



# Oklahoma's Longitudinal Data System

## A Look at the Current System, the Future Possibilities, and a Roadmap to P-20 SLDS

9/21/2012

***Oklahoma State***

***Department of Education***

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## Table of Contents

|   |           |
|---|-----------|
| <b>Executive Summary</b>                      | <b>3</b>  |
| <b>Section 1 – Current System</b>             | <b>4</b>  |
| Architectural Overview                        | 7         |
| Published Data Collections                    | 13        |
| “Lay of the Land”                             | 14        |
| Statewide Assessments                         | 14        |
| Current Projects                              | 15        |
| Data Certification                            | 15        |
| Help Desk                                     | 18        |
| Updating Data Collections                     | 21        |
| Updates to MyData                             | 22        |
| xDValidator Enhancements                      | 22        |
| Longitudinal Reporting                        | 22        |
| <b>Section 2 – Future Possibilities</b>       | <b>24</b> |
| <b>Section 3 – Roadmap to the Future</b>      | <b>27</b> |
| Populating Data into the Ed-Fi Data Warehouse | 27        |
| Automatically Creating EdFacts Uploads        | 27        |
| Enhancing the Wave System                     | 27        |
| Aligning and Integrating with Higher Ed       | 29        |
| Aligning and Integrating with Work Force      | 30        |
| Integrating with Career Tech                  | 30        |
| Move Student Data between Agencies            | 31        |
| Ad Hoc Reporting and Education Intelligence   | 31        |
| <b>Conclusion</b>                             | <b>32</b> |

## Executive Summary

CPSI is pleased to be the vendor providing the current system for data reporting for LEAs to the Oklahoma State Department of Education's Wave system. The current system includes real time data collection, ETL processes, data integration, operational data stores, real time data validation, data marts, a longitudinal data system, data analysis, ad hoc reporting, and education analysis. Data certification is currently being implemented for state reporting. In addition, the system has allowed the SDE to create and implement an Early Warning System for educators in Oklahoma.

Oklahoma has the most advanced state data system in the United States today, and it has been implemented statewide for every district. The system, powered by the CPSI xDStudio toolset, allows for the real-time collection as data that is automated from the LEA to the SEA. All data collections are centrally managed. The SDE receives "All the Data – All the Time", which ensures timely decisions based on real facts.

Features of the system include:

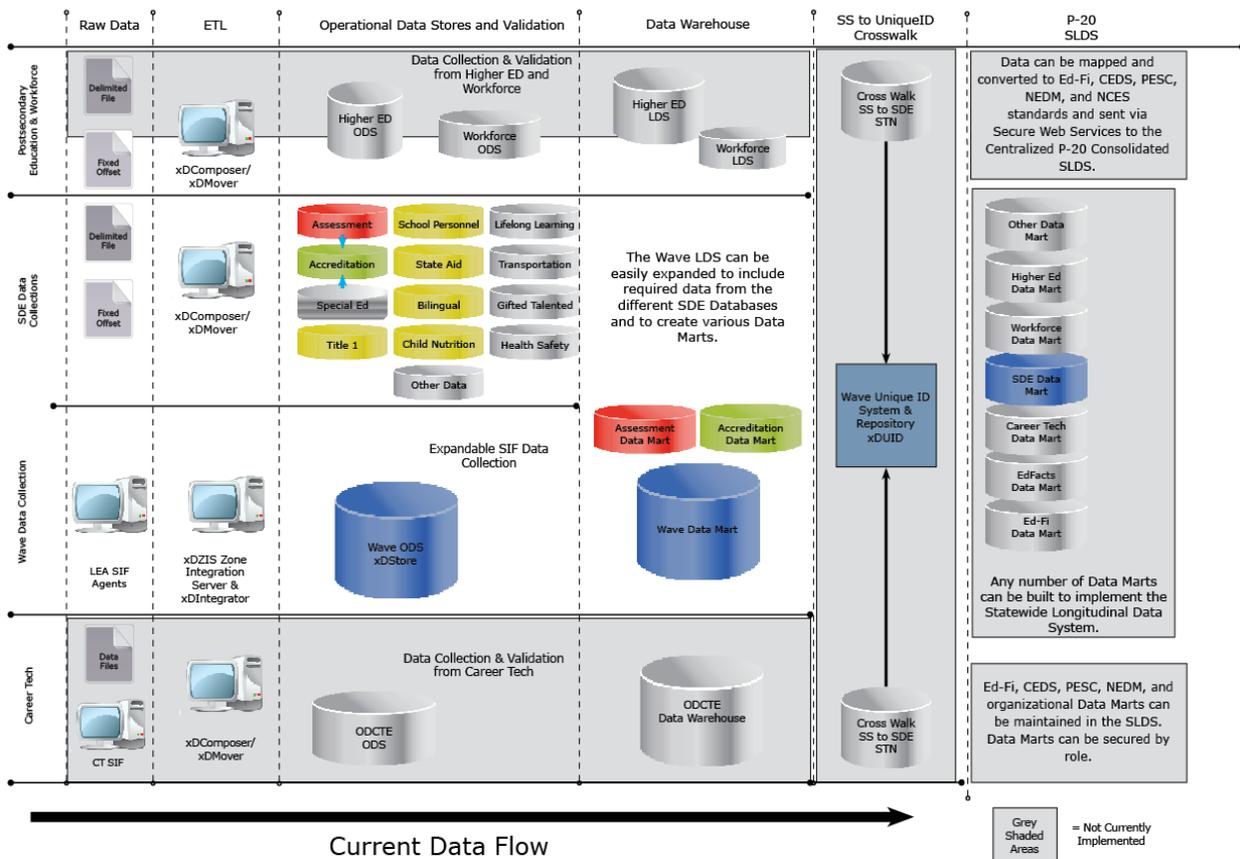
-  A Standardized Data Model for Data Collection and Reporting Using the SIF Data Model
-  Robust ETL Functions Providing Data to the ODS
-  Operational Data Store that is Centrally Managed and Highly Expandable
-  Extensive Real-Time Data Validation
-  Data Marts for Departments and Functions
  - Assessment
  - Wave
  - Others
-  Ability to "Mix and Match" Data Standards to Integrate with Ed-Fi and Provide Data for EdFacts
-  Built In Support for any Data Standard
-  Collection of Data Marts built into an LDS
-  Ad Hoc Error Reporting
-  Unique ID Automation and Generation
-  Education Intelligence

Updates and upgrades are done by CPSI staff with the approval of the SDE as part of our support agreement. The upgrades and services from CPSI are covered under the Maintenance agreement.

The first section of this paper describes the current system, including current projects, architecture, data collections, and toolsets. The second section describes a "future" scenario based on the capabilities of the current system. The last section describes the ways that the "future" scenario can be implemented by leveraging the current system.

## Section One - The Current System

Below is a high-level view of the Oklahoma SEA IT infrastructure showing the data in and out, the databases, the warehouse (or data marts), and the reporting functions. The gray shaded areas are not currently implemented features, but are part of the “future scenario”.



The current system includes the following CPSI toolsets:

1. xDStore Operational Data Store and Data Mart provider
2. xDValidator Validation Rules Engine and real-time validations
3. xDAdHoc for error reporting and ad hoc reporting
4. xDComposer as the data standardization tool and data “crosswalk” tool
5. xDMover for moving data from the ODS to the various data marts
6. xDZIS Zone Integration Server
7. xDTools for educational business intelligence operations
8. xDUID for State Testing Number creation and management

The SDE is licensed for the entire toolset, which includes the tools to convert SIF to Ed-Fi for the Ed-Fi data reporting warehouse and to create EdFacts reports for state to federal reporting. There are some very key differences between the SDE's automated data collection system and other state systems:

| <b>Function</b>                                  | <b>Oklahoma</b>   | <b>Other SEA Implementations</b>   |
|--|---|--|
| Real Time Data                                   | The SDE collects and sends data in real time.   | Uploads are scheduled at various times throughout the school year, usually three to four times a year.   |
| All the Data – All the Time                      | The SDE's collection process is enabled at all times. Thus, the SDE can essentially receive all of the data, all of the time. This enables the data provider to correct data in a timely fashion for reporting periods. | Most state systems only collect and send data when the data provider chooses to deliver that data via a file upload.                                     |
| No Human Intervention                            | The SDE's collection process does not require human intervention on the collection and publishing of data.  | Other technologies require a human to remember to login and initiate both the collection and the submission process.                                     |
| Universal XML Generator                          | The SDE's system includes a Universal XML generator for data collection and mapping.  | Other systems cannot handle multiple data standards or enhancements to current data standards.   |
| Collect data from multiple sources               | The SDE system can automatically collect data from multiple sources, and can collect just differentials if configured to do so.   | Many SEA implementations only collect full data sets and not differential data alone.  |
| Up-to-Date Data is Available at the SEA All Year | Since the SDE's system automatically collects all the data, all the time, the state always has the most up-to-date data available.  | Since most states only collect data at reporting time periods, the data is not updated continuously and the current data may not be timely and accurate. |
| Continuous Automatic Data Collections            | The SDE's functions are "on" all the time and publishing. The data providers and the SEA do not have to have human intervention for the collections.  | Most states do not allow for continuous automatic data collections.  |
| Upload Flat Files                                | The SDE's system does NOT require the use of flat file uploads. The collection is automated and sent via SIF XML.   | Most state systems require users to upload flat files without automation.  |

There are many benefits to the current SDE system:

- STN's are assigned back to districts within three minutes of a student entering an LEA
- Student enrollments are automatically tracked state wide on a daily basis
- Student attendance issues can be tracked and monitored
- Student ownership and student ownership issues are automatically tracked
- Accurate student mobility and dropout rates are tracked
- The system gives educators the ability to truly start identifying students with problems for early intervention
- Districts and schools are able to see their data errors (validation) and correct the data on a daily basis at the source of the data
- Districts and schools can see a real time picture of the status of their students
- Data marts are built based on organizational and departmental needs and can be secured by role
- Education business intelligence can be applied to the data to make better decisions
- Timely, valid, and relevant data is provided to policymakers and educators
- Teachers gain the information they need to help tailor instruction for student improvement
- Administrators can effectively track the success of programs and policy initiatives
- Data can be standardized on NEDM, CEDS, Ed-Fi, PESC, SIF, or any other desired data model
- Complete standards-based solution with a commonality of data elements
- Source data undergoes a constant cycle of correction provides more accuracy in the data and minimizes the need for data correction at collection periods

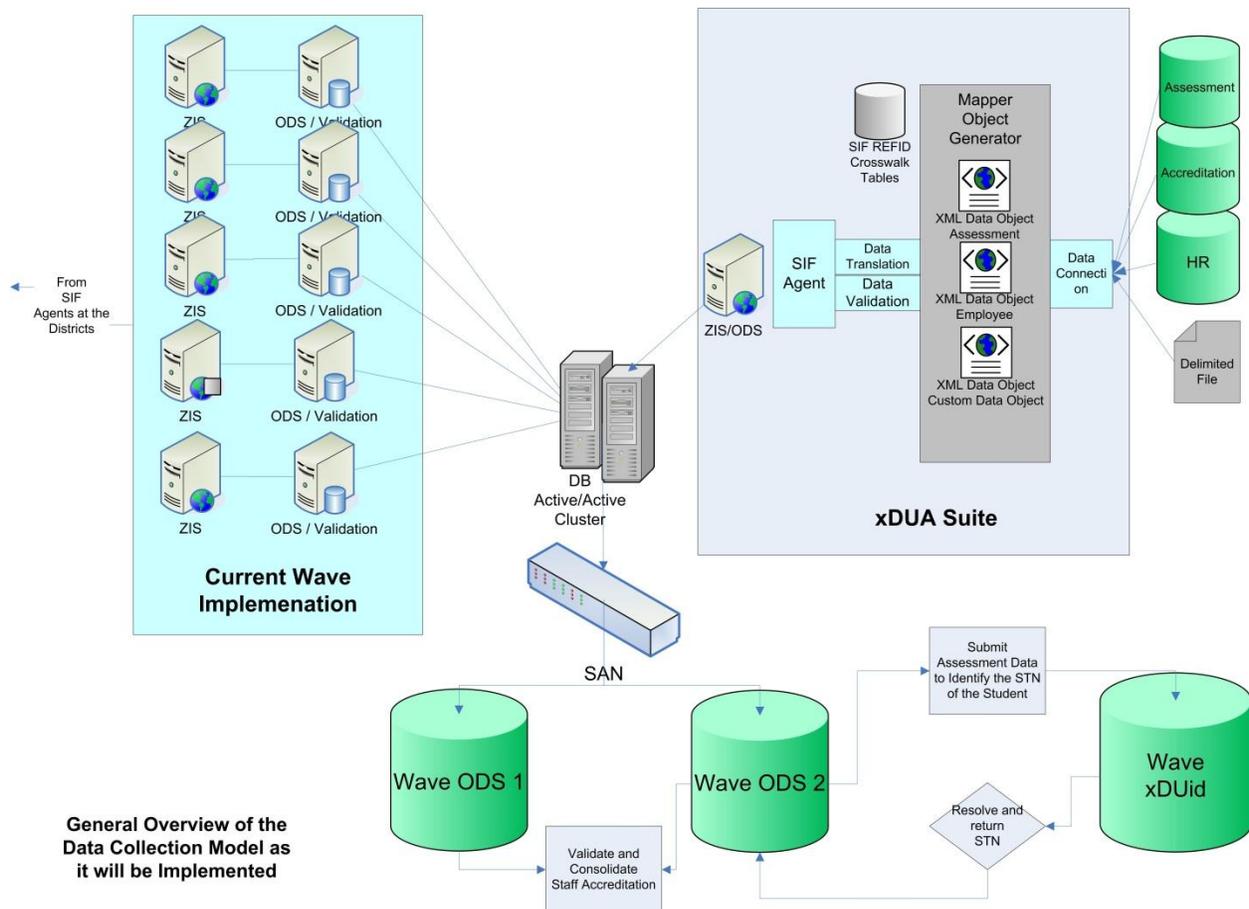
The technical benefits include:

- The toolset provides a consistent mechanism of data collection and storage.
- Data is stored based on national standards.
- Code sets are converted to NCES standards.
- Metadata management is performed by the xDStore ODS and the ADS based on XSD schemas providing for an automated and dynamic metadata system.
- Validation rules are reusable across all agencies (if licensed for use) based on the xDValidator architectural design. Each agency can leverage the validation rules of the other agencies saving time and money.
- The xDValidator uses the metadata XSD schema built by the xDStore ODS and ADS, thus maintaining a proper relationship between validation rules, data objects and data elements and allowing for dynamic documentation.
- Advanced error reporting (xDAdHoc) becomes available to all agencies (if licensed for use).
- The consistency allows for resources to be trained in order to assist all agencies with data collection, validation, and reporting, and can be a shared expense once grant funds are exhausted.
- This model meets the requirements of sustainability after proposal funds have been exhausted.
- The system is fully expandable by the Oklahoma SDE.
- The SDE can leverage the data in the LDS to provide EdFacts and US Department of Education Reporting.

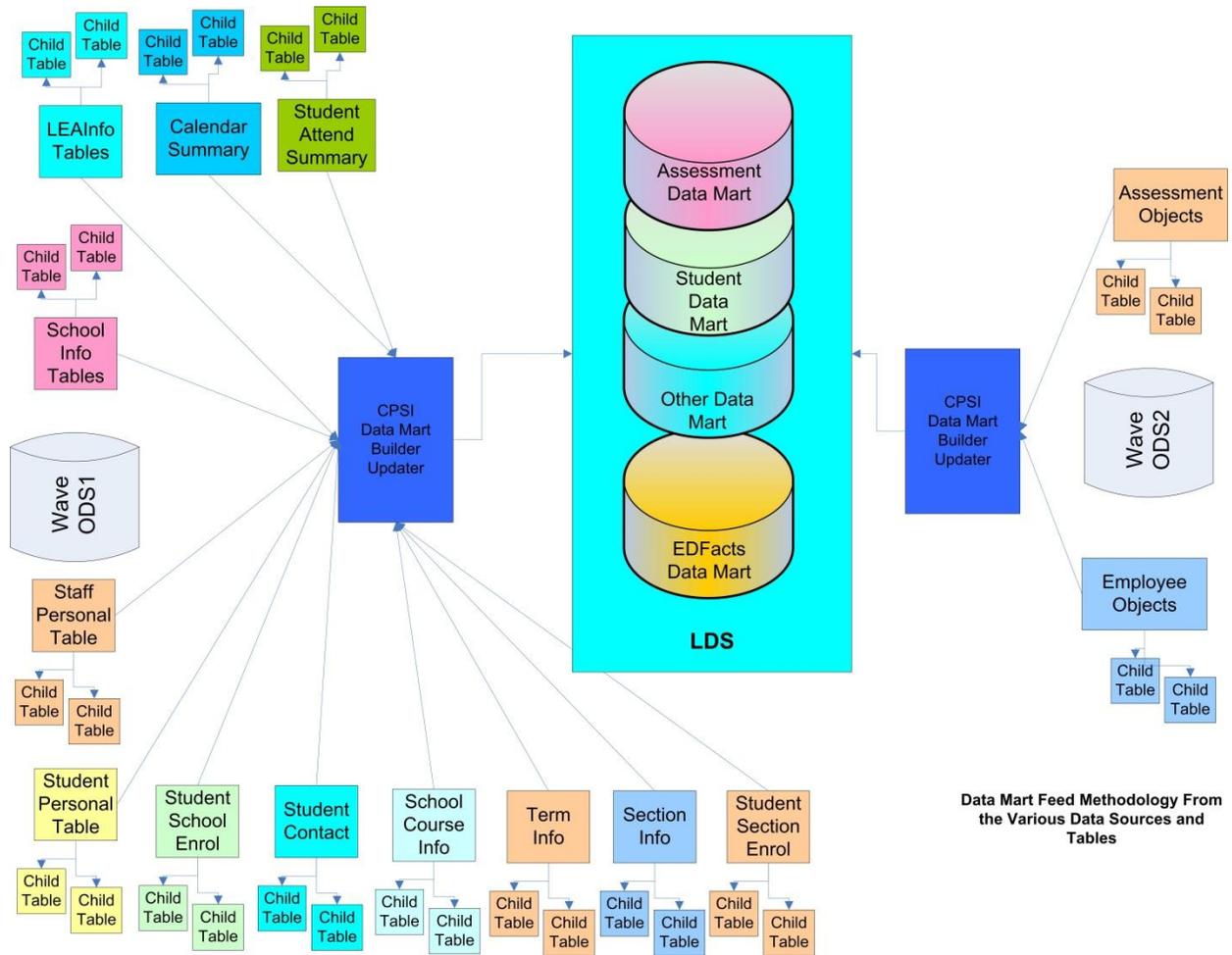
- The system is fully compatible with CEDS.
- Integration with the Shared Learning Infrastructure and Ed-FI is built into the system.

## Architectural Overview

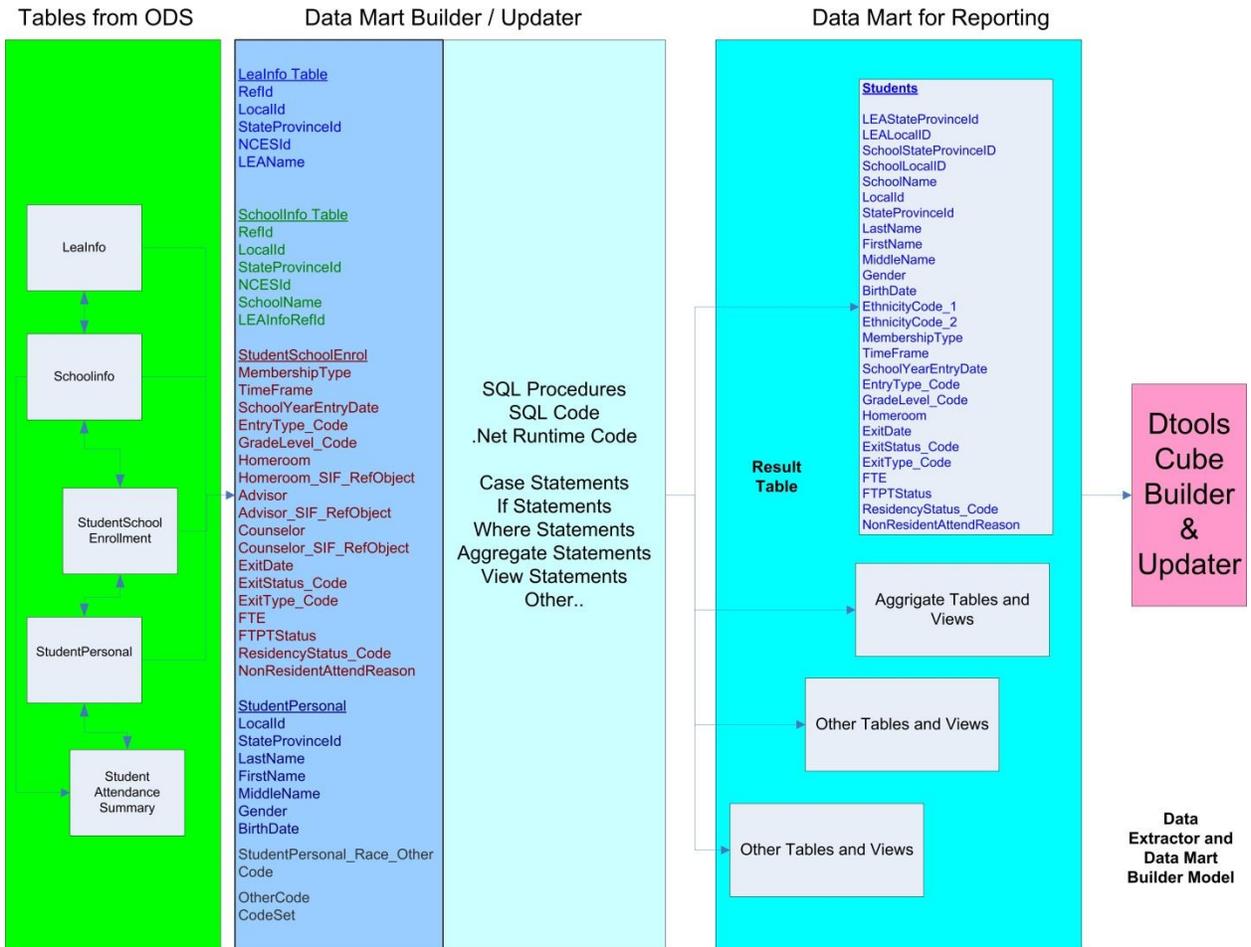
The following series of diagrams describes the current SDE architecture. Some of the diagrams refer to items that are marked as "To Be Implemented". Some of these items have already been implemented in the system.



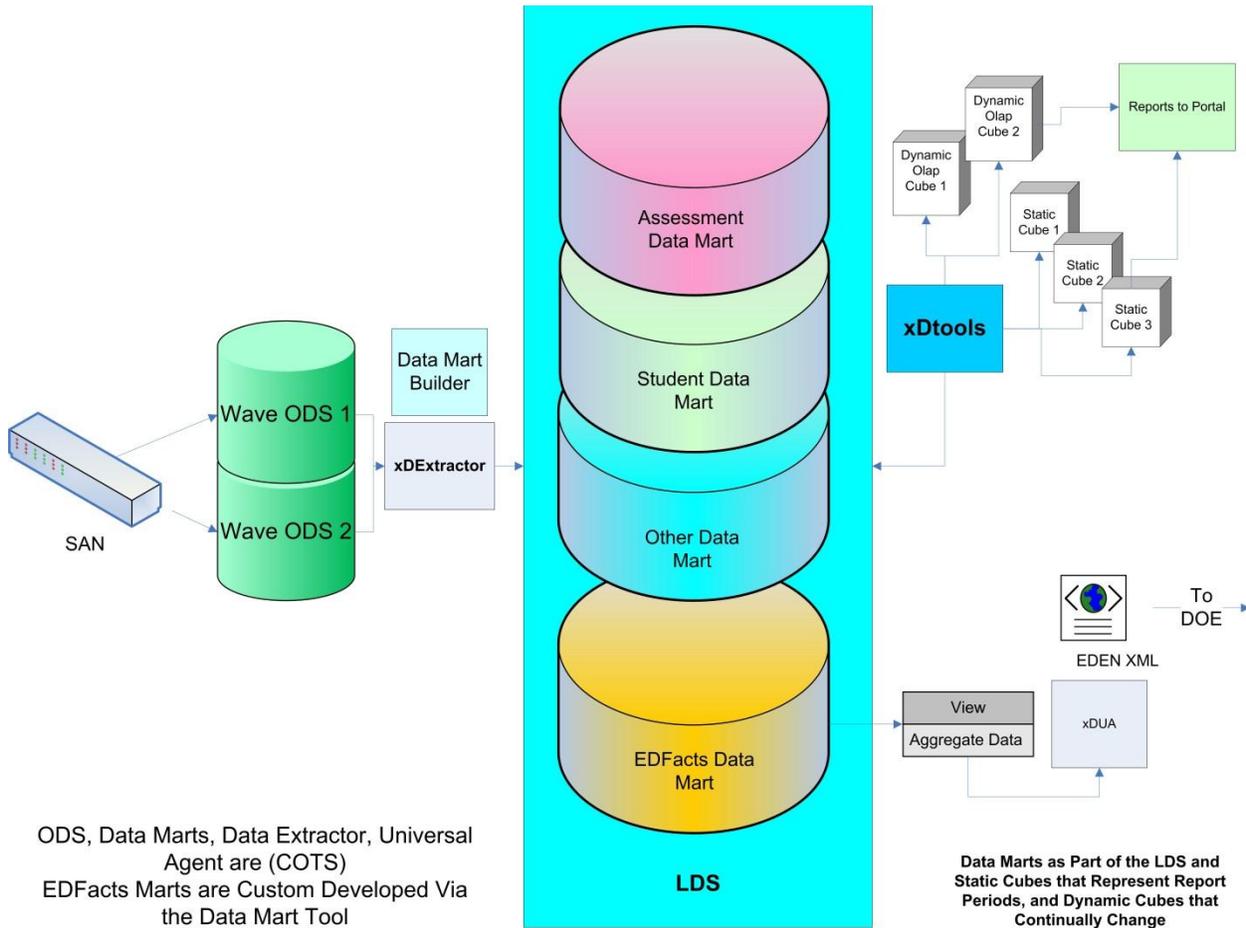
Above is a diagram of the Data Collection Model in Oklahoma.



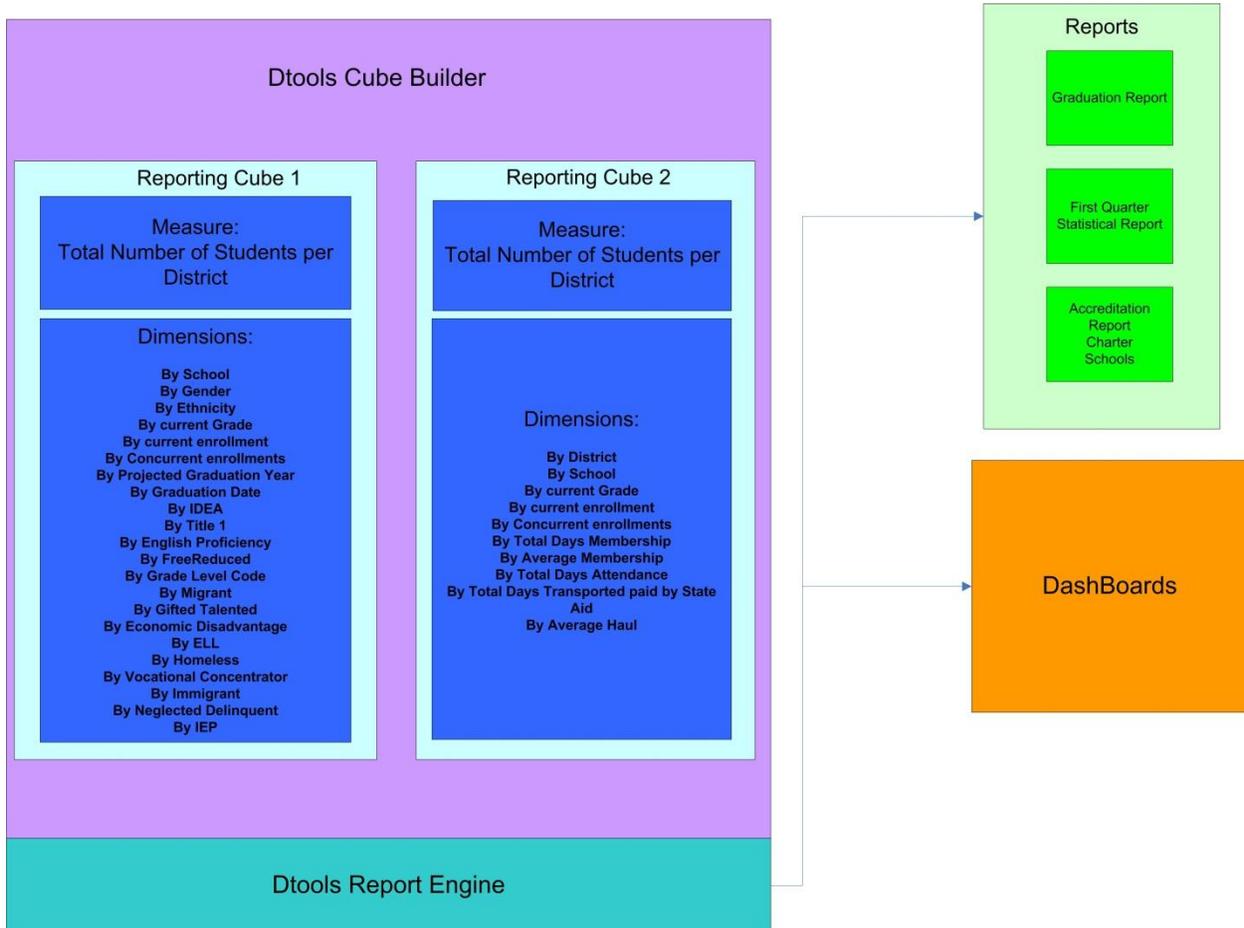
The Data Mart Feed methodology is shown in this diagram.



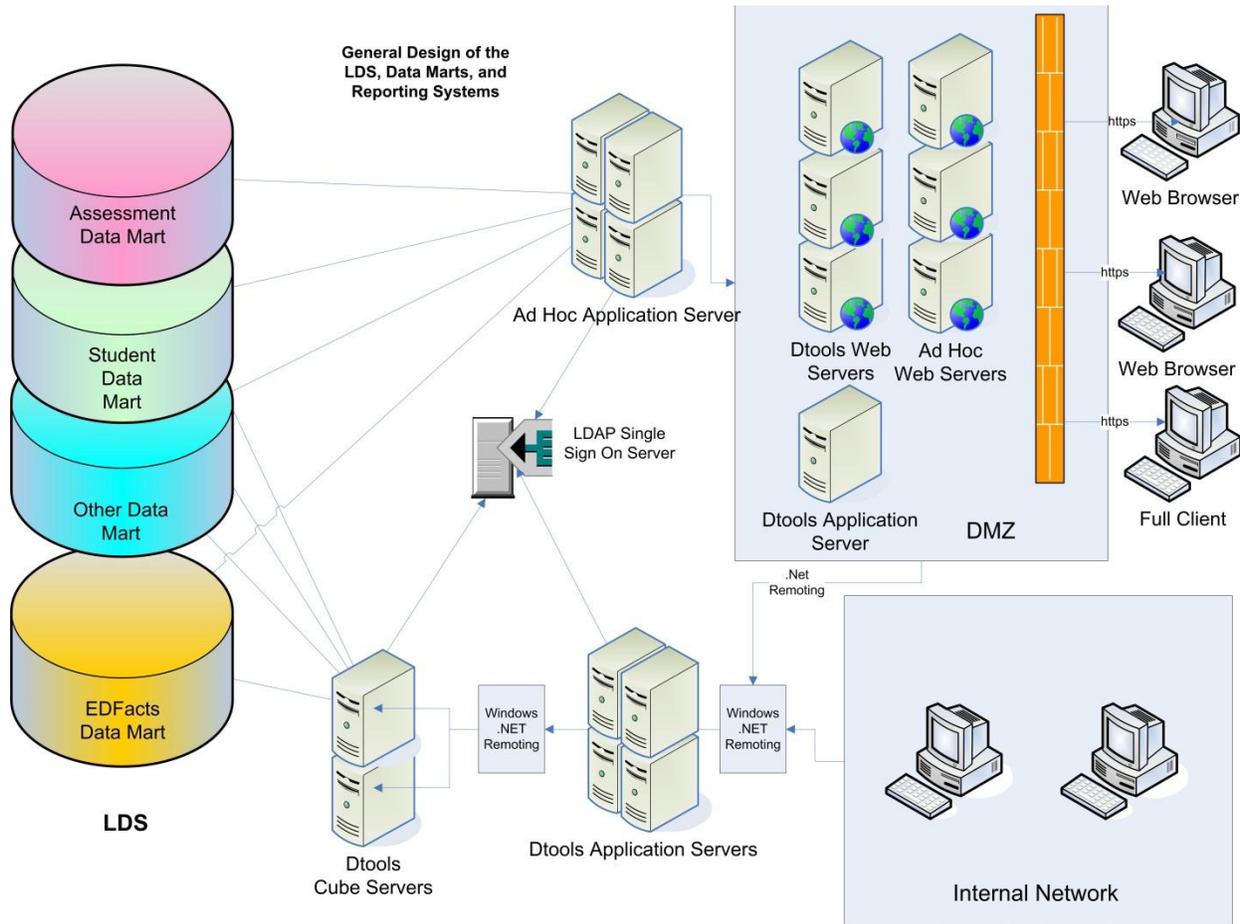
The Data Extractor and the Data Mart Builder Model is show in this diagram.



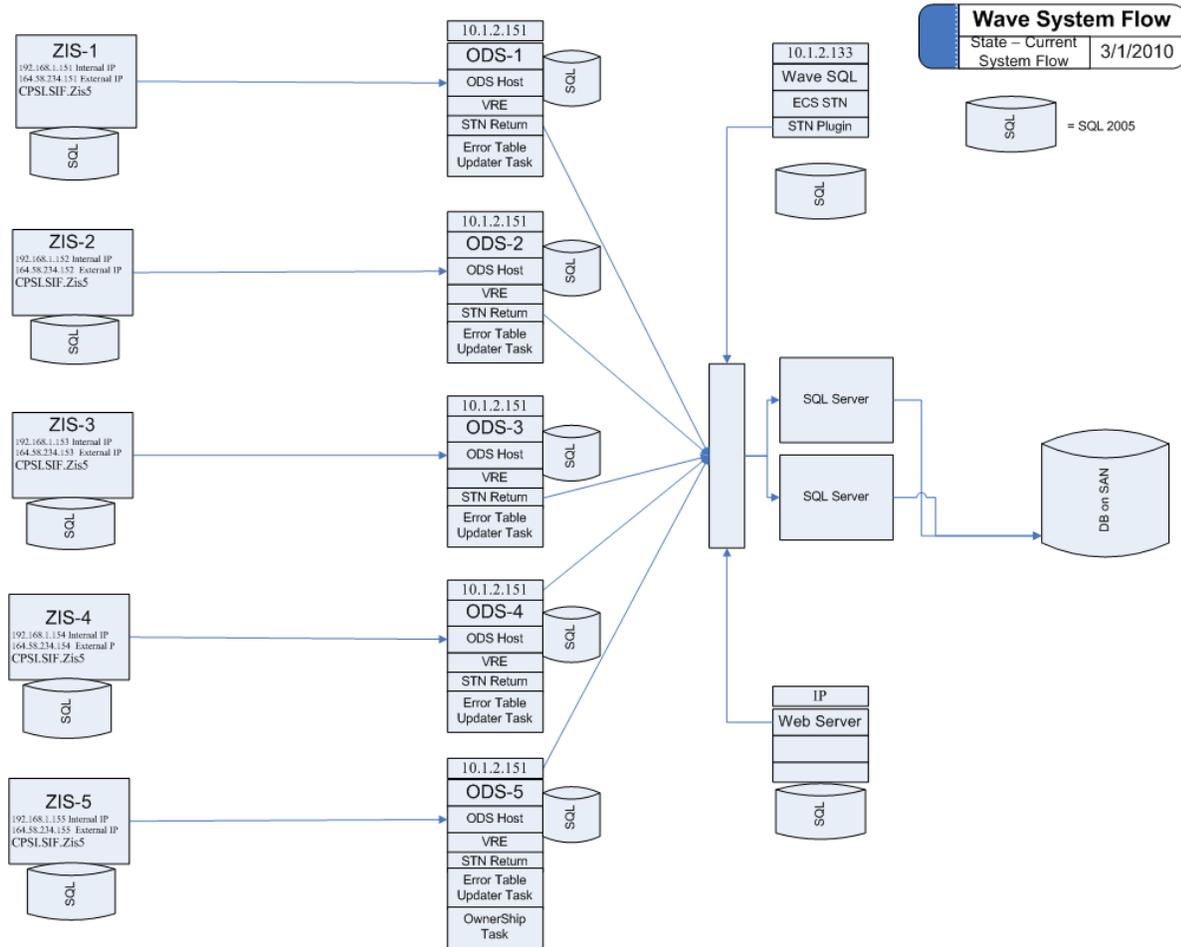
This diagram shows how the EdFacts Data Mart can be built from the current system. The Ed-Fi Data Mart can be built in the same fashion.



The xDTools Reporting Engine is used to build reporting cubes with measures and dimensions. Dashboards can be built from the reports.



The general design of the LDS, Data Marts, and Reporting system is diagrammed above.



This diagram shows the Wave System data flow as of March 2010. When the systems moved to the new location, this may have changed.

## Published Data Collections from the LEAs to the SEA

CPSI has been providing the data collection process from the LEA to the SEA for several years in Oklahoma. The data is collected via a SIF-architecture using the SIF data model. Each year, more data is added to the collection. The data collections are automated to the xDStore (ODS) at the SEA, where it is validated for business rules and quality. Data reports are shown to the schools, and they correct the data at the source (Student Information System). Once a data change occurs, as in a data correction, that data is then resent to the SDE where it will be validated again. Once correct, the data can be sent to data marts for use by the SDE. These data collections are used for various functions at the SDE. More detailed information is provided in the Oklahoma SIF State Profile. The current data collection includes the following SIF objects with their associated SIF elements.

- AttendanceCodeInfo
- CalendarDate
- CalendarSummary
- DisciplineIncident
- LEAInfo
- RoomInfo
- SchoolCourseInfo
- SchoolInfo
- SectionInfo
- StaffAssignment
- StaffPersonal
- StudentAcademicRecord
- StudentAttendanceSummary
- StudentContact
- StudentDailyAttendance
- StudentPersonal
- StudentSchoolEnrollment
- StudentSectionEnrollment
- StudentSectionMarks

More data can be added at any time by enhancing and expanding the SIF agents at the districts. CPSI has tools that can provide additional data collection activities from the LEAs.



## **"Lay of the Land" for District IT Infrastructures**

Data can be pulled from any data system at the LEA and that data can be automatically sent to the SDE. There are several options for collecting this data from the applications, databases, and spreadsheets. Options include using the xDComposer and xDMover to collect and provide the data. Section Three of this document discusses some of the options.



## **Statewide Assessments and College Entrance Exams**

With the current system, data can be pulled from any data system. The Wave currently integrates some assessment data to the ODS. The exact data can be determined by speaking with the Wave staff.

## Current Projects

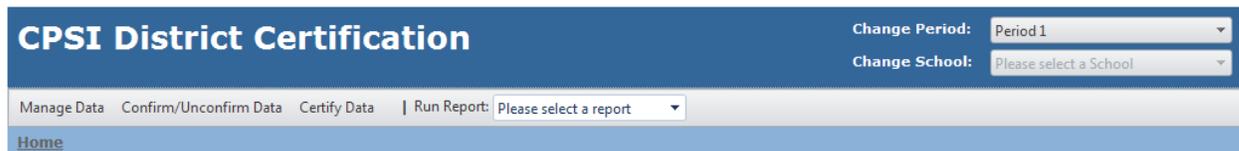
CPSI is currently working on several projects with the SDE staff. These projects are described below.

## District Data Certification Module

In this module, the districts will view their data collections that are sent to the state, verify that the data is “golden”, and then “certify” the data so that the data can be used by the state for federal reporting periods (October, March, EOY, and others). This is a new project for the SDE, and CPSI is designing the interface, the backend infrastructure, the user documentation, and more. The certified data can then be used by the state for federal reporting as it is verified data from each district.

CPSI develop a process that allows for the certification of district data. The data is pulled and displayed in applications and reports developed by CPSI. These reports contain, at minimum, the legislatively required federal and state reports submitted by districts currently to the State Department of Education in aggregate and student level formats through the School District Reporting Site or the Wave Web site. CPSI worked with the staff at the Wave to determine all of the criteria for developing the reports. The data contained in the reports are aggregated from student level data, but provide the drill down ability for appropriate district level users to see the student level data behind the aggregate numbers.

Some screen shots of the District Data Certification module are shown below. Please note that the application is nearly complete, but has not been finalized yet. We are working quickly to have everything ready for the October reporting period and delivering the module in the next week. The first screen is the “Home Page”. This page shows all schools in the district and is intended for District Level users, such as the superintendent.



### State and Federal Reporting Certification Application

| Site Name | Status    |
|-----------|-----------|
| C12345671 | Certified |
| C12345672 | Certified |
| C12345673 | Certified |
| C12345674 | Certified |
| C12345675 | Certified |
| C12345678 | Certified |

Districts are able to manage their data through the next screen.

CPSI District Certification

 Change Period: 
  
 Change School:

Manage Data   Confirm/Unconfirm Data   Certify Data   |   Run Report:

[Home](#)

### Manage Data

This site has been confirmed and the data cannot be edited.

Enter field:      
 Upload File:   
   
   

Drag a column header and drop it here to group by that column

| Membership Type  | Time Frame   | School Year  | Entry Date   | Entry Type Code  |
|--|--|--|--|--|
| <input type="text" value=""/> <input type="button" value="Y"/> |
| Away   | Current  | 2013   | 08-25-2012   | 9999   |
| Home   | Current  | 2013   | 08-25-2012   | 9999   |

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A sample report is shown below:

## CPSI District Certification

Change Period:   
Change School:

Manage Data | Confirm/Unconfirm Data | Certify Data | Run Report:

[Home](#)

### View Reports

1 of 2 | Export to the selected format | Export

Oklahoma State Department of Education

Southborough Public Schools, 027600

### Reporting Period 1

Student Local Id: 07304723

School: Margaret Neary School, 0262000A

| STN       | Prefix | Last Name | First Name | Middle Name | Suffix | Hispanic Latino | Gender | Birth Date | Migrant |
|-----------|--------|-----------|------------|-------------|--------|-----------------|--------|------------|---------|
| 305932895 |        | Hill      | Gretchen   | I           | 1      | No              | M      | 6/22/2000  | No      |
| 149067897 |        | Puckett   | Karen      | U           |        | No              | F      | 9/17/1999  | No      |
| 129161133 |        | Hamilton  | Elsie      | A           |        | No              | F      | 4/19/2000  | No      |
| 626565986 |        | Lawrence  | Neil       | A           |        | No              | F      | 8/4/2000   | No      |
| 154042099 |        | Steele    | Eric       | T           |        | No              | F      | 3/30/2000  | No      |
| 179638436 |        | Allen     | Pat        | L           |        | No              | F      | 4/9/2000   | No      |
| 582348706 |        | Grant     | Evan       | R           |        | No              | M      | 9/21/2000  | No      |
| 118317773 |        | Lloyd     | Hazel      | L           |        | No              | F      | 11/6/1999  | No      |

School: Woodward Memorial Elementary School, 0262000A

| STN       | Prefix | Last Name | First Name | Middle Name | Suffix | Hispanic Latino | Gender | Birth Date | Migrant |
|-----------|--------|-----------|------------|-------------|--------|-----------------|--------|------------|---------|
| 170574429 |        | Woodard   | Beth       | O           |        | No              | F      | 2/7/2003   | No      |

School: P. Brent Trottier Middle School, 0262000A

| STN       | Prefix | Last Name | First Name | Middle Name | Suffix | Hispanic Latino | Gender | Birth Date | Migrant |
|-----------|--------|-----------|------------|-------------|--------|-----------------|--------|------------|---------|
| 156608112 |        | Christian | Jennifer   | H           |        | No              | M      | 6/9/1999   | No      |

When data has been confirmed, the districts are then able to “Certify” their data through the following screen:

## CPSI District Certification

Change Period:   
 Change School:

Manage Data | Confirm/Unconfirm Data | Certify Data | Run Report:

[Home](#)

### Certify Data

You are about to mark this Reporting Period as Certified. This is an indication to the state that all data has been reviewed and is ready for submission for use on federal and state reports. Once marked as "Certified" only a state level user responsible for the collection of the data for this Reporting Period can decertify your district.

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Once complete, CPSI will write the User Manual for the District Certification Module for use in Oklahoma. CPSI will also provide training to the staff at the SDE so that they can support their users at the districts.

## Help Desk Module

In this module, non-admin users at the SDE Help Desk can choose to view the data by site and determine what stage the data is "stuck" at in case the data does not make it to the SDE reports. It is very customizable and will reduce the number of Help Desk issues sent to the Wave group. The Help Desk could also be provided to the school districts, if the SDE chooses to give them a login to the module. The Help Desk has been completed and deployed at the SDE. Screen shots with explanations are below:

### HELP DESK

[Home](#) : [Help Desk Search](#)

Search For Local ID

Select District:

Select search type:

LocalID:

Upload Multiple Local ID's

Select District:

Select search type:

Multiple LocalID:

## HELP DESK

[Home](#) : [Help Desk Search](#)

**Search For Local ID**

Select District:  
Halcyon

Select search type:  
 Select .....  
 Select .....  
 Student Data  
 District Data  
 SIMS Data  
 School Data

**Upload Multiple Local ID's**

Select District:  
Halcyon

Select search type:  
Select .....

Multiple LocalID:

In the Help Desk, you can search for Local IDs or Upload Multiple Local IDs. First, select the district, then the type of search, and then enter the Local ID or multiple IDs separated by commas. Click on Submit to get back information.

**XD HELP DESK DETAILS**

[Home](#) : [Help Desk Reports](#)

| Date                  | Search Type   |               |
|-----------------------|---------------|---------------|
| 4/12/2012 12:00:00 AM | Student Data  |               |
|                       | LocalID       | District Name |
|                       | V12           | Halcyon       |
|                       | V123          | Halcyon       |
|                       | V1234         | Halcyon       |
|                       | V12345        | Halcyon       |
| 4/4/2012 12:00:00 AM  | District Data |               |

The details screen will show you information by Local ID and District. Click on the "Report" icon to show the detailed data.

WELCOME TO XD HELP DESK !

[Home](#) : [Help Desk Reports](#) : [View HelpDesk Reports](#)

LocalID: V12

### Student Personal



**Discription:** Student Record Exists in the ODS

**Error Count:** 2

**Issue Message:** The StudentPersonal Record has Validation Errors - Please review the erros

| Error Number | Error Type | Error Description                 | Validation Level | Error Group | Help |
|--------------|------------|-----------------------------------|------------------|-------------|------|
| Code Set     | Error      | GradeLevel_Code is invalid.       | 3                | Group1      | ?    |
| Code Set     | Error      | GradeLevel_Code is invalid.       | 3                | Group2      | ?    |
| Code Set     | Error      | GradeLevel_Code is invalid.       | 2                | Group1      | ?    |
| Code Set     | Error      | GradeLevel_Code is invalid.       | 3                | Group2      | ?    |
| Blank Field  | Error      | FirstName field was not provided. | 4                | Group1      | ?    |
| Blank Field  | Error      | FirstName field was not provided. | 3                | Group1      | ?    |
| Blank Field  | Error      | LastName field was not provided.  | 2                | Group2      | ?    |

### LEA Info



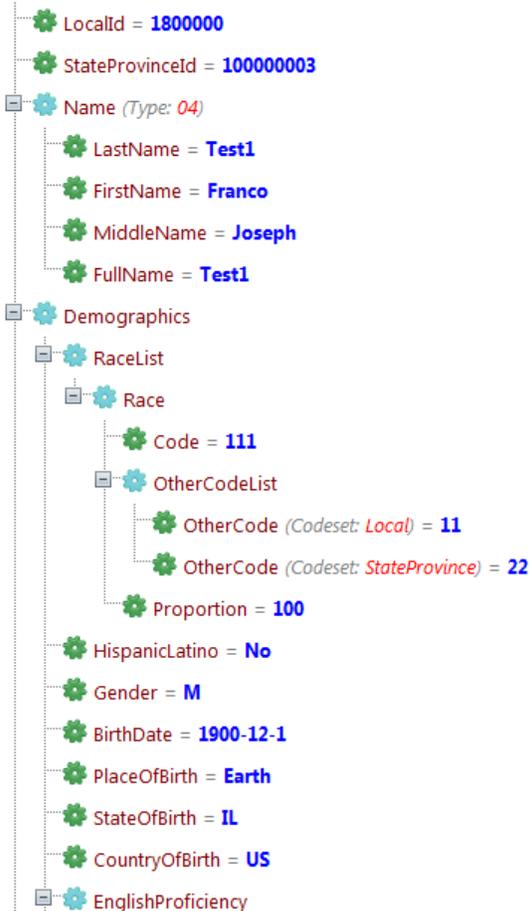
**Discription:** LEA Record Exists in the ODS for this Student

The report displayed will show the Error Number, the Error Type, the Error Description, Validation Level of the Error, which Error Group the error belongs to, and gives "Help" that will allow the user to see a detailed description of the validation error. You can also click on the XML icon to show the raw XML file for the data. A sample XML report is shown below:

[Home](#) : [Help Desk Reports](#) : [View HelpDesk Reports](#) : [View SIF XML](#)

[Expand All Nodes](#) [Collapse All Nodes](#)

StudentPersonal (RefId: D86129AE26D9468BA4F027987EEC5BAE, xmlns: http://www.sifinfo.org/infrastructure/2.x)



## Updating the Data Collections

There are 2 new SIF objects that have been added this year by the SDE. They are Discipline and StudentAcademicRecord. CPSI is working with some of the districts and vendors to ensure that the new data is being sent properly and completely to the SDE. The current data collection receives the data for 19 SIF Data Objects. These data objects are provided below in the section on the published data collections. The xDStore and other components have been updated to collect the additional data.

## Updates to MyData Extractions

CPSI has been working with Duane Brown on the updates that need to be completed to the MyDATA extraction. There have been multiple modifications and updates this year on the MyDATA extraction process.

## Validation Engine (xDValidator) Update

CPSI provide an updated version of the Validation Rules Engine to the Wave this year. CPSI assisted the Wave in setting up the Validation Rules Engine, trained developers in its use, and provided guidance and expertise in converting older versions of validation rules over to the newer validation model. CPSI provided and provides staff time to assist in the conversion process as well as documentation and live training in the use of the Validation Rules Engine. The Validation Rules Engine work has been completed.

One of CPSI's core competencies is in the validation of data using the xDValidator. With this toolset, all of the validations occur at the SDE level, even when data comes directly from a school or other agency. The Rules Engine performs real-time validations at a rate of over 30,000 validations per minute. The xDValidator Validation Rules Engine has an interface that allows the SDE to design and implement any validation on any tables and databases. The toolset is fully extendable through an API (DLL) or by implementing scripted C# code, SQL language, stored procedures and regular expressions. The system is designed to be extended and maintained by the end user. All errors and warnings are written to tables that can be accessed by any reporting system.

There are no limits on the validation reports that can be created. The validation system is integrated with Ad Hoc reporting capabilities. Each School/Data Provider will only see errors related to their information only. Users can view errors by Object Type, by error type, and by State report impacted. Authorized users can create a variety of error reports without writing code. Reports can be scheduled, emailed, and exported as well as many other features.

The maximum data/traffic volume has high performance efficiency. The ODS agent can receive and process and validate 1000 to 2000 XML objects per minute per service instance depending on the message size. The SDE has five Agent services running simultaneously and processes an average of 400,000 records per hour. The system is fully scalable and is truly only dependent on the capability of the backend SQL server and the hardware. The Validation Rules Engine keeps up with the ODS process.

## Longitudinal Reporting

CPSI will develop a reporting portal that will allow users by role to access historical and currently available longitudinal data for the purpose of building reports and researching data trends. Users may include but is not limited to: site level (principals, teachers), district level (superintendent, research staff), and state level (state superintendent, research staff, program



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coordinators). This reporting portal and longitudinal data system will be set up to house multiple years of data to follow a student from Early Childhood through Higher Education/Workforce. All data will be linked with the State Student Testing Number assigned either directly by the Wave or indirectly by using other identifying elements such as Name, Birth Date, Social Security Number, etc. This project will include a monthly snapshot of data to be used for trends analysis to be taken on the first day of each month. School Districts will have the opportunity to certify this data during the first month of the school year and then each subsequent month will only have to review and certify changes to the original set of data. **This piece has not been set in place and the services contract was not completed, but CPSI has committed to providing this work under the current contract.**

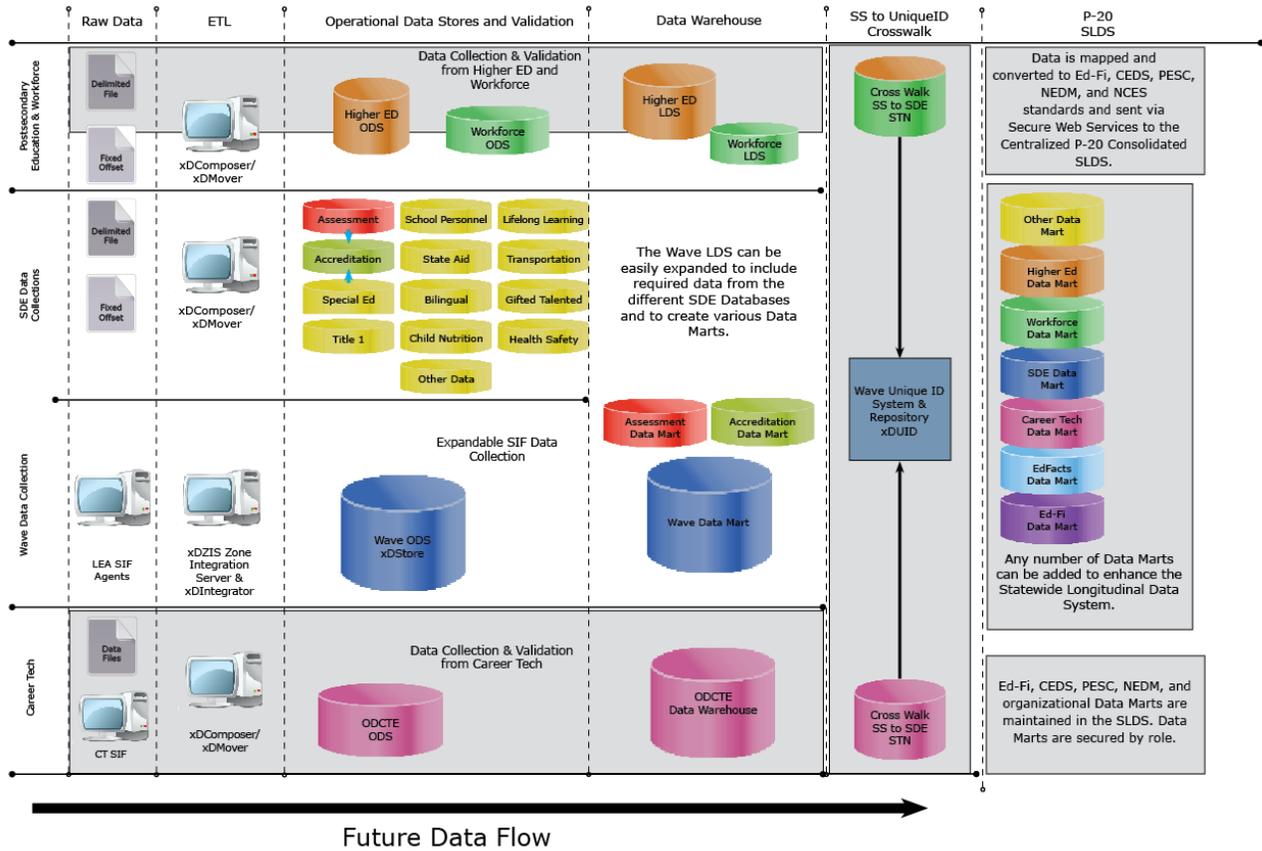
## Section 2 – Future Possibilities

Due to the flexibility and robustness of the current system, there are many enhancements that can be made to the system using the current Wave infrastructure. Many of the enhancements relate to the P-20 SLDS while others relate to aligning data with different standards and providing educators with learning dashboards and education intelligence tools.

The “future” possibilities include:

- Populating Data into the Ed-Fi Data Warehouse
- Automatically Creating EdFacts Uploads
- Enhancing the Wave System
  1. Adding more data from the student information systems at the LEA’s
  2. Adding data from other departments
  3. Adding data from other applications/databases at the LEA’s
- Aligning and Integrating with Higher Ed
  1. Converting Social Security Numbers to Unique IDs using xDUID
  2. Creating a Higher Education ODS
  3. Creating a Higher Education Data Mart
  4. Pulling data from Higher Education to the SLDS
  5. Providing data from PK-12 to Higher Education
- Aligning and Integrating with Work Force
  1. Converting Social Security Numbers to Unique IDs using xDUID
  2. Creating a Work Force ODS
  3. Creating a Work Force Data Mart
  4. Pulling data from Work Force to the SLDS
  5. Providing data from PK-12 and Higher Education to Work Force
- Integrating with Career Tech
  1. Converting Social Security Numbers to Unique IDs using xDUID
  2. Creating a Career Tech ODS
  3. Creating a Career Tech Data Mart
  4. Pulling data from Career Tech to the SLDS
  5. Providing data from PK-12 Career Tech
- Move Student Data Between Agencies
  1. District to District
  2. District to Higher Education
  3. District to Career Tech
- Ad Hoc Reporting and Education Intelligence

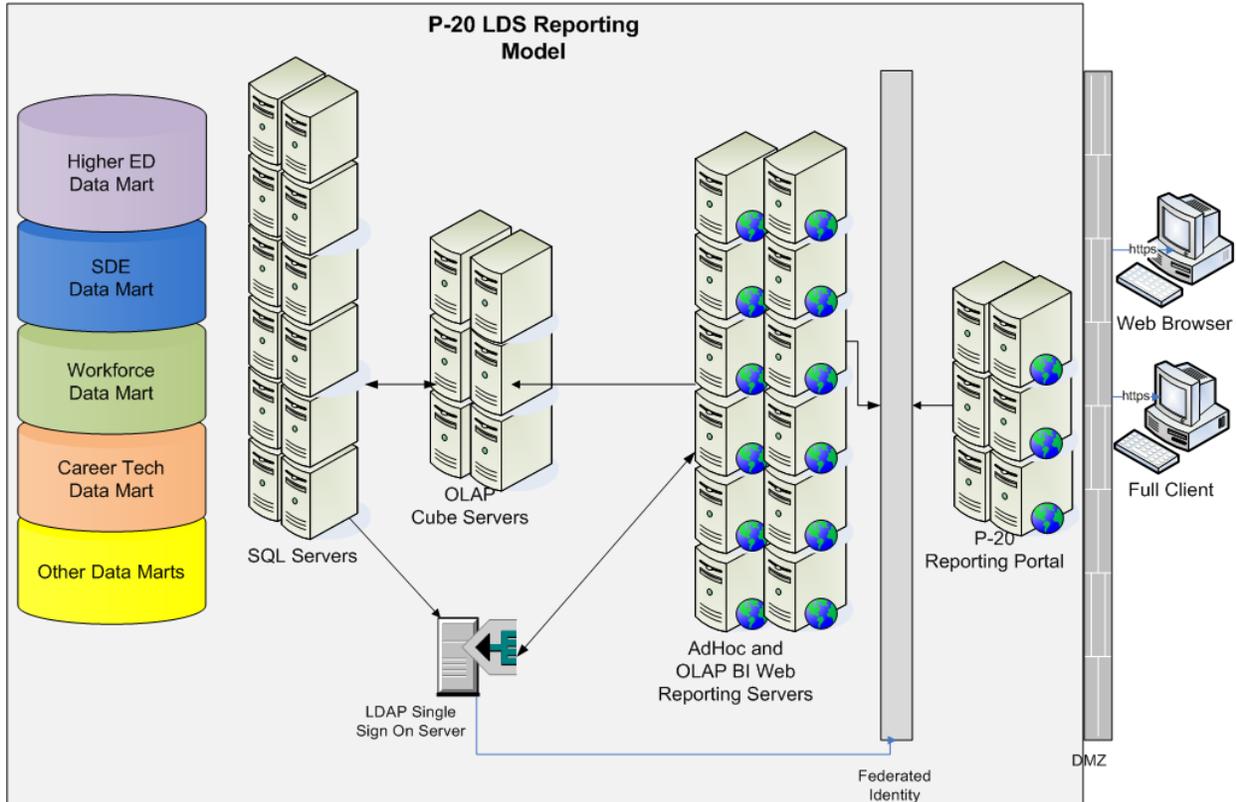
A diagram of the “future” of the SLDS system is provided below:



The SDE currently is licensed for applications from CPSI that can integrate and enhance the data within the Wave, between agencies, and pull data together to create a P-20 SLDS. The toolsets provided will also allow for movement of data between different data standards, such as from SIF to Ed-Fi and from SIF to CEDS for EdFacts reporting. The SDE also is licensed for tools that will give the educators in Oklahoma the ability to make better decisions through data analysis provided with the Ad Hoc reporting and Business Intelligence toolsets.

The “future” expanded data collection model would be built as shown in the diagram below for the P-20 SLDS Reporting model:

Grey Shaded Area = Funded via the P-20 LDS Grant



The next section describes the “Roadmap to the Future”. The high level steps involved in moving from the current system to the future possibilities will be provided.

## **Section 3 – Roadmap to the Future**

While moving from the current system to the “future” SLDS will take time, departmental and agency collaboration, planning, and design, the technology and infrastructure backbone is already in place to integrate and align the data for the P-20 SLDS, Ed-Fi Data Warehouse, and EdFacts reporting.

### **Populating Data into the Ed-Fi Data Warehouse**

CPSI has developed a SIF-to-Ed-Fi conversion tool that is included in the licensing for xDStudio. The tool leverages the xDComposer to “map” the data between SIF and Ed-Fi. Using the tool, the SDE can automatically move data from the SIF ODS to the Ed-Fi data warehouse. This is the same tool that is being used by CPSI for the Shared Learning Consortium (SLC) initiative.

In order to complete the project of moving data from the SIF ODS to the Ed-Fi data warehouse, a full gap analysis will need to be completed. If more data is needed, that data can be provided to the SDE through an enhancement of the SIF data collections from the LEA’s.

### **Automatically Creating EdFacts Uploads**

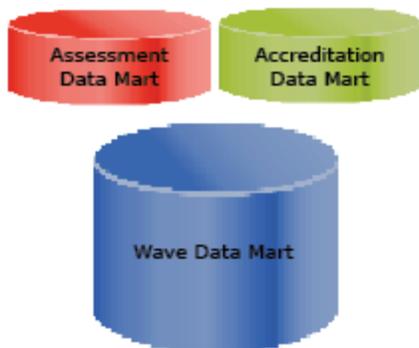
CPSI’s toolsets also will allow for an EdFacts data mart to be created at the SDE. Once there, the data will be validated to meet EdFacts requirements. The xDComposer will transform the data from SIF to CEDS and the xDMover will be used to automatically move the data into EdFacts files for shipment to the US DOE. While the DOE may not be able to handle the automatic uploads at this time, the files will be created and can easily be sent to the DOE at reporting times.

In order to complete the EdFacts project, a full gap analysis will need to be completed. If more data is needed, that data can be provided to the SDE through an enhancement of the SIF data collections from the LEA’s and through data collections from other departments at the SDE.

### **Enhancing the Wave/LDS System**

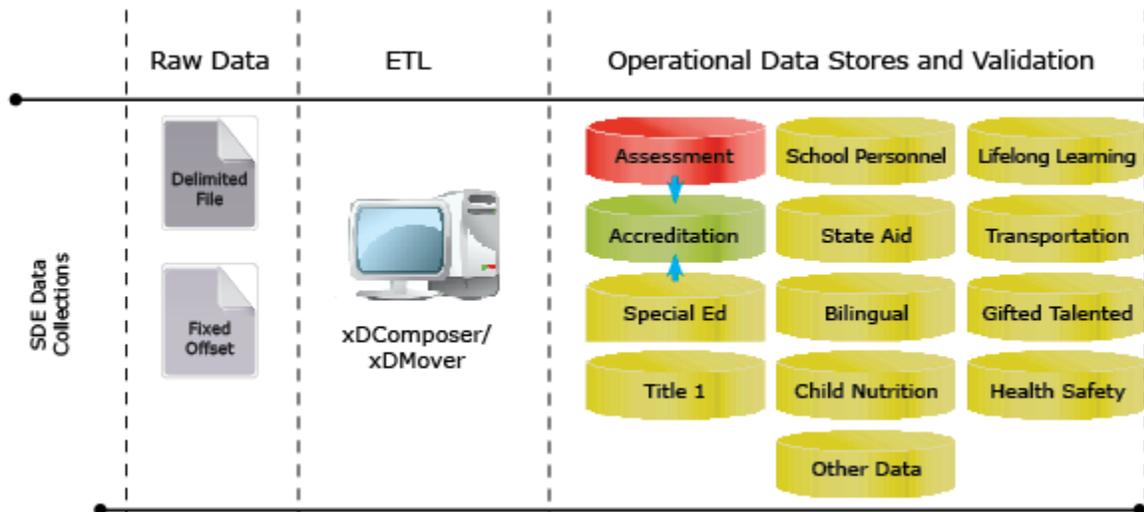
The P-20 SLDS, Ed-Fi data warehouse, and EdFacts reporting will require an enhancement of the data in the Wave/LDS system. There are three ways to enhance the data collections. First, the Wave can collect more data from the student information systems at the LEA’s. SIF Agents can be enhanced by the SIS vendors or the CPSI xDMover toolset can be used to enhance the data provided by the student information systems. Second, the Wave can collect more data from the other applications and databases that exist at the LEA’s. SIF Agents, the

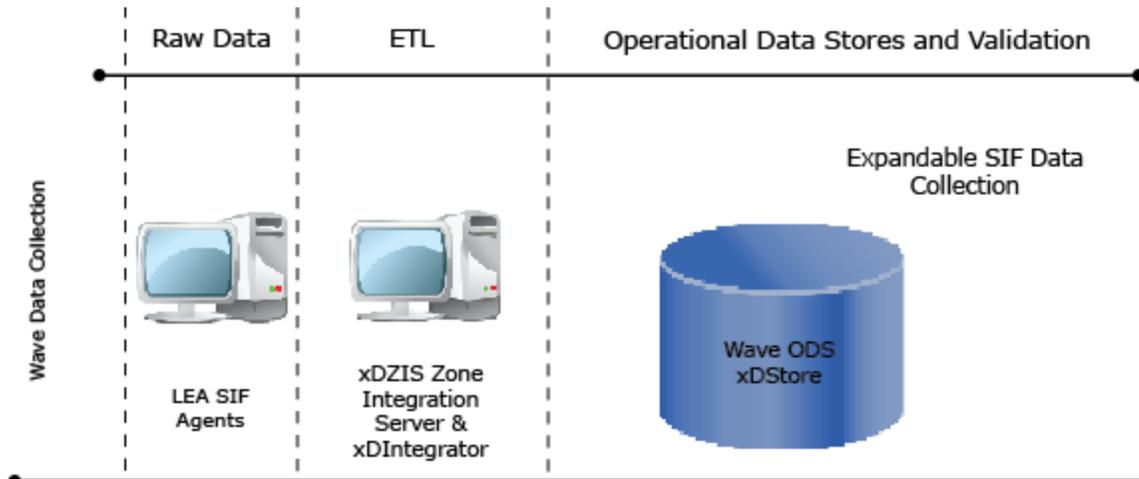
The Wave LDS can be easily expanded to include required data from the different SDE Databases and to create various Data Marts.



xDComposer, and the xDMover are all tools that can be used to collect data from the other systems at the LEA's. Third, the Wave can collect more data into the system by collecting and integrating data from other departments within the SDE. The xDComposer and xDMover can be used to pull this data into the Wave ODS.

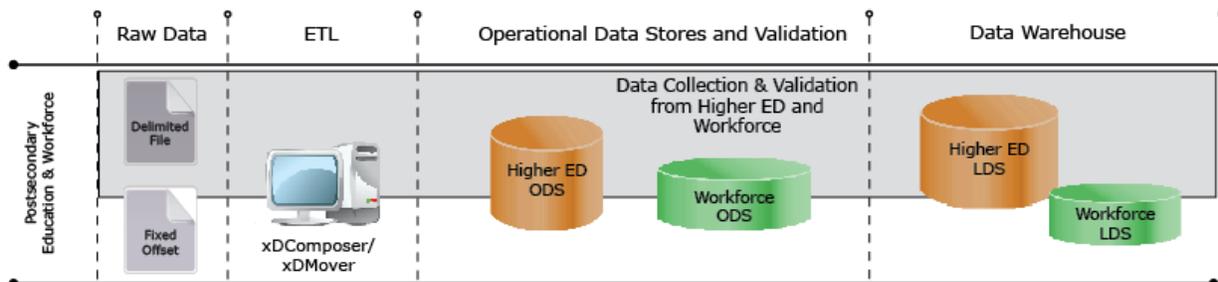
Data profiling will need to be completed in order to identify the additional data and to understand where the data might be located with the LEA's and the SDE. In addition to enhancing the current Wave system, departmental data marts can be built that will allow for each department to report on and analyze their own data. All data will be validated based on the SDE's business rules using the xDValidator. The validated data can then be moved to the P-20 SLDS on a scheduled basis or in real-time.





## Aligning and Integrating with Higher Ed

One of the goals of a P-20 SLDS is to align and integrate PK-12 data with Higher Ed data. In order to accomplish this project, it is important to ensure that the unique ID's for students are correct. In the case of Oklahoma, this means that social security numbers at the Higher Ed level will need to be converted to STN number (or unique ID's). The xDUID can be used for this conversion process, along with the xDValidator to validate the conversions.



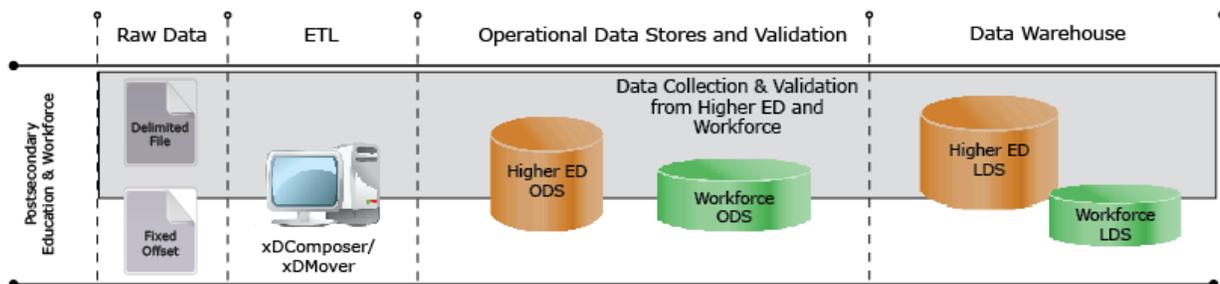
A data gap analysis will need to be completed to ensure that all data required for and from Higher Ed is accounted for. The xDComposer and xDMover can be used to move the data from the Higher Ed databases to the Higher Ed ODS (xDStore). As with the other systems, data validation will be completed at the ODS. A Higher Education data mart will be developed for reporting and analysis.

The data from the Higher Ed data mart will be sent to the P-20 SLDS. Data from the Higher Ed data mart will also be sent to Work Force as aggregates for analysis and decision making purposes.

## Aligning and Integrating with Work Force

Another goal of a P-20 SLDS is to align and integrate PK-12 and Higher Ed data with Work Force data. In order to accomplish this project, it is important to ensure that unique ID's are correct. In the case of Oklahoma, this means that social security numbers at the Work Force level will need to be integrated with the student STN numbers (or unique ID's). The xDUID can be used for this integration process, along with the xDValidator to validate the integration.

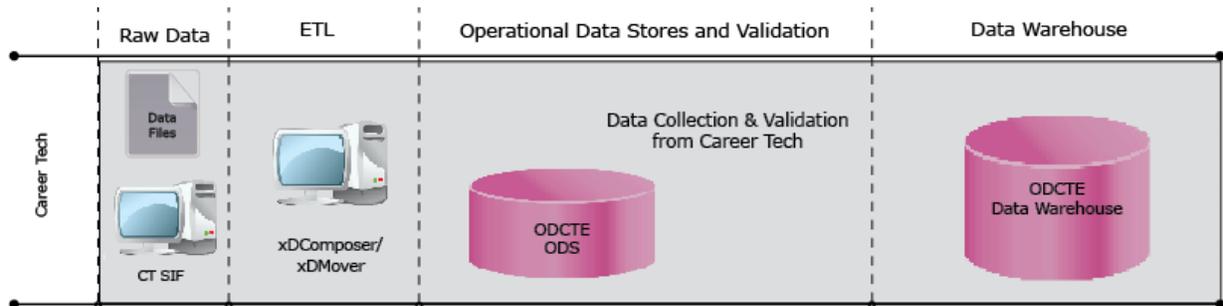
A data gap analysis will need to be completed to ensure that all data required for and from Work Force is accounted for. The xDComposer and xDMover can be used to move the data from the Work Force databases to the Work Force ODS (xDStore). As with the other systems, data validation will be completed at the ODS. A Work Force data mart will be developed for reporting and analysis.



The data from the Work Force data mart will be sent to the P-20 SLDS. Data from the Higher Ed, PK-12, and Career Tech data marts will be sent to Work Force as aggregates for analysis and decision making purposes.

## Integrating with Career Tech

One of the goals of the P-20 SLDS in many states is to align and integrate Career Tech and PK-12. In order to accomplish this project, it is important to ensure that the unique ID's for students are correct. The xDUID can be used for this matching process, along with the xDValidator to validate the matches.



A data gap analysis will need to be completed to ensure that all data required for and from Career Tech is accounted for. The xDComposer and xDMover can be used to move the data from the Career Tech databases to the Career Tech ODS (xDStore). As with the other systems, data validation will be completed at the ODS. A Career Tech data mart will be developed for reporting and analysis.

The data from the Career Tech data mart will be sent to the P-20 SLDS. Data from the Career Tech data mart will also be sent to Work Force as aggregates for analysis and decision making purposes.

## Move Student Data Between Agencies

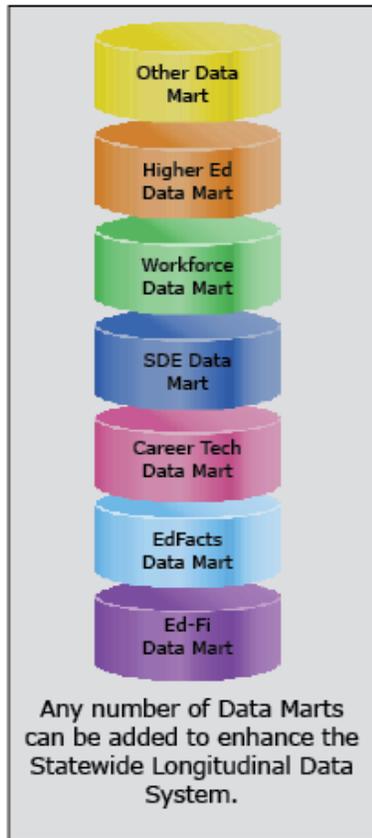
The desired movement of data between districts, agencies, and departments is a desired feature in most Statewide Longitudinal Data Systems. The current system can be used to provide the infrastructure for this data movement. District-to-district data movement might include the transfer of transcripts, IEP's and student portfolios. District-to-Higher Ed data movement might mean the movement of transcripts between the districts and the Oklahoma colleges and universities. Other movement between agencies and departments might also be indicated.

## Ad Hoc Reporting and Education Intelligence

The SDE is currently licensed for xDAdHoc and xDTools. xDAdHoc is a robust Ad Hoc Reporting toolset. CPSI is an OEM vendor for LogiXML and uses it, along with several security enhancements, to implement xDAdHoc for states and districts. LogiXML is recommended by the Gartner group. For more information, please see <http://www.logixml.com/>.

The SDE is licensed for CPSI's Business Intelligence product called xDTools. xDTools is an easy-to-use business analysis toolset that can be used by both power users and educators. The plan for xDTools was to roll it out this summer to the LEA's, but other projects took precedence at the SDE.

## Conclusion



**P-20 SLDS**

The State of Oklahoma has one of the most advanced data collection and LDS systems in the United States today. The integration and addition of the data from other applications and databases at the LEA's, other SDE departments, and other agencies will build the Statewide Longitudinal Data System that tracks children from birth to their entry into the work force in Oklahoma.

The tools exist to map and convert data to Ed-Fi, CEDS, PESC, NEDM, and NCES standards, where that data will be sent to the centralized P-20 consolidated SLDS via secure web services. Data Marts will be built for each agency and function, such as Higher Ed, Work Force, Career Tech, Ed-Fi, and EdFacts. Any number of data marts can be added to enhance the SLDS. Data marts are secured by roles.

CPSI's commitment to education and the Oklahoma SDE ensures that the state will receive the highest level of service and support from CPSI throughout the process of building the SLDS. CPSI looks forward to an enhanced relationship with the State as we work through the "Roadmap to the Future" and the goals of the SLDS project and the SDE.