

## 6. Project Narrative

The DDOE will complete a significant phase in its construction of its P-20 Statewide Longitudinal Data System (SLDS) to support Delaware schools mid-2012 when the Insight Data Warehouse and the Insight Dashboard projects will deliver a functional system for decision support. This is a comprehensive and integrated warehouse supporting a series of performance management dashboards that have been constructed using the EdFi standard ([www.ed-fi.org](http://www.ed-fi.org)). This is a significant milestone in terms of functionality. However, at this time, DDOE will require \$5 million over three years in funding to complete a fully functioning and sustainable longitudinal data system. The technology initiative that launched the Warehouse and Dashboard was envisioned by the P-20 Council and described in Delaware's Race to the Top application. The success DDOE has demonstrated in designing and implementing the Warehouse and Dashboard has positioned us now to engage the next phase—creating a significant reliance upon the P-20 SLDS for decision making, reporting, and research such that legacy systems and processes can be retired. This initiative has the support and endorsement of all school district superintendents in Delaware (See Appendix).

Three key projects are proposed in this next phase. DDOE must respond to the needs of teachers and schools to add content to the Insight Dashboard's analytic and reporting capabilities. The area at the top of their priority list is local assessment scores that can be linked to the other data already in the Data Warehouse tables. This first project, Local Assessment Builder (LAB), will assist teachers to build their local assessments, present them on-line to their students, score them, and analyze the results for interpretation within the context of their own curriculum.

The second project, Delaware Data-Driven Analysis Program (3DAP), will train and support all users of the P-20 SLDS to improve and maintain data quality, and to ensure proper interpretation and use of the data and reports from the Insight Dashboard. In addition to direct training activities, this project will create an on-going resource of materials for training and support.

The third project, Legacy Migration (LM), will complete the migration of legacy repositories and reports into the Insight Data Warehouse. While 33 source repositories and a few of their standard reports were initially included in the funding of the contract for the building of the Data Warehouse there remain other legacy repositories (such as those supporting EDFacts and other federal reporting) that the schools, districts, and DDOE staff continue to fill and use to manage reports. This project will reduce burden while eliminating the opportunity for duplication within the Data Warehouse.

Thus, the technology initiative begun by the Insight Data Warehouse and Dashboard with their momentum toward improved data quality and increased data for decision-making will fall back to a slow pace mid-2012 without a new, significant funding source.

The initiative logically continues its momentum with these three projects by adding content, training users, and migrating the remaining legacy repositories.

On November 16, 2011, consultants from ESP Solutions, Group, Inc. (ESP) met with staff from Delaware Department of Education (DDOE) to explore possibilities, review best practices from across the states, describe the current status of systems within Delaware, and determine a direction to follow in designing programs that leverage the information system assets within Delaware. ESP is the prime contractor for the Insight Data Warehouse. Multiple alternatives were discussed including how to involve higher education, workforce agencies, health agencies, human services agencies, early childhood agencies, and others that potentially could improve the exchange of data for the benefit of students. For this effort, the decision was made to focus on K-12 education in order to take full advantage of the Insight Data Warehouse and the Insight Dashboard's capacities, and to acknowledge that the Department does not have the resources to do so on its own.

DDOE staff discussed a number of needs that have been identified in the recent months. From these, three were determined to be the highest priority and to be the highest potential for return on investment.

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1. Delaware Local Assessment Builder (LAB)

The Delaware LAB Project is envisioned to create the capacity for Delaware schools and teachers to manage their own local assessments using both a national content library and local items. Teachers will also be able to both scan their paper tests and have their students take them online. Schools and districts will manage assessment data mapped to their curriculum and their benchmark assessments. With the capacity to upload these data to the Insight Data Warehouse, the users will be able to link to all the data there. For example, teacher data in the Insight Data Warehouse includes performance ratings, certification status, and highly qualified teacher status. For students, the data include elements such as statewide assessment scores, attendance, grades, and discipline. The Insight Dashboard and its reporting tools will then be available for analysis and reporting.

2. Delaware Data-Driven Analysis Program (3DAP)

The 3DAP is envisioned to provide the users of the Insight Dashboard and Warehouse the analytical tools, training, and support required to understand the data and make full and proper use of them. Users of all roles will be personally trained and have printed and on-line guidance materials available to them.

Data quality is significant because preventing poor data from ever entering the Insight

Data Warehouse saves resources from being used to edit and clean the data later. Training the data providers either at the school and district levels or in the program offices will be conducted. Improving the documentation they are provided will also be a priority.

As the quantity and complexity of the available data increases, and especially as the number of years of data grows, the challenges for users increase. DDOE will create guides documenting the definitions, disclaimers, assumptions, and parameters associated with the data; recommended uses; limitations of the data; sample analyses; and other advice for users to ensure proper interpretation. The media and format of these guides will vary to ensure that the users will find one that fits their style and needs.

### 3. Legacy Migration (LM)

The LM project is envisioned as the completion of the systems re-engineering begun by the Insight Data Warehouse. The Insight Data Warehouse brings data from 33 source repositories into a central data store for access by the Insight Dashboard. The Insight Dashboard in turn provides the new capacity for *ad hoc* queries, longitudinal analyses, and research. However, all of the 33 source repositories did not go away, and many legacy reports are still generated from them. In addition, there are many other legacy databases from which reports are generated, such as ED*Facts*. The impact of these legacy systems on DDOE, the schools, and districts is that there remains duplication in reporting, data checking, and processing. Without additional resources, DDOE does not have the capacity to convert these repositories to the Insight Data Warehouse and then to build new reports from those new tables. The LM project will provide the resources to make this migration begin at the time DDOE completes the final phase of the Insight Data Warehouse implementation.

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## **Section (a): Need for the Projects**

Delaware needs to seek additional external funding to support its efforts to build out the current K-12 statewide longitudinal data system. The needs are significant and cannot be met with State funds provided through current budgets. The Delaware Department of Education (DDOE) only has sufficient State funding to maintain the level of functionality that has been designed and provided by the State and federal resources associated with the Race to the Top grant that underwrote the building of the Insight Data Warehouse and the Insight Dashboard. Phase 1 of these two projects will be successfully completed and in production by April 2012. The projects continue through 2013 to bring in additional datasets for higher education, labor, and possibly other State agencies; and to add dashboards for additional stakeholders and users such as principals and administrators.

DDOE envisioned a comprehensive technology initiative that guided our successful Race to the Top application. The technology component of this grant provided \$6 million for identity management, project management, common course codes, electronic data exchange, data dictionary, and a client ID tracking system. This included the funding for a limited, first phase development of the Insight Data Warehouse (\$2 Million) and Insight Dashboard design (\$840,000). The build-out of the Dashboard will be completed internally by DDOE. Both are based on the Michael and Susan Dell Foundation Canonical Data Model, now EdFi data model.

However, the limited funding placed a cap on the number of data sources (i.e., legacy repositories) that could be identified for inclusion in the Data Warehouse in the first phase. This in turn limits both the content and the scope of the analyses and decisions that will initially be supported by the Dashboard.

The good news is that the architecture and design of the system are robust. Both the Insight Data Warehouse and the Dashboard will support expansion. The analytical tools and portal capability are available when the contents are there and the users are capable of taking advantage of them.

The Insight Dashboard interface, its analytical tools, and the processes for accessing the data are new and somewhat complex for the school, district, and DDOE users. There were funds in the Insight Data Warehouse and Dashboard projects for training and support of users and DDOE staff. However, these funds covered only the initial introduction of users to the new systems and their capabilities, and the required knowledge transfer from the contractors to the DDOE technical staff who will maintain the systems. Even though DDOE values professional development activities, the funding level of those projects was such that the priority was placed upon building well-architected and functioning infrastructure with the assumption that those had to work at the highest level of performance, then content and user skills could be added in a measured and controlled manner as resources became available.

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Thus, DDOE, by mid-2012, will have in place an excellent data warehouse, dashboard, and analytical toolset—an infrastructure with which the Department can confidently collect, manage and present quality, longitudinal data for decision makers.

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The Delaware P-20 Council was established in 2003 by Governor Ruth Ann Minner's Executive Order 47 and placed in statute in 2005. The Council is an inclusive organization designed to align Delaware's education efforts across all grade levels. Its main goal is to establish a logical progression of learning from early childhood to postsecondary education while reducing the need for remediation. With cooperation from State leaders, higher education, school administrators, the business community, and parents, the P-20 Council will be able to open more doors for Delaware's children and prepare them to become self-sufficient, contributing members of society who will continue to learn throughout their lives. The goals of the P-20 Council:

- Smooth transitions between these levels will make the schools more efficient and effective while raising the level of student achievement.
- Closing the achievement gap between majority and minority students.

The keys to achieving the goals of the P-20 Council include:

- A challenging curriculum taking into account expectations at the next level.
- Increased teacher recruitment, education, and professional development, especially in critical needs areas.
- An advisement or support system to help identify student problems early and prepare them for success across all levels of education.

In fiscal year 2012 House Bill 213 (HB 213, Attached) was introduced which allows for the sharing of data for required audits or evaluations imposed by state or federal law and allows for sharing of data for research questions approved by the P-20 Council that can help guide policy and practice for better outcomes for students. The legislations also expands the membership of the P-20 Council to include: Secretary of the Department of Labor, Secretary of the Department of Services for Children, Youth and their Families; Secretary of the Department of Health, Chief of the Delaware Chief School Officers Association, President of the Delaware State Education Association, and President of the Charter School Network (or their designees). A significant part also calls for regulations to be developed that governs data collection, analysis, use and reporting (See 'P20 Data Governance Handbook', Attached).

DDOE has used the P-20 Council goals and priorities along with those of its stakeholder groups to identify three priority needs we are ready to address—content, training, and migration.

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First, the priority need for content is local assessments. Teachers need DDOE to provide them with a system for building, administering, scoring, analyzing, and tracking their own local assessments. DDOE needs the resources to acquire a management system for this then the Insight Data Warehouse can be enhanced to store the data and provide them to the Insight Dashboard. The Dashboard will then offer the analytics and reports to integrate the local assessment data with other data already available.

Second, the need to train data providers, users, and managers is crucial to data quality and proper use of the data. DDOE needs to not only directly train people, but also build training modules and materials to create an on-going resource.

Third, the need to migrate the remainder of the legacy databases' reports and processes into the Insight Data Warehouse is basic to the integrity of the overall technology vision. This migration contributes in all the following ways:

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1. Increasing Sustainability: DDOE cannot maintain two systems now that the Data Warehouse is being completed. The DDOE resources still devoted to the legacy databases must be migrated to the Data Warehouse.
  2. Reducing the Burden on Schools: This also will reduce the duplication of effort and burden on schools and districts that are reporting and receiving reports from the legacy processes.
  3. Promoting Research: Without consolidation of the data from across the various legacy repositories and the Data Warehouse, researchers and those conducting *ad hoc* analyses will continue to be required to search across multiple sources for data. However, the greatest need is an expanded toolset, enhanced processes and revised policies that will allow researchers to access the warehouse directly, based upon Family Educational Rights and Privacy Act (FERPA) rules. This will bypass direct DDOE staff contacts and increase efficiency.
  4. Updating Federal Reporting and ED*Facts* ETL: An example of a legacy system is ED*Facts*. ED*Facts* is working well now. However, as its source files migrate to the Insight Data Warehouse, ED*Facts* ETL processes must change. Performing this transition in a planned project, using best practices from other states doing the same makes sense and reduces risk.

To help focus the design of these projects, DDOE reviewed the input gathered from stakeholders over the past few years. This allowed DDOE to establish the following criteria for priority and return on investment when selecting and designing the projects to include in the grant application.

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- Priority was defined as:
    - a documented need from the schools and districts that would benefit instructional improvement from the use of data,

- a documented need associated with the Insight Data Warehouse and Insight Dashboard projects that was not funded by those projects, or
  - a documented need within the DDOE Information Technology (IT) area that if addressed would reduce the data reporting burden on schools and districts, result in improved data quality, and reduce the cycle time for reporting.
  - Return on investment was defined as a project that, for the cost, resulted in:
    - the highest amount of useful and timely data and actionable reports being returned to the schools,
    - the highest increase in the quality of the data within the Insight Data Warehouse,
    - the highest increase in the proper use of the data through the Insight Dashboard, or
    - the highest increase in efficiency of the DDOE IT staff in managing the data.
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## **Section (b) Project Deliverables**

Three projects were defined that meet these criteria for priority and return on investment.

### **1. Delaware Local Assessment Builder (LAB)**

The Delaware LAB Project is envisioned to create the capacity for Delaware schools and teachers to manage their own local assessments using both a national content library and local items. Teachers will also be able to both scan their paper tests and have their students take them online. Delaware is well positioned to deliver these local assessments online. We are one of a handful of states that are currently delivering state assessments to students via an online system.

Schools and districts will manage assessment data mapped to their curriculum and their benchmark assessments. With the capacity to upload these data to the Insight Data Warehouse, the users will be able to link to all the data there. For example, teacher data in the Insight Data Warehouse include performance ratings, certification status, and highly qualified teacher status. For students, the data include elements such as statewide assessment scores, attendance, grades, and discipline. The Insight Dashboard and its reporting tools will then be available for analysis and reporting.

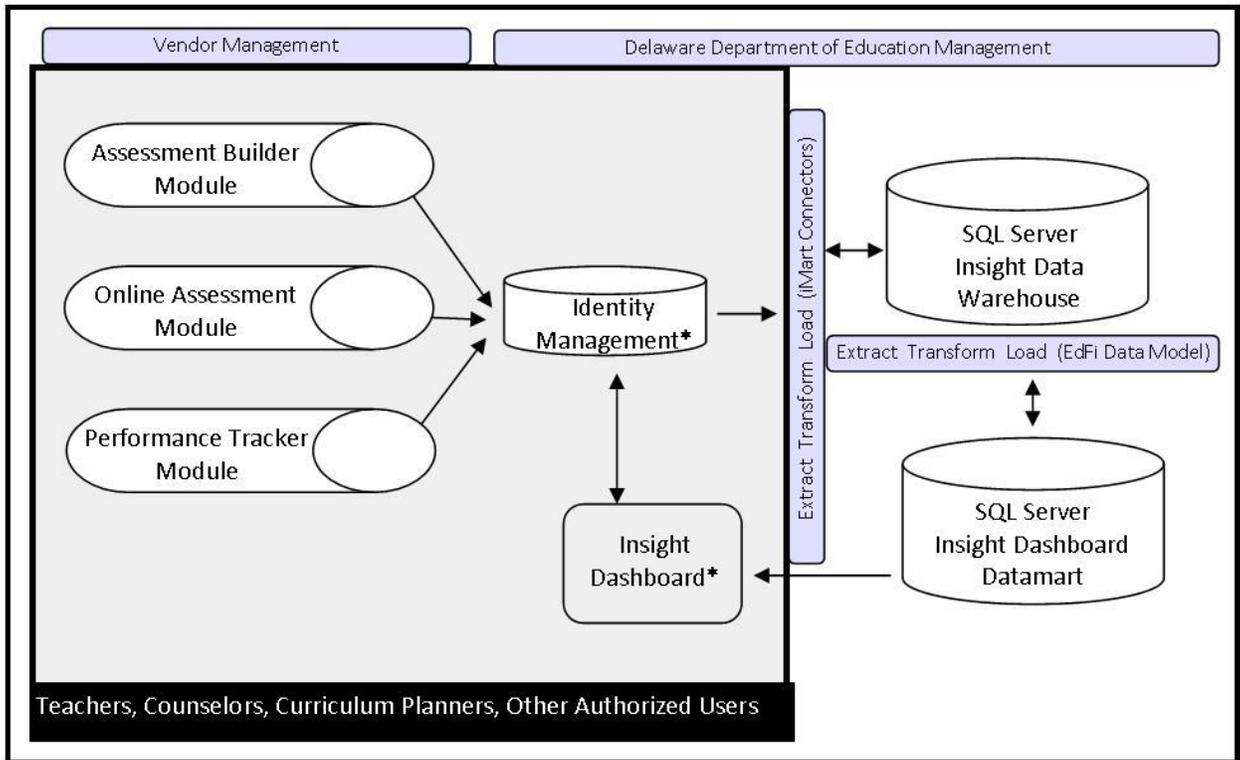
The LAB addresses the priority of a documented need from the schools and districts that would drive instructional improvement from the use of data. In a survey of districts, about 70 local assessments were reported to be in use. This illustrates the need in Delaware where the statewide assessment Delaware Comprehensive Assessment System (DCAS) is an adaptive measure, computer administered, that does not assign the same items to every student; therefore, diagnostic analyses are not appropriate for classrooms or grade levels within schools as they can be in other states.

Across Delaware, every teacher is creating, administering, scoring, and tracking local assessments for their students; and needing to align them with their curriculum. In addition, Research in Action, Inc. (RIA) and the Delaware Department of Education (DDOE) are constructing a process to create valid measures of student performance in the various subject areas, such as mathematics, English Language Arts (ELA), science, social studies, world languages, visual and performing arts, music, physical education, English as a second language (ESL), and career/technical education (CTE). Measures for teachers, accountability specialists, educational diagnosticians, physical and occupational therapists, school counselors, school nurses, and school librarians are also being developed. These internally developed measures are scheduled to become available no later than July 2012. Further, these measures may also be used in conjunction with the vendor-made (external) assessments approved by the Secretary of Education.

At this time, DDOE does not have the resources to design and import these data, nor to create the reporting processes with the enhanced identity management processes to serve the teachers. A major need is also to procure an assessment-building application with an item bank feature that will provide the schools the functionality to administer the assessments on-line. With this tool, DDOE will be able to establish a start-to-finish process from the classroom to the dashboard.

Figure 1 provides a high-level view of how the LAB components will interoperate with the Insight Data Warehouse and the Insight Dashboard.

**Figure 1: Delaware Local Assessment Builder (LAB) Interoperability with Insight Data Warehouse and Dashboard**



LAB will also provide DDOE with the ability to deliver a statewide assessment that can be used for Component 5 of Delaware’s Teacher Accountability Program. DDOE is developing statewide assessments to be used for accountability in non-core areas. The integration of the assessment builder application into the Insight Data Warehouse and Dashboard is crucial to the use of the results of the assessments by teachers.

The LAB addresses the return on investment criterion by generating the highest amount of useful and timely data and actionable reports being returned to the schools. By giving individual teachers the capability to create their own assessment items and to use items from banks, a tremendous number of assessment scores will be generated throughout the school year. By the nature of these scores being on-demand, they will meet the criterion of being timely and useful. The reports available from the on-line scoring service will be actionable. The reports from the Insight Dashboard will link teachers and students, and have the capacity to be longitudinal.

Integration of the LAB into the Insight Data Warehouse and Dashboard will require several technical tasks:

- The data elements within the assessment builder application database will need to be entered into DDOE’s metadata dictionary.
  - This will be done by defining this database as a repository and describing each table, field, and option set.
  - Next, the fields/elements from the application will be mapped to the core DDOE elements in the metadata dictionary, which are linked to EdFi and

contributed to that national data dictionary effort.

- The source data within the application's database will need to be extracted, transformed, and loaded using the connectors that are part of the tools provided by DDOE's data warehouse. The Insight Data Warehouse will need to be modified to accept the new data from the assessment application.
  - Connectors will need to be built for each database used by the assessment application.
  - New tables will need to be defined and built to accept the data from the assessment builder application.
- The exchange process between the Data Warehouse and the Dashboard will need to be enhanced using the established architecture to move the new data into the Dashboard data mart.
  - The EdFi data model will need to be enhanced.
  - The exchange process and code will need to be expanded to accommodate the additional assessment tables and fields.
- The Insight Dashboard will need to be enhanced to accommodate the additional assessment analysis and reporting functionality and reporting features.
  - After the procurement process for the assessment builder application, the requirements for analytics, user interface, and reporting will need to be accommodated into the Dashboard features.

## 2. Delaware Data-Driven Analysis Program (3DAP)

The 3DAP has five foci:

1. To train and support the users of the data within the Insight Data Warehouse and accessible through the Insight Dashboard to interpret them correctly and to use them properly.
2. To train and support the providers of data to the Insight Data Warehouse to improve and sustain the quality of the data available for analysis and reporting.
3. To train and support the managers of the Insight Data Warehouse and Insight Dashboard to develop and sustain the skills required to maintain them.
4. To provide additional analytical tools identified by the users and stakeholders as helpful to their understanding of the data.
5. To create and maintain a multi-media library of resources for training and support.

The 3DAP has been designed to leverage the training and support systems and resources that Delaware has established in the past years as part of a comprehensive infrastructure. This varied infrastructure demonstrates DDOE's commitment to the importance of professional development.

Delaware's statewide Professional Development Management System (PDMS) is used to track course work, assign clock hours, and deliver course work. This was used to train

over 10,000 K-12 users at the beginning of the 2010-2011 school year in the new Delaware Performance Appraisal System.

DDOE has in place a contract with Blackboard that will be leveraged as an in-kind resource managed through the PDMS. With the new content and multi-media training and support resources that will be designed and developed by Expanding Delaware's Insight Data Warehouse Reporting and Instructional Improvement Capabilities (for the sake of brevity we are calling this Insight Plus in the rest of the narrative), Blackboard will be used for DDOE staff to schedule training and for individuals to register for training. This training can be instructor-led or Internet provided.

Because Delaware has not held an annual statewide data conference for over a decade, there is no mechanism in place to build upon for training and sharing of best practices. DDOE will provide through Insight Plus as necessary the traditional stipends for training and the fees for rental of facilities within the three counties to reduce travel expenses and time. Various methodologies will be used to expand the effectiveness of the training and support. There are 30 Data Coaches available statewide who can use the materials produced by Insight Plus. Train-the-trainer strategies can also be used. The initial activity of the 3DAP will be to build a comprehensive plan for maximizing the resources within Delaware with the resources provided by the grant.

The 3DAP is envisioned to provide the users of the Insight Dashboard and Warehouse the training and support required to understand the data and make full and proper use of them. Users of all roles will be personally trained and have available to them printed and on-line guidance materials.

A major gap in the Insight Data Warehouse and Insight Dashboard projects' funding was in adequate resources for training and support of the users. This is true not only in the short-term, but also in the long-term for sustainability. There is the need for DDOE to create an on-going process for training the users and then for training new users as they enter the community.

The 3DAP addresses the priority of a documented need associated with the Insight Data Warehouse and Insight Dashboard projects that was not funded by those projects. Neither of those projects includes adequate funding for training. Initial training budgets included a minimum of resources for DDOE staff, and some for the end users. However, it is evident now that the extent of the training required is far beyond what can be funded.

The new vision is not only to train users on the Insight Dashboard and how to generate reports, but also to build a library resource of training and support documents and videos. These resources would need to be continually updated for content and for changes in the system.

The 3DAP addresses two of the return on investment criteria; the highest increase in the quality of the data within the Insight Data Warehouse, and the highest increase in the proper use of the data through the Insight Dashboard.

Data quality is significant because preventing poor data from ever entering the Insight Data Warehouse saves resources from being used to edit and clean the data later. Training the data providers either at the school and district levels or in the program offices will be conducted. Improving the documentation they are provided will also be a priority.

As the quantity and complexity of the available data increases, and especially as the number of years of data grows, the challenges for users increase. DDOE will create guides documenting the definitions, disclaimers, assumptions, and parameters associated with the data; recommended uses; limitations of the data; sample analyses; and other advice for users to ensure proper interpretation. The media and format of these guides will vary to ensure that the users will find one that fits their style and needs.

### 3. Legacy Migration (LM)

This deliverable is the key to sustainability for all the benefits stakeholders will gain from Insight Plus. The Legacy Migration (LM) project is envisioned as the completion of the systems re-engineering begun by the Insight Data Warehouse. The Insight Data Warehouse will bring data from 33 legacy repositories into the central data store for access by the Insight Dashboard. The Insight Dashboard in turn provides the new capacity for *ad hoc* queries, longitudinal analyses, and research. However, all of the 33 source repositories will not go away, and many legacy reports, such as *EDFacts*, are still generated from them. In addition, there are many other legacy databases from which official and management reports are generated. The impact of these legacy systems on DDOE and the schools and districts is that there remains duplication in reporting, data checking, and processing. Without additional resources, DDOE does not have the capacity to convert these repositories to the Insight Data Warehouse and then to build new reports from those new tables. The LM project will provide the resources to make this migration begin at the time DDOE completes the final phase of the Insight Data Warehouse implementation.

For example, the data in the Highly Qualified Teacher database will be extracted, transformed, and loaded into the Insight Data Warehouse using a configured iMart connector. However, the data will still be analyzed and cleansed in the Highly Qualified Teacher database rather than using the new capabilities and processes built within the Insight Data Warehouse. In addition, official reporting is still scheduled to originate from the Highly Qualified Teacher database. A substantial gain in efficiency for the districts and DDOE will be achieved when this grant provides the resources to move the

data analyzing, cleansing, and reporting into the Insight Data Warehouse. The access of these data for official purposes such as *EDFacts* will then be from that new location. Then the final goal of efficiency will be gained when the legacy Highly Qualified Teacher database is retired.

The LM project addresses the priority of a documented need within the DDOE IT area that if addressed would reduce the data reporting burden on schools and districts, result in improved data quality, and reduce the cycle time for reporting. This need is that the Insight Data Warehouse project was able to include only a portion of DDOE's data sources in the initial design. Therefore there is still a legacy of reporting using older systems. For DDOE IT staff, this means that some data are now imported into the Insight Data Warehouse but remain in their legacy databases for official reporting for *EDFacts*, State statistics, and other purposes. For schools and districts, they will continue to receive reports from two processes until all the migration has been completed.

The LM project addresses the return on investment criterion of the highest increase in efficiency of the DDOE IT staff in managing the data. The current legacy systems, reports, and databases require significant personnel to maintain. Migrating them to the Insight Data Warehouse will transition them into the same processes and standards that have been established for those data and reports. The number of FTE personnel required to manage the combined number of reports will be less.

Migrating the additional legacy repositories requires several technical tasks.

- Each repository, database, and their associated reports will need to be documented in DDOE's metadata dictionary.
  - The repositories' tables, fields, and option sets need to be defined in order to align them with the DDOE data standards established for the Data Warehouse.
  - The field contents/elements need to be mapped to DDOE's core data element standards that have been aligned with EdFi.
- Using the metadata, new tables and fields must be built in the Insight Data Warehouse.
  - The source data within the legacy sources will need to be extracted, transformed, and loaded using the connectors that are the tools provided by DDOE's data warehouse. The Insight Data Warehouse will need to be modified to accept the new data from the assessment application.
  - Connectors will need to be built for each database.
  - New tables will need to be defined and built to accept the data from the sources.
- The exchange process between the Data Warehouse and the Dashboard will need to be enhanced using the established architecture to move the new data into the Dashboard data mart.
  - The EdFi data model will need to be enhanced.
  - The exchange process and code will need to be expanded to

accommodate the additional tables and fields.

- The Insight Dashboard will need to be enhanced to accommodate the additional potential analysis and reporting functionality and reporting features.

### **Section (c) Timeline for Project Deliverables**

The development deliverables funded by the Race to the Top grant are scheduled to be completed in April 2012. By that time, users will be able to access the data from that phase through the Insight Dashboard. The data model and processes for enhancing it will be in place. The enterprise information architecture specifying the standards and processes for Extract, Transform, and Load (ETL) and building connectors for new data sources will be established. The enterprise metadata dictionary that manages the definitions and option sets that ensure all data sources are compatible and defined for users will be fully loaded and available to developers and users alike.

By this time, all of the initial training and knowledge transfer provided by the Warehouse and Dashboard contractors will have been completed.

At this time, the DDOE internal staff will take over the maintenance of the updates of the data from the collections to the Data Warehouse to the Dashboard on the periodicity driven by the data collections.

Duplication will be avoided with the Race to the Top grant-funded activities because they will end before the beginning of the new grant. There will be no other federally funded grants providing the same deliverables. The limited available State-funded resources will be used to supplement the deliverables described here by maintaining the Insight Data Warehouse and Dashboard infrastructure, and the legacy repositories until they are migrated to the new system.

May 2012 is the ideal time for a new funding source to begin to provide renewed resources for the next phase that includes the deliverables outlined in the timetable below.

Two of the projects can begin immediately upon funding of the grant.

- 3DAP can begin its project planning activities and build on the content and analysis tools already available in the Insight Dashboard. Then as additional content, tools, features, and functions phase in, the 3DAP activities will expand.
- LM will leverage the ETL process and Insight Data Warehouse architecture already established.

The LAB project will require a procurement process, and will begin project activities after a contract is in place.

<b>Deliverable</b>	<b>Begin Date</b>	<b>End Date</b>	<b>Person/ Office Responsible</b>
1. Local Assessment Builder	May 2012	April 2015	Bruce Dacey
a. LAB Project Plan Finalized	May 2012	July 2012	Bruce Dacey
b. Procurement Process	August 2012	December 2012	Robert Czeizinger & Bruce Dacey
i. Requirements published			
ii. Contractor selected			
c. Warehouse Integration	January 2013	December 2013	Sean Anthony & Bruce Dacey
i. Metadata dictionary documentation			With Data Admin & Pupil Support Teams
ii. Requirements for ETL			
iii. Development of ETL process			
iv. Testing & Acceptance			
v. Operation			
d. Software Configuration, Implementation	January 2013	December 2013	Bruce Dacey & Paul Pond
i. Requirements documentation & analysis			with Pupil Support & Information Systems Teams
ii. Systems preparation			
iii. Installation & testing			
iv. Acceptance & operations			
e. Pilot Implementations	March 2013	December 2013	Bruce Dacey & Pupil Support Team
i. Requirements for pilots			
ii. Selection of pilot schools			
iii. Pilot implementation			
iv. Evaluation of pilots			
v. Expansion to additional schools			
vi. Evaluation & recommendations for full implementation			
f. Roll Outs	January 2014	April 2015	Bruce Dacey & Pupil Support Team
i. Phase 1 schools selected & trained			
ii. Phase 1 schools implemented & monitored			
iii. Phase 2 schools selected & trained			
iv. Phase 2 schools implemented & monitored			
v. Phase 3 schools selected & trained			
vi. Phase 3 schools implemented &			

monitored vii. Problem schools remediated			
2. Data Driven Analysis Program	May 2012	April 2015	Sean Anthony
a. DAP Project Plan Finalized	June 2012	August 2012	Sean Anthony
b. Development of Training Modules i. User guides for Dashboard modules developed ii. Proper use of data guides developed iii. Data provider guides developed	October 2012	December 2014	Sean Anthony & Data Admin Team
c. Training of Staff i. Training for DBAs provided ii. Training for data providers conducted iii. Training alternatives for users launched, evaluated, modified, and finalized	January 2013	April 2015	Sean Anthony & Data Admin Team
3. Legacy Migration	May 2012	April 2014	Jeff Fleming (Application Support Team)
a. LM Project Plan Finalized	May 2012	July 2012	Jeff Fleming
b. Warehouse Enhancements Developed i. Sources documented in metadata dictionary ii. ETL requirements documented iii. Data model expanded iv. Tables built	August 2012	December 2013	Jeff Fleming & Sean Anthony & Tommy Tao
c. ETL Processes Developed i. ETL processes designed ii. ETL code written, tested	November 2012	February 2014	Sean Anthony & Tommy Tao
d. Data Imported, Verified i. ETL processes tested, verified, accepted ii. Sources imported, verified iii. Dashboard analytics run iv. Final acceptance completed	January 2013	April 2014	Sean Anthony, Jeff Fleming, & T Tao with Data Admin and Application Support Teams

4. Project Management	May 2012	April 2015	Robert Czeizinger & TBD
a. Project Management Plan Finalized	May 2012	June 2012	TBD & Robert Czeizinger
<ul style="list-style-type: none"> <li>i. Weekly status meetings conducted</li> <li>ii. Monthly executive updates conducted</li> <li>iii. Annual status and evaluation reports submitted</li> </ul>	May 2012	June 2012	TBD

#### **Section (d) Project Management and Governance**

Statewide governance of Insight Plus will be assured by aligning it with the P-20 Council. The Delaware P-20 Council was formalized by Delaware Code Title 14, Chapter 1, Subchapter 1 § 107. P-20 Council to coordinate educational efforts of publicly-funded programs from early care through higher education and to foster partnerships among groups concerned with public education. The P-20 Council makes recommendations designed to ensure a more integrated, seamless education system that enables children to enter school ready to learn, receive challenging instruction throughout their school careers, graduate from high school ready for college or work, and continue their education in a way that makes them productive and successful citizens. The P-20 Council is co-chaired by the Secretary of Education and the President of the State Board of Education. The Council members includes the presidents (or their designees) of the public institutions of higher education in Delaware, along with the presidents of the institutions of higher education offering degree programs in education (or their designees). Additional members include the Chair of the Delaware Early Care and Education Council, the Chairs of the House and Senate Education Committees, a representative of the Governor's Office, the Chair of the Business Roundtable Education Committee, and the Executive Director of the Delaware State Chamber of Commerce, or their designees.

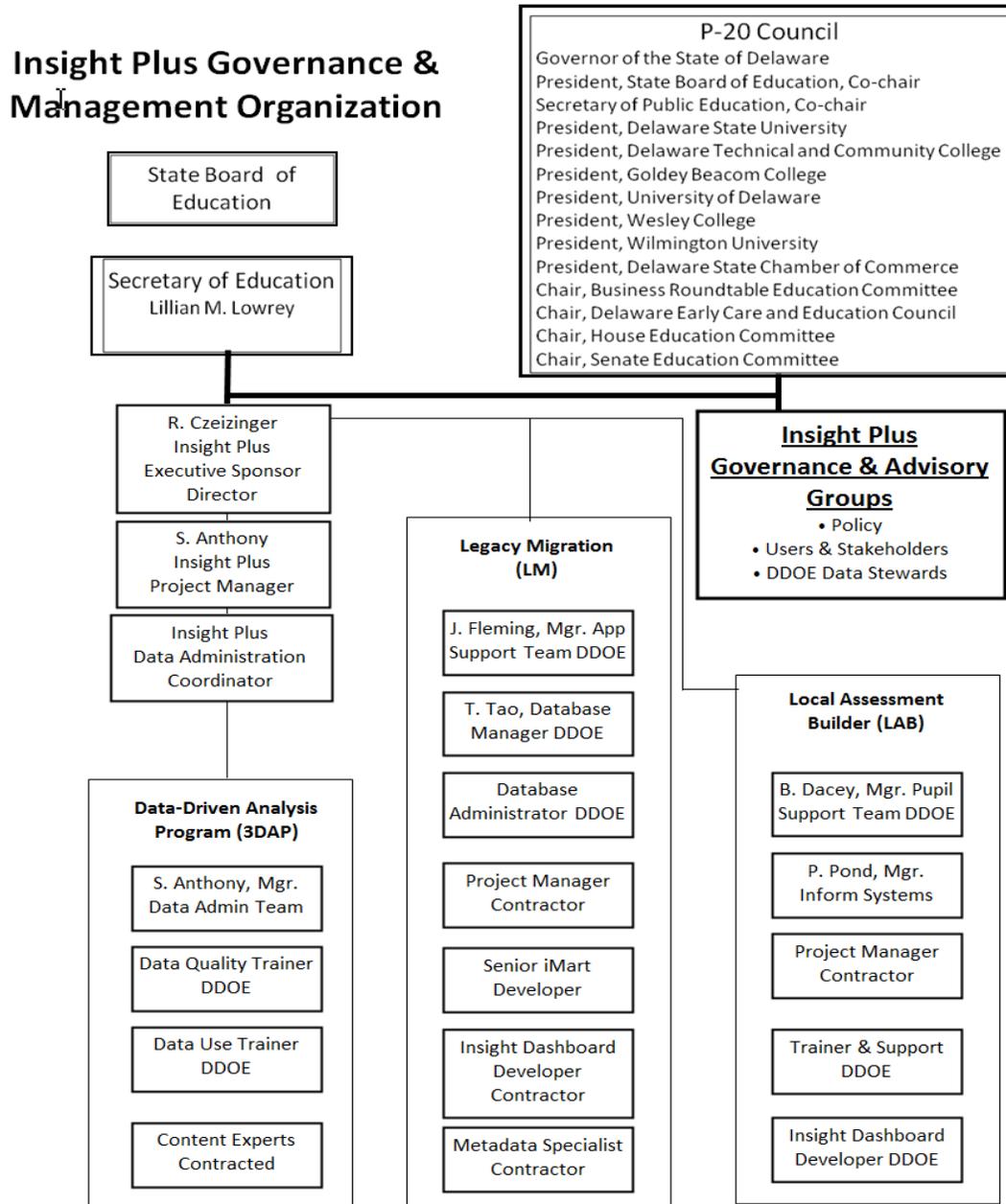
The P-20 Council will continue to monitor the policy-level issues related to the sharing of data across agencies and levels of government compliant with FERPA, HIPAA, State, and other applicable rules. The Delaware Department of Education (DDOE) Executive Sponsor and the Project Manager will monitor compliance with FERPA and these other rules by all parties to Insight Plus.

The Project Executive will guide the development during the first quarter of the project of the Governance Plan. This deliverable will describe how Insight Plus will be governed to ensure both the involvement of key stakeholder groups and the compliance with policy requirements. As a starting point, the plan will be drafted by a working group of stakeholders from a perspective of having a policy oversight group, a stakeholder/data user advisory group, and a

data steward advisory group.

The Delaware P-20 Statewide Longitudinal Data System (SLDS) is located within the DDOE and managed by its technology staff. Figure 2 is an organization chart showing where the management of Insight Plus resides. As is clear, this structure will ensure that the deliverables are seamlessly coordinated and aligned with the Insight Data Warehouse and Dashboard within which they will be created and made available to the users.

**Figure 2: Organization Chart for Insight Plus**



For example, the DDOE Data Management Group, which has data quality as its charter, provides a forum to set standards and policy for K-12 data integrity and timeliness (See Data Administration Charter and Data Administration Communication announcing the group, Attached).

The project management of Insight Plus will not only be located along side that of the Insight Data Warehouse and Dashboard but will also be led by the same project management team that successfully managed the Race to the Top's deliverables.

Insight Plus will be managed by DDOE and the certified project manager provided by the contractor selected through the DDOE's standard procurement process. As with the Data Warehouse and Dashboard projects, DDOE and the contractor will use a unique approach to project management designed specifically with education agencies in mind due to the special blend of public politics, divergent stakeholder groups, and technical challenges that make education agencies unique from other businesses. The quality that makes project management by DDOE most successful for an education agency is our teamwork philosophy and methodology of constant communications. DDOE and our contractor will leverage management processes that are grounded in a wealth of resources from the National Center for Education Statistics (NCES) and other national standards groups (e.g., State Automation Site Visits, Decision Support System Best Practice Project, and Performance Based Data Management Initiative (PBDMI) state documentation visits), and the publications from the National Forum on Education Statistics. DDOE will use the standards and benchmarks from Capability Maturity Model (CMM), Capability Maturity Model Integration (CMMI), Control Objectives for Information and Related Technology (CobIT), the Project Management Institute (PMI), ISO9000, Six Sigma, American Productivity and Quality Center (APQC) Process Improvement and Innovation in Education (PIIE), and United States Education Department (USED) best practices studies.

On projects of the magnitude of Insight Plus, DDOE will emphasize our comprehensive management techniques, team communication, and the analysis of project risks to create an environment where all stakeholders are equipped to identify issues and present them in a manner so that both issues and risks can be addressed and resolved methodically and quickly.

DDOE will use our existing internal project management site to support the quick and seamless sharing of project documents. In addition, it allows all schedules, deliverables, design materials, and other project assets to be managed with individual and group role based authentication.

The enforcement of DDOE's enterprise information systems architecture standards will be a primary responsibility of the Project Manager. The metadata standards are described in detail in DDOE's data dictionary, and all three projects, LAB, 3DAP, and LM include resources to ensure they register and maintain their data elements, business rules, and documentation in the metadata tool used by DDOE. The Project Manager for DDOE will monitor this compliance by all projects.

This will ensure the interoperability of all systems, the ability of all projects to collect and provide comparable data, and the ability of the users to understand and interpret the data appropriately.

**Section (e) Staffing**

Insight Plus will benefit from timing. With the ending of the Race to the Top Data Warehouse and Dashboard projects occurring in April 2012, the experienced Delaware Department of Education (DDOE) staff assigned to those tasks will be available to transition to Insight positions. This provides DDOE a unique benefit. Instead of using these valuable human resources in maintenance and support roles, they can be taken advantage of in creative development roles that they have a part in designing. This will give DDOE a substantial advantage in momentum by avoiding any ramping up or knowledge transfer period at the beginning of the project.

DDOE acknowledges that there will be a significant need for recruiting and hiring qualified people into key positions for this grant. We have carefully analyzed this risk and have planned strategies for addressing it. First, there are realistic timelines for recruiting and filling the positions based upon the experience with the Insight Data Warehouse and Dashboard projects, and with the eSchoolPLUS implementation. Our experienced staff has built the timeline for this grant to provide planning and start-up time in which DDOE personnel will be conducting activities during the time period that contracted staff positions will be filled. This grant has been crafted with a careful mix of experienced in-house professionals and new expertise to give DDOE the team needed to ensure that all three projects are built upon the standards established by DDOE but are open to the best practices available from other states.

<b>Staff Position</b>	<b>FTE</b>	<b>Funding Source</b>	<b>Location</b>	<b>Person Designated</b>
<b>Project Management</b>				
DDOE Executive Sponsor	35%	100% DDOE	DDOE	Robert Czeizinger
DDOE Project Manager	100%	100% DDOE	DDOE	Sean Anthony
Data Administration Coordinator	100%	100% Grant	DDOE	TBD
<b>Local Assessment Builder</b>				
DDOE Coordinator	100%	100% DDOE	DDOE	Bruce Dacey
Assessment	100%	100% Grant	DDOE	TBD

Content Expert				
LAB DBA	100%	100% Grant	DDOE	TBD
LAB Project Manager	100%	100% Grant	Contractor	TBD
LAB Trainer & Support	100%	100% Grant	DDOE	TBD
LAB Insight Dashboard Developer	100%	100% Grant	DDOE	TBD
<b>Data-Drive Analysis Program (3DAP)</b>				
3DAP Project Manager	100%	100% Grant	Contractor	TBD
3DAP Data Quality Trainer	100%	100% Grant	DDOE	TBD
3DAP Data Use Trainer	100%	100% Grant	DDOE	TBD
3DAP Content Experts	Hourly	100% Grant	DDOE	TBD
<b>Legacy Migration (LM)</b>				
LM Database Manager	100%	100% DDOE	DDOE	Tommy Tao
LM DBAs 2	100%	100% Grant	DDOE	TBD
LM Project Manager	Hourly	100% Grant	Contract	TBD
LM Senior iMart Developer	Hourly	100% Grant	Contract	TBD
LM Insight Dashboard Developer	Hourly	100% Grant	Contract	TBD
LM Metadata Specialist	Hourly	100% Grant	Contract	TBD

### Description of Requirements

The Data Quality Campaign has provided to states a set of criteria for assessing a longitudinal data system. The table below applies those criteria to the management of the three projects described above.

<i>Governance and Policy Requirements</i>	
<p><u>Need and Uses.</u> In addition to providing information that helps to improve student achievement and reduce achievement gaps among students, a successful data system should address several of the State’s other key educational policy questions. The system should provide data and data-use tools that can be used in education decision-making at multiple levels, from policy to classroom instruction.</p>	<p>The Delaware Department of Education (DDOE) is committed to providing data more available to educators, as well as the tools that will be useful for analyzing the data. This commitment is evidenced in the development of a portal to provide data in the EdFi dashboards being rolled out in the Spring of 2012. To assist DDOE in planning for educator usage of the system, we are planning to review what tools are available and determining what tools best meet the needs of our educators. Additional data is proposed to be provided through developing capacity for formative assessments and tracking student performance. To make the available data even more useful, however, DDOE proposes to develop a comprehensive training and support system that will help educators and others learn how to better understand how to analyze and use data and provide sustainable support for educators over time.</p>
<p><u>Governance.</u> A successful data system rests upon a governance structure involving both State and local stakeholders in the system’s design and implementation. Particularly when expanding the data capacity in existing K-12 systems to include other educational data, an Statewide Longitudinal Data System (SLDS) must identify the entities responsible for the operation of the statewide data system and should include a common understanding of data ownership, data management, and data confidentiality and access, as well as the means to resolve differences among partners.</p>	<p>DDOE has begun the development of a data governance structure as part of the development of the P-20 Council. P-20 committees have been identified and documentation developed concerning membership and responsibilities. Within DDOE, data stewards are identified within the agency. Data confidentiality and access are carefully managed, and there are procedures for researchers to request access to DDOE data. However, more work is needed and will be covered as a part of the activity under this proposal.</p>
<p><u>Institutional Support.</u> A successful data system requires institutional support from leadership within the State Education Agency (SEA) and from relevant stakeholders within and outside the SEA. The support must include authorization to develop and implement the SLDS, as well as the</p>	<p>DDOE leadership is very supportive of the data development activities and commitment to making high quality data available to users. For instance, support for successful usage of education data is provided by 30 Data Coaches hired by DDOE and housed within school districts.</p>

<p>commitment of necessary staff and other resources. If the SLDS is to be expanded to include data from other systems, all involved institutions must agree to a shared vision for deliverables and objectives.</p>	<p>Letters of support have been collected from an impressive array of partners and stakeholders who will be benefitted by Insight Plus and the on-going operations of the Insight Data Warehouse and Dashboard.</p>
<p><u>Sustainability.</u> A successful data system requires ongoing support from the SEA after it has been implemented. At a minimum, the system requires ongoing commitment of staff and other resources for system maintenance, quality control, and user training.</p>	<p>DDOE recognizes the need for ongoing support for schools and districts. Support for data providers is available, but DDOE wants to provide more support. One type of support desired is training modules and other materials that can be used by current and future users of the data system. Stakeholders need to be brought into the planning for ongoing support so that their needs are considered. The development of these materials and training modules are included in this proposal, as are the provision of training.</p> <p>DDOE has a long history of supporting SEA systems. For example eSchool is used by every district and charter school, and is maintained by DDOE at zero cost to users.</p>
<p><i>Technical Requirements</i></p>	
<p><u>Federal Reporting.</u> A successful data system must be able to meet Federal reporting requirements, including those of the U.S. Department of Education’s (Department) ED<i>Facts</i> system. The system should provide efficiencies that reduce the burden of Federal reporting for schools and districts.</p>	<p>DDOE is consistently at the top of the list of ED<i>Facts</i> providers, and has been since the beginning. DDOE collects extensive data from LEAs and can easily do federal reporting. DDOE is implementing a new data warehouse, and is planning to transition reporting to come out of the data warehouse. As a result, the reporting will be more direct, but no less accurate and timely.</p>
<p><u>Privacy Protection and Data Accessibility.</u> An SLDS must ensure the confidentiality of student data, consistent with the requirements of the Family Educational Rights and Privacy Act (FERPA) and State laws or regulations concerning the confidentiality of individual records. The system should also include public documentation that clearly articulates what data will be accessible, to which users, and for what purposes.</p>	<p>DDOE has extensive requirements related to ensuring the confidentiality of student data according to FERPA requirements. Special security components are under development in the new data warehouse to ensure that when access is provided beyond DDOE, the data will be secure. Accessibility will be clearly documented and data users will be expected to adhere to strict standards.</p>

<p><u>Data Quality.</u> A successful data system must ensure the integrity, security, and quality of data. It should include an ongoing plan for training those entering or using the data, as well as procedures for monitoring the accuracy of information.</p>	<p>Data quality is a continuing concern of DDOE and much is done to ensure that the data are as accurate and valid as possible. For example, the DDOE Data Management Group, which has data quality as its charter, provides a forum to set standards and policy for K-12 data integrity and timeliness.</p> <p>Cross-year comparisons are done. A system is available to identify where students are enrolled in multiple locations, and procedures require the districts to determine what is correct.</p>
<p><u>Interoperability.</u> The system should use a common set of data elements with common data standards to allow interoperability and comparability of data among programs such as the Common Education Data Standards, as available and applicable. A successful data system has the capacity to exchange data between the SEA and its Local Education Agencies (LEAs), as well as among LEAs, or with other appropriate State agencies or educational entities.</p>	<p>DDOE is committed to using the Common Education Data Standards as available and applicable, including the usage in EdFi “standards” for making data available to educators. The DDOE data governance work requires that data stewards work together to avoid duplicative reporting by LEAs, and to identify the authoritative source for data reported in ED<i>Facts</i>. These activities are also planned for cross-agency work being done by the P-20 Council.</p>
<p><u>Enterprise-wide Architecture.</u> A successful SLDS includes an enterprise-wide data architecture that links records across information systems and data elements across time and allows for longitudinal analysis of dropout and graduation rates and student achievement growth. The architecture should include, at a minimum, a system for assigning unique student identifiers, a data dictionary, a data model, and business rules. The system must make data dictionaries publicly available.</p>	<p>DDOE has recently completed the development of an enterprise-wide data architecture that shows the data collections, repositories, and reporting data marts maintained by DDOE. DDOE is working on the use of its new data warehouse to do longitudinal analyses of dropouts and graduates, student achievement growth, etc. The current data system consists of a number of data marts for reporting. The goal is to migrate these legacy data marts into the statewide longitudinal data system for future reporting. This will require running parallel processing until data quality is assured.</p>
<p><i>Data Use Requirements</i></p>	
<p><u>Secure Access to Useful Data for Key Stakeholder Groups.</u> Appropriate and secure access to data must be provided to key stakeholder groups including policymakers, SEA program staff, external researchers,</p>	<p>As mentioned above, special security components are under development in the new data warehouse to ensure that when access is provided, the data will be secure. Accessibility levels will be clearly documented</p>

<p>district administrators, and school-level educators. Access must be balanced with the need to protect student privacy and confidentiality consistent with applicable privacy protection laws.</p>	<p>and data users will be expected to adhere to strict standards. LEA users will only have access to their own data; similarly teachers will only see data from their assigned students. External researchers must complete an application for access to the data which is reviewed by DDOE staff for adherence to strict confidentiality standards. DDOE is extremely careful when reporting data to suppress small cells of data and not allow for cross-report comparisons to allow these small cells to be deciphered.</p>
<p><u>Data Use Deliverables.</u> The system must include deliverables to meet end-user needs (to inform decision-making and evaluate policies and programs) such as reporting and analysis tools. Design of these deliverables must be informed by early and sustained engagement of representatives from user groups to ensure the system will meet their information needs and continuously improve to meet evolving needs.</p>	<p>Insight Plus has a major emphasis on enhancing data use. DDOE is making data available to teachers and administrators via dashboards under development. To ensure that additional analyses can be done, DDOE proposes to give additional analytic capability to LEAs with the implementation of the assessment builder and performance tracking systems. DDOE will work with stakeholders to determine how the systems are being used and what additional capabilities are needed.</p>
<p><u>Training on Use of Data Tools and Products.</u> The system should include a professional development program to prepare end-users to effectively use the data products.</p>	<p>Training is a major area covered in this proposal. The development of the statewide longitudinal data system is well underway and will be available to users in the Spring of 2012. DDOE needs assistance in developing a set of professional development materials and a training plan to prepare users to benefit from the system. DDOE desires a training/professional development program that will cover initial training, that can be available to existing educators for review after initial training, and that can be used for teachers and administrators new the system in the future. A professional development management system is already available and can be used to provide for enrollment and tracking of participation.</p>
<p><u>Professional Development on Data Use.</u> The system should include a professional development program to help end-users to effectively interpret and apply the data to</p>	<p>In addition to training on the use of the data system, DDOE desires a professional development program that focuses on effective use of data for decision-making. This</p>

<p>inform decision-making and improve practices.</p>	<p>is also a part of this proposal.</p>
<p><u>Evaluation of Data Products, Training, and Professional Development.</u> The system should include a process for evaluating the effectiveness of the data use deliverables, and training and professional development programs.</p>	<p>Evaluation is an essential component of DDOE planning for its SLDS.</p> <p>Evaluation at the beginning the project being proposed in this application, various educator tools will be reviewed to determine the fit between educator needs and tool capacity. Once the tools and system are implemented, DDOE will monitor usage of the system and seek stakeholder input on the effectiveness of the system in meeting stakeholder needs. The feedback received from stakeholders will help DDOE to revise training and professional development activities and determine if additional types of support are needed.</p>
<p><u>Partnerships with Research Community.</u> The State must have a policy in place for the processing of requests for data for research purposes and for communicating the scope of data available for analysis. The State should establish partnerships with internal and/or external research groups to assist with answering questions that can inform policy and practice. The State should actively disseminate research and analysis findings to the public while ensuring confidentiality of individual student data.</p>	<p>DDOE has a longstanding relationship with the research community, including the University of Delaware, regional education organizations, and a California organization. Procedures exist for reviewing applications for access to data. DDOE plans to move these procedures online to allow better tracking of the research. DDOE produces numerous public reports and is extremely careful when reporting data to suppress small cells of data and not allow for cross-report comparisons to allow these small cells to be deciphered.</p>
<p><u>Sustainability Plan.</u> The system must include a plan for sustaining the deliverables and training beyond the life of the grant.</p>	<p>Establishing an SLDS is an intensive process and ensuring the sustainability of the system is essential. DDOE has developed this proposal to put into place essential components that will ensure the sustainability of the system while being sustainable in and of themselves. Three components are proposed. Migration of legacy data systems into the SLDS will build the capacity of the SLDS to meet essential state needs. The development of a training and support component will also promote the utility of the SLDS. But DDOE is adamant that the training and support program be sustainable, including guidance on how to monitor and update the training and support</p>

	based on stakeholder needs and revisions to the system. The assessment and performance monitoring component is focused on providing long term assistance to educators in devising better ways to help students learn.
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