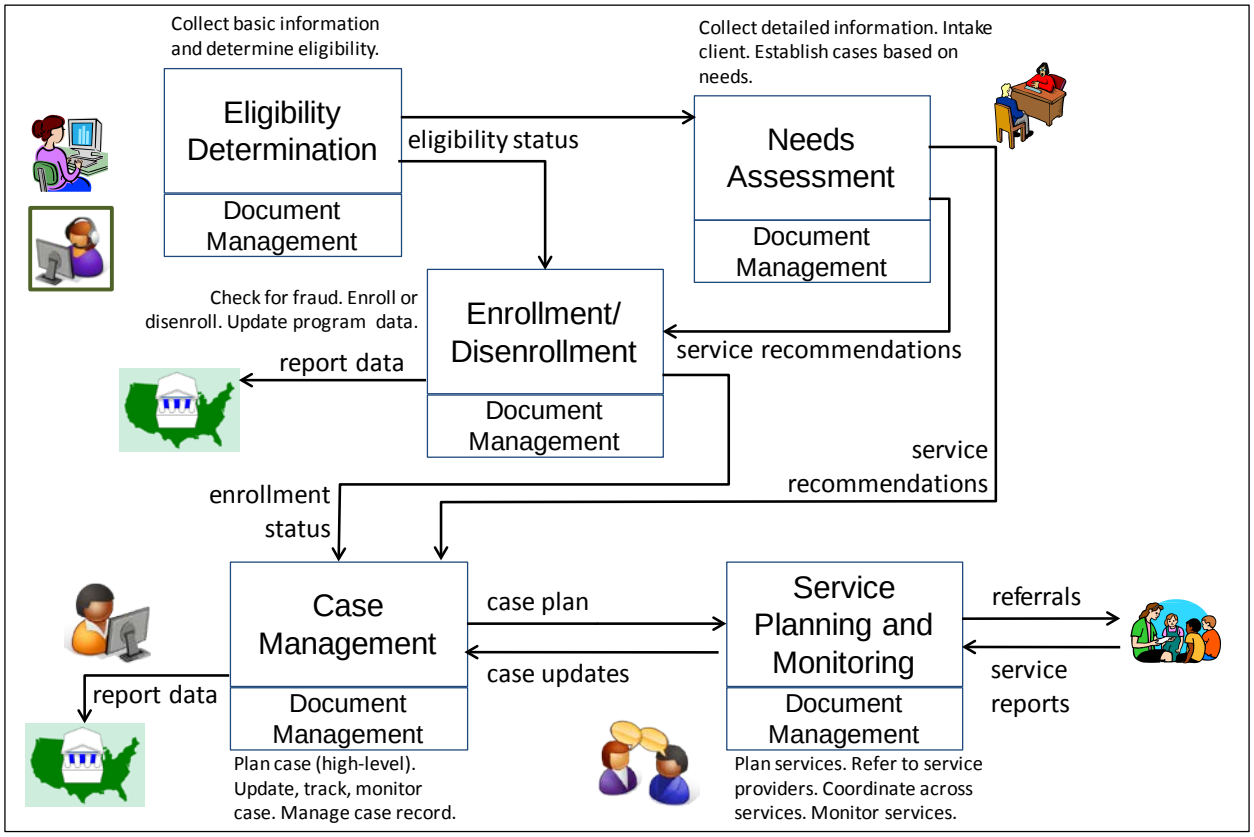

Figure 6–4 Typical Human Services Activity Flow

Document management (e.g., scanning a driver's license, importing a file) may be part of any step. Other supporting applications are not shown, but may apply. The figure shows only selected key outputs from each step. Throughout the cycle, the applications use and update the appropriate records.

Because a single application that supports all tasks is not affordable or feasible for practical reasons (e.g., risk management), jurisdictions are likely to choose to implement the applications as several separate applications. Sections 6.1.2 through 6.1.7 describe each box in the figure as a distinct application. Section 6.1.8 describes Caseload Management, which is not depicted on the figure. Each section provides this information in draft form:

- Description
- Domain applicability
- Delivery level
- Major functions

Section 6.1.9 identifies additional supporting applications. See Table 8-1 for a mapping of applications to selected business processes. See the separate Systems Viewpoint artifact Services Invoked by Applications for an initial and partial list of the proposed services that each application would invoke.

6.1.2 Eligibility Determination

Description
Using interview tools, the Eligibility Determination application collects basic information required to determine client eligibility for particular human services or programs. Some data may be initially populated from existing databases or smart cards (e.g., electronic health record, personal health record or driver's license). The application is a rule-based process that performs an automated assessment about eligibility. The application presents the results and solicits approval. Once approved, the application triggers follow-on processes.

Domain Applicability
All that require eligibility determination

Stakeholder Applicability
Primarily at the local/tribal level
Used by public, staff, and systems

Major Functions

- Collect basic information about the person (e.g., name, demographics, contact information, other identifiers, income, dependents, household situation)
- Check information versus independent sources
- Determine eligibility (e.g., for TANF, SNAP, etc.)
- Request eligibility approval
- Approve eligibility

- Trigger follow-on processes (e.g., needs assessment, case management for enrollment)
- Inform stakeholders
- Collect and report performance indicators

6.1.3 Enrollment/ Disenrollment

Description
The Enrollment/ Disenrollment application would typically be triggered by either the Eligibility Determination or Needs Assessment applications. The Enrollment/ Disenrollment application checks for potential fraud before enrolling the client in a program. This application completes the enrollment or disenrollment process, notifies stakeholders, and updates program-related data for reporting purposes.

Domain Applicability
Anywhere "enrollment" applies.

Stakeholder Applicability
Used by workers to support enrollment programs

Major Functions

- Check the client against lists of already-enrolled clients
- Check the client against lists of disqualified clients
- Confirm eligibility status
- If client is to be disqualified from future enrollment, update a "disqualified" list
- Enroll or disenroll client and update the appropriate enrollment status
- Update client records
- Update program records

6.1.4 Needs Assessment

Description
Using interview tools, the Needs Assessment application collects detailed information about the client and their situation. The application creates the initial case record(s) and case person record(s) for every person who is a member of the case. Using decision support tools, this application assesses the client's needs and makes initial recommendations about what kinds of services might be appropriate to meet those needs.

Domain Applicability
All

Stakeholder Applicability
Primarily at the local/tribal government or private level

Major Functions

- Collect detailed information about each person who is part of the client group and establish case
- Associate persons with the case
- Check information against independent sources
- Gather service history
- Identify needs
- Recommend services
- Identify candidate programs and benefits
- Trigger follow-on processes (e.g., case management for case planning)
- Inform stakeholders
- Collect and report performance indicators

6.1.5 Case Management

Description
This application collects, organizes, summarizes, evaluates, and manages ongoing case information. Workers use the application to develop a case plan, make updates to case information, and manage case records. Workers use this application to arrange for investigations and record results. Supervisors use the application to review and approve the case plan.

Domain Applicability
All

Stakeholder Applicability
According to jurisdiction's organization and administration approach, this application is used at the state or local level.

Major Functions

- Update case with case entry information
- Manage case records
- Check information against independent sources
- Plan case
- Request plan approval
- Review case
- Approve case plan
- Summarize case
- Determine case status
- Monitor case milestones and progress
- Track case (e.g., client visits and outreach activities, court hearings, telephone contacts, email contacts, administrative functions, etc.)

- Trigger follow-on processes (e.g., service planning)
- Inform stakeholders
- Collect and report performance indicators
- Respond to external requests for person, case person, and case information; control access

6.1.6 Service Planning and Monitoring

Description

Based on the case plan, caseworkers use this application to accomplish detailed service planning, coordination, referral, and placement for a client in a case. Rule-based processes make initial service provider recommendations. The caseworker can choose specific services and refer clients to or place clients with service providers. Rules also identify standard performance indicators associated with the planned services. The application also provides scheduling, notification, and collaboration capabilities to coordinate services. The application tracks the status of the referral, allows the worker or provider to record performance indicators, and monitors progress against planned milestones. Caseworkers will use this application in conjunction with the Case Management application; some jurisdictions may integrate the two applications.

Domain Applicability

Domains which require detailed service planning (e.g., adoption and foster care, child care, etc.)

Stakeholder Applicability

According to jurisdiction's organization and administration approach, this application is used at the state or local level.

Major Functions

- Plan service events
- Record service events
- Define key milestones and performance progress measurements
- Refer clients to providers for services
- Coordinate service activities across programs, agencies, and service providers
- Collaborate with colleagues and clients
- Monitor service delivery
- Trigger follow-on processes (e.g., case management for updates)
- Inform stakeholders
- Collect and report performance indicators

6.1.7 Document Management

Description
This supporting application stores and tracks electronic documents or images of paper documents. It associates the electronic files with the entity to which they relate (e.g., person, case, provider, agency, etc.). (Note: NHSIA assumes that electronic versions of documents are accepted as authentic by the human services community at large.)

Domain Applicability
All

Stakeholder Applicability
Wherever information is collected from clients or providers

Major Functions

- Enter, scan, or update document
- Enter or update document description
- Associate with related entity
- Manage versions
- Organize documents
- Support search and retrieval
- Control and track access
- Reproduce (e.g., print)

Note: Stakeholders may determine that it would be useful to provide similar descriptions of other supporting applications in a future version of this document.

6.1.8 Caseload Management

Description
Caseworkers and supervisors use this application to assign cases, review cases carried by caseworkers, measure workload, prioritize workload activities, and compile caseload information.

Domain Applicability
All

Stakeholder Applicability
Agency level.

Major Functions

- View caseworker's list of cases, schedules, in-service activities
- Dashboard to access case information
- Track key case milestones
- Manage workflow

- Assign case
- Generate waitlist
- Trigger follow-on processes (e.g., case management for development of case plan)
- Inform stakeholders
- Collect and report performance indicators
- Transfer case to another worker
- Transfer case to another jurisdiction
- Accept case from another jurisdiction

6.1.9 Additional Supporting Applications

Other supporting applications may be shared to leverage investments, reduce maintenance costs, and share information. These applications might be integrated with or invoked by the functionally-oriented applications identified in this document. The supporting applications serve all business areas.

Additional supporting applications include:

- Frequently Asked Questions Management. This kind of application handles requests for general information about programs, agencies, service providers, and services. This application also supports those who maintain the information.
- Workflow Management. This kind of application triggers activities based on rules. This application sends notifications, requests actions (e.g., approval of a plan), sends reminders (e.g., for periodic activities), and performs other rule-based actions.
- Rules Engine. This is a utility used to execute business rules. Implementing business rules using this approach avoids making coding changes directly in an application.
- Analytics. This kind of application provides statistical, trend, predictive, and other forms of analysis.
- Warehouse. A data warehouse typically contains replicated information from production operational databases. The warehouse data is normally used for reporting and analysis.

Other supporting applications may be defined. Software vendors may provide some of the supporting applications functions described here in a single application. For example, some business process management software programs provide both workflow management and rules engine capabilities.

6.1.10 Unique (to a human services domain) applications

For now, this section identifies existing applications used to support ACF programs. Some may be moved to 6.2 (Program management applications) in the next version of the document. See the separate Capability Viewpoint artifact Performance Reference Model, Appendix B-Major Information Systems and Data Bases for information about each application.

- AFCARS (Adoption and Family Care Analysis and Reporting System)
- ACSES (Automated Child Support Enforcement System)
- CFSR (Children's Bureau Database on Child and Family Services Reviews)
- NCANDS (National Child Abuse and Neglect Data System)
- OCCIS (Office of Child Care Information System)
- PARIS (Public Assistance Reporting Information System)
- QRIS (Quality Rating and Improvement System)
- SACWIS (Statewide Automated Child Welfare Information System)
- TANF (Temporary Assistance for Needy Families)

6.2 Program management applications

Program management applications for human services agencies and service providers support the processes in the Performance Management, Contractor Management, Financial Management, Operations Management, Program Management, and Business Relationships business areas.

Applications include:

- Integrated Program Management Applications. Those that provide multiple capabilities drawn from the list below (or others) to support one or more programs.
- Financial Management. This kind of application provides accounts receivable and accounts payable functionality.
- Grants Management. This kind of application manages and tracks applications for grants, responses, funding awards, and grant status.
- Outreach. This kind of application supports generating lists of those who should be the subject of outreach activities, accomplishing outreach, and recording outreach activities. The applications may maintain pointers to content used for outreach and/or a configuration controlled library of material used for outreach.
- Partner Management. This kind of application manages business relationships with partners (e.g., among agencies or between agencies and service providers). This includes managing agreements for information sharing and provisioning of user access to that information. These applications may schedule and track communications and other interactions.
- Performance Monitoring. This kind of application assesses performance data to identify anomalies, trends, and summarize performance parameters. These applications display a dashboard to show key performance indicators.
- Program Planning and Management. This kind of application supports budgeting, scheduling, and task planning for programs and projects. These applications help managers to assign resources to different tasks within a program or project, define task dependencies and milestones, report and track progress, and conduct “what if” analysis to juggle priorities.

- Program Reporting. This kind of application accesses information from the other applications in this section to generate the standard reports required. These applications can also generate ad hoc reports to meet special needs.
- Unique (to a program or agency) applications. Section 6.1.10 identifies several existing ACF-related applications. Some of those may be moved into this section in the next version of this document. Other program- or agency-unique “management” applications may be identified.

In a future version of this document, we may expand on selected items from this list based on feedback on priorities from the human services community.

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7 Shared Services Layer

The shared services layer (Figure 7–1) includes components that deliver functionally-oriented IT services (application services and data services) and information 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.

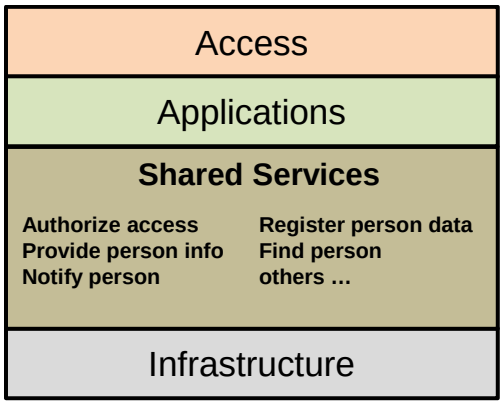

Figure 7–1. Shared Services Layer

This chapter includes a few overview sections (7.1 through 7.3). Section 7.4 describes a set of services to support each business "action" specified in the Business Model for various business activities. In this version of the architecture, the Business Model details actions for a limited number of business processes; hence, shared services are proposed for a limited set of actions. The Service Matrix spreadsheet (see the separate Systems Viewpoint artifact Service Matrix) provides additional details about the specific services in each group. This version of the document explains what kinds of services are anticipated in each action category. The Service Matrix proposes ~110 candidate services to support the Client Management, Eligibility and Enrollment, and selected Service Management business processes specified in the Business Model. The proposed services provide a mix of higher-level and lower-level functionality. Future versions of the document may adjust the mix, add, or remove services from the list.

7.1 Conventions to Support the Business Model

As a reminder, the NHSIA Business Viewpoint describes the business model in terms of business areas, business processes, business activities, and actions. Figure 7–2 shows the hierarchy.

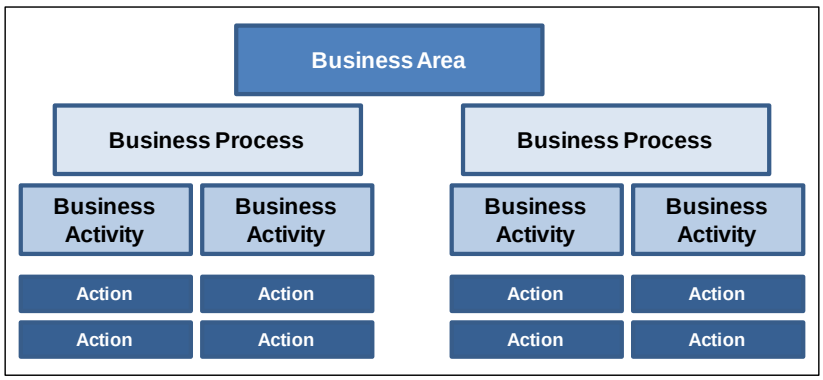

Figure 7–2 NHSIA Business Model Hierarchy

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

- Client management
- Eligibility and enrollment
- Service management

In many cases, multiple IT shared services support a single business activity. For instance, the CM2 Manage Shared Client Information business process defines several business activities. The first business activity (CM2a) is “Interview client”. The Business Model defines several actions associated with the “Interview client” business activity: interview, enter, record, request, retrieve, and verify. Table 7-1 shows the services to support each action for this business activity.

Table 7-1. Example: Shared Services that Support the "Interview client" Business Activity (CM2a)

(Business) Action	Description	Shared IT Service
interview	To support a particular type of interview about a person or a client, ask a series of structured questions according to rules. Reject answers (and ask for re-entry) that don't fall within acceptable values. Map each response to the appropriate section of the record where the answers will be stored. This is a higher-level service that would invoke services to interview clients to collect categories of information about the person (e.g., basic, children, other relationships, health, education, employment, etc.).	Interview Client
enter	Update the shared record for a particular person to reflect initial or revised person information. "Person information" may include any or all of the categories of information stored in the record (contact information, demographics, education, employment, family and references, finances, health, legal/ court history, name, other identifiers).	Update Person Information
	Update an existing Master Person Index entry to add one or more pointers to additional information. Specify metadata fields necessary to access the information.	Register Person Data

(Business) Action	Description	Shared IT Service
	Update an existing Master Person Index entry to modify or add to the information that identifies the person (e.g., name or address).	Update Person Identifying Information
record	Record the association between documentation (e.g., scanned document, photograph, or other file) and the client the document pertains to. Enter a link to the documentation (in the Master Person Index) and to the person (in the Documentation Record).	Record Person Documentation
request	The business actions of request, retrieve, and respond are satisfied by a single category of IT services (mapped to the "respond" action) to supply the information.	
respond	Supply <whatever kind of> information about a specific person.	Provide Contact Information; Provide Person Demographic Information[5]; Provide Person Education Information; Provide Person Employment Information; Provide Person Family and References Information; Provide Person Finances Information; Provide Person Health Information; Provide Person Legal/ Court Information; Provide Person Name; Provide Person Other Identifiers Information
retrieve	The business actions of request, retrieve, and respond are satisfied by a single category of IT services (mapped to the "respond" action) to supply the information.	

[5] Note: Provide Person Demographic Information service allows using applications to ask for a pre-defined subset of all Person Information. NHSIA defines similar services for each of the other subsets of Person Information (education, employment, etc.). This approach facilitates interface definition between partners who will ask for and provide the information.

(Business) Action	Description	Shared IT Service
verify	Compare <whatever kind of> information about a specific person from one source versus another. Use fuzzy match for text data. Raise flag if the comparison falls outside the specified tolerance.	Verify Contact Information; Verify Person Demographic Information; Verify Person Education Information; Verify Person Employment Information; Verify Person Family and References Information; Verify Person Finances Information; Verify Person Health Information; Verify Person Legal/ Court Information; Verify Person Name; Verify Person Other Identifiers Information; Or more specific services to verify other person data (citizenship status, residency, lawful presence, income, Native American status, or social security number)

The approach to defining shared services for business activities follows the conventions described below.

As shown in the example in Table 7-1 above, several shared services support business activities that involve collecting information from people through an online or in-person **interview**. The "interview" business process involves collecting information from the interviewee (using interview, enter and record IT services) and corroborating the information by checking it against other sources. To corroborate information the application may invoke a service from the authoritative source to provide the information and compare the data. Or the application may use a verify service to corroborate the information.

In this version of the Systems Viewpoint, this chapter focuses on services for business activities related to **shared records**. Jurisdictions could develop comparable services to support activities for agency-specific records.

People (and businesses) can **control access to information** about themselves. Allowing access will involve the application of two services: a service that will Authorize Access to <the specified kind of record> and a service that will support the Operations Management (OM) business process Manage User Provisioning. This version of the Systems Viewpoint does not define any OM services.

A client is a person, small group, or larger population who is receiving or may receive human services. In the IT services context, we assume that a client has at least one associated case, case person, and person. An **inquiry about a client** may initiate one or more sets of IT services: identify (to locate records about the case, persons, and case persons associated with the case) and provide (systems to provide information from those records).

7.2 Shared Service Development and Applicability

Some components and IT services may be developed at the national level for use by any state or local partner. These might include services to accomplish these functions:

- Match identity
- Verify financial information (e.g., verify income with the IRS)
- Determine eligibility - based on federal rules via a rules engine
- Manage federal system access

Characteristics of the services that have national applicability include those with highly standardized data interfaces, a limited number of "authoritative sources" for the data, and needed by many jurisdictions.

Other components and IT services may be developed and shared **across multiple human service programs at the state or local level**. Other states or local jurisdictions could use a pilot implementation as a model for their own. Examples of candidate high-level services or components that might be developed to support the eligibility processes include those to accomplish these functions:

- Request client information
- Interview client
- Determine eligibility - based on jurisdiction-specific rules via a rules engine

Characteristics of the services that have cross-program applicability within a jurisdiction include those that share information from shared data repositories managed within the jurisdiction and are needed by workers at several agencies.

Examples of candidate lower-level IT services that might be developed as pilots/prototypes include:

- Update contact information
- Update person demographics
- Approve client eligibility
- Notify person

These services may be prototyped by one jurisdiction as models for others to implement similar functionality.

7.3 Wrappers

To take advantage of shared services, developers may need to build “wrappers”. In this context, a wrapper enables a legacy system to use a shared service and/or data. Several models for wrappers may be implemented; Figure 7–3 illustrates three options.

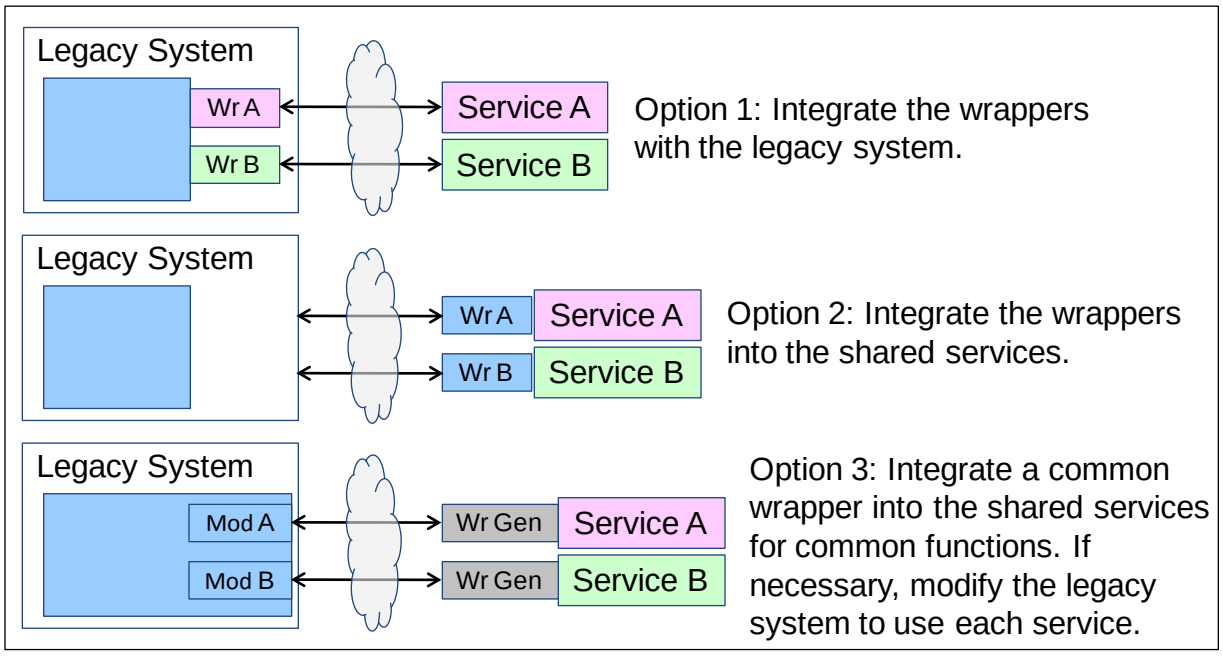

Figure 7–3 Wrappers

In option 1, legacy system architects develop unique wrappers for services A and B (“Wr A” and “Wr B” on the diagram) and integrate each wrapper with the legacy system. This approach is practical if the services support widely used and well-established standards.

In option 2, architects for each service develop unique wrappers for their services to accommodate the legacy system. This approach moves the standardization of each wrapper to the service. This approach is practical if there are many legacy systems that can take advantage of the same wrapper for a service.

In option 3, IT service A and B architects develop a single generic wrapper (“Wr Gen” on the diagram) for their service to accommodate the legacy system. For this approach to work, the functionality provided by the generic wrapper must be common across the services. Typically this approach would be practical if many service users adopt the same set of protocols (e.g., security, message store-and-forward, etc.) for a family of services. The legacy system architect may need to make additional changes to the legacy system (“Mod A” and “Mod B” on the diagram) to accommodate unique functions associated with each service.

Other forms of adaptation may be necessary for existing legacy systems to take advantage of shared services. In some cases, it may also be possible to make legacy systems discoverable as services through the use of wrappers or other means of adaptation.

7.4 Proposed Services to Support NHSIA "Actions"

This section includes a subsection for each action identified in the Business Viewpoint's business activities. Each subsection defines the action term, summarizes the services that would support that action, and lists the proposed services that support that kind of "action". The service lists are subject to change after further review, evolution of the business model, and feedback from stakeholders. See the separate Systems Viewpoint artifact Service Matrix for additional information about each proposed service.

7.4.1 Approve

Term definition: Approve services, enrollment, etc. Involves a decision.

The "Approve" services allow a human user to approve something. For example, the user may be a caseworker approving a preliminary (automated) eligibility determination, or a supervisor approving a plan. The recommended services each handle a different kind of approval. The services include applying an electronic equivalent of a signature to the item being approved.

- Approve Client Eligibility
- Approve Case Plan
- Approve Referral

7.4.2 Archive

Term definition: Create a copy of person-related or case-related records for retention purposes.

The "Archive" services preserve electronic records. The recommended services make a copy of the designated record and make it "read only".

- Archive Shared Person Record
- Archive Entire Case Record

7.4.3 Authorize

Term definition: Allow / give permission to access data; used in context of security, i.e., access authorization.

The "Authorize" services allow a human user to authorize release of information. For example, the user may be a client granting access to their personal or case information. The recommended services each handle a different kind of authorization.

- Authorize Release of Person Record
- Authorize Release of Case Record

7.4.4 Delete

Term definition: Remove a record, file, folder, etc.

The "Delete" services archive (store outside the active record area) and remove (delete from the active record area) entire records, a specific entry in a record, or an index entry. The

recommended services each handle deleting different levels of information about a different kind of stakeholder.

- Delete Entire Person Record
- Delete Person Index Entry
- Delete Entire Service Provider Record
- Delete Entire Case Record

7.4.5 Determine

Term definition: Make a decision based on (client) information and rules/criteria.

The “Determine” services support making a decision. Metadata that define rules or criteria drive the automated decision-making process. The results of a “Determine” service may be a recommendation. In many cases, a person must approve the recommendation using an “Approve” service before action can be taken.

- Determine Needed Services
- Determine State LIHEAP Eligibility
- Determine State SNAP Eligibility
- Determine State TANF Eligibility
- Determine Federal LIHEAP Eligibility
- Determine Federal SNAP Eligibility
- Determine Federal TANF Eligibility
- Determine Adoption and Guardianship Assistance Enrollment
- Determine Adoption Incentive Payments Enrollment
- Determine Child Care Development Fund Enrollment
- Determine Child Support Enforcement Enrollment
- Determine Foster Care Maintenance Payments Program Enrollment
- Determine LIHEAP Enrollment
- Determine SNAP Enrollment
- Determine TANF Enrollment

7.4.6 Develop

Term definition: Generate a plan or course of action based on client and/or case information, agency procedures, rules, guidelines, objectives.

The “Develop” services assemble data and information from different sources to generate or modify a list, plan, summary, or other product. In some cases, the “source” is the user who is creating the product.

- Make Outreach Content
- Develop Case Plan
- Edit Case Plan

7.4.7 Enter

Term definition: Insert client, provider, case information into physical or electronic record.

The "Enter" services allow people to update information in existing records. The assumption is that a record was created via one of the "Initiate" services. The "Enter" services should be used in concert with the "Verify" services to ensure data quality.

- Update Person Information
- Register Person Data
- Update Person Identifying Information
- Update Provider Information
- Update Case
- Update Case Person
- Update Contact Information
- Save Outreach Material
- Transfer Person Index Entry
- Register Provider Data

7.4.8 Evaluate

Term definition: Assess client situation to determine needs, risk, etc.

The "Evaluate" services use rules acting on data to assess some aspect of the client's situation. Rules specify data to be considered and thresholds for different levels of outcomes.

- Screen Client
- Assess Risk

7.4.9 Freeze

Term definition: Manage data so that it cannot be updated in order to preserve a record of actions, decisions, status, etc.

The "Freeze" services effectively make data in a record "read only".

- Freeze Entire Person Record
- Freeze Entire Case Record
- Freeze Case Entry

7.4.10 Identify

Term definition: Provide enough information to uniquely identify/name/specify an entity (e.g., client, provider, case, worker).

The "Identify" services are used to locate a record. Users of this kind of service either want a list (e.g., Find Person) of candidate records that match some or all of the identifying criteria so that a person can decide which records apply, or are seeking the best record match (e.g., Match Person)

determined algorithmically so that an application can use the matched record automatically. "Match" services should be invoked with a specified tolerance level; if no record meets the desired tolerance for successful matching, then no record should be identified.

- Find Person
- Identify Available Person Records
- Match Person
- Find Case Person Records
- Find Case Records
- Find Agency Information
- Find Program
- Identify Available Program Records
- Match Program
- Find Service Provider
- Identify Available Service Provider Records
- Match Service Provider
- Find Service Information
- Find Client Outreach List

7.4.11 Initiate

Term definition: Start a file, record, etc., such as case record/file.

The "Initiate" services create a new record or an entry in an existing record.

- Create Shared Person Record
- Create Shared Service Provider Record
- Create Person Index Entry
- Create Case Record
- Create Case Person Record
- Create Provider Registry Entry

7.4.12 Interview

Term definition: Interact with client to collect information; could be done in person or through an application.

The high-level "Interview" services ask a series of structured questions according to rules. The services vet the answers against acceptable values and ask for re-entry as necessary. The services map each answer to the appropriate part of a record where the information will be stored.

- Interview Client

7.4.13 Notify

Term definition: Inform specific stakeholders about new information, decisions, status, etc.

The “Notify” services provide notification, alerts, or ticklers to designated recipients about one or more subjects. They also support referrals.

- Notify Person
- Refer Client

7.4.14 Record

Term definition: Capture information (e.g., scan a document or import a file) so that it can be later retrieved.

The “Record” services record the association between documentation and the entity the documentation pertains to. (Note: actually scanning a document or importing a file may occur using a separate COTS product.)

- Record Person Documentation
- Record Case Documentation

7.4.15 Request

Term definition: Asking for information.

The business actions of request, retrieve, and respond are satisfied by a single category of IT services (mapped to the “respond” action) to supply the information.

7.4.16 Respond

Term definition: Prepare information in a format useful to the recipient.

The business actions of request, retrieve, and respond are satisfied by a single category of IT services (mapped to the “respond” action) to supply the information.

- Provide Contact Information
- Provide Person Demographics Information
- Provide Person Education Information
- Provide Person Employment Information
- Provide Person Family and References Information
- Provide Person Finances Information
- Provide Person Health Information
- Provide Person Legal/Court Information
- Provide Person Name
- Provide Person Other Identifiers Information
- Provide Person Information
- Provide Case Information
- Provide Person in a Case <person in a case information type>
- Provide Agency Query Response

- Provide Program <program information type>
- Provide Service Provider <service provider information type>
- Provide Summary of Cases
- Provide Individual Case Summary

7.4.17 Retrieve

Term definition: Fetch information from one or more electronic resources.

The business actions of request, retrieve, and respond are satisfied by a single category of IT services (mapped to the "respond" action) to supply the information.

7.4.18 Review

Term definition: View information, check information.

"Review" services will enable users to look at information.

7.4.19 Share

Term definition: Exchange information with stakeholder or system.

The "Share" services provide a response to a query or disseminate content to designated recipients.

- Distribute Outreach Material

7.4.20 Track

Term definition: Maintain information that indicates the status, responsibility, progress on, a particular issue or treatment or problem related to a client or service provider.

The "Track" services measure and log performance of activities.

- Track Response
- Track Outreach Status

7.4.21 Trigger

Term definition: Cause a process or activity to be initiated or prompted.

The "Trigger" services invoke other processes.

- Trigger Manage Information Processes

7.4.22 Verify

Term definition: Check information against one or more other sources.

The “Verify” services compare a set of information from one source versus another and identify mismatches outside a specified tolerance.

- Verify Contact Information
- Verify Person Demographics Information
- Verify Person Education Information
- Verify Person Employment Information
- Verify Person Family and References Information
- Verify Person Finances Information
- Verify Person Health Information
- Verify Person Legal/Court Information
- Verify Person Name
- Verify Person Other Identifiers Information
- Verify Case Information
- Verify Person Income
- Verify Person Citizenship Status
- Verify Person Residency Status
- Verify Person Native American Status
- Verify Person Social Security Number
- Verify Person <information type>
- Verify Provider <credential type>
- Verify Provider <information type>

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8 Connections and Relationships

8.1 Applications and Business Processes

Each **application supports one or more business processes** from the Business Model. Table 8-1 maps the applications defined in this version of the architecture to the business processes.

Table 8-1 Application Support for Business Processes

ID	Process Name	Eligibility Determination	Enrollment/ Disenrollment	Needs Assessment	Case Management	Service Planning and Coordination	Document Management
Client Management (CM)							
Client Information Management							
CM1	Establish Shared Client Information	P	X	X	X		
CM2	Manage Shared Client Information	X	X	X	X	X	X
CM3	Establish Agency Client Information						
CM4	Manage Agency Client Information						
CM5	Find Client Information	X	X	X	X	X	X
Client Support							
CM6	Manage Client Communications				P	P	
CM7	Perform Population and Client Outreach						
Eligibility and Enrollment Management (EE)							
EE5	Eligibility Intake	P					
EE1	Determine Eligibility	P					
EE2	Disenroll Client		P				
EE3	Enroll Client		P				
EE4	Inquire Client Enrollment	P	X	X	P	X	
Service Management (SM)							
Core Services Management							
SM1	Establish Case	X	X	P	X		
SM2	Manage Case Information	X	X	X	X	X	X
SM3	Find Case Information	X	X	X	X	X	X
SM4	Intake Client	X	X	P	X	X	
SM5	Screening and Assessment	X		P	X		
SM6	Develop Service Plan(Goals, Methods and Outcomes)				P		
SM7	Conduct Investigation				P		
SM8	Service Arrangement, Referral, Placement				X	P	
SM9	Manage and Monitor Client and Outcomes				X	P	
SM10	Cross-Agency Case Coordination				X	P	
SM11	Close Case				P		
Authorization Determination							
SM12	Authorize Referral					P	
SM13	Authorize Service, Level of Service					P	
SM14	Authorize Plan				P		

"P" means the application provides the primary support for the business process. "X" means the application supports the business process.

8.2 Services, Information, Business Activities, and Applications

The **Service Matrix spreadsheet** (see the separate Systems Viewpoint artifact Service Matrix) shows additional detail about each proposed shared IT service and how the service relates to other aspects of the architecture.

Columns in the matrix include:

- Column A = Service designator. For the core services identified in the Project Viewpoint, this column contains the designator used in the "NHSIA Core" Concepts document, Appendix A.
- Column B = Action from the business model.
- Columns C and D = Service function and object of service. Merging these two columns yields the name of the service. Cells are shaded blue.
- Column E = For the core services identified in the Project Viewpoint, this column contains the interface designator used in the "NHSIA Core" Concepts document, Appendix A.
- Columns F through H = Business activity(ies) identifier from the Business Model that the service supports.
  - CM = Client Management
  - SM = Service Management
  - EE = Eligibility and Enrollment.
- Columns I through N = Application(s) that invokes the service.
  - EL = Eligibility Determination
  - EN = Enrollment
  - NE = Needs Assessment
  - CS = Case Management
  - SP = Service Planning and Monitoring
  - DM = Document Management
- Column O = Service description.
- Column P = "F" if the service is expected to be provided by a federal agency. This column is pink (new in version D0.2)
- Column Q = Each service is classified as common, core, or custom. This column is pink. Core is a subset of common. Core and common services should be implemented everywhere. Priority should be given to core services. Logic for classifying a service as Custom vs. Common vs. Core: Core = supports foundational capability; mostly a service marked "core" enables cross-jurisdiction sharing. Common = supports cross-agency or cross-program sharing as well as cross-jurisdiction sharing. Custom = the rest. Includes services that a single stakeholder group associated with a single jurisdiction, agency, or

program would need. The NHSIA architecture team identified the draft list of core services using the Global Reference Architecture methodology.[6]

Entries in the table are arranged alphabetically according to column A (action). Figure 8–1 shows an excerpt of columns A-E. Figure 8–2 shows an excerpt from columns F-Q; columns A-D are repeated for clarity.

In this excerpt, Row 34 shows the service CS-MPI-006, "Update Person Identifying Information". This uses standard information exchange CI-MPI-001. Invoked by all applications listed (X in columns I-N), this service provides support for the business activities that update client information. Column O states the full description of the service: *Update an existing MPI entry to modify or add to the information that identifies the person (e.g., name or address).*

Please see the NHSIA Information Viewpoint for the associations between proposed core services and information exchanges.

[6] U.S. Department of Justice's Global Reference Architecture (GRA) Guidelines for Identifying and Designing Services, Global Infrastructure/Standards Working Group (GISWG), Version 1.1, May 2011. Available online at http://it.ojp.gov/globaljra.

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	A	B	C	D	E
1	Service Designator	Action (from Business Model)	Service Name part 1: Service Function	Service Name part 2: Object of service	Standard Information Exchange
32	CS-MPI-005	Enter	Register	Person Data	CI-MPI-001
33	CS-MPI-006	Enter	Update	Person Identifying Information	CI-MPI-001
34	CS-PROVREG-006	Enter	Update	Provider Information	CI-PROVREG-001

Figure 8–1 Service Matrix Excerpt: Columns A-E

	A	B	C	D	F	G	H	I	J	K	L	M	N	O	P	Q
1	Service Designator	Action (from Business Model)	Service Name part 1: Service Function	Service Name part 2: Object of service	Business Activity: CM (Client Mgt)	Business Activity: SM (Service Mgt)	Bsuiness Activity: EE (Eligibility & Enrollment)	EL	EN	NE	CS	SP	DM	Description	Federal	Classification (Common, Core, Custom)
32	CS-MPI-005	Enter	Register	Person Data	CM2a, CM2b	SM2b; SM4a	EE5a; EE2a; EE3a	X	X	X	X	X	X	Update an existing MPI entry to add one or more pointers to additional information. Specify metadata fields necessary to access the information.		Core
33	CS-MPI-006	Enter	Update	Person Identifying Information	CM2a, CM2b	SM2b; SM4a	EE5a; EE2a; EE3a	X	X	X	X	X	X	Update an existing MPI entry to modify or add to the information that identifies the person (e.g., name or address).		Core
34	CS-PROVREG-006	Enter	Update	Provider Information										Update an existing provider registry entry to modify or add to the information about the provider (e.g., facility or affiliation).		Core

Figure 8–2 Service Matrix Excerpt: Columns F-Q

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The current version of the Service Matrix spreadsheet maps the proposed services to Client Management, Eligibility and Enrollment, and selected Service Management business activities. See the separate Business Viewpoint spreadsheets B-1 through B-4 for the names for each business activity identifier included in Services Matrix.

The services may use electronic record structures in database systems or virtual structures that are constructed when needed. Table 8-2 identifies candidate structures. Jurisdictions will make choices about whether to implement these. Additional structures may be appropriate.

Table 8-2 Structures

Structure	Description
Case Person Record	Captures information about the association of a person with a case. Each agency has a case person record for every person who is a client of a case. Information included: case person identifier, case identifier, person identifier, case member status (within the case), client group head flag, dates (into, out of case), relationship information (for this case). May be multiple entries per record to show changes in status, entry and departure, and relationships.
Case Portfolio	Grouping of multiple Case Records aggregated to reflect a client's service history and status. Includes both active and inactive Case Records. A Case Portfolio is an electronic accumulation of case records over a client's lifetime.
Case Record	Collection of case entries held by a caseworker, service provider, or program/agency staff system. A case is associated with a client and may address one or more services within the purview of the program/agency.
Confidentiality and Privacy Authorization	Permission to share specified information related to the signer of the authorization with designated agencies, jurisdictions, systems, and/or persons.
Documentation Record	Captures information about the association of a document with a person or case.
Master Person Index	A structure of identifying information about persons. The Master Person Index (MPI) is used to link to information about the person in different source systems.
Outreach Record	Content, intended recipients, actual distribution, and performance results for a broad outreach effort.
Shared Person Record	A Person Record captures information about an individual person that may apply to multiple cases with which the person is associated. A "Shared Person Record" is accessible to more than one agency, based on permissions and role.
Provider Registry	A structure of identifying information about human services providers. The registry is used to link to information about the service provider in different source systems.

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9 References

1. NHSIA Business Viewpoint
2. NHSIA How the Client and Case Management are Addressed in NHSIA White Paper
3. NHSIA Master Person Index Services White Paper
4. NHSIA Eligibility White Paper
5. NHSIA Systems Viewpoint artifact, Services Invoked by Applications
6. NHSIA Information Viewpoint
7. NHSIA Capability Viewpoint artifact, Performance Reference Model, Appendix B-Major Information Systems and Data Bases
8. NHSIA Systems Viewpoint artifact, Service Matrix
9. NHSIA Project Viewpoint, "NHSIA Core" Concepts

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10 Accessibility Appendix

This section contains accessible versions of figures and tables in this document. Table and figure numbers that appear here correspond to versions that appear earlier in this document.

People:	Organizations	Systems for:
Assistor Auditor Case worker Client Community partner Legal staff Program/agency staff Researcher Service contractor Service provider The Public	Community-based agency Court Educational institution Financial institution Government agency Health institution Insurance company Legislative, regulatory body National association Other private company Research institution	Adoption/foster care Child care Child protection Child support Disability Domestic violence Education Employability Financial assistance Food/nutrition Health Housing & energy assistance Parenting/family planning Public health Substance abuse & mental health

Figure 2-3 NHSIA Supports People, Organizations, and Systems

Technologies & Standards:	Access points:	Structures:
Architecture patterns Best practice Business intelligence Business rules and rules engine Cloud computing Customer relationship management Data standard (e.g., HL7, NIEM) Decision support Design pattern Fixed & mobile communications Internet and Web Networks Security Service-oriented Architecture (SOA) Workflow XML	At home At work In call centers In clinical settings In field/mobile systems In office-based service-related systems In schools	Agency Person Record Case Person Record Case Record Confidentiality and Privacy Authorization Electronic Case File Case Record Electronic Health Record (EHR) Health Information Exchange (HIE) Master Person Index (MPI) Medicaid Information Technology Architecture (MITA)-derived structures Personal Health Record (PHR) Service Provider Registry Shared Person Record

Figure 2-4 NHSIA Identifies Technologies and Standards for Interoperability

Information about:	Actions:
Account, payment	Apply for
Association	Approve
Benefit	Archive
Business (provider, contractor, etc.)	Authorize
Case	Bill
Credential	Collaborate
Document	Delete
Facility	Determine/screen
Finances	Develop
Group	Educate
Job	Freeze
Legal action	Identify and select
Metrics	Initiate
Organization	Interview
Outcome	Manage
Person	Monitor/assess/detect
Placement	Notify/communicate
Population	Pay
Program	Plan
Resource capacity	Record
Rule, policy, regulation, law	Refer
Service	Register
Status	Report
System	Request
Workflow	Research/analyze
	Respond
	Retrieve
	Review
	Schedule/coordinate
	Share
	Trigger
	Verify

Figure 2-5 NHSIA Describes Sharing Information to Support Human Services Actions