



# Illinois Unified System Planning Project

**Deliverable #8:** Create and present general system design on how to fill the gaps between IDLS and Framework and link the two data systems to create a coordinated data system to the OECD and DREC.

**Deliverable #10:** Develop comprehensive technical architecture of systems and data. The structure must include all of the essential data elements and oversight requirements listed in the Early learning Challenge application. It should also describe access levels for users.

Prepared for:  
**Governor's Office  
Of  
Early Childhood Development**

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## I. Introduction

As part of the Race to the Top Early Learning Challenge project, Illinois has conceptualized a Unified System that will support the collection, maintenance and use of early childhood data across all early childhood programs and systems. The Unified System will link information across programs and agencies to improve policy and practice. The Unified System represents a tremendously complex endeavor from both technology and management perspectives. To ensure a successful outcome to this effort, it is critical that a well thought out technical architecture and system design is documented, reviewed and supported by responsible parties. As conceptualized, the Unified System will provide the following functionality:

- Provide a broad and diverse user community access to early childhood data.
- Provide a structured and highly accountable user, program and organization hierarchy that will ensure secure, authorized and appropriate access to early childhood data.
- Provide a broad and diverse user community a set of web-enabled tools that support query, data analysis, reporting and management of early childhood data.
- Provide a set of tools that will collect, normalize, and manage early childhood data from all participating early childhood data systems across the State.

There are many issues to consider when designing a technology-based system to serve as a tool for data exchange, data integration and most importantly, a tool that can be used to help manage and improve early childhood programs across the State of Illinois. The existing environment consists of a mix of legacy and newly developed systems, all of which use a mix of technologies, standards and best practices that add to the complexity of developing such a platform. To inform this phase of the Unified System Planning Project (USPP), the project team has performed the prerequisite analysis of existing systems and business practices, the capabilities of other state systems, as well as the strategies of the Office of Early Childhood Development and other participating organizations. Using this information, as well as the guidance from parallel efforts associated with the integration of the nation's healthcare system, the Unified System technical architecture and system design described in this report is proposed.

## II. Technical Architecture Overview

The technical architecture for a system is a high level description of system features and capabilities. The technical architecture can be described as a series of building blocks or modules, each with its own features and functions. It is important to note that the technical architecture does not contain elements of system design. System design describes the internal working of the architectural components and is described in a subsequent section of the report. The goal of this report is to provide a review of the technical architecture in a modular fashion so that the overall complexity of the system can be simplified. The modular approach provides benefits in other areas as well. A modular approach supports the evolving nature of the system. Modules that are more relevant to immediate needs can be built sooner than other modules. Also, varying solutions and technologies can be used for different modules, ensuring the use of the least costly and most effective technologies. Finally, as the system evolves and new requirements

are identified, modules can be added in a seamless fashion, thereby reducing or even eliminating the need for existing modules to be updated or replaced.

- **Overarching Themes:** A series of technology-based best practices as well as a set of business related considerations must be understood and agreed upon prior to formalizing the technical architecture.
- **Conceptual Framework:** A broad-based conceptual framework is provided to represent the system at the highest level.
- **Modular Components:** The conceptual framework is represented in more detail as a series of functional modules that collectively represent all system functionality.
- **Module Core Functions:** Each module provides specific functionality that is not duplicated within the other components.
- **Architectural Views:** The system is described within the context of specific system functions that typically require interaction between two or more modules. These capabilities are described in the context of specific business processes.
- **System Design:** The detailed functional requirements of each module are described. The functional requirements serve as the most granular set of specifications for how the modules function and integrate.

One strong driver for the recommended technical architecture is the reality on the ground. Illinois has made commitments to a number of initiatives that directly or peripherally influence the Unified System. These include The Framework and Integrated Eligibility System (IES), the Illinois Longitudinal Data System and Data Warehouse (ILDS), the Illinois Health Information Exchange (ILHIE) and others. It is premature to suggest that these initiatives can be integrated in specific ways given the evolving nature of these projects and the lack of close collaboration to date, however the recommended technical architecture will ensure that the Unified System is capable of such integration as it is prioritized by the leaders of these projects and the participating agencies.

### III. Overarching Themes

This section describes a series of requirements that influence the design of the overall architecture and system design. They are relevant to each of the modules in different ways and must be considered within the context of the specific capabilities of each module. In some cases, the topic at hand will be addressed by a single module, in other cases it serves as a prerequisite consideration for several modules.

- **Privacy and Security:** Privacy and security are critically important to the success of the Unified System. State agencies and their staffs will only use the Unified System if they know that sensitive information is kept private and secure. The nature of the Unified System, in that it supports the transmission, sharing and broader accessibility of child data poses new and complex risks to privacy and security. How privacy and security are handled impacts virtually all modules of the technical architecture.

- **Organization and role-based hierarchy:** In order to ensure the accuracy and accountability of the Unified System and the security of the data stored within the system, an organizational hierarchy and associated business rules must be defined. The organization hierarchy will include:
  - Organization hierarchy - State agencies, programs, providers and sites
  - Staff hierarchy – Administrators, workforce, system users, support staff and researchers
- **Interoperability:** One of the key requirements of the Unified System is the exchange of data with other early childhood systems. Given the fact that currently there is no consistent or standard capability for data sharing between systems, the ability of the Unified System to serve as an integrator or arbiter among these systems is even more important. For these reasons, the technical architecture of the Unified System must provide the following capabilities:
  - **Technical interoperability** focuses on the physical transmission and receipt of data and its transport between participating systems. Much of the work here is on message formats and reliable, secure message transport.
  - **Semantic interoperability** focuses on ensuring shared meaning between sending and receiving partners – ensuring that the meaning of what was sent is consistent with the understanding of what was received.
  - **Process interoperability** focuses on higher-order workflow associated with data exchange which provides accountability for the data exchange process but also ensures that data exchange integrates well with underlying business needs. Issues of data usability and timeliness are examples of process interoperability concerns.
- **Service Oriented Architecture:** The technical architecture will be designed within a flexible and modular construct called service-oriented architecture (SOA). SOA principles suggest that modular components of the overall system are designed to function independently and to exchange data in reliable, structured ways. In an SOA, complex systems are comprised of discreet functions, or services, that are available to other systems on a network and perform specific tasks. These services form system building blocks capable of being reused over and over again in the context of different needs and applications. Diverse systems can share important algorithms, features, and capabilities by relying on these shared services rather than reproducing this functionality each time it is needed.
- **Federated vs. Centralized Framework:** Systems that collect, store and manage data from other systems are typically referred to as *federated* or *centralized* systems. Typically, one of these two models are employed for collecting and providing access to client data however, some systems will take advantage of the benefits of both frameworks in what is referred to as a *hybrid* model. A centralized model stores client data physically within the central infrastructure and provides direct access to consolidated information about a client. This approach allows for quicker access to data, the opportunity for centralized data normalization, and can better position the system to support community-

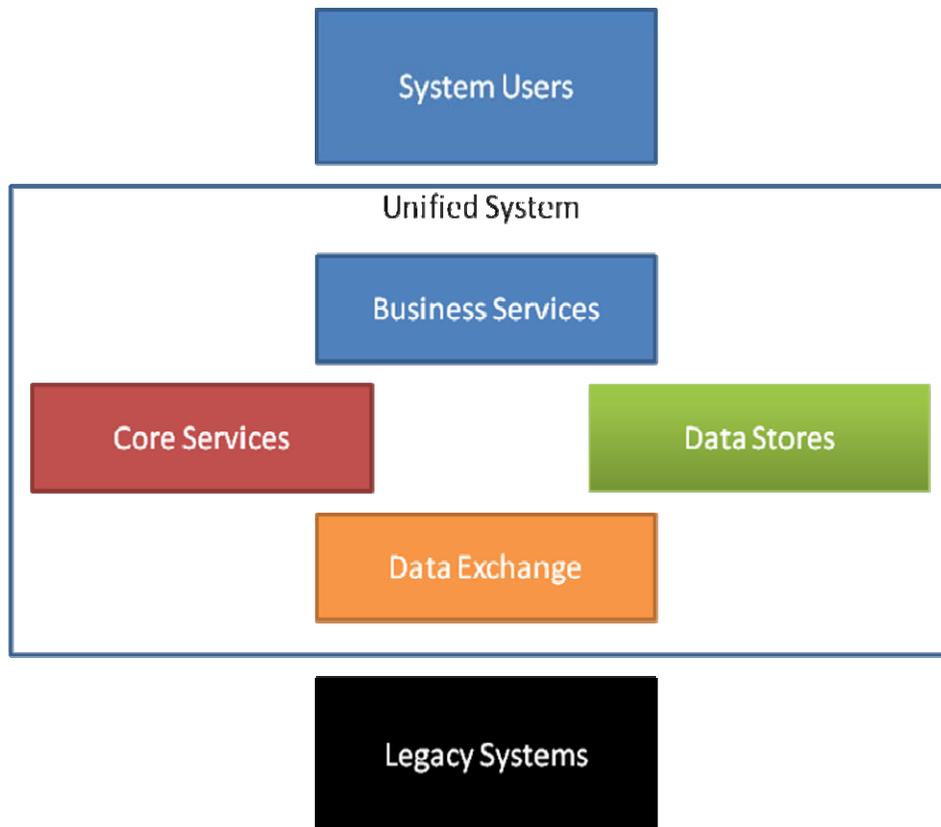
wide data analysis. This approach does require, however, fairly extensive central infrastructure and coordination among parties, as well as staff capable of supporting data consolidation.

In a *federated* (also known as a distributed or record locator service) model, the system's core contains a master index of all clients in all participating systems but does *not* contain any actual data records. Using the central index, system users query the system for a client and the system has the ability to reach out to the broader integrated systems and retrieve the relevant data. This model allows partner organizations to retain greater control over their clients' records as educational and administrative data is not replicated in a central repository. However, it may take longer to satisfy a data query over the broader network. This approach also requires that datasets are mature and normalized within the participating organization environments.

- **Network Infrastructure:** The system will require a far-reaching network infrastructure to provide access to the Unified System but also, to connect to integrated systems with which it exchanges data. Participating organizations, staff and systems need to be connected on a common wide-area network that provides adequate levels of accessibility, performance and security. The Internet will serve as the preferred method of connectivity. When properly configured and managed, the Internet will meet most if not all requirements for network infrastructure and provides a much less costly alternative to private networks. Bandwidth requirements will vary from site to site, but are usually quite modest for small sites. Broadband connections (via DSL or cable) are considered essential for even small sites as they offer a persistent connection at reasonable speeds and cost. Larger sites may require leased lines of varying speeds, and rural sites may have more limited connectivity options. Encryption is essential for transactions that are passing over the Internet and existing technologies are widely available to support this requirement.
- **Technology Standards:** The report provides a set of recommended standards and best practices that should be consistently used across the entire enterprise system to the extent practical. Use of these standards will ensure sound investment, improved capacity for integration and interoperability, and efficient utilization of resources. Recommended technology standards are provided in Appendix A. These standards may be replaced or modified depending on Illinois agencies' standards and best practices, the capabilities of 3<sup>rd</sup> party technologies, and evolving technologies in the marketplace.

## IV. Conceptual Framework

Figure 1 provides a high level representation of the technical architecture. In its simplest form, the Unified System must support the early childhood service providers and program administrators across the State (**system users**). The Unified System will provide an evolving set of web-enabled applications or **business services** that allow system users to access early childhood data in a variety of forms including dashboard views, standard reports, detailed data analysis and individual queries. These business services will provide access to early childhood data from a number of sources via a set of **data stores**. The data stores provide sets of remote and centralized, individualized and aggregate data sets that support the business services. To populate the data stores, the system must have the capacity to collect and share data with participating systems across the early childhood community. This requirement is supported by a **data exchange** feature that integrates participating **legacy systems** in a variety of ways. Finally, the system must provide a set of **core services** that enable the ongoing operation and performance of the system, and provide users secure and accountable access to the system and early childhood data. These high level features of the technical architecture of the Unified System will be referenced repeatedly throughout this document and are reviewed in more detail below and even greater detail in the following sections of the report.



**Figure 1**

The conceptual framework of the Unified System consists of the following areas:

- **System Users:** System users represent the entire community of program administrators, early childhood workforce, program support, researchers and system support staff that are authorized to use the Unified System. The Unified System will be accessed via a web services interface that will provide structured and secure access to all Unified System business and administrative services.
- **Business Services:** are an expanding set of value-added software services that provide system users with the ability to share data as well as a set of tools that provide access to early childhood data stored in the system. Business services also include capabilities such as dashboard, query, data analysis, reporting and other business functions.
- **Core Services:** To support the continued operation of the system, a set of system operational and administrative capabilities will be developed. These tools allow technical support and system operations staff to monitor, operate and manage the system in an ongoing manner. These tools enable management of organizational and role-based hierarchies, directory services for managing users and providers, master client index and identity resolution utilities for managing person identities across multiple data sets, and other administrative services such as report processing, auditing and control functions.
- **Data Stores:** A set of operational data stores will support data collection, data analysis, data reporting, data security and system operations. Data stores used for program data associated with children, families, workforce and programs will be structured to comply with Common Education Data Standards (CEDS). Other data stores will be designed to support administrative functions.
- **Data Exchange:** A set of modules will support data collection, data normalization and data management between the Unified System, legacy early childhood systems and other systems that share data with the Unified System. Key features of this module include vocabulary service for normalizing disparate data, messaging and translation service for exchanging data between systems, record locator service to support federated data sharing, and a batch file exchange service.
- **Legacy Systems:** Early childhood and administrative data systems will be “integrated” (federated model) or “affiliated” (centralized model) with the Unified System depending on system capabilities and the business requirements of the Unified System.

## V. Technical Architecture – Modular View

The Unified System Technical Architecture modular view is initially represented here (figure 2) in its complete form. This initial overview omits the complexity of more detailed architectural views and provides a point of reference in support of the more detailed analysis to follow.

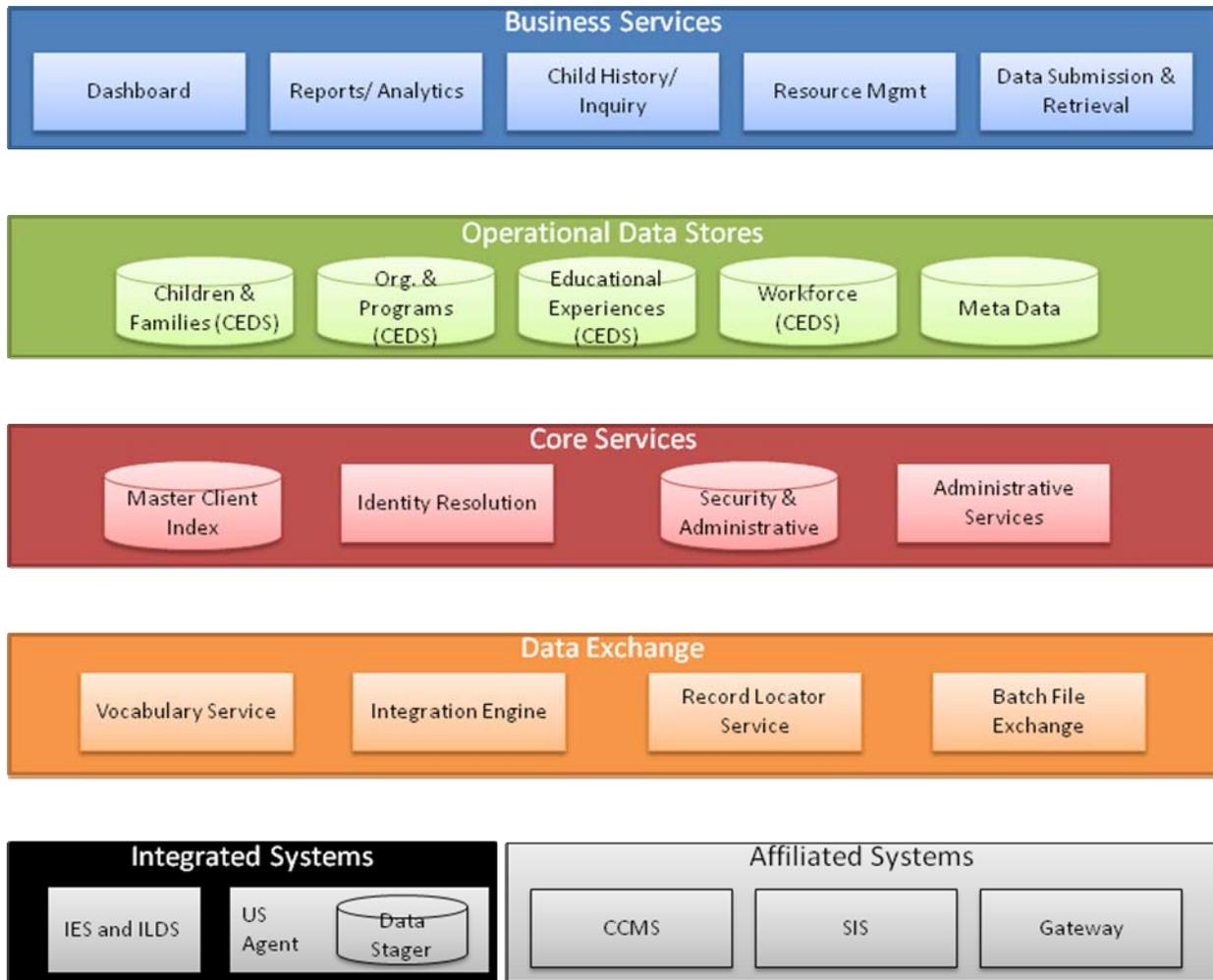


Figure 2

## A. Business Services



The Business Services module consists of a series of services that are made available to Unified System users based on their roles and responsibilities. Business services are made available via a standard web browser. The set of business services described in this report are not comprehensive. Business services may be added as the Unified System evolves over time. Business services may also be developed and made available in a phased manner depending on funding and other priorities. The preliminary set of recommended business services includes:

- **Dashboard:** Provides a set of “at-a-glance” views of the early childhood data stored in or available through the Unified System. The dashboard is configurable and provides multiple views into the database for different types of users.
- **Reports/Analytics:** Provides predefined and configurable reports that can be generated on demand or on a scheduled basis. Predefined reports are preformatted and widely available. Configurable reports are supported by a data analysis utility that allows submission of a predetermined set of report parameters to meet the specific reporting requirements of the user.
- **Child History/Inquiry:** Provides the ability to query the database in search of a child or family’s data. This module provides additional tools for service providers to support assessments, evaluations and progress reports.
- **Resource Management:** Provides the ability to add/edit/delete organizations, programs and staff to the system. Configuration specifications are controlled through this service allowing/restricting access to system features as well as breadth and depth of data access.
- **Data Submission & Retrieval:** Provides the ability for authorized users to submit data to or retrieve data from the system. The service provides technical support resources for acceptable data formats and templates as required. The service provides audit and other operational controls to manage the overall data exchange process.

## B. Operational Data Stores



The operational data stores contain, manage and provide effective access to data. Data is separated into various data stores to support the optimization of the database structure for its specific purposes. Individual data stores include:

- **Children & Families:** This data store will contain identifying information of children, their parents and guardians, and families. Information will include identifying information, contact information and demographic information. CEDS will serve as the foundation for the data store but it may contain extensions to support other data requirements.
- **Organizations & Programs:** This data store will contain identifying information of organizational entities and programs including identifying characteristics, contact information and program characteristics. CEDS will serve as the foundation for the data store but it may contain extensions to support other data requirements.
- **Educational Experiences:** This data store will contain event driven information for children. This will include enrollment, assessments, evaluations, health related events and program participation information. CEDS will serve as the foundation for the data store but it may contain extensions to support other data requirements.
- **Workforce:** This data store will contain identifying, employment and credential information on the early childhood workforce. CEDS will serve as the foundation for the data store but it may contain extensions to support other data requirements.
- **Meta Data:** The meta data repository contains “data about data”. This data store will contain de-identified aggregate data that is used to support modules such as the dashboard as well as data analysis and reporting functionality.
- **Unified System Agent/Data Stager:** The Unified System agent/data stager is a remote utility and database that supports integrated systems that use the federated model for data sharing. The remote system populates the data stager with data from their legacy system on a predetermined schedule. The Unified System Agent also provides the Unified System with tags that identify the information stored in the data stager. When queries for early childhood data are made in the Unified System, the data stager is accessed and the data is provided to the Unified System for processing. This model allows the participating agency to maintain control over and responsibility for their data.

## C. Core Services



Unified System core services are the internal service modules that support the ongoing operation of the system. Core services function behind the scenes and are typically administered by operations and technical support staff as required to maintain the overall performance of the system. The core services modules include:

- **Master Client Index:** The Unified System will collect data from a number of participating systems. These systems use unique identifiers to track children and family members that are not consistent from system to system. The master client index module will track multiple unique identifiers and ensure that data collected by the system is assigned correctly.
- **Identity Resolution:** As client data is collected, there will be occasions where there is a question relative to how the incoming data matches/does not match existing records in the database. This module will include a set of customizable algorithms that analyze demographic data in order to identify and reconcile client records. The module will support the creation of multiple matching algorithms and the assignment of those algorithms to multiple data exchange interfaces. When questionable matches occur, the records are managed by the identity resolution module. Inbound records are posted to a work queue along with references to the potential matching record(s). Unified System operational staff is responsible for managing these transactions and resolving client identification issues.
- **Security and Administrative Data Store:** This data store will contain data to support the security features of the system such as organizational and role-based security schemes. It will also contain database structures to support the ongoing management of the system such as data processing and report scheduling. This data store will also contain other security related data sets such as event logging and auditing information.
- **Administrative Services:** System administration staff and system operations staff will require system functionality that will allow them to manage ongoing system operations as well as requests from system users. Managing data exchange activity with other systems as well as managing user requests (e.g. data and report requests) are examples of administrative services. Another key feature of this service is security management. This module manages credentials (authentication) as well as access rights (authorization) for system users. Examples of system functionality offered through this service includes:
  - Add/edit/delete system users, programs and organizations
  - Manage system and data access privileges
  - Configure data exchange interfaces

- Submit and monitor reports for completion
- Monitor data exchange activity
- Perform scheduled and ad-hoc system audits

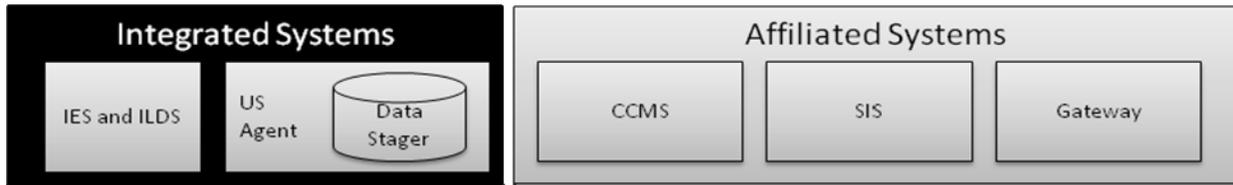
## D. Data Exchange



The Data Exchange module consists of a set of services that support data exchange between participating entities and systems.

- **Vocabulary Service:** Legacy systems maintain client data using a variety of standard and custom code sets. The Unified System in contrast will maintain data in standard data sets such as those described by CEDS (see Appendix B). The vocabulary module will be responsible for providing data translation services between participating legacy systems and the Unified System. The vocabulary service is integrated with other data exchange modules to provide a fully integrated set of data exchange services.
- **Integration Engine:** A core feature of the Unified System will be its capacity to exchange data with other entities. The integration engine has two major components: a *message service* that stands ready to receive, queue, and forward authorized messages from source systems to destination systems, and a *translation service* that provides the proper translation of message formats and code sets so that a receiving system can understand what the sending system is transmitting.
- **Record Locator Service:** The record locator service provides access to data that may be stored in distributed databases (Unified System Data Stagers). This module supports the federated model of data exchange. Integrated systems will maintain control of their data and make it available to the Unified System as requested. The record locator service requires that participating systems tell the central system when client records are created or updated. Key information including the transaction date, transaction type, and client identifying information is shared with the central system. The record locator tracks distributed data and tags its location. When a query is performed at a later date, the tag is found; the data is retrieved, and is subsequently made available to the requesting user.
- **Batch File Exchange:** For loosely integrated systems that align with the centralized data exchange model, the system will provide a batch file exchange module that will support “other than real time” data exchange between participating systems and the Unified System. This module will also support generation and routing of batch files containing Unified System data in support of special data requests.

## E. Participating Early Childhood and Illinois State Systems



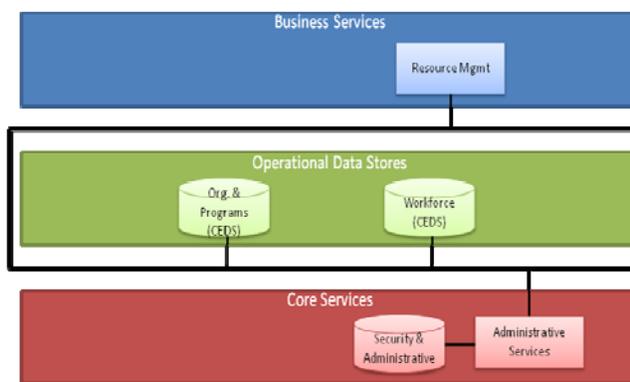
The extent to which other state systems will be integrated with the Unified System will depend on several factors including the sensitivity of data, the frequency with which data is updated and/or exchanged, the quality of the data, and the technical capacity of the system to support data exchange. For those systems that demonstrate greater data sensitivity (security and privacy concerns), frequent data exchange with the Unified System, high quality data (compliance with defined data standards), and technical capacity to support integration, the systems will be more tightly coupled or “integrated”. These systems will align with the “federated” model of system integration. Current expectations are that the DHS Integrated Eligibility System (IES) and ISBE Illinois Longitudinal Data System (ILDS) Data Warehouse will fit this model. For those systems that have less stringent security and privacy concerns (aggregated data sets for example), less frequent data exchange requirements, lower quality data (data requiring manual collection or review), or systems that don’t have technology-based capabilities to support integration, these systems will be “affiliated” or loosely coupled with the Unified System. These systems will align with the “centralized” model of systems integration.

## VI. Technical Architecture Integrated Views

This section of the report describes practical examples of how the architecture will support specific requirements of the Unified System. The specific modules associated with each function are highlighted and their interaction to deliver the specified functionality is described. The examples are not intended to be comprehensive. They are simply a representative set of functionalities of the system.

### A. Enrollment and Activation of Agencies, Programs, Organizations, Sites and Users

The enrollment and activation function is supported for authorized users of external agencies and organizations through the **Resource Management** business service. This function is also supported by Unified System administration staff through the **Administrative Services** module.

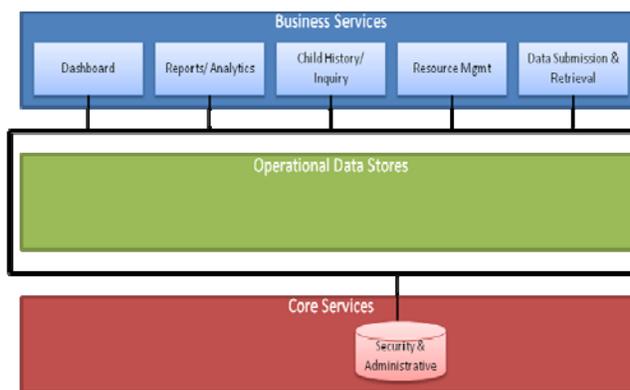


External users and system administrators must be authorized to this function through the user privileges security structure. The ability to create programs and users is further controlled via the organizational hierarchy security structure. Agency administrators are only authorized to create programs, sites and users for those entities that fall within their organizational structure as defined in the system. CEDS information captured through the enrollment process such as demographic

and identifying information is stored in the **Organizations & Programs** and **Workforce** data stores as appropriate. System user, demographic and identifying information will also be stored in the **Security & Administrative** data stores as appropriate. Organizational hierarchy, user authentication and access related information for all users is stored in the **Security & Administrative** data store.

### B. User Login – Service Request

Following enrollment, Unified System users will be provided user accounts and passwords.

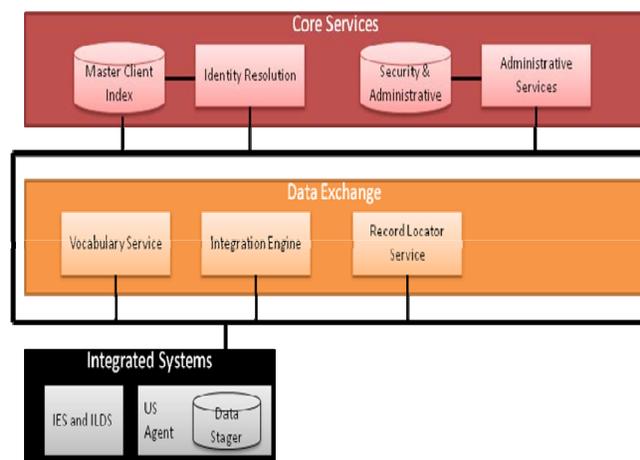


Access to the system will be provided via a standard web browser. The various Business Services modules including **Dashboard, Reports/Analytics, Child History/Inquiry, Resource Management and Data Submission & Retrieval** services will be made available depending on the access privileges that were specified for the user. These privileges are stored in the **Security &**

**Administrative** data store. For any business services the authorized user has access to, the data that is made available will depend on the user’s level or authorization to agencies, programs and sites. These access privileges are also stored in the Security & Administrative data store.

### C. Integrated Systems Update (Federated Model)

Maintaining data through the federated model of data sharing is one of the more complicated activities of the Unified System. There are multiple goals of this activity including normalizing



data stored in the **Data Stager** at the participating agencies’ facility, updating the **Master Client Index** for clients that are new to the system, and updating the **Record Locator Service** to store new references to the data stored in the Data Stager.

The **Unified System Agent** will be configured to extract data directly from the database(s) of the legacy system. The extracted information will be submitted to the Unified System **Integration Engine** for translation and validation. The **Vocabulary Service** will also be used to support the translation of code sets as required.

Following validation, records will be processed through the **Identity Resolution** module and Master Client Index. Records that are associated with an existing person will be assigned to the corresponding Master Client Index record. Records that are identified as being for a person that is new to the system will be assigned a new identifier in the Master Client Index module. Records that have questionable matching results will be assigned to a work queue and will be reviewed manually by Unified System support staff.

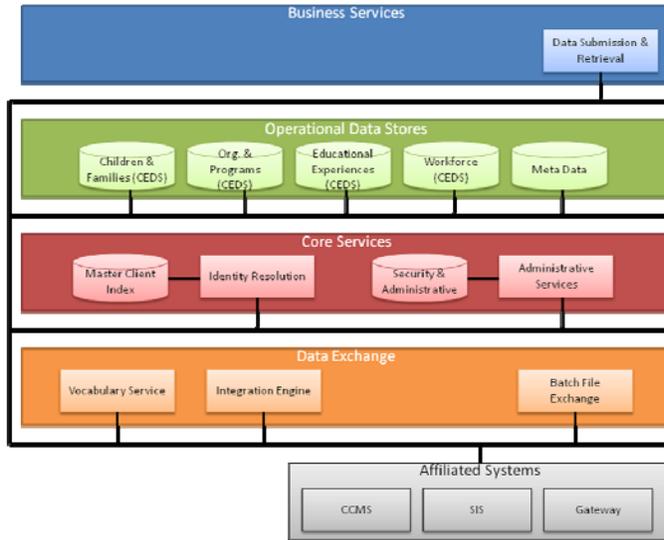
Records that have processed successfully through the system and are assigned a Master Client Index identifier will also be assigned an identifier for the Record Locator Service. Each record is assigned an index record so that the record can then be easily retrieved from the agencies’ Data Stager when system users query client records. Finally, after the normalized record has been assigned the proper Master Client Index and Record Locator Service identifiers, the record is returned to the Data Stager.

It is important to understand that the complexity of the process just described may be simplified significantly if the participating agency provides normalized data to the Unified System agent. The Unified System agent will have localized validation processes that reduce the need to call Unified Systems modules such as the Integration Engine and Vocabulary Services modules.

### D. Affiliated Systems Update (Centralized Model)

Maintaining Unified System data from affiliated systems will be accomplished through a batch file data exchange process. This process may be initiated by an agency system user through the

**Data Submission & Retrieval** module, or it may be initiated by the Unified System Administrator through the **Administrative Services** module (both scheduled file processing and on-demand requests are supported). In both cases, the user in question must be authorized to perform the requested function as specified in the **Security & Administrative** data store. In cases, the organization and system from where the file is being submitted, as well as the type of data file being submitted must be specified. This information is also stored in the Security & Administrative data store.



Following submission, the batch file is queued for processing in the **Batch File Exchange Service**. When processed, the records will be submitted to the **Integration Engine** for translation and validation. The **Vocabulary Service** will also be used to support the translation of code sets as required.

Following validation, records will be processed through the **Identity Resolution** module and **Master Client Index**. Records that are associated with an existing person will be assigned to the corresponding Master Client Index record. Records that are identified as being for a

person that is new to the system will be assigned a new identifier in the Master Client Index module. Records that have questionable matching results will be assigned to a work queue and will be reviewed manually by Unified System support staff.

Records that have processed successfully through the system and are assigned a Master Client Index identifier are posted to the appropriate operational data stores for **Children & Families, Organizations & Programs, Educational Experiences, Workforce or Meta Data** as specified by record type.

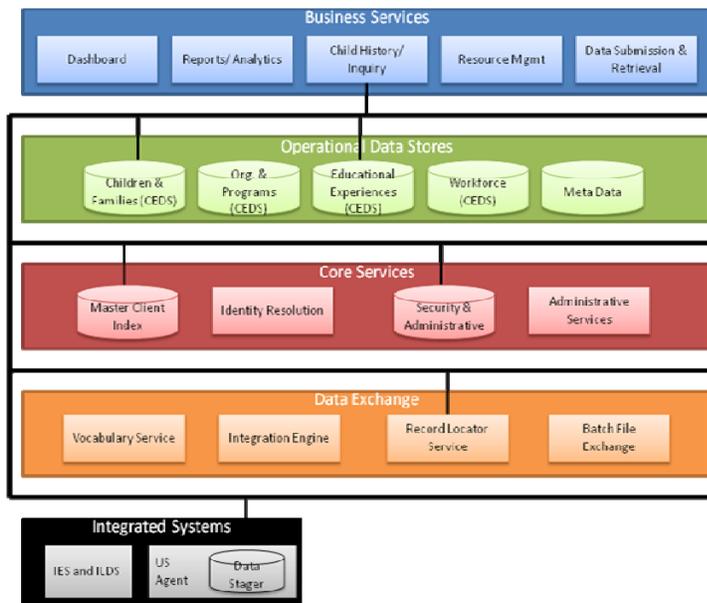
It is important to understand that the complexity of the process just described may be simplified significantly if the participating agency provides normalized data to the Batch File Exchange Service.

## E. Child History/Inquiry

NOTE: This example can be used for any user based data request that is initiated by any of the Business Services supported by the Unified System.

Whether data is made available to the Unified System through the federated or centralized models just described, that data is then available to authorized users of the system for a variety of purposes. System users are authorized to the **Child History/Inquiry** module as specified in the **Security & Administrative** data store. System users are also authorized to specific

organizations and programs as well as the data associated with those entities. These access privileges are also specified in the Security & Administrative data store.

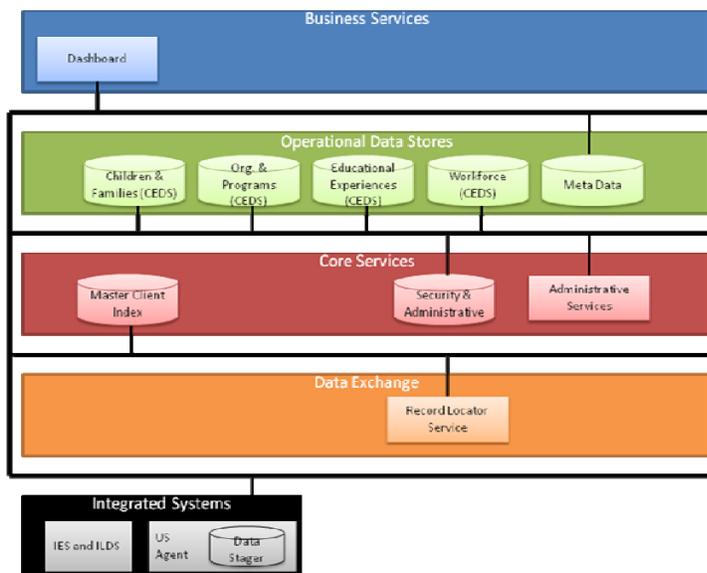


The system user will initiate a query from the Child History/Inquiry module that is based on child demographic or other identifying information. The **Master Client Index** is referenced to determine if the submitted data matches any children currently stored in the system. If yes, the specifications of the query and the indexes stored in the master client index are used to retrieve the relevant child data. The information may be stored in the Unified System operational data stores but may also be located in the **Data Stagers** of participating integrated agencies. If the Master Client Index indicates that records exist in the participating agency Data Stagers, the **Record Locator**

**Service** is engaged and the records are retrieved. Ultimately, the retrieved data is presented via the Child History/Inquiry module. System users may take other action on the child data depending on the capabilities of the module and their authorization privileges.

## F. Dashboard Update

The dashboard update is one of the more resource intensive activities in the Unified System. It



can be more appropriately thought of as an update to the **Meta Data** data store which is where the majority of the Dashboard related data is stored. Given the resource intensive nature of this activity, the Dashboard Update is normally performed overnight as a scheduled task through the **Administrative Services** module. The configuration specifications of the update including which tables to update and which organizations and programs to include are all stored within the **Security & Administrative** data store.

When the process is initiated, a query is performed against the **Master Client**

**Index** for the specified child and family data. Data sets are returned from the operational data stores (**Children & Families** and **Educational Experiences**) and from the authorized **Data Stagers** through the **Record Locator Service**. Records are also retrieved from the **Organization & Programs** and **Workforce** data stores as required to support the update. The data is aggregated according to a set of predetermined business rules and the Meta Data data store is updated. At this point, queries performed via the Dashboard will be accessing the most up to date information available.

## VI. System Design

This section of the report provides a description of system design specifications. At this stage of the project, detailed system design specifications are somewhat premature, given that the Unified System will more than likely consist of a series of commercial off the shelf (COTS) software applications and/or software utilities, and one or more custom developed software applications or modules. Given this likelihood from a systems development perspective, it is appropriate to describe the design of the Unified System as a set of functional requirements that must be met by the vendor(s) products that are adopted.

### A. Organization and Role-based Hierarchy

In order to ensure the accuracy and accountability of the Unified System and the security of the data stored within the system, an organizational hierarchy and associated business rules must be defined. The hierarchy will include:

- **Organization hierarchy:** Participating State agencies, programs, provider organizations and sites will follow a tiered organizational structure. Users will be assigned to specific agencies, programs, organizations or sites and will be authorized to data as controlled by that structure. Agencies, programs and sites will have hierarchical relationships that support data security and system integrity.
- **Role-based authorization hierarchy:** Administrators, early childhood workforce, program support staff, and researchers will be given access to appropriate Business Services and Core Services of the system.
- **User authentication:** Each user will be required to log into the system with a pre-assigned user name and password. More complex authentication schemes may be employed as required.
- **Data access privileges:** System users will be authorized to specific categories of data (children & families, organizations & programs, workforce and meta data) depending on their specific roles and the business services to which they are authorized. Data access will be further controlled though the organization hierarchy.

Business rules will be overlaid onto the organization hierarchy, role-based authorization structure and data access privileges. The business rules will enable/restrict access to both data by type as well as business services.

A.1	Organization Hierarchy Requirements
A.1.1	The system will support a hierarchical organization structure consisting of participating State agencies, programs, provider organizations, and sites.
A.1.2	State agencies will have a one-to-many relationship with programs.
A.1.3	Programs will have a one-to-many relationship with provider organizations.
A.1.4	Provider organizations may be affiliated with more than one program.

<b>A.1</b>	<b>Organization Hierarchy Requirements</b>
A.1.4	Provider organizations will have a one-to-many relationship with sites.
A.1.5	Sites may only be affiliated with a single provider organization.
A.1.6	Users may be affiliated with multiple agencies, programs, organizations and sites.
A.1.7	Users are not authorized to any organizational entity (sites, organizations or programs) that is a subordinate of an entity to which the user is not authorized.
A.1.8	The system will support an embedded data sharing structure that enables/restricts data that may be shared among participating organizations, programs and sites.
A.1.9	An administrative function will be provided that allows data sharing to be enabled/restricted between participating organizations and programs.

<b>A.2</b>	<b>Role-based hierarchy requirements</b>
A.2.1	Organization administrators will be assigned to State agencies, provider organizations and sites to provide localized control over access privileges for system users.
A.2.2	Organization administrators will be assigned to programs as required to provide localized control over who can access which programs.
A.2.3	Workforce, program support staff and researchers will be assigned to provider organizations, programs and sites by the Organization Administrator.
A.2.4	Organization administrators may only assign privileges to organizations, programs and sites to which they are authorized.

<b>A.3</b>	<b>Role – based Authorization Requirements</b>
A.3.1	Business services will have pre-configured restrictions on the user roles that are authorized access to the business services.
A.3.2	The system will support the addition of new business services as they are identified and approved for integration with the Unified System.
A.3.3	Organization administrators, early childhood workforce, program support and researchers may be authorized to one or more business services depending on their role and responsibilities.
A.3.4	Unified System Administrators will have overarching administrative privileges over all administrative functions, agencies, programs organizations, sites and users configured on the system.

<b>A.4</b>	<b>User Authentication Requirements</b>
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<b>A.4</b>	<b>User Authentication Requirements</b>
A.4.1	System users will be assigned unique user name/password combinations to enable access to the Unified System.
A.4.2	The system will specify minimal character count and character type restrictions to both user name and passwords.
A.4.3	The system will require periodic changes to passwords based on a predetermined schedule and will prompt the user automatically to change their password.
A.4.4	The system will provide a security mechanism to allow the user to obtain their password automatically in the event that they've forgotten it.

<b>A.5</b>	<b>Data Access Requirements</b>
A.5.1	System users will be authorized to operational data stores depending on their specific roles and the business services to which they are authorized.
A.5.2	System users will be authorized to data that is associated with specific programs, organizations and sites, only if they are authorized to those entities.

## **B. Business Services**

Business services are an expanding set of value-added software services that provide system users with the ability to share data as well as a set of tools that provide access to early childhood data stored in the system. Access to business services is controlled via the role-based specifications defined in the previous section.

1. Unified System Dashboard: The dashboard provides a set of “at-a-glance” views of the early childhood data stored in or available through the Unified System. The dashboard is configurable and provides multiple views into the database for different types of users.

<b>B.1</b>	<b>Unified System Dashboard Requirements</b>
B.1.1	The Dashboard will be accessible via a web services interface to authorized system users.
B.1.2	Dashboard features will be designed to support the ten key policy questions and other early childhood oversight requirements (details to be determined).
B.1.3	Dashboard features will be made available to system users based on their role-based assignments and as authorized by the Organization Administrator.
B.1.4	The dashboard will consist of both static (periodic updates) and dynamic (on demand updates) data sets.
B.1.5	Dynamic components of the dashboard will be updated upon user request in real time.

<b>B.1</b>	<b>Unified System Dashboard Requirements</b>
B.1.6	Static components of the dashboard will be updated on a predetermined schedule (i.e. daily, weekly, monthly).
B.1.7	The dashboard will provide search variables including geographic region (city/town, county and state), program, agency and date range.
B.1.8	The dashboard will provide a set of preconfigured graphical representations of early childhood data (to be determined).

2. Reports/Analytics: Provides predefined and configurable reports that can be generated on demand or on a scheduled basis. Predefined reports are preformatted and widely available. The configurable reports are supported by a data analysis feature that allows submission of a predetermined set of report parameters to meet the specific reporting requirements of the user.

<b>B.2</b>	<b>Reports/Analytics Requirements</b>
B.2.1	The reports/analytics tool will accessible via a web services interface to authorized system users.
B.2.2	Predefined report categories and types will be available to system users based on their role-based assignments and as authorized by the Organization Administrator.
B.2.3	Reports/Analytics capabilities will be designed to support the ten key policy questions and other early childhood oversight requirements (to be determined – please refer to Unified System Planning Project Q2 Deliverable – CEDS Analysis Report for a listing of possible reports).
B.2.4	Users will be given the ability to select one or more reports by type.
B.2.5	Users will be able to select the program of interest (as authorized) which will in turn list program specific report options.
B.2.6	Users will be able to make organization-based selections (provider organizations and/or sites) which will restrict the organizations that are included in their report request.
B.2.7	Users will be able to select report detail by agency, program, organization or site for both predefined and configurable report types.
B.2.8	Users will be able to enter to/from date ranges for both predefined and configurable reports.
B.2.9	Reports will analyze and report early childhood data based on the organization hierarchy and organization assignment of the requesting user.
B.2.10	Reports may be submitted for immediate processing or for batch processing (i.e. overnight).

<b>B.2</b>	<b>Reports/Analytics Requirements</b>
B.2.11	Users will be notified when the submitted report is complete.
B.2.12	Predefined and configurable reports will be generated in HTML, Excel or PDF versions as requested by the system user.

3. Child History/Inquiry: Provides the ability to query the database in search of a child or family’s data. Provide additional capabilities to support value added features such as child assessments and evaluations.

<b>B.3</b>	<b>Child History/Inquiry Requirements</b>
B.3.1	The child inquiry/history business service will be accessible via a web services interface to authorized system users.
B.3.2	Child inquiry functions will be available to system users based on their role-based assignments and as authorized by the Organization Administrator.
B.3.3	Child data categories to be displayed may include contact, demographic, developmental assessments, educational experiences, health information, identity, language, family, and parent/guardian information as specified by CEDS.
B.3.4	Child data categories to be displayed will be restricted by the type of inquiry performed.
B.3.5	Authorized users will be able to perform child inquiry searches based on specified criteria (to be determined).
B.3.6	Access to child records will be restricted based on system-configured data sharing agreements between participating programs and organizations.
B.3.7	Access to child records will be restricted by the organization hierarchy and organization assignment of the requesting user.
B.3.8	Child assessments and evaluations will be supported (to be determined).
B.3.9	The service will comply with the Assessment Interoperability Framework (AIF) being developed by the SIF Association (SIF) and IMS GLC (IMS) communities, in partnership with the SBAC and PARCC as required.

4. Resource Management: Provides the ability to search/add/edit/activate/deactivate organizations, programs, sites, workforce and staff to the system. Configuration specifications are controlled through this service allowing/restricting access to system features as well as breadth and depth of data access.

<b>B.4</b>	<b>Resource Management Requirements</b>
B.4.1	The resource management tool will be accessible via a web services interface to authorized system users.
B.4.2	Authorized users will be able to search/add/edit/activate/deactivate organizations, programs, sites, workforce and support staff as specified by organization and role-based privileges.
B.4.3	Workforce data captured by the system will include contact, demographic, employment, identity, language and education training as specified by CEDS.
B.4.4	Organization data captured by the system will include organization information as specified by CEDS.
B.4.5	Site data captured by the system will include site level characteristics data as specified by CEDS.
B.4.6	Support staff data captured by the system will include contact information, organization assignment and privileges, program assignment and privileges, and role-based privileges.
B.4.7	Authorized users will be able to assign programs to authorized agencies, organizations to authorized programs, sites to authorized organizations and workforce to authorized programs/organizations/sites.
B.4.8	The system will support a reciprocal activation process for organizations, programs, sites and workforce between the Organization Administrator and the Unified System Administrator. Both parties are required to flag records for activation.
B.4.9	The resource manager will provide the ability to print resource summary records.

5. Data Submission & Retrieval: Provides the ability for authorized users to submit data to the system or retrieve data from the system. The service provides technical support resources for acceptable data formats and templates as required for supporting data exchange. The service provides audit and other operational controls to manage the overall data exchange process.

<b>B.5</b>	<b>Data Submission &amp; Retrieval</b>
B.5.1	The data submission & retrieval module will be accessible via a web services interface to authorized system users.
B.5.2	Authorized users will be able to view/download data file templates and processing instructions in order submit and retrieve data in a timely and accurate manner.
B.5.3	The system will support file upload and/or file download to the user's desktop as authorized. File types supported are still to be determined.
B.5.4	The system will provide a list of authorized file types for file upload/download. The user will select the file type as part of the submission process.

<b>B.5</b>	<b>Data Submission &amp; Retrieval</b>
B.5.5	Authorized file types will be identified by the user's organization name. Batch file configurations will be stored by organization name in the Security & Administrative data store.
B.5.6	Following submission, files will be placed on a processing queue for subsequent processing by the Data Exchange service.
B.5.7	Users will be provided a work queue listing available inbound and outbound files.
B.5.8	Following file processing, users will be provided an audit report describing the results of file processing.
B.5.9	The system will provide the user the ability to cancel a submission following review of the audit report.
B.5.10	The system will flag files by processing status including file submitted, file validated, file processing error, file posted.
B.5.11	The system will provide the user the ability to cancel a submission following review of the audit report (file validation process). If the file has been posted to the database (file posted), the file submission cannot be cancelled.

## **C. Unified System Operational Data Stores**

The operational data stores contain, manage and provide effective access to data associated with the early learning environment including data on children and families, organizations and programs, and the early childhood workforce. The database will provide access to both client specific data as well as aggregate data. The database structure will provide the following capabilities:

<b>C.1</b>	<b>Operational Data Stores Requirements</b>
C.1.1	The database will capture Child data including identity, contact, demographic, developmental assessments, educational experiences, health information and language information (please refer to CEDS database description and schema referenced in appendices C and D).
C.1.2	The database will capture Family data including family and household information (please refer to CEDS database description and schema referenced in appendices C and D).
C.1.3	The database will capture Organization and Program data including identifying information, contact information, program characteristics and site level characteristics (please refer to CEDS database description and schema referenced in appendices C and D).
C.1.4	The database will capture early childhood education Staff data including identifying, contact, demographic, employment, language, and education/training data (please refer

C.1	Operational Data Stores Requirements
	to CEDS database description and schema referenced in appendices C and D).
C.1.5	The database will capture Parent/Guardian data including education and identity data (please refer to CEDS database description and schema referenced in appendices C and D).
C.1.6	The database will contain “data about data” that will support the ten key policy questions developed by the Early Learning Council’s Data Research & Evaluation Committee. This data store will contain de-identified aggregate data that is used to support other modules such as the dashboard as well as data analysis and reporting functionality.
C.1.7	The use of data types and naming conventions will follow a detailed and logical database structure that is easily understood. Please refer to the CEDS Database Description in Appendix C for a recommended naming convention structure.
C.1.8	Database relationships between tables and objects shall be structured as to ensure optimized performance and accountability of the database.
C.1.9	The database will be structured for Online Transaction Processing (OLTP) as appropriate to maximize performance of large data processing needs but other structures will follow Online Analytical Processing (OLAP) design specifications for research and data analysis related activities.
C.1.10	The CEDS database structure and schema proposed in Appendix C and D will be used as the database design specification unless an acceptable alternative design is developed and approved.
C.1.11	The database will use triggers and stored procedures to the extent that they streamline processing and improve processing speed and efficiency.
C.1.12	The database will maximize the use of appropriate parent/child relationships and primary/foreign keys in order to reduce redundancy and maximize the overall integrity of the database.
C.1.13	<p>The database will not use natural data for primary keys. Unique constraints may be used to prohibit data duplication. Primary key characteristics include:</p> <ol style="list-style-type: none"> <li>1) Every table has a primary key.</li> <li>2) The primary key is a single field.</li> <li>3) The primary key is the first field.</li> <li>4) The primary key field is named to correspond with the table name.</li> <li>5) The primary key migrates to child tables as a foreign key with the same</li> </ol>

C.1	Operational Data Stores Requirements
	characteristics. 6) The primary key field is numeric. 7) The primary key field is a 4-byte integer data type. 8) The primary key field uses the IDENTITY property (starting at 1 and incrementing by 1).
C.1.14	The database will not use self-referencing tables. An example is an employee table where an employee record references a supervisor in the same table.
C.1.15	The database will use indexes where appropriate to maximize the effectiveness of queries.
C.1.16	The database will have well defined mechanisms for managing concurrent access (multiple users accessing the same data).
C.1.17	The database will contain mechanisms to track activity and provide audit reports, and will also track change history as required to maintain accountability over data.
C.1.18	Sensitive database tables will contain standard fields for tracking activity including record created by, last modified by, record status (active, inactive, pending, deleted, etc.) and date time stamps for created and modified activity.
C.1.19	The database will use standard triggers, stored procedures, user-defined functions and views to manage the integrity and performance of the database.
C.1.20	The database will use standard RDBMS concepts to ensure the integrity of the database including the use of constraints to ensure that: <ol style="list-style-type: none"> <li>1) primary key values are guaranteed to be unique</li> <li>2) child records cannot be inserted if they reference parent records that do not exist</li> <li>3) parent records cannot be deleted if there are child records referring to them</li> </ol>

## D. Unified System Agent/Data Stager

The Unified System Agent/Data Stager is a remote utility and database that supports integrated systems that use the federated model for data sharing. The remote system populates the data stager with data from their legacy system on a predetermined schedule. The Unified System Agent also provides the Unified System with tags that identify the information stored in the data stager. When queries for early childhood data are made in the Unified System, the data stager is

accessed and the data is provided to the Unified System for processing. This model allows the participating agency to maintain control over and responsibility for their data.

1. Data Stager

<b>D.1</b>	<b>Unified System Data Stager Requirements</b>
D.1.1	The Data Stager database will meet all requirements of the database design as specified in section C.1 above as required to meet database performance, integrity and accountability requirements.
D.1.2	The Data Stager will support predefined data sets (to be determined) and table structures as required to support Unified System Business Services.
D.1.3	The Data Stager will interface with the record locator service to manage data exchange activity between the Data Stager and the Unified System Business Services.

2. Unified System Agent

<b>D.2</b>	<b>Unified System Agent Requirements</b>
D.2.1	The Unified System Agent will be accessible via a web services interface to authorized system users.
D.2.2	The Agent Administrator at the participating organization will be provided administrative access to the US Agent Module and Data Stager to manage all data exchange activity.
D.2.3	The Agent Administrator will be provided a scheduling utility interface to support data exchange activities between the legacy system and the Unified System.
D.2.4	The system will provide a list of authorized record formats, code sets and integration specifications for the Agent Administrator via the user interface.
D.2.5	The Agent Administrator will configure individual data extract interfaces with the legacy system as necessary to support data exchange with the Unified System.
D.2.6	The Unified System Agent (US Agent) will interface with the integration engine to support record and field level translation requirements.
D.2.7	The US Agent will interface with the vocabulary service in order to support code set translation requirements.
D.2.8	The US Agent will interface with the identity resolution service in order to support client identification and master client index requirements.
D.2.9	The US Agent will interface with the record locator service in order to support data management requirements.
D.2.10	The system will support transaction-level or batch processing of legacy system records.
D.2.11	Audit logs will be available to the Agent Administrator to support the review of all processing activity.

**E. Core Services**

Unified System core services are the internal service modules that support the ongoing operation of the system. Core services function behind the scenes and are typically administered by operations and technical support staff as required to maintain the overall performance of the system. The core services modules include:

### 1. Master Client Index

The Unified System will collect data from a number of participating systems. These systems use unique identifiers to track children and family members that are not consistent from system to system. The master client index module will track multiple unique identifiers and ensure that data collected by the system is assigned correctly.

<b>E.1</b>	<b>Master Client Index Requirements</b>
E.1.1	The Master Client Index database will meet all requirements of the database design as specified in section C.1 above as required to meet database performance, integrity and accountability requirements.
E.1.2	The Master Client Index will provide the ability to store and manage multiple unique identifiers from multiple legacy systems.
E.1.3	The Master Client Index will provide the ability to seamlessly add unique identifiers as new legacy systems are added to the Unified System.
E.1.4	The Master Client Index will store demographic and other identifying information as required to support identity resolution requirements of the Identity Resolution Module.
E.1.5	The Master Client Index will provide indexed references to records stored in the Data Stagers as required to support the Record Locator Service module.

### 2. Identity Resolution

As client data is collected, a key step in the process involves verifying the identity of the person associated with the data record. This involves matching the incoming data with preexisting records in the database. This module will include a set of customizable algorithms that analyze unique identifiers and demographic data in order to match client records. A single algorithm might review first name, last name, date of birth and client ID. If all data items of an incoming record match an existing client record in the database, the incoming record will be matched to that database record. This module will support the creation of multiple matching algorithms and the assignment of those algorithms to multiple data exchange interfaces. When questionable matches occur, the records are managed by the identity resolution module. Inbound records are posted to a work queue along with references to the potential matching record(s). Unified System and/or records management staffs or participating organizations are responsible for managing these transactions and resolving client identification.

<b>E.2</b>	<b>Identity Resolution Requirements</b>
E.2.1	The Identity Resolution Module will be accessible via a web services interface to

<b>E.2</b>	<b>Identity Resolution Requirements</b>
	authorized system users.
E.2.2	The system will provide the ability to define record matching algorithms that select demographic and unique identifier fields.
E.2.3	Record matching algorithms are assigned to specific organization interfaces. One interface may have zero or more matching algorithms.
E.2.4	The system will accept requests from the Integration Engine for identity resolution services.
E.2.5	Record matching algorithms will be executed against each inbound record and the identifying data elements of the record will be compared to the master client index.
E.2.6	Record matches will result in the assignment of the existing record's internal Unified System unique identifier to the inbound record.
E.2.7	Records that result in no match that have the required legacy system unique identifiers will be assigned new record status and will be assigned an internal Unified System unique identifier.
E.2.8	Following assignment of the required unique identifier, the matched record will be returned to the integration engine.
E.2.9	Partial matches will result in records being routed to a work queue for manual review.

### 3. Administrative Services

The Unified System will be required to track multiple types of entities and their attributes including system users, the early childhood workforce, early childhood programs, service delivery sites, and organizations. Directory services provide a structured method for managing these entities and their associated data. Directory Services also contains the required security components for network nodes and users including user and node definitions, credentials, unique identifier(s) and digital certificates as required.

System administration staff and system operations staff will require system functionality that will allow them to manage ongoing system operations as well as requests from system users. Managing data exchange activity with other systems as well as managing user requests (e.g. data and report requests) are examples of administrative services. Another key feature of this service is security management. The Administrative Services Module manages credentials (authentication) as well as access rights (authorization) for system users. Examples of system functionality offered through this service include:

- Add/edit/delete system users, programs and organizations
- Manage authorization privileges
- Manage user authentication
- Schedule, monitor and manage reports

- Perform scheduled and ad-hoc system audits
- Monitor system performance

<b>E.3.1</b>	<b>Administrative Services General Functions</b>
E.3.1.1	The Administrative Services Module will be accessible via a web services interface to authorized system users (Unified System Administrators).
E.3.1.2	The system will log all activity associated with user, program and organization management (add/edit/delete/activate/deactivate and assignment/revocation of privileges).
E.3.1.3	The system will log all activity associated with report processing, file processing, and related data processing activity.
E.3.1.2	The system will provide the ability to view and query audit logs and provide user friendly printable views of audit log activity in both detailed and summary form.

<b>E.3.2</b>	<b>Manage Users, Programs and Organizations</b>
E.3.2.1	Authorized users will be able to search/add/edit/activate/deactivate organizations, programs, sites, workforce and support staff as specified by organization and role-based privileges.
E.3.2.2	Workforce data captured by the system will include contact, demographic, employment, identity, language and education training as specified by CEDS.
E.3.2.3	Organization data captured by the system will include organization information as specified by CEDS.
E.3.2.4	Site data captured by the system will include site level characteristics data as specified by CEDS.
E.3.2.5	Support staff data captured by the system will include contact information and identifying information.

<b>E.3.3</b>	<b>Manage Authorization Privileges</b>
E.3.3.1	The system will provide a feature to assign programs to authorized agencies, organizations to authorized programs, sites to authorized organizations and workforce to authorized programs/organizations/sites.
E.3.3.2	The system will provide a feature to assign business services to authorized users.
E.3.3.3	The system will have the ability to seamlessly incorporate additional Business Services into the authorization structure as they are added to the Unified System.

<b>E.3.4</b>	<b>Manage User Authentication</b>
E.3.4.1	The system will support the management of user name and password based access to the system.
E.3.4.2	The system will allow a Unified System Administrator to specify requirements for minimal character count and character type requirements for user names and passwords.
E.3.4.3	The system will allow a Unified System Administrator to specify a timeframe for passwords to auto expire.
E.3.4.4	The system will allow a Unified System Administrator to specify the number of times a user can enter an invalid password before the account is disabled.
E.3.4.5	The system will provide an interface to view user account status (enabled/disabled/login status) and provide the ability to reset the account.
E.3.4.6	The system will encrypt passwords when stored in the database.
E.3.4.7	The system will track all user name and password related activity (add/edit/delete/activate/deactivate) in an audit log and provide a user friendly interface to monitor and report the activity.

<b>E.3.5</b>	<b>Schedule, Monitor and Manage Reports</b>
E.3.5.1	The system will provide a scheduling and report management utility to allow the Unified System Administrator to view submitted reports and take actions as necessary to manage the effective processing and delivery of reports.
E.3.5.2	A list of available reports will be provided.
E.3.5.3	Resource intensive reports may be flagged as “restricted” by the Unified System Administrator so that they may only be processed in batch or overnight mode.
E.3.5.4	Reports may be selected for submission from a list of available reports.
E.3.5.5	Reports may be processed immediately or submitted for later processing and retrieval (i.e. overnight).
E.3.5.6	Reports may be scheduled to be processed indefinitely (i.e. daily, weekly, monthly, quarterly, annually).
E.3.5.7	Distribution lists may be assigned to reports. Reports will be made available to users via the Reports/Analytics business service.
E.3.5.8	Following selection, report parameters will be provided for user selection. These may include report type, date/time selections, organization/program/site selections, and output type (excel, pdf, html).
E.3.5.9	Reports that were previously scheduled for later processing may be processed immediately from the report queue.

#### 4. Security & Administrative Data Store

This data store will contain data to support the security features of the system such as organizational hierarchies, organizational and role-based security schemes, and user-based authorization and authentication specifications. It will also contain an LDAP compliant user directory containing all workforce information such as identifying information, contact information, demographic information and credentials as necessary to support integration with other LDAP compliant systems. This data store will also contain other security related data sets such as event logging and auditing information.

<b>E.4</b>	<b>Security &amp; Administrative Data Store</b>
E.4.1	The Security & Administrative database will meet all requirements of the database design as specified in section C.1 as required to meet database performance, integrity and accountability requirements.
E.4.2	The database will include LDAP compliant directory services related tables to track organization, workforce and staff information.
E.4.3	The database will include audit tables to track all resource management related activities including organization, program, workforce and support staff management activities.
E.4.4	The database will include audit tables to track all report submission, processing and management activities.
E.4.5	The database will include audit tables to track all data exchange activities.

#### F. Data Exchange

The Data Exchange module consists of a set of services that support data exchange between participating entities and systems. This module will support real time and batch processing of data from/to participating systems.

##### 1. Vocabulary Service

Legacy systems maintain client data using a variety of standard and custom code sets. The Unified System in contrast will maintain data in standard data sets such as those described in CEDS (see Appendix B). The vocabulary module will be responsible for providing data translation services between integrated legacy systems and the Unified System. The vocabulary service is integrated with other data exchange modules to provide a fully integrated set of data exchange services.

<b>F.1</b>	<b>Vocabulary Service</b>
F.1.1	The Vocabulary Service will be accessible via a web services interface to authorized system users.

<b>F.1</b>	<b>Vocabulary Service</b>
F.1.2	Vocabulary master tables will maintain standards-based and non-standard data sets for use by the Integration Engine.
F.1.3	Vocabulary master tables will contain descriptive text and formatting specifications for supported data sets.
F.1.4	The Vocabulary Service will support all code set specifications for CEDS data elements.
F.1.5	The Vocabulary Service will maintain multiple sets of vocabulary-based crosswalks.
F.1.6	Vocabularies will be available for viewing, printing and downloading by authorized users.
F.1.7	The Vocabulary Service will support the creation of crosswalks between standard vocabularies and the vocabularies supported by integrated and affiliated data systems.
F.1.8	Crosswalks will be assigned to specific integrated system configurations to support the unique data translation needs of that entity.
F.1.9	The Vocabulary Service will accept data translation requests from the Integration Engine and return an acceptable value or an error message.

## 2. Integration Engine (messaging service and translation service)

A core feature of the Unified System will be its capacity to exchange data with other entities. The integration engine has two major components: a *message service* that stands ready to receive, queue, and forward authorized messages from source systems to destination systems, and a *translation service* that provides the proper translation of message formats and code sets so that a receiving system can understand what the sending system is transmitting.

<b>F.2</b>	<b>Integration Engine</b>
F.2.1	The Integration Engine will be accessible via a web services interface to authorized system users.
F.2.2	The Integration Engine will provide the ability to configure data translation interfaces between integrated and affiliated systems.
F.2.3	Data translation interfaces will be assigned to specific legacy systems as required to support their data exchange requirements.
F.2.4	The Integration Engine will support defined record sets for children & families, programs & organizations, educational experiences and workforce (record sets to be determined).
F.2.5	The Integration Engine will support the ability to add additional record sets as the Unified System evolves.
F.2.6	The Integration Engine will initiate requests to and accept responses from the

<b>F.2</b>	<b>Integration Engine</b>
	Vocabulary Service and incorporate the results into processed data sets.
F.2.7	The Integration Engine will initiate requests to and accept responses from the Identity Resolution service to support identity resolution and assignment of unique identifiers.
F.2.8	The Integration Engine will accept transaction-based data processing requests from the Unified System Agent.
F.2.9	The Integration Engine will accept batch file data processing requests from the Batch File Exchange module.
F.2.10	The Integration Engine will log all data processing activity to log files as required to support monitoring and management of data translation activity.
F.2.11	The Integration Engine will log all activity as required to fully support integrated modules including Identity Resolution, Vocabulary Service, Record Locator Service, Unified System Agents and Batch File Exchange modules.
F.2.12	All transactions will be logged to database tables including initial record content, converted record content and status.

### 3. Record Locator Service

The record locator service provides access to data that may be stored in distributed databases (Unified System Data Stagers). This module supports the federated model of data exchange. Integrated systems will maintain control of their data and make it available to the Unified System as requested. The record locator service requires that participating systems tell the central system when client records are created or updated. Key information including the transaction date, transaction type, and client identifying information is shared with the central system. The record locator tracks distributed data and tags its location. When a query is performed at a later date, the tag is found; the data is retrieved, and is subsequently made available to the requesting user.

<b>F.3</b>	<b>Record Locator Service</b>
F.3.1	The Record Locator Service will be accessible via a web services interface to authorized system users.
F.3.2	The Record Locator Service will accept requests from the Integration Engine to log entries associated with Data Stager records.
F.3.3	The Record Locator Service will support defined record sets for children & families, programs & organizations, educational experiences and workforce (record sets to be determined).
F.3.4	The Record Locator Service will integrate with the Master Patient Index to track records across the enterprise system (all integrated Data Stagers).
F.3.5	The Record Locator Service will support the ability to add additional record types as

<b>F.3</b>	<b>Record Locator Service</b>
	the Unified System evolves.
F.3.6	The Record Locator Service will log all data processing activity to log files as required to support monitoring and management of data processing activity.

#### 4. Batch File Exchange

For loosely integrated systems that align with the centralized data exchange model, the system will provide a batch file exchange module that will support “other than real time” data exchange between participating systems and the Unified System. This module will also support generation and routing of batch files containing Unified System data in support of special data requests.

<b>F.4</b>	<b>Batch File Exchange</b>
F.4.1	The Batch File Exchange will be accessible via a web services interface to authorized system users.
F.4.2	The Batch File Exchange will have the ability to configure batch file exchange interfaces with affiliated systems.
F.4.3	The Batch File Exchange will support secure FTP push and pull for inbound and outbound files.
F.4.3	The Batch File Exchange will have the ability to accept batch file submissions from authorized users via the File Submission & Retrieval business service.
F.4.4	The Batch File Exchange will support defined record sets for children & families, programs & organizations, educational experiences and workforce (record sets to be determined).
F.4.5	The Batch File Exchange will support the ability to add additional record sets as the Unified System evolves.
F.4.6	The Batch File Exchange will submit batch files to the Integration Engine for processing.
F.4.7	The Batch File Exchange will log all processing activity in order to provide users with a detailed account of file processing results.

## VIII. Appendix A: Technology Infrastructure Standards

A collection of well established and integrated technology standards is recommended as the technology infrastructure for the Unified System. Recommended standards are listed in the table below.

<b>Unified System Technical Standards</b>		
<b>Focus Area</b>	<b>Standard</b>	<b>Description</b>
Network Connectivity	Internet Engineering Task Force (IETF) Transmission Control Protocol/Internet Protocol (TCP/IP) Version 4	This is the de facto networking standard of the Internet and most mature intra-organizational local area and enterprise-wide networks.
Web Applications	Web Browser compatible with IETF Hypertext Transfer Protocol (HTTP) Version 1.1	This represents the minimum level of compliance for web-based applications. Specific applications may be dependent on other software or compatibility (e.g., Java, JavaScript).
Transport Encryption	IETF Transport Layer Security (TLS) Version 1.0/Secure Socket Layer (SSL) Version 3.0	This is the de facto transport encryption protocol of the Internet. Note that transport encryption is only necessary when data is transported over public (insecure) networks and not when data is transported over private (secure) networks.
Authentication	Username/Strong Password Public Key Infrastructure (PKI) Hardware Tokens Biometric Devices	Many strategies exist, and their specific use will depend on the application. Specific rules may differ for username/password for specific applications. Multi-factor authentication may also be necessary for some applications.
Message Formats	Schools Interoperability Framework (SIF)	SIF provides for a data and transport standard for managing student and other educational data.
Semantic Standards	Common Education Data Standards (CEDS) v 2.0	CEDS is a national collaborative effort to develop voluntary, common data standards for a key set of education data elements to streamline the exchange and comparison of data across institutions and sectors.

<b>Unified System Technical Standards</b>		
<b>Focus Area</b>	<b>Standard</b>	<b>Description</b>
Application Architecture	Multi-tier with separation between presentation layer, business logic and data	A multi-tier architecture better ensures application scalability and security.
	Service oriented architecture	SOA is especially useful for loosely coupled, network applications that are typical of many integrated systems environments.
Database	ANSI Structured Query Language (SQL)	This is the de facto query language for commercial and open source relational database management systems.
Web applications	Rehabilitation Act of 1973 Section 508 Compliant	Application user interfaces must be accessible to individuals with disabilities.
Directory Services	IETF Lightweight Directory Access Protocol (LDAP) Version 3.0	This is the de facto directory storage and access protocol of the Internet.
Authentication	Single Sign-On (SSO)	In conjunction with other authentication strategies, SSO provides a more comprehensive solution that makes the management of credentials for multiple systems easier for users.

## IX. Appendix B: CEDS Summary Reference Table

Table 1 – CEDS Summary Reference Table	
CEDS Entities and Categories	Description and Data Elements
<b>Child</b>	
Contact	Where the child lives including street, city, state, zip code, county.
Demographic	Identifying characteristics of the child including DOB, gender, race, ethnicity, homeless status and program eligibility.
Developmental Assessments	Developmental screening status, evaluation finding (disorder type), disability type.
Educational Experiences	Details of early learning services received including current and prior program type, individualized programs, early intervention services received and program participation dates (application, enrollment, entry, and exit).
Health Information	Details of health services received including immunizations, dental/hearing/ vision screening status, birth data and insurance coverage.
Identity	First name, last name, middle name, generation code or suffix.
Language	Language type and language code.
<b>Family</b>	
Family/Household Information	Family/household size, income and proof of residency.
<b>Organization</b>	
Organization Information	Organization name, address, telephone.
Program Characteristics	Child/staff ratio, hours/days available per week, program option, program setting, QRIS info.
Site level characteristics	Site name, licensing info, ages served.
<b>Staff</b>	
Contact	Where the resource lives including street, city, state, zip code, county.

<b>Table 1 – CEDS Summary Reference Table</b>	
<b>CEDS Entities and Categories</b>	<b>Description and Data Elements</b>
Demographic	DOB and gender.
Employment	Classification (job type), start date, hire date, employment status.
Identity	First name, last name, middle name, generation code or suffix, title.
Language	Language type and language code.
Staff Education/Training	Degrees, certifications and credentials.
<b>Parent/Guardian</b>	
Education	Education level completed.
Identity	First name, last name, middle name, generation code or suffix, title and relationship to child.

## X. Appendix C: CEDS Database Description

CEDS Database Description			
Table Name	Column Name	Data Type	Notes
C_			<b>All tables related to the Child begins with C_</b>
C_Contact			C_Contact contains contact information for the child
C_Contact	C_ContactId	int	This is the primary key for the table
C_Contact	C_IdentityId	int	This related to the primary key in C_Identity, which tracks the child's name and gender, which is also the unique id for a child in the Unified System
C_Contact	AddressTypeForStudent	int	The type of address listed for a learner. The corresponding description for the int stored can be look up in Option table
C_Contact	AddressStreetNumberAndName	nvarchar	The street number and street name or post office box number of an address for a child
C_Contact	AddressApartmentRoomOrSuiteNumber	nvarchar	Apartment Number or suite for Child
C_Contact	AddressCity	nvarchar	City for Child
C_Contact	AddressCountyName	nvarchar	The name of the county, parish, borough, or comparable unit (within a state) in which an address is located for the Child, if applicable
C_Contact	StateAbbreviation	int	Id for the state that the child resides, definition can be look up in Op_States table
C_Contact	AddressPostalCode	nvarchar	A number that identifies each postal delivery area in the United States used as a portion of an address.
C_Contact	CountryCode	int	Country code for child, country name can be looked up in Op_Country
C_Demographic			C_Demographic tracks the demographic for a child
C_Demographic	C_DemographicId	int	Primary Key

CEDS Database Description			
Table Name	Column Name	Data Type	Notes
C_Demographic	C_IdentityId	int	This related to the primary key in C_Identity, which tracks the child's name and gender, which is also the unique id for a child in the Unified System
C_Demographic	Sex	int	Gender for the child
C_Demographic	Birthdate	date	The year, month and day on which a person was born.
C_Demographic	AmericanIndianOrAlaskaNative	int	A person having origins in any of the original peoples of North and South America (including Central America), and who maintains cultural identification through tribal affiliation or community attachment. 1 for Yes, 0 for No
C_Demographic	Asian	int	A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian Subcontinent. This area includes, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam. 1 for Yes, 0 for No
C_Demographic	BlackOrAfricanAmerican	int	A person having origins in any of the black racial groups of Africa. 1 for Yes, 0 for No
C_Demographic	NativeHawaiianOrOtherPacificIslander	int	A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands. 1 for Yes, 0 for No
C_Demographic	White	int	A person having origins in any of the original peoples of Europe, Middle East, or North Africa. 1 for Yes, 0 for No

<b>CEDS Database Description</b>			
<b>Table Name</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Notes</b>
C_Demographic	HispanicOrLatinoEthnicity	int	An indication that the person traces his or her origin or descent to Mexico, Puerto Rico, Cuba, Central and South America, and other Spanish cultures, regardless of race. 1 for Yes, 0 for No
C_Demographic	ProgramEligibility	int	Category under which the person is eligible for an early childhood program or service, value can be look up in Option table
C_Demographic	HomelessnessStatus	int	1 for Yes, 0 for No Children and youth who lack a fixed, regular, and adequate nighttime residence. See detailed CEDS technical specification for further details.
C_DevelopmentalAssessments			This table tracks the developmental screening status, evaluation finding (disorder type) for a child disability type.
C_DevelopmentalAssessments	C_DevelopmentalAssessmentsId	int	Primary Key
C_DevelopmentalAssessments	C_IdentityId	int	This related to the primary key in C_Identity, which tracks the child's name and gender, which is also the unique id for a child in the Unified System
C_DevelopmentalAssessments	DevelopmentalScreening	int	The administration of a brief standardized screening tool aiding in the identification of children at risk of a developmental disorder. Values can be look up in Option table.

<b>CEDS Database Description</b>			
<b>Table Name</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Notes</b>
C_DevelopmentalAssessments	DevelopmentalEvaluationFinding	int	Child developmental disorder or disordered determined by procedure used by appropriate qualified personnel. Values can be look up in Option table.
C_DevelopmentalAssessments	PrimaryDisabilityType	int	The major or overriding disability condition that best describes a person's impairment. Values can be look up in Option Table
C_EducationalExp			Details of early learning services received including current and prior program type, individualized programs, early intervention services received and program participation dates (application, enrollment, entry, and exit).
C_EducationalExp	C_EducationalExpId	int	Primary Key
C_EducationalExp	C_IdentityId	int	This related to the primary key in C_Identity, which tracks the child's name and gender, which is also the unique id for a child in the Unified System
C_EducationalExp	EarlyChildhoodProgramTypeEnrollment	int	The type of programs in which the child is enrolled. Value can be look up in Option table
C_EducationalExp	ProgramParticipationStartDate	date	The year, month and day on which the person began to participate in a program.
C_EducationalExp	ProgramParticipationExitDate	date	The year, month and day on which the person ceased to participate in a program.
C_EducationalExp	PriorEarlyChildhoodExperience	int	Type(s) of prior experience (if any) in an early childhood program. Value can be look up in Option table
C_EducationalExp	IndividualizedProgramType	int	A designation of the type of program developed for a student. Value can be look up in Option table.

<b>CEDS Database Description</b>			
<b>Table Name</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Notes</b>
C_EducationalExp	EarlyInterventionOrSpecialEducationServicesReceived	int	The types of service, specially designed and at no cost to the parent/guardian, that adapts the curriculum, materials, or instruction for students identified as needing special education because of a disabling condition. Value can be look up in Option table.
C_EducationalExp	EarlyInterventionOrSpecialEducationServicesSetting	int	The setting in which a person receives services that adapt the curriculum, materials, or instruction for students identified as needing special education because of a disabling condition. Value can be look up in Option table.
C_EducationalExp	ApplicationDate	date	The year, month and day on which an individual application is received by the organization.
C_EducationalExp	EnrollmentDate	date	The year, month and day on which a person is considered officially enrolled in the program.
C_EducationalExp	EntryDate	date	The month, day, and year on which a person enters and begins to receive instructional services in a school, institution, program, or class-section during a given session.
C_EducationalExp	ExitDate	date	The year, month and day on which the student officially withdrew or graduated, i.e. the date on which the student's enrollment ended.
C_EducationalExp	ServiceEntryDate	date	The year, month and day on which a person begins to receive early intervention or special education services.
C_EducationalExp	ServiceExitDate	date	The year, month and day on which a person stops receiving early intervention or special education services.
C_EducationalExp	NumberOfDaysInAttendance	decimal	The number of days a person is present when school is in session during a given reporting period.

<b>CEDS Database Description</b>			
<b>Table Name</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Notes</b>
C_EducationalExp	ParticipationInSchoolFoodServicePrograms	int	An indication of a student's participation in free, reduced price, full price breakfast, lunch, snack, supper, and milk programs. Value can be look up in Option table.
C_HealthInformation			Details of health services received including immunizations, dental/ hearing/ vision screening status, birth data and insurance coverage for a child are tracked in this table
C_HealthInformation	C_HealthInformationId	int	Primary Key
C_HealthInformation	C_IdentityId	int	This related to the primary key in C_Identity, which tracks the child's name and gender, which is also the unique id for a child in the Unified System
C_HealthInformation	ImmunizationDate	date	The year, month and day of an immunization.
C_HealthInformation	RequiredImmunization	int	An indication that an immunization is specifically required by an organization or governing body. Value can be look up in Option table
C_HealthInformation	VisionScreening	int	An examination used to measure a person's ability to see. Value can be look up in Option table.
C_HealthInformation	VisionScreeningDate	date	The year, month and day of a vision screening.
C_HealthInformation	HearingScreening	int	An examination used to measure a person's ability to perceive sounds. Value can be look up in Option table.
C_HealthInformation	HearingScreeningDate	date	The year, month and day of a hearing screening.

CEDS Database Description			
Table Name	Column Name	Data Type	Notes
C_HealthInformation	DentalScreening	int	The condition of a person's mouth or oral cavity; more specifically the condition of the hard tissues (i.e., teeth and jaws) and the soft tissues (i.e., gums, tongue, lips, palate, mouth floor, and inner cheeks). Good oral health denotes the absence of clinically manifested disease or abnormalities of the oral cavity. Value can be look up in Option table.
C_HealthInformation	DentalScreeningDate	date	The year, month and day of a dental screening
C_HealthInformation	WeightAtBirth	nvarchar	The weight of a child at birth in pounds and ounces.
C_HealthInformation	WeeksOfGestation	int	The number of weeks during gestational period.
C_HealthInformation	InsuranceCoverage	int	The nature of insurance covering an person's hospitalization and other health or medical care. Value can be look up in Option table.
C_HealthInformation	DentalInsuranceCov erage	int	The nature of insurance covering an person's dental care. Value can be look up in Option table.
C_Identity			This table stores First name, last name, middle name, generation code or suffix for a child
C_Identity	C_IdentityId	int	This is the primary key for the table, C_IdentityId is the unique id for a child in the Unified System
C_Identity	FirstName	nvarchar	The full legal first name given to a person at birth, baptism, or through legal change.
C_Identity	MiddleName	nvarchar	A full legal middle name given to a person at birth, baptism, or through legal change.
C_Identity	LastOrSurname	nvarchar	The full legal last name borne in common by members of a family.
C_Identity	GenerationCodeOrSuff ix	nvarchar	An appendage, if any, used to denote a person's generation in his family (e.g., Jr., Sr., III).

<b>CEDS Database Description</b>			
<b>Table Name</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Notes</b>
C_Identity	AddDate	datetime	The date the record was added to the system
C_Identity	ModifyDate	datetime	The last time the record was modified
C_Language			This table tracks the language type and language code for the child
C_Language	C_LanguageId	int	Primary Key
C_Language	C_IdentityId	int	This related to the primary key in C_Identity, which tracks the child's name and gender, which is also the unique id for a child in the Unified System
C_Language	LanguageType	int	An indication of the function and context in which a person uses a language to communicate. Value can be look up in Option table.
C_Language	LanguageCode	int	The code for the specific language or dialect that a person uses to communicate. Value can be look up in Option table.
<b>F_</b>			<b>All tables related to family begins with F_</b>
F_Family			This table tracks family information
F_Family	F_FamilyId	int	Primary Key

<b>CEDS Database Description</b>			
<b>Table Name</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Notes</b>
F_Family	NumberOfPeopleInFamily	int	Total number of persons in immediate family. Family means for the purposes of the regulations in this part all persons: (i) Living in the same household who are: (A) Supported by the income of the parent(s) or guardian(s) of the child enrolling or participating in the program; or (B) Related to the child by blood, marriage, or adoption; or (ii) Related to the child enrolling or participating in the program as parents or siblings, by blood, marriage, or adoption.
F_Family	NumberOfPeopleInHousehold	int	Total number of persons residing in the same household.
F_Family	ProofOfResidency	int	An accepted form of proof of residency in the district/county/other locality. Value can be look up in Option table.
F_Family	FamilyIncome	decimal	Total income of family from all sources. Income includes money, wages or salary before deductions; net income from non-farm self-employment; net income from farm self-employment; regular payments from Social Security or railroad retirement; payments from unemployment compensation, strike benefits from union funds, workers' compensation, veterans benefits (with the exception noted below), public assistance (including Temporary Assistance for Needy Families, Supplemental Security Income, Emergency Assistance money payments, and non-Federally funded General Assistance or General Relief money payments); training stipends; alimony, child support, and military family allotments or other regular support from an absent family member or someone not living in the

CEDS Database Description			
Table Name	Column Name	Data Type	Notes
			household; private pensions, government employee pensions (including military retirement pay), and regular insurance or annuity payments; college or university scholarships, grants, fellowships, and assistantships; and dividends, interest, net rental income, net royalties, and periodic receipts from estates or trusts; and net gambling or lottery winnings.
F_Family	SourceOfFamilyIncome	int	Sources of total family income. Value can be look up in Option table.
F_Family	IncomeCalculationMethod	int	The calculation method used by a program to determine total family income. Value can be look up in Option table.
F_Family	AddDate	datetime	The date the record was added to the system
F_Family	ModifyDate	datetime	The last time the record was modified
<b>O_</b>			<b>All tables related to organization begins with O_</b>
O_Organization			This table keeps track of the organization's information such as name, address and telephone
O_Organization	O_OrganizationId	int	Id for organization, primary key
O_Organization	ResponsibleOrganizationName	nvarchar	The name of a non-person entity such as an organization, institution, agency or business responsible for the institution/site.
O_Organization	AddressTypeForOrganization	int	The type of address listed for an organization. Value can be look up in Option table.
O_Organization	AddressStreetNumberAndName	nvarchar	The street number and street name or post office box number of an address.
O_Organization	AddressApartmentRoomOrSuiteNumber	nvarchar	The apartment, room, or suite number of an address.
O_Organization	AddressCity	nvarchar	The name of the city in which an address is located.

CEDS Database Description			
Table Name	Column Name	Data Type	Notes
O_Organization	AddressCountyName	nvarchar	The name of the county, parish, borough, or comparable unit (within a state) in which an address is located.
O_Organization	StateAbbreviation	int	The abbreviation for the state (within the United States) or outlying area in which an address is located. Value can be look up in Op_States table.
O_Organization	AddressPostalCode	nvarchar	A number that identifies each postal delivery area in the United States used as a portion of an address.
O_Organization	PrimaryTelephoneNumberIndicator	int	An indication that the telephone number should be used as the principal number for a person or organization.
O_Organization	TelephoneNumber	nvarchar	The telephone number including the area code, and extension, if applicable.
O_Organization	AddDate	datetime	The date the record was added to the system
O_Organization	ModifyDate	datetime	The last time the record was modified
O_ProgramCharacteristics			This table tracks Child/staff ratio, hours/days available per week, program option, program setting, QRIS info.
O_ProgramCharacteristics	O_ProgramCharacteristicsId	int	Primary Key
O_ProgramCharacteristics	O_OrganizationId	int	The organization id for the this program
O_ProgramCharacteristics	ChildToInstructionalStaffRatio	decimal	The number of children per instructional staff member.
O_ProgramCharacteristics	ProgramOptionVariation	int	Nature of early childhood program in which a person is enrolled. Value can be look up in Option table.
O_ProgramCharacteristics	HoursAvailablePerDay	decimal	The number of hours per day the site or classroom is open for children to attend.

<b>CEDS Database Description</b>			
<b>Table Name</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Notes</b>
O_ProgramCharacteristics	DaysAvailablePerWeek	int	The number of days per week the site or classroom is open for children to attend.
O_ProgramCharacteristics	EarlyChildhoodProgramSetting	int	The site or setting in which early childhood care, education, and/or services are provided. Value can be look up in Option table.
O_ProgramCharacteristics	QRISParticipation	int	Program site participates in a Quality Rating and Improvement System (QRIS). Value can be look up in Option table.
O_ProgramCharacteristics	QRISScore	nvarchar	The score, rating or level received by a program for its Quality Rating and Improvement System (QRIS).
O_SiteLevel			Site name, licensing info, ages served.
O_SiteLevel	O_SiteLevelId	int	Primary Key
O_SiteLevel	O_OrganizationId	int	The organization id for the this program
O_SiteLevel	SiteName	nvarchar	The full, legally accepted name of the institution at the site level.
O_SiteLevel	InitialLicenseDate	date	The year, month and day on which a program or center received its initial license.
O_SiteLevel	ContinuingLicenseDate	date	The year, month and day on which a program or center received its continuing license.
O_SiteLevel	LicenseExempt	int	The program or center is legally exempt from licensing. Value can be look up in Option table.
O_SiteLevel	OperationDate	date	The year, month and day on which a program or center began operation.
O_SiteLevel	AgesServed	nvarchar	The ages of children served by an institution as identified by the funding and/or licensing source.
<b>Op_</b>			<b>All tables related to Options begins with Op_</b>

<b>CEDS Database Description</b>			
<b>Table Name</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Notes</b>
Op_Country			Table that tracks all the countries available for Unified System Use
Op_Country	Op_CountryId	int	Id for country, primary key for table
Op_Country	CountryAbbr	nvarchar	Abbreviation for country
Op_Country	CountryDesc	nvarchar	Full country name
Op_States			Table that tracks all the states available for use for the Unified System
Op_States	Op_StateId	int	Id for state, primary key for table
Op_States	StateAbbr	nvarchar	State abbreviation
Op_States	StateName	nvarchar	Full state name
Op_Option			All the available options available for the Unified System
Op_Option	OptionId	int	Id for option, primary key
Op_Option	ShortDesc	nvarchar	Short desc for option
Op_Option	LongDesc	nvarchar	Long description for option
Op_FieldSet			This table keeps track of which field from which table uses which option, for example, Table Name is O_SiteLevel, FieldName is LicenseExempt and OptionId can be 1,2 ,3 which could be Yes, No, Not Applicable
Op_FieldSet	OptionetFieldId	int	Primary Key
Op_FieldSet	OptionId	int	Id for option from Op_Option table
Op_FieldSet	TableName	nvarchar	the table where the option id is assigned to
Op_FieldSet	FieldName	nvarchar	the field name from the table which the option id is assigned to
<b>P_</b>			<b>All tables related to parents begins with p_</b>
P_Education			This table tracks education level completed for a parent
P_Education	P_EducationId	int	Primary Key

<b>CEDS Database Description</b>			
<b>Table Name</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Notes</b>
P_Education	P_IdentityId	int	Parent Id
P_Education	HighestLevelOfEducationCompleted	int	The extent of formal instruction a person has received (e.g., the highest grade in school completed or its equivalent or the highest degree received). Value can be look up in Option table.
P_Identity			This tables tracks parent's identity - First name, last name, middle name, generation code or suffix, title and relationship to child.
P_Identity	P_IdentityId	int	Parent id, primary key
P_Identity	FirstName	nvarchar	The full legal first name given to a person at birth, baptism, or through legal change.
P_Identity	MiddleName	nvarchar	A full legal middle name given to a person at birth, baptism, or through legal change.
P_Identity	LastOrSurname	nvarchar	The full legal last name borne in common by members of a family.
P_Identity	GenerationCodeOrSuffix	nvarchar	An appendage, if any, used to denote a person's generation in his family (e.g., Jr., Sr., III).
P_Identity	PersonalTitleOrPrefix	nvarchar	An appellation, if any, used to denote rank, placement, or status (e.g., Mr., Ms., Reverend, Sister, Dr., Colonel).
P_Identity	PersonRelationshipToLearnerType	int	The nature of the person's relationship to a learner. The learner may be an Early Learning Child, K12 Student, Postsecondary Student, or an adult learner in a workforce education program. Value can be look up in Option table.
P_Identity	CustodialParentOrGuardianIndicator	int	An indication that a person has legal custody of a child. Value can be look up in Option table.

CEDS Database Description			
Table Name	Column Name	Data Type	Notes
P_Identity	PersonRelationshiptoLearnerQualifierType	int	A qualifier used with the element Person Relationship to Learner Type to further define the nature of the person's relationship to a learner. Value can be look up in Option table.
P_Identity	AddDate	datetime	The date the record was added to the system
P_Identity	ModifyDate	datetime	The last time the record was modified
<b>R_</b>			<b>All relationship tables are prefixed with R_</b>
R_ChildFamily			This tables tracks which child belongs which family
R_ChildFamily	ChildFamilyId	int	Primary Key
R_ChildFamily	C_IdentityId	int	Child's Identity Id from C_Identity table
R_ChildFamily	F_FamilyId	int	Family's Identity Id from F_Family
R_ChildParent			This table tracks child / parent relationship
R_ChildParent	R_ChildParentId	int	Primary Key
R_ChildParent	C_IdentityId	int	Child's Identity Id from C_Identity table
R_ChildParent	P_IdentityId	int	Parent's Identity Id from P_Identity table
R_ChildStaff			This table tracks the child / staff relationship
R_ChildStaff	R_ChildStaffId	int	Primary Key
R_ChildStaff	C_Identity	int	Child's Identity Id from C_Identity table
R_ChildStaff	S_IdentityId	int	Staff's Id from S_IdentityId
R_ChildSystem			This table tracks Child/System Relationship
R_ChildSystem	R_ChildSystem	int	Primary Key
R_ChildSystem	C_IdentityId	int	Child's Identity Id from C_Identity table
R_ChildSystem	Sys_IdentityId	int	System Id from Sys_Identity table
R_ChildSystem	ChildIdForSystem	nvarchar	
R_StaffOrganization			This table tracks Staff/Organization
R_StaffOrganization	R_StaffOrganizationId	int	Primary Key

CEDS Database Description			
Table Name	Column Name	Data Type	Notes
R_StaffOrganization	S_IdentityId	int	Staff's Id from S_IdentityId
R_StaffOrganization	O_OrganizationId	int	Organization Id from O_Organization
R_SystemField			This table tracks which fields are being use by system to identity a child
R_SystemField	R_SystemFieldId	int	Primary Key
R_SystemField	FieldName	nvarchar	field name that a system is using for Master Client Index identification
R_SystemField	Sys_IdentityId	int	Id for system from Sys_Identity table
R_SystemOrganization			This table tracks which organization belongs to which system
R_SystemOrganization	R_SysOrganizationId	int	Primary Key
R_SystemOrganization	Sys_IdentityId	int	System Id from Sys_Identity table
R_SystemOrganization	O_OrganizationId	int	Organization Id from O_Organization
<b>S_</b>			<b>All tables related to staff is prefixed with S_</b>
S_Contact			This table tracks a staff's contact information
S_Contact	S_ContactId	int	primary key
S_Contact	S_IdentityId	int	Staff's identity Id in the system
S_Contact	AddressStreetNumber AndName	nvarchar	The street number and street name or post office box number of an address.
S_Contact	AddressApartmentRoomOrSuiteNumber	nvarchar	The apartment, room, or suite number of an address.
S_Contact	AddressCity	nvarchar	The name of the city in which an address is located.
S_Contact	AddressCountyName	nvarchar	The name of the county, parish, borough, or comparable unit (within a state) in which an address is located.

<b>CEDS Database Description</b>			
<b>Table Name</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Notes</b>
S_Contact	StateAbbreviation	int	The abbreviation for the state (within the United States) or outlying area in which an address is located. Value can be look up in Op_States table.
S_Contact	AddressPostalCode	nvarchar	A number that identifies each postal delivery area in the United States used as a portion of an address.
S_Contact	CountryCode	int	The unique two character International Organization for Standardization (ISO) code for the country in which an address is located. Values can be looked up from Op_Country table
S_Demographic			This table tracks the demographic of a staff
S_Demographic	S_DemographicId	int	Primary Key
S_Demographic	S_IdentityId	int	Staff's identity Id in the system
S_Demographic	Sex	int	The concept describing the biological traits that distinguish the males and females of a species.
S_Demographic	Birthdate	datetime	The year, month and day on which a person was born.
S_Education_Training			Staff's Degrees, certifications and credentials.
S_Education_Training	S_Education_TrainingId	int	Primary Key
S_Education_Training	S_IdentityId	int	Staff's identity Id in the system
S_Education_Training	NameOfInstitution	nvarchar	The full legally accepted name of the institution.
S_Education_Training	LevelOfSpecializationInEarlyLearning	int	The extent to which a person concentrates upon a particular subject matter area during his or her period of study at an educational institution. Value can be look up in Option table.
S_Education_Training	DegreeOrCertificateTitleOrSubject	nchar	The name of the degree or certificate earned by a person. This includes honorary degrees conferred upon an individual.

CEDS Database Description			
Table Name	Column Name	Data Type	Notes
S_Education_Training	DegreeOrCertificateType	int	The type of degree or certificate earned by a person. Value can be look up in Option table.
S_Education_Training	DegreeOrCertificateConferringDate	date	The year, month and day on which a person received a degree or certificate.
S_Education_Training	EarlyChildhoodCredential	int	The credential related to early childhood education or development held by a person. Value can be look up in Option table.
S_Employment			This table tracks a staff's employment
S_Employment	S_EmploymentId	int	Primary Key
S_Employment	S_IdentityId	int	Staff's identity Id in the system
S_Employment	EducationStaffClassification	int	The titles of employment, official status, or rank of education staff. Value can be look up in Option table.
S_Employment	HireDate	date	The year, month and day on which a person was hired for a position, or consecutive positions within the same organization and job classification.
S_Employment	EmploymentStartDate	date	The year, month and day on which a person began self-employment or employment with an organization or institution.
S_Employment	EmploymentStatus	int	The condition under which a person has agreed to serve an employer. Value can be look up in Option table.
S_Identity			This table tracks First name, last name, middle name, generation code or suffix, title of a staff
S_Identity	S_IdentityId	int	Primary Key
S_Identity	FirstName	nvarchar	The full legal first name given to a person at birth, baptism, or through legal change.

CEDS Database Description			
Table Name	Column Name	Data Type	Notes
S_Identity	MiddleName	nvarchar	A full legal middle name given to a person at birth, baptism, or through legal change.
S_Identity	LastOrSurname	nvarchar	The full legal last name borne in common by members of a family.
S_Identity	GenerationCodeOrSuffix	nvarchar	An appendage, if any, used to denote a person's generation in his family (e.g., Jr., Sr., III).
S_Identity	PersonalTitleOrPrefix	nvarchar	An appellation, if any, used to denote rank, placement, or status (e.g., Mr., Ms., Reverend, Sister, Dr., Colonel).
S_Identity	AddDate	datetime	The date the record was added to the system
S_Identity	ModifyDate	datetime	The last time the record was modified
S_Language			This table tracks the language type and language code of a staff
S_Language	S_LanguageId	int	Primary Key
S_Language	S_IdentityId	int	Staff's identity Id in the system
S_Language	LanguageType	int	An indication of the function and context in which a person uses a language to communicate. Value can be look up in Option table.
S_Language	LanguageCode	int	The code for the specific language or dialect that a person uses to communicate. Value can be look up in Option table.
<b>Sys_</b>			<b>All system tables are prefixed with sys_</b>
Sys_Identity			This table tracks system's identity
Sys_Identity	Sys_IdentityId	int	System's identity Id in the system
Sys_Identity	SystemName	nvarchar	System's name
Sys_Identity	Address	nvarchar	System's main address
Sys_Identity	Address2	nvarchar	System's address line 2

<b>CEDS Database Description</b>			
<b>Table Name</b>	<b>Column Name</b>	<b>Data Type</b>	<b>Notes</b>
Sys_Identity	City	nvarchar	System's City
Sys_Identity	State	int	System's State Id, values can be look up from Op_State table
Sys_Identity	ZipCode	nvarchar	A number that identifies each postal delivery area in the United States used as a portion of an address.
Sys_MatchAction			This table tracks how many fields should match and what action to take to identify a child
Sys_MatchAction	Sys_MatchActionId	int	Primary Key
Sys_MatchAction	Sys_IdentityId	int	System's identity Id in the system
Sys_MatchAction	MinFieldsMatched	int	Minimum of matching fields need to trigger this action
Sys_MatchAction	MaxFieldsMatched	int	Maximum of matching fields allowed to trigger this action
Sys_MatchAction	Action	nvarchar	Short description for Action
Sys_MatchAction	ActionDesc	nvarchar	Description of Action
Sys_MatchAction	ActionLink	nvarchar	Link for page where action takes place
Sys_MatchAction	Email	nvarchar	email for admin if necessary
Sys_ChildIdentifier			This tables tracks the identifiers of the child for systems
Sys_ChildIdentifier	Sys_ChildIdentifierId	int	Primary Key
Sys_ChildIdentifier	ChildIdentity	nvarchar	value from the system
Sys_ChildIdentifier	C_IdentityId	int	Unified System's child Id
Sys_ChildIdentifier	Sys_IdentityId	int	Unified System's system id

## **XI. Appendix D: CEDS Database Schema**

(starts on following page)

### C\_Identity

Column Name	Data Type	Identity	Nullable
C_IdentityId	int	<input checked="" type="checkbox"/>	No
FirstName	nvarcha...	<input type="checkbox"/>	No
MiddleName	nvarcha...	<input type="checkbox"/>	Yes
LastOrSurname	nvarcha...	<input type="checkbox"/>	No
GenerationCodeOrSuffix	nvarcha...	<input type="checkbox"/>	Yes
AddDate	datetime	<input type="checkbox"/>	No
ModifyDate	datetime	<input type="checkbox"/>	No

### C\_Demographic

Column Name	Data Type	Identity	Nullable
C_DemographicId	int	<input checked="" type="checkbox"/>	No
C_IdentityId	int	<input type="checkbox"/>	No
Sex	int	<input type="checkbox"/>	Yes
Birthdate	date	<input type="checkbox"/>	Yes
AmericanIndianOrAlaskaNative	int	<input type="checkbox"/>	Yes
Asian	int	<input type="checkbox"/>	Yes
BlackOrAfricanAmerican	int	<input type="checkbox"/>	Yes
NativeHawaiianOrOtherPacificIslan...	int	<input type="checkbox"/>	Yes
White	int	<input type="checkbox"/>	Yes
HispanicOrLatinoEthnicity	int	<input type="checkbox"/>	Yes
ProgramEligibility	int	<input type="checkbox"/>	Yes
HomelessnessStatus	int	<input type="checkbox"/>	Yes

### C\_EducationalExp

Column Name	Data Type	Identity	Nullable
C_EducationalExpId	int	<input type="checkbox"/>	No
C_IdentityId	int	<input type="checkbox"/>	No
EarlyChildhoodProgramTypeEnrollment	int	<input type="checkbox"/>	Yes
ProgramParticipationStartDate	date	<input type="checkbox"/>	Yes
ProgramParticipationExitDate	date	<input type="checkbox"/>	Yes
PriorEarlyChildhoodExperience	int	<input type="checkbox"/>	Yes
IndividualizedProgramType	int	<input type="checkbox"/>	Yes
EarlyInterventionOrSpecialEducationServicesReceiv...	int	<input type="checkbox"/>	Yes
EarlyInterventionOrSpecialEducationServicesSetting	int	<input type="checkbox"/>	Yes
ApplicationDate	date	<input type="checkbox"/>	Yes
EnrollmentDate	date	<input type="checkbox"/>	Yes
EntryDate	date	<input type="checkbox"/>	Yes
ExitDate	date	<input type="checkbox"/>	Yes
ServiceEntryDate	date	<input type="checkbox"/>	Yes
ServiceExitDate	date	<input type="checkbox"/>	Yes
NumberOfDaysInAttendance	decimal...	<input type="checkbox"/>	Yes
ParticipationInSchoolFoodServicePrograms	int	<input type="checkbox"/>	Yes

### C\_Contact

Column Name	Data Type	Identity	Nullable
C_ContactId	int	<input checked="" type="checkbox"/>	No
C_IdentityId	int	<input type="checkbox"/>	No
AddressTypeForStudent	int	<input type="checkbox"/>	Yes
AddressStreetNumberAndName	nvarcha...	<input type="checkbox"/>	Yes
AddressApartmentRoomOrSuiteNum...	nvarcha...	<input type="checkbox"/>	Yes
AddressCity	nvarcha...	<input type="checkbox"/>	Yes
AddressCountyName	nvarcha...	<input type="checkbox"/>	Yes
StateAbbreviation	int	<input type="checkbox"/>	Yes
AddressPostalCode	nvarcha...	<input type="checkbox"/>	Yes
CountryCode	int	<input type="checkbox"/>	Yes

### C\_DevelopmentalAssessments

Column Name	Data Type	Identity	Nullable
C_DevelopmentalAssessment...	int	<input checked="" type="checkbox"/>	No
C_IdentityId	int	<input type="checkbox"/>	No
DevelopmentalScreening	int	<input type="checkbox"/>	Yes
DevelopmentalEvaluationFind...	int	<input type="checkbox"/>	Yes
PrimaryDisabilityType	int	<input type="checkbox"/>	Yes

### C\_HealthInformation

Column Name	Data Type	Identity	Nullable
C_HealthInformationId	int	<input checked="" type="checkbox"/>	No
C_IdentityId	int	<input type="checkbox"/>	No
ImmunizationDate	date	<input type="checkbox"/>	No
RequiredImmunization	int	<input type="checkbox"/>	Yes
VisionScreening	int	<input type="checkbox"/>	Yes
VisionScreeningDate	date	<input type="checkbox"/>	Yes
HearingScreening	int	<input type="checkbox"/>	Yes
HearingScreeningDate	date	<input type="checkbox"/>	Yes
DentalScreening	int	<input type="checkbox"/>	Yes
DentalScreeningDate	date	<input type="checkbox"/>	Yes
WeightAtBirth	nvarcha...	<input type="checkbox"/>	Yes
WeeksOfGestation	int	<input type="checkbox"/>	Yes
InsuranceCoverage	int	<input type="checkbox"/>	Yes
DentalInsuranceCoverage	int	<input type="checkbox"/>	Yes

### C\_Language

Column Name	Data Type	Identity	Nullable
C_LanguageId	int	<input type="checkbox"/>	No
C_IdentityId	int	<input type="checkbox"/>	No
LanguageType	int	<input type="checkbox"/>	Yes
LanguageCode	int	<input type="checkbox"/>	Yes

### F\_Family

Column Name	Condensed Type	Identity	Nullable
 F_FamilyId	int	<input checked="" type="checkbox"/>	No
NumberOfPeopleInFamily	int	<input type="checkbox"/>	Yes
NumberOfPeopleInHouseh...	int	<input type="checkbox"/>	Yes
ProofOfResidency	int	<input type="checkbox"/>	Yes
FamilyIncome	decimal(18, 2)	<input type="checkbox"/>	Yes
SourceOfFamilyIncome	int	<input type="checkbox"/>	Yes
IncomeCalculationMethod	int	<input type="checkbox"/>	Yes
AddDate	datetime	<input type="checkbox"/>	Yes
ModifyDate	datetime	<input type="checkbox"/>	Yes
		<input type="checkbox"/>	

### P\_Identity

	Column Name	Condensed Type	Identity	Nullable	Default Value
	P_IdentityId	int	<input checked="" type="checkbox"/>	No	
	FirstName	nvarchar(35)	<input type="checkbox"/>	Yes	
	MiddleName	nvarchar(35)	<input type="checkbox"/>	Yes	
	LastOrSurn...	nvarchar(35)	<input type="checkbox"/>	Yes	
	Generation...	nvarchar(10)	<input type="checkbox"/>	Yes	
	PersonalTitl...	nvarchar(30)	<input type="checkbox"/>	Yes	
	PersonRelat...	int	<input type="checkbox"/>	Yes	
	CustodialPa...	int	<input type="checkbox"/>	Yes	
	PersonRelat...	int	<input type="checkbox"/>	Yes	
	AddDate	datetime	<input type="checkbox"/>	Yes	(getdate())
	ModifyDate	datetime	<input type="checkbox"/>	Yes	(getdate())
			<input type="checkbox"/>		



### P\_Education

	Column Name	Condensed Type	Identity	Nullable	Default Value
	P_Educatio...	int	<input checked="" type="checkbox"/>	No	
	P_IdentityId	int	<input type="checkbox"/>	No	
	HighestLev...	int	<input type="checkbox"/>	Yes	
			<input type="checkbox"/>		

### S\_Identity

Column Name	Condensed Type	Identity	Nullable
 S_IdentityId	int	<input checked="" type="checkbox"/>	No
FirstName	nvarchar(35)	<input type="checkbox"/>	Yes
MiddleName	nvarchar(35)	<input type="checkbox"/>	Yes
LastOrSurn...	nvarchar(35)	<input type="checkbox"/>	Yes
Generation...	nvarchar(10)	<input type="checkbox"/>	Yes
PersonalTitl...	nvarchar(30)	<input type="checkbox"/>	Yes
AddDate	datetime	<input type="checkbox"/>	No
ModifyDate	datetime	<input type="checkbox"/>	No

### S\_Contact

Column Name	Condensed Type	Identity	Nullable
 S_ContactId	int	<input checked="" type="checkbox"/>	No
S_IdentityId	int	<input type="checkbox"/>	No
AddressStreetNumberAndName	nvarchar(40)	<input type="checkbox"/>	Yes
AddressApartmentRoomOrSuiteNum...	nvarchar(30)	<input type="checkbox"/>	Yes
AddressCity	nvarchar(30)	<input type="checkbox"/>	Yes
AddressCountyName	nvarchar(30)	<input type="checkbox"/>	Yes
StateAbbreviation	int	<input type="checkbox"/>	Yes
AddressPostalCode	nvarchar(17)	<input type="checkbox"/>	Yes
CountryCode	int	<input type="checkbox"/>	Yes

### S\_Education\_Training

Column Name	Condensed Type	Identity	Nullable
 S_Education_TrainingId	int	<input checked="" type="checkbox"/>	No
S_IdentityId	int	<input type="checkbox"/>	No
NameOfInstitution	nvarchar(60)	<input type="checkbox"/>	Yes
LevelOfSpecializationInEarlyLearn...	int	<input type="checkbox"/>	Yes
DegreeOrCertificateTitleOrSubject	nchar(45)	<input type="checkbox"/>	Yes
DegreeOrCertificateType	int	<input type="checkbox"/>	Yes
DegreeOrCertificateConferringDate	date	<input type="checkbox"/>	Yes
EarlyChildhoodCredential	int	<input type="checkbox"/>	Yes

### S\_Demographic

Column Name	Condensed Type	Identity	Nullable
 S_Demographi...	int	<input checked="" type="checkbox"/>	No
S_IdentityId	int	<input type="checkbox"/>	Yes
Sex	int	<input type="checkbox"/>	Yes
Birthdate	datetime	<input type="checkbox"/>	Yes

### S\_Language

Column Name	Condensed Type	Identity	Nullable
 S_LanguageId	int	<input checked="" type="checkbox"/>	No
S_IdentityId	int	<input type="checkbox"/>	No
LanguageType	int	<input type="checkbox"/>	Yes
LanguageCode	int	<input type="checkbox"/>	Yes

### S\_Employment

Column Name	Condensed Type	Identity	Nullable
 S_EmploymentId	int	<input checked="" type="checkbox"/>	No
S_IdentityId	int	<input type="checkbox"/>	No
EducationStaffClassification	int	<input type="checkbox"/>	Yes
HireDate	date	<input type="checkbox"/>	Yes
EmploymentStartDate	date	<input type="checkbox"/>	Yes
EmploymentStatus	int	<input type="checkbox"/>	Yes

### Sys\_Identity

	Column Name	Condensed Type	Identity	Nullable	Default Value
	Sys_IdentityId	int	<input checked="" type="checkbox"/>	No	
	SystemName	nvarchar(50)	<input type="checkbox"/>	No	
	Address	nvarchar(50)	<input type="checkbox"/>	Yes	
	Address2	nvarchar(50)	<input type="checkbox"/>	Yes	
	City	nvarchar(30)	<input type="checkbox"/>	Yes	
	State	int	<input type="checkbox"/>	Yes	
	ZipCode	nvarchar(10)	<input type="checkbox"/>	Yes	
			<input type="checkbox"/>		

### Sys\_MatchAction

	Column Name	Condensed Type	Identity	Nullable	Default V ▲
	Sys_MatchActionId	int	<input checked="" type="checkbox"/>	No	
	Sys_IdentityId	int	<input type="checkbox"/>	No	
	MinFieldsMatched	int	<input type="checkbox"/>	No	
	MaxFieldsMatched	int	<input type="checkbox"/>	No	
	Action	nvarchar(10)	<input type="checkbox"/>	No	
	ActionDesc	nvarchar(MAX)	<input type="checkbox"/>	Yes	
	ActionLink	nvarchar(MAX)	<input type="checkbox"/>	Yes	
	Email	nvarchar(50)	<input type="checkbox"/>	Yes	

### Sys\_ChildIdentifier

	Column Name	Condensed Type	Identity	Nullable	Default Vali
	Sys_ChildIdentifie...	int	<input checked="" type="checkbox"/>	No	
	ChildIdentity	nvarchar(50)	<input type="checkbox"/>	No	
	C_IdentityId	int	<input type="checkbox"/>	No	
	Sys_IdentityId	int	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

## O\_Organization

Column Name	Condensed Type	Identity	Nullable	Default Val...
 O_OrganizationId	int	<input checked="" type="checkbox"/>	No	
ResponsibleOrganizationName	nvarchar(60)	<input type="checkbox"/>	Yes	
AddressTypeForOrganization	int	<input type="checkbox"/>	Yes	
AddressStreetNumberAndName	nvarchar(40)	<input type="checkbox"/>	Yes	
AddressApartmentRoomOrSuiteNum...	nvarchar(30)	<input type="checkbox"/>	Yes	
AddressCity	nvarchar(30)	<input type="checkbox"/>	Yes	
AddressCountyName	nvarchar(30)	<input type="checkbox"/>	Yes	
StateAbbreviation	int	<input type="checkbox"/>	Yes	
AddressPostalCode	nvarchar(17)	<input type="checkbox"/>	Yes	
PrimaryTelephoneNumberIndicator	int	<input type="checkbox"/>	Yes	
TelephoneNumber	nvarchar(24)	<input type="checkbox"/>	Yes	
AddDate	datetime	<input type="checkbox"/>	Yes	(getdate())
ModifyDate	datetime	<input type="checkbox"/>	Yes	(getdate())
		<input type="checkbox"/>		

## O\_ProgramCharacteristics

Column Name	Condensed Type	Identity	Nullable	Default Val...
 O_ProgramCharacteristicsId	int	<input checked="" type="checkbox"/>	No	
O_OrganizationId	int	<input type="checkbox"/>	No	
ChildToInstructionalStaffR...	decimal(18, 2)	<input type="checkbox"/>	Yes	
ProgramOptionVariation	int	<input type="checkbox"/>	Yes	
HoursAvailablePerDay	decimal(4, 2)	<input type="checkbox"/>	Yes	
DaysAvailablePerWeek	int	<input type="checkbox"/>	Yes	
EarlyChildhoodProgramSett...	int	<input type="checkbox"/>	Yes	
QRISParticipation	int	<input type="checkbox"/>	Yes	
QRISScore	nvarchar(45)	<input type="checkbox"/>	Yes	
		<input type="checkbox"/>		

## O\_SiteLevel

Column Name	Condensed Type	Identity	Nullable	Default Val...	Description
 O_SiteLevelId	int	<input checked="" type="checkbox"/>	No		
O_OrganizationId	int	<input type="checkbox"/>	No		
SiteName	nvarchar(60)	<input type="checkbox"/>	Yes		
InitialLicenseDate	date	<input type="checkbox"/>	Yes		YYYY-MM-...
ContinuingLicenseD...	date	<input type="checkbox"/>	Yes		
LicenseExempt	int	<input type="checkbox"/>	Yes		
OperationDate	date	<input type="checkbox"/>	Yes		
AgesServed	nvarchar(60)	<input type="checkbox"/>	Yes		
		<input type="checkbox"/>			

### Op\_Country

	Column Name	Condensed Type	Identity	Nullable	Descripti
	Op_CountryId	int	<input checked="" type="checkbox"/>	No	
	CountryAbbr	nvarchar(2)	<input type="checkbox"/>	No	
	CountryDesc	nvarchar(50)	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

### Op\_States

	Column Name	Condensed Type	Identity	Nullable	Description
	Op_StateId	int	<input checked="" type="checkbox"/>	No	
	StateAbbr	nvarchar(2)	<input type="checkbox"/>	No	
	StateName	nvarchar(15)	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

### Op\_FieldSet

	Column Name	Condensed Type	Identity	Nullable	Description
	OptionSetFi...	int	<input checked="" type="checkbox"/>	No	
	OptionId	int	<input type="checkbox"/>	No	
	TableName	nvarchar(50)	<input type="checkbox"/>	No	
	FieldName	nvarchar(50)	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

### Op\_Option

	Column Name	Condensed Type	Identity	Nullable	Description
	OptionId	int	<input type="checkbox"/>	No	
	ShortDesc	nvarchar(20)	<input type="checkbox"/>	No	
	LongDesc	nvarchar(150)	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

### R\_ChildSystem

	Column Name	Condensed Type	Identity	Nullable	Default Value
	R_ChildSystem	int	<input checked="" type="checkbox"/>	No	
	C_IdentityId	int	<input type="checkbox"/>	No	
	Sys_IdentityId	int	<input type="checkbox"/>	No	
	ChildIdForSyst...	nvarchar(50)	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

### R\_SystemFields

	Column Name	Condensed Type	Identity	Nullable	Default Value
	R_SystemFieldsId	int	<input checked="" type="checkbox"/>	No	
	FieldName	nvarchar(50)	<input type="checkbox"/>	No	
	Sys_IdentityId	int	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

### R\_ChildStaff

	Column Name	Condensed Type	Identity	Nullable	Default Value
	ChildStaffId	int	<input checked="" type="checkbox"/>	No	
	C_Identity	int	<input type="checkbox"/>	No	
	S_StaffId	int	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

### R\_SystemAction

	Column Name	Condensed Type	Identity	Nullable	Default Value
	R_SystemActionId	int	<input checked="" type="checkbox"/>	No	
	Sys_ContactId	int	<input type="checkbox"/>	No	
	Op_ActionId	int	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

### R\_StaffOrganization

	Column Name	Condensed Type	Identity	Nullable	Default Value
	StaffOrganizatio...	int	<input checked="" type="checkbox"/>	No	
	S_IdentityId	int	<input type="checkbox"/>	No	
	O_OrganizationId	int	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

### R\_ChildParent

	Column Name	Condensed Type	Identity	Nullable	Default Value
	ChildParentId	int	<input checked="" type="checkbox"/>	No	
	C_IdentityId	int	<input type="checkbox"/>	No	
	P_IdentityId	int	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

### R\_ChildFamily

	Column Name	Condensed Type	Identity	Nullable	Default Value
	R_ChildFa...	int	<input checked="" type="checkbox"/>	No	
	C_IdentityId	int	<input type="checkbox"/>	No	
	F_FamilyId	int	<input type="checkbox"/>	No	
			<input type="checkbox"/>		

### R\_SystemOrganization

	Column Name	Condensed Type	Identity	Nullable	Default Value
	R_SysOrganization	int	<input checked="" type="checkbox"/>	No	
	Sys_ContactId	int	<input type="checkbox"/>	Yes	
	O_OrganizationId	int	<input type="checkbox"/>	Yes	
			<input type="checkbox"/>		