

Developing a Longitudinal Data System to Support 21st Century Learning in Wisconsin

An LDS Grant Application

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**Wisconsin Department of Public Instruction
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SECTION A: WISCONSIN LDS PROJECT—ABSTRACT

(1) Project Title

Developing a Longitudinal Data System to Support 21st Century Learning in Wisconsin

(2) Project Description

Wisconsin's state education agency, the Department of Public Instruction (DPI), is submitting an application to continue development of our longitudinal data system (LDS) in order to meet the demands of our state's educational priorities: closing the achievement gap, building 21st century skills, and moving toward a PK-16 model in which all stakeholders—educators, students, business, government—can make informed decisions based on sound longitudinal data.

Developing a Longitudinal Data System to Support 21st Century Learning in Wisconsin is a proposal that will enable Wisconsin's data systems to move in step with State Superintendent Burmaster's vision of 21st century learning outlined in the *New Wisconsin Promise*. Our commitment is to close the achievement gap, equip students with 21st century learning, and create stronger links between PK-12 and the world of post-secondary education and/or work. So a rich educational picture of Wisconsin students can emerge in this data system—and we can evaluate whether Wisconsin is meeting the *New Wisconsin Promise*—we need to:

- 1) Build student-level datasets to inform a PK-16 data system, and to increase alignment to LDS data quality standards.
- 2) Move the public reporting of aggregate data into the LDS where disaggregated student data already resides to reduce redundant data and total costs
- 3) Develop (restricted-access) analytical tools and public reporting tools that allow a variety of users to access LDS data on an ad hoc basis

In order for educators and other stakeholders to gauge progress on meeting these priorities, we need to have data that follows students over time, ideally PK-16 data. Currently, Wisconsin's LDS system stores student-level achievement data from a variety of sources and while this data is critical, it is not comprehensive enough for our state's demands and cannot answer pressing policy questions. For example, currently we do not have a way to analyze test scores alongside, or in comparison to, courses taken. We are limited by the few K-12 data contained in the LDS, and limited by the lack of a PK-16 data structure. By adding the elements listed above, we will be able to follow student achievement in a more holistic way, provide a more robust picture of student learning in Wisconsin, and a richer context for policy decisions. All of this is necessary if we are to move forward with our vision of preparing students for the 21st century and fulfilling the *New Wisconsin Promise*.

(3) Expected Outcomes on State's education data system

Several outcomes are expected. We expect that adding three student-level datasets will lead to more robust research and analysis that will directly inform a PK-16 system. We expect that consolidating disaggregated student data with aggregated (publicly reported) data will result in improved data quality, and more accurate reporting. We expect a variety of stakeholders will begin to access the LDS for data-mining by way of the interactive reporting tools we build, relying on the system as the central repository of education data in the state.

SECTION B: WISCONSIN LDS PROJECT—NARRATIVE

(A) NEED FOR THE PROJECT

Wisconsin’s state education agency, the Department of Public Instruction, is submitting an application to develop a comprehensive PK-16 data system. We will build upon the initial successes we have had with our state longitudinal data system (LDS). Department of Public Instruction (DPI) began building the LDS to track students over time, not simply to make longitudinal data available, but to have student-level data available to inform our work on the *New Wisconsin Promise*, a statewide initiative which aims to close the achievement gap, improve student achievement, and advance 21st century learning.

While our state LDS has the technical architecture, necessary governance, institutional support, and security/privacy protections in place, it does not contain key datasets that are needed to make evidenced-based decisions, nor does it have interactive research and analytic tools needed to properly evaluate educational effectiveness.

The data currently contained in the LDS cannot fully answer the myriad of questions around student achievement. The LDS does not include our publicly reported data (aggregate school-level and district-level results), nor does it include pertinent student data currently available at the local level. Without these additional data, we cannot obtain a complete K-12 profile of student achievement. We would like to better determine when and how achievement gaps have been closed. We would like to use data to determine which schools and districts are successful at preparing middle school students for high schools, and how high schools are preparing students for post-secondary course work. We are not able to differentiate between the preparation of Career & Technical Education (CTE) students and the preparation of non-CTE students. Our current data limits our ability to determine which students are prepared for post-secondary level work. As such, we cannot fully evaluate our progress relative to the *New Wisconsin Promise* with the current LDS.

We know that linking summative test data to other critical local data—such as course data—is key to properly evaluating student achievement. It would be short-sighted if we only viewed results from high-stakes testing. Yet this is what Wisconsin’s LDS contains today. A comprehensive picture of student achievement must include a variety of data sources. We believe a sound longitudinal data system is a data portal that includes:

- Both aggregated (publicly reported) and disaggregated (individual student data available on restricted access to authorized users) data;
- Both data collected at the local-level and state-level;
- Multiple years of data showing trends over time and the ability to show growth in individual students, schools, and districts.

Currently, the LDS does not contain Wisconsin’s publicly reported data. For the past ten years, our redacted data has been stored in a separate application called WINSS: Wisconsin's Information Network for Successful Schools. It was recommended by our LDS Implementation Team that we convert the public reporting and data stored in WINSS to the LDS in order to

leverage the original investment in our longitudinal data system and minimize total technology costs to the state. Transitioning the publicly reported data – collected since 1998 – into the LDS will mean the import of a significant amount of data, allowing for a longitudinal perspective of Wisconsin’s accountability data.

We want to be responsive to these recommendations and keep our internal stakeholders engaged in the LDS initiative. As such, with this grant, we plan to migrate the aggregate data over to the LDS and publish public reports from this application.

The LDS also does not contain key data that is collected and stored locally by LEAs. Today, DPI does not have the required interoperability between the state and our districts to gather this critical data. With this grant we will develop the ability to collect course data from LEAs. The Data Quality Campaign lists ten essential elements of a longitudinal data system, and Wisconsin’s objective with this grant is to address two major areas of need:

Element #6

Student-level transcript information, including information on courses completed and grades earned. State will be able to track course-taking patterns and analyze their relationship to success on state assessments and readiness for college and work.

Element #7

Student-level college readiness test scores. Student performance on the SAT, SAT II, ACT, Advanced Placement, and other college readiness exams is a good indicator of whether students are prepared to succeed in postsecondary education and work.

The collection of course data is also of prime importance to Wisconsin’s higher education agencies. The University of Wisconsin system, the Wisconsin Association of Independent Colleges and Universities, and the Wisconsin Technical College Board have all expressed the need for this data. Echoing the need to link primary, secondary and post-secondary data, all of these institutions believe those links are critical to understanding student success. A number of recurring research questions have surfaced:

- Are Wisconsin students prepared for college-level work?
- What math classes are students taking and when? Does their sequencing affect secondary and/or post-secondary success?
- Does sequencing of math in HS make a difference in remedial course-taking?
- What districts/schools have the least amount of graduates requiring remedial education in the first year of college?
- With a focus on STEM, how can we track what student groups are taking which courses, with what success rate, and when in their high school careers?
- How can we better tie assessment data into standards and drive school improvement?
- How effective are the career and technical educational programs? How does student preparation here compare to prep for students outside of vocational programs?

Data itself is important, but providing data to support evidence-based decisions is critical. With this grant, Wisconsin would gain a longitudinal perspective using multiple sources of educational

data. In addition we will leverage the available technology to create interactive datasets that can be constructed spontaneously according to the user's data question. Offering our stakeholders and Wisconsin's education community a chance to view a fuller picture of our state education data – rather than just static reports created for federal reporting – will allow DPI to fulfill our commitment to providing thoughtful, useful, quality services to Wisconsin's LEAs. We also know that reducing the burden of data reporting and analysis, and providing new information and analyses to districts are services that districts favor.

There is a pressing need to migrate the aggregated public data into the LDS so that users can view student-level, school-level, and district-level data in one data source. There is also a pressing need to compile, view, analyze, and make available local course data in conjunction with state testing data. We believe DPI is in an ideal position to implement these activities and to follow-through on the next stages of LDS development. Wisconsin has both the necessary governance requirements and technical requirements in place, which sets the stage for us to develop a truly effective PK-16 data system.

Technical Requirements

Wisconsin meets the core set of minimum requirements set forth in the request for applications. Because of the initial development of the LDS, our agency has developed the capacity of many staff members to build – and the agency as a whole to sustain – a longitudinal data system. However, we still need to develop significant parts of the system and shore up our technical requirements as outlined below.

Federal Reporting

Federal EdFacts reporting via EDEN became mandatory for the 2006-07 school year. The process for gathering the required data was substantial in Wisconsin because the required data is stored in a number of databases throughout the agency. In order to streamline our federal reporting processes, we need to consolidate competing data systems within DPI. We propose pulling data required for EdFacts from the LDS repository rather than the sundry data sources spread throughout the agency. The data quality processes that were put in place for EdFacts federal reporting will remain in place, and we therefore believe, data integrity will increase since data pulled from the LDS will already be “cleaned.”

In addition, aggregate reporting for state and federal accountability (that is now stored on WINSS) will be transferred to the LDS so that staff can access one data source, and complete state and federal reporting requirements in a more efficient manner. By accessing the data repository, we again believe data integrity will be improved because data pulled from the LDS will have already passed through data verification and data cleaning processes.

Privacy Protection and Data Accessibility

Confidential student data is at the heart of the LDS. Wisconsin residents have historically regarded the privacy of student records as extremely important. Suppression rules and privacy safeguards are therefore taken very seriously throughout the agency. Only authorized district and school personnel have access to individual student data, or unredacted data, at the school and district level. Publicly reported data does not disaggregate further than student subgroup and will continue to be redacted when necessary to protect student privacy. DPI has a state-of-art security

system and will continue to implement strict security rules, ensuring the LDS is a secure and confidential data environment.

Data Quality

DPI data collections have processes and tools in place to ensure the validity and reliability of the data. These include business rule validations and edits at the moment of data capture, limited progress, and summary reports allowing school districts to verify data prior to final submission. DPI technical staff provides comparison reports and follow-up with districts with a significant changes from year to year. These reports, however, are accessible only within the specific data collection tools. Currently there is no way for users to combine data from disparate data sets, and thus data remains in discrete silos. The ability to migrate and link student-level and aggregate data sets will allow users to view interrelated datasets, and will strengthen data quality efforts.

Wisconsin needs to leverage all LDS investments in technology and data cleansing to not only minimize the future effort necessary to satisfy federal reporting requirements, but also to improve the quality and accuracy of data submissions. The Applications Development team uses the same toolset to create EdFacts/EDEN data files that the LDS team uses to build ETL (extract, transformation, and load) routines. EDEN job streams are continually modified to take advantage of new data sets stored in the LDS production database, and therefore, Wisconsin plans to have improved data quality once we consolidate, via LDS, the data pulls required for EDEN reporting. We believe this consolidation will improve data quality and decrease the demands of responding to federal reporting.

Interoperability

Currently, LEA-SEA data exchange between the districts and DPI is primarily one-way, with the districts providing mandated data to DPI. Unfortunately, DPI does not currently have the tools to allow school districts to merge locally stored data with the state's data repository. School districts have asked for additional ways to merge local data with the data held in the state repository.

In part, the demand for increased interoperability is due to the number of data collections that districts are required to respond to in Wisconsin. We have over 1,000 discrete data collections in the agency—ranging from hard copy forms that local districts complete and mail into our offices—to state-of-art, electronic student-level data collections. Wisconsin needs to emphasize internet-based data collections to make these processes less burdensome and more efficient for LEAs and the SEA alike. We need to leverage the power of the longitudinal data system along with our statewide student identifier (implemented in 2005) to better capture student data.

DPI will accomplish this by developing a student-level data collection that captures local course completion data for Grades 6-12. Districts will be able to complete this data collection online and see student-level results in the LDS, increasing the interoperability and two-way traffic between the state and local districts.

Enterprise-wide Architecture

A significant component of this proposal is to strengthen the enterprise wide architecture by combining student-level and aggregate-level data into a single data repository. To date DPI has

linked student-level enrollment data and student-level assessment data into a single data repository. An enterprise data model has been created and will continue to be updated as the publicly reported data as well as the additional data sets—such as ACT College Admissions data, Vocational Education Enrollment Reporting System (VEERS) data, and Course Completion data—are migrated into the LDS.

These datasets will lay the foundation for a PK-16 data system that will inform teams throughout the agency, districts throughout the state, and post-secondary institutions external to the agency. The migration of new data sets into the LDS also provides the opportunity to solidify common definitions across the agency. We will continue to develop a data dictionary to include these new datasets, and to provide standardized guidance to both internal and external users of the LDS.

(B) OBJECTIVES FOR PROPOSED SYSTEM

While the foundation of our state longitudinal data system has been established, key pieces have not been developed and the need for further development is apparent. We are ready to build on the initial success of the LDS by incorporating publicly reported data into the system. We will migrate our aggregate, summary data currently stored in WINSS to the LDS so that both aggregate and disaggregated data are available to authorized users. This will minimize total technology costs for the state. We will increase local-state interoperability by building the infrastructure to collect local course data. By doing so, we will be able to track student achievement holistically, and provide a more robust picture of student learning in Wisconsin. In turn, this will provide a richer context for PK-16 policy decisions. All of this is necessary if we are to move forward with our vision of improving student achievement, reducing the achievement gap, and preparing students with 21st century skills.

Objective 1: Create a Comprehensive Education Portal & Data Repository

Consolidating data systems under one roof for “one-stop-shopping” data needs is an advanced goal of any state longitudinal data system. Currently Wisconsin has several public reporting sites. Data needed to satisfy the ESEA Report Card requirements and the state mandated School Performance Report can be found on WINSS (Wisconsin’s Information Network for Successful Schools). Other public reports are located throughout DPI’s public website, usually on a program area team page. As such, users unfamiliar with DPI’s organizational structure may have difficulty locating desired data. Integrating data from multiple locations can also be difficult as the reporting format is not always uniform. A comprehensive educational portal drawing from a single data repository can address some of these challenges by including not only student-level (restricted access) data, but also publicly reported data, aggregate test results, accountability data, course data and graduate information. This will allow users to create a cohesive data picture, allowing for more in-depth research and ultimately, more answers for stakeholders.

WINSS has been a valuable resource for parents, students and educators in Wisconsin for many years. The website reports assessment data, displays demographic data, and provides research and resources for school improvement efforts. It has become the cornerstone of Wisconsin’s public reporting of data with the data analysis section receiving 15 million hits last year.

However, as with any system, technologies change, organizational needs change, and new strategies for state-level leadership emerge.

WINSS was developed more than ten years ago. At that time, the application was developed by an out-of-state vendor. This software development firm continues to host and support the application. In the years since the development of WINSS, the information technology team at DPI has grown significantly in terms of skills, knowledge and experience with web-based applications, but also in terms of actual full-time personnel. Publishing data and the public reports from the current system is labor intensive and costly. Much of the data used to populate WINSS is needed for data informed decision making and longitudinal research, thus duplicative effort is needed to populate and maintain both WINSS and the LDS system. Furthermore, anytime there are multiple sources for the same data, the potential for errors increases and data integrity decreases. Extensive effort is spent with quality assurance checks to ensure that the multiple reporting sites agree.

Wisconsin has begun to build a longitudinal data system, acquiring the technology and fostering the technical skills necessary to build a data repository. This work has been done internally with minimal outsourcing. Migrating the publicly reported data over to the LDS will eliminate the need to maintain two data systems, which is expensive and unnecessary. This will eliminate duplicative resources and streamline our data processes. It was also recommended by the LDS Project Implementation Team that we convert WINSS data to LDS in order to fully leverage the original investment in our longitudinal data system. As a result, it is a DPI priority to move the data, structure and governance of WINSS into the LDS.

In fact from the start, the LDS was designed and managed by DPI staff. Given the recent investment in LDS and the growth of the DPI information technology team, we would like to bring the hosting of our publicly reported data back in-house. This will eliminate the redundancies of having two data reporting systems and reduce our costs. In addition, not outsourcing the management of the public reporting system will allow DPI to have more ownership and control over the data and reporting architecture.

In addition, the technology driving WINSS is aged and limited by offering ASP/HTML defined reports that are no longer consistent with DPI technical architecture. The technology behind WINSS has become inconsistent with our educational priorities. Bringing this data and reporting functions back in-house will afford DPI more control over technology that is ever-changing. We believe this will allow us more flexibility with the LDS, and the ability to be more responsive to the data needs of our staff and stakeholders in Wisconsin's education community. The LDS will offer tools that provide greater flexibility for analysis that will better meet the needs of stakeholders.

Another goal of creating a single data repository is to ensure consistency between what is reported publicly on the DPI website with what is submitted to the US Department of Education through the EDEN Submission System. Federal reporting through the EDEN system became mandatory for the 2006-07 school years. In an effort to comply, DPI took steps to begin centralizing federal reporting through the agency's Data Management and Reporting team. Meetings were conducted with program area staff to identify the data collection systems used

and where that data is currently located. Business Analysts documented the source and transformations needed to comply with the EDEN file formats. Developers created the necessary data files, and program area users reviewed the data before submission. Data sources were wide and varied ranging from excel spreadsheets to large Oracle databases. Many files were interrelated, but because of the specific data collection systems involved, it was not uncommon to use multiple sources of data to create a single EDEN file.

With the development of a single data repository, it will be possible to use the same underlying data structures designed for the agency's public reporting site for the creation of EDEN files. This will reduce the potential for data quality errors and will increase data integrity between federally reported and publicly reported data. The improved datasets, in turn, will enable improved EDEN reporting processes.

Rather than expending resources to maintain and support multiple data systems, efforts can be focused on making the LDS data repository the gold standard of education data in Wisconsin – and create a central point of entry for education data. This repository will enable DPI staff, external stakeholders, districts, and researchers to analyze data in relation to the New Wisconsin Promise and 21st century learning by creating a more complete picture of the educational environment in Wisconsin.

There are strong financial, technical, and management incentives behind the plan to consolidate our public and restricted data. Rather than be constrained by the technologies chosen over ten years ago, we plan to leverage the growth and abilities of our technology staff and keep the maintenance in-house. This will allow us to adapt to changes in technology, changes in data reporting, or changes in the technical architecture of the system in a more efficient manner. Leveraging new technologies will also streamline our data, thus reducing the expenses incurred by maintaining a reporting structure that is dated.

Objective 2: Develop Student-Level Data Collection & Data Set-Course Data

Student course data (Data Quality Campaign, Essential Element# 6) in Wisconsin is currently collected in aggregate form only. It is collected by subject and topic at the district level. Individual districts have wide latitude in determining under which subject and topic area to report a specific course. This means two districts teaching the same course may report under different subject and topic areas. Furthermore, a given subject and topic area may include a wide range of courses. As a result it is hard to do comparative analysis between districts.

Next school year, Wisconsin schools will begin to use the *Secondary School Course Classification System: School Codes for the Exchange of Data (SCED)* taxonomy and course descriptions from the National Center for Education Statistics. By shifting to a set of common course codes, our state will achieve uniformity in course collection data, and will allow schools and districts to communicate, compare, and analyze the performance of their students under a standardized course code system.

This marks a great opportunity for the collection and analysis of courses taken across the state. DPI plans to build upon the shift to the new collection of course codes by requesting that districts enter course data (using the NCES course codes) at the student-level into a new application.

Currently DPI collects aggregate course data via Excel spreadsheets. This method is less than precise. We have found it is not efficient, effective, nor particularly relevant to schools. We will transition to a web-based application that will directly feed the LDS, to collect Grade 6-12 course data. The data that is collected will be the first set of data using consistent codes across the state based on the NCES taxonomy course descriptions. This will allow Wisconsin to not only examine trends on a district-by-district basis, but on a school and student level. Schools will be able to make comparisons to other similar schools, knowing that all schools across the state are using a common set of course codes.

These steps have long-range implications for the development of the longitudinal database system. As stated in the publication *Secondary School Course Classification System: School Codes for the Exchange of Data (SCED)*, “growing national and state interest in building longitudinal databases that can measure the added value of education over time, as well as the accountability requirement of No Child Left Behind, suggest that SCED will be a useful tool for state and local education agencies. SCED will also be useful when school districts exchange transcript information electronically. On receipt of an electronic transcript, the course coding structure combined with course descriptions enable new students to be placed in appropriate classes with no delay.”

Of course, there are a plethora of educational institutions in Wisconsin – external to DPI – that would like this data to be made available. DPI has had a number of discussions with higher education institutions in the state on the importance of applying primary and secondary course data to answer questions on student readiness for college-level work. They are eager to have data on incoming classes of students, particularly related to the course work that prepares students for successful completion of college-level coursework. In turn, the higher education schools in our state are also interested in understanding what gaps exist in preparing students for post-secondary success. As providers of numerous remedial mathematics and English courses, our colleges and universities have a vested interest in student-level course data.

Both the University of Wisconsin system and the Wisconsin Association of Independent Colleges & Universities are eager to strengthen our partnership in building strong PK-16 connections. Letters of support can be found in Appendix A.

Objective 3: Add Student-Level Data Sets-ACT Data

Another key student data set we will add to the LDS will be results from the ACT college admissions test. The Data Quality Campaign specifically calls for “student-level college readiness test scores” as a key feature of successful state longitudinal data systems (Essential Element #7).

Nearly 70% of Wisconsin graduates take the ACT, and Wisconsin students have historically outperformed students nationally on the ACT. However, we do not have the ACT scores linked to what courses our students may have taken to prepare them for this test, nor do we have ACT scores linked to other student achievement indicators such as the state accountability test given in Grade 10. With such a large proportion of Wisconsin students taking this test annually, ACT scores represent an important and highly relevant dataset for our longitudinal student data system. By adding ACT test data into the LDS, links between curriculum, course taking, course

sequencing, and standardized testing can be established, creating genuine PK-16 connections. This was recognized as a priority at a recent statewide meeting of school district administrators.

Currently, disaggregated ACT data is not available and comparative data cannot be generated, nor analyzed to establish these links between courses taken, ACT achievement and state test results. Therefore, with this grant we will incorporate five years of ACT results (2005-2009) and continue to add ACT data each year going forward.

Objective 4: Add Student-Level Data Sets-VEERS Data

Career and Technical Education (CTE) programs are very popular with Wisconsin students. In fact, over 90,000 students were enrolled in high school vocational courses in 2007. Career and Technical Education focuses on exploration of the self in relation to the world of work. Students discover their interests, talents, abilities, and the niches where their talents and abilities might best be used. Career and Technical Education also equips students with research skills to enable them to form a realistic picture of job opportunities. CTE prepares students for all post-high school opportunities. Whether moving on to further education, training or employment, every Wisconsin student moves through curriculum-based career awareness, exploration, planning and preparation leading to a realistic individualized career plan which is compatible with the student's abilities, aptitudes and interests.

The Vocational Education Enrollment Reporting System (VEERS) is an important aspect of the Carl Perkins Career & Technical Education Improvement Act as it collects career and technical education enrollment information from districts receiving federal Perkins funds. This enrollment information is used to fulfill mandated requirements including the Federal Performance Report; to gather information related to the districts for the State Plan; to assist districts in measuring progress to mandated Core Indicators of Performance; and as a criterion in the Office of Civil Rights process. While VEERS data is not reported at the individual level, it is collected at the student-level. This dataset, therefore, represents an excellent complement to data on post-secondary readiness and course data that is planned for the LDS, and would greatly inform the PK-16 model.

The federal VEERS data collection includes post-graduation plans. From the VEERS data set we will know how many students are planning to enter baccalaureate, non-baccalaureate, or career prep courses. This dataset details which CTE learning methodology was chosen: apprenticeship, state certified cooperative education, or industry sponsored programs. We also will have data on students who choose agriculture, business, economics, health occupations, marketing or technology concentrations. This information will undoubtedly be useful to Wisconsin's technical, vocational schools, as well as the college and universities that will be accepting these students into their institutions.

With this grant, we will populate the LDS with VEERS data, and we will add the preceding five years of VEERS data (2005-2009) to aid those measuring CTE effectiveness, but also to create a longitudinal dataset that concretely connects to the world of work and post-secondary success. The Wisconsin Technical College System Board (WTCSB) is highly supportive of these plans and has included a letter of support (Appendix A).

Objective 5: Build Next Generation Analysis and Reporting Tools

Currently available datasets contain aggregate data only. They are static and were designed to answer specific questions – generally addressing questions of state and federal accountability. These datasets do not lend themselves to answering today’s complex and varied data-driven questions, nor do they support the interconnected research questions facing educators today.

Rather than providing “canned” reports, we will allow users to drive data output based on their specific research question. We will build interactive reporting solutions into the LDS. Building this interactive capacity will enable users to access to a variety of datasets, create ad hoc reports and enable research that was never possible before. In addition, the next generation analysis and reporting tools would allow longitudinal data analysis for schools and districts wanting to track student growth. Educators would be able to access reports and queries that would display individual growth of their students over time. As a result, LDS users will be able to view reports that combine course data, a variety of test scores, and demographic features on either a disaggregated or aggregated basis. Our regional partners, the Cooperative Education Services Agencies (CESA), are strongly in favor of this and have expressed the need for customized reports for regional education and economic purposes. (See Appendix A, Letters of Support.)

(C) PROJECT DESIGN

The main thrust of Wisconsin’s plan is to establish a longitudinal data system that supports a PK-16 evaluation and decision support system. The components included in our request will work to achieve this goal and to reinforce the importance of clear, accurate data linkages as students move through the state educational system. This grant request is a combination of foundational data and systems work that the DPI has not had the capacity to embark on until now. The requested funds will build on the grant awarded to Wisconsin in 2006, *Longitudinal Data Systems to Support Data-Driven Decision-Making*. The hardware and software put in place over the last three years laid the foundation for work on new solutions to proceed immediately.

Objective 1 Design: Create a Comprehensive Education Portal & Data Repository

With the funding made available with this grant, DPI will:

- Move publicly reported aggregate data into the LDS production environment
- Finalize the EdFacts Management Portal and move to the LDS production environment
- Develop clean, consistent data sets in the data warehouse that will ultimately become the sole source for all reporting and analysis, including federal EdFacts reporting
- Build our internal expertise and capacity made available by the Oracle toolset

Wisconsin will migrate the aggregate data from the dated repository (WINSS) to the LDS so that publicly reported data can be accessed from the same source as student-level longitudinal data. Though a significant effort, this is necessary to solidify the importance of accurate longitudinal education data, and key to enabling our constituents to properly evaluate educational progress.

As part of the migration process, summary data tables and structures will be created within the LDS to house data from WINSS. Extraction, translation and loading processes will be developed

to bring data from the original sources into the new aggregate data structures. Redaction algorithms will be run to create public data sets, reproducing all mandated reports in the LDS. Throughout the process, DPI will perform user acceptance testing and data verification procedures to ensure the accuracy and quality of data.

The LDS will contain more than data. DPI will load all of the standards and assessment information relevant to school improvement efforts on the WINSS website, along with best practices to support 21st century learning into the longitudinal data system. DPI will use this opportunity to update our presence on the web, and better meet the needs of parents and educators in search of tools/data related to education and student outcomes. Completion of this effort will establish the LDS as the comprehensive education data portal in Wisconsin.

Much of this data resides in existing DPI databases. Reporting data structures will be created in the LDS production environment with a new user interface. DPI will use Oracle portal technologies to provide the structure. This technology will also be used to develop search capabilities. Oracle technology will enable the LDS team to catalog, store and display all related school improvement documents and resources related to standards, assessments, accountability, best practices, school improvement and 21st century learning.

DPI will build upon components already in place, including a production server environment (Please see Appendix A, Attachment 1), a state-of-the-art security system, the Oracle Data Warehouse suite of tools and the Oracle Portal. This will lower the total cost of ownership because completion of this effort enables Wisconsin to terminate its contract with an external vendor that develops and hosts WINSS today. This will also permit the cost savings to be applied to DPI's continued support of the LDS.

Wisconsin will also incorporate the datasets used for EdFacts/EDEN reporting to the LDS. Wisconsin has built a prototype EdFacts Management Portal that enables the real-time monitoring of this federal reporting process. (Please see Appendix A, Attachment 2 for a screen shot.) This management tool documents the processes required for EDEN reporting, and allows DPI staff to track completion status. It was built using Oracle tools—the same platform that is used for the LDS—and therefore, DPI is confident that the transition of EDEN datasets over to the LDS will be smooth.

This effort will deliver a number of new datasets to the LDS. All data sets will be built utilizing conformed dimensions as defined by Ralph Kimball in *The Data Warehouse Toolkit*. This means all attributes that are coded (for example, race and ethnicity) will use the same codes no matter where the data comes from or how old the data is. These clean, consistent data sets will fulfill both public reporting needs and federal reporting requirements. By incorporating mandated, publicly reported data sets into the longitudinal data system, Wisconsin will be creating a comprehensive data repository that fulfill internal and external stakeholder data needs.

Work to accomplish this objective will be sponsored by Rick Grobschmidt, Assistant State Superintendent for the Division of Libraries, Technology and Community Learning who is also the Executive Sponsor of LDS. It is estimated at 4.0 FTE for one year. The development team will include a part-time Business Analyst/Project Lead, a part-time education consultant and up

to three full-time developers. This team will work with a cross-agency team that includes staff from the Data Management & Reporting team, the Title I School Support team, Content & Learning, and the Office of Educational Accountability. The work breakdown structure associated with these steps is included in Appendix A, Attachment 3.

Objective 2 Design: Add Student-Level Data Sets-Course Data

The Data Quality Campaign is a national, collaborative effort to encourage and support state policymakers to improve the collection, availability and use of high-quality education data and to implement state longitudinal data systems to improve student achievement. As such they have identified ten key elements to a successful LDS. Wisconsin currently collects seven of these and plans to add to our list of essential elements by creating a data collection to capture course completion data between Grades 6 and 12.

With student-level class participation data available, Wisconsin will lay the foundation for a comprehensive PK-16 system, and begin to answer key policy questions. For example, we will be able to identify which middle schools are doing the best job of preparing students for secondary course work.

Plans are in place to begin collecting aggregate level course data from Wisconsin districts using the NCES' national course code taxonomy, instead of the subject and topic codes currently used. A fitting complement to this transition will be our proposed student-level course data collection for Grades 6 to 12. A web-based application will collect this data from districts electronically. The collection tool will define a standard file format, enable districts to review the file and then upload into the database. DPI would then run a number of quality control checks, including producing any necessary error reports. Districts would be unable to submit their data until all necessary errors had been corrected. After the initial submission period, districts will be given a verification and edit period during which they can amend the course data before finalizing their submission. The system will also provide status and summary reports so DPI staff and the districts can see how complete the collection process is at that point in time.

This effort will be sponsored by Michael George, Director of Content & Learning in the Division of Academic Excellence and is estimated at 4.0 FTE for nine months. This development team requires a different skill set and will be separate from the team working on the LDS portal and data warehousing portions of the project. This team will include a project leader and three developers from the IT Applications Team. The development team will also work across the agency with staff from the Data Management & Reporting team, the Title I School Support team, Content & Learning, and the Office of Educational Accountability. A work breakdown associated with these steps is included in the timeline in Section F. Please also refer to Appendix A, Attachment 3 for the work breakdown.

Objective 3 Design: Add Student-Level Data Sets-ACT Data

Though not required for federal reporting, ACT data is of primary importance to the high schools, colleges and the universities of Wisconsin. Unfortunately, aggregate ACT results can only inform schools of so much. Therefore, student-level ACT data will be integrated into the LDS relying on the LDS-Student-Key systems already in place.

The development team will determine how the data will be used and establish what kind of reporting the agency will want to provide. The team will then model the data to support those needs, build the data structure, map the source to the LDS dataset location and test in the quality assurance environment. As with other student-level datasets, once the data is cleansed and stored in the LDS database, subsequent reporting is simplified. The accuracy of data increases thanks to the added data validation steps already in place.

This effort will be sponsored by Rick Grobschmidt, Assistant State Superintendent for the Division of Libraries, Technology and Community Learning who is also the Executive Sponsor of LDS. This effort is estimated at two full time employees for three months and includes a part-time Business Analyst/Project Lead, a part time educational consultant and one full-time developer. This team will model the data and design ETL specifications. The team will work across the agency with staff from the Data Management & Reporting team, Content & Learning, and the Office of Educational Accountability. A work breakdown associated with these steps is included in the timeline (Section D) as well as in Appendix A, Attachment 3.

Objective 4 Design: Add Student-Level Data Sets-VEERS Data

Another key student-level dataset identified for the LDS comes from the federal Vocational Education Enrollment Reporting System (VEERS). Perkins Authorization defines the federal reporting requirements for VEERS, and though Wisconsin succeeds in meeting these requirements every year, the effort necessary to do so is considerable.

The development team will determine how VEERS data will be used and establish what kind of reporting the program areas and LDS team need to provide. The development team will then model the data to support those needs, build the data structure, map the source to the LDS dataset location and test in the quality assurance environment. As historic data is cleansed and incorporated into the LDS all subsequent reporting will be simplified due to the fact all “cleansing” has been completed ahead of time. In addition, automated processes can then be built that take standard input (student-level datasets) and create standard outputs (aggregated reporting data sets). This data will reside in the same location as all other LDS student-level data sets and have an appropriate key assigned to every student. This will enable research, analysis and reporting never before possible in Wisconsin.

This effort will be co-sponsored by Rick Grobschmidt, Assistant State Superintendent for the Division of Libraries, Technology and Community Learning who is also the Executive Sponsor of LDS, and Sharon Wendt, Director of Career & Technical Education. The project is estimated at two people for three months and includes a part-time Business Analyst/Project Lead, a part time educational consultant, and one full-time developer. The team will work across the agency with staff from the Career & Technical Education team, Data Management & Reporting team, the Title I School Support team, and the Office of Educational Accountability. A work breakdown associated with these steps is included in the timeline (Section D) as well as in Appendix A, Attachment 3.

Objective 5 Design: Build Next Generation Analysis and Reporting Tools

Next Generation Analysis and Reporting Tools allow users to create ad hoc, interactive reports by selecting variables of interest. Because the LDS is planned to be the central data repository

and main point of entry to education data in the state, Wisconsin must design a system that allows both technical and non-technical users to access desired data. The ability for non-technical users to obtain meaningful data has been and will remain a priority goal of DPI's student data system. Next generation reporting tools allow non-technical users to explore the data available on the system in a meaningful way, and allows technical users (e.g. DPI staff) the ability to analyze data from multiple sources.

In order to create a system that supports interactive reporting, DPI must upgrade the current reporting system that is foundational to the LDS. As the LDS continues to grow in size and complexity, Wisconsin will be required to upgrade both the production environment and the development/quality assurance (QA) environment. The production hardware will be upgraded as more data is moved to the system and to accommodate new data collections. The quality assurance environment will be created to allow system testing and verification procedures before moving to data into the production environment.

Certainly DPI will leverage the existing production and development environments as we enter the next phase of this project. This proposal includes a cost estimate to expand the existing development hardware to serve as both development and quality assurance environments. DPI will continue to utilize Oracle database solutions. This software requires the agency to continue to pay the licensing costs of the existing LDS infrastructure. These costs are mainly paid to Oracle for both their database solution as well as their Fusion Middleware Suite of products, which includes the security and web portal for the LDS system.

This effort will be co-sponsored by Rodney Packard, Chief Information Officer in the Division for Libraries, Technology, and Community Learning, and by Phil Olsen, Assistant Director for the Office of Educational Accountability. This effort is scheduled for late in the first year of the grant through the early part of the second year. It is estimated to require at least two FTE people for one year. This team will include a part-time Business Analyst/Project Lead from the IT Applications Team, part-time educational data consultant and one full-time developer. The team will work across the agency with staff from the Data Management & Reporting team, the Division for Libraries, Technology, & Community Learning, and the Division for Academic Excellence. A work breakdown associated with these steps is included in the timeline (Section D) as well as in Appendix A, Attachment 3.

System Requirements: Governance & Policy Requirements

The Department of Public Instruction has developed significant data governance and rigor since the inception of Wisconsin's longitudinal data system. Steps have been taken at all levels of the organization to remove barriers to the integration of data and information systems.

Governance was first addressed with a Project Management environment by establishing a common process for all information technology projects. This included the establishment of a Data Management Steering Committee, which is chaired by the State Superintendent's Executive Assistant. Management representatives attend this committee from each program area as well as the agency's Budget Director. This committee reviews and establishes priorities for all projects. This structure ensures communication with the State Superintendent's Cabinet, the highest level of agency management.

Another significant entity in the governance structure is the Student Data Workgroup (SDW), commissioned by the Data Management Steering Committee. The SDW is the gatekeeper for student-level data collections for the entire organization. Each request for student-level data from school districts must pass through this workgroup. It determines whether the data should be included in the Individual Student Enrollment System (ISES), which is based on unique statewide student identifiers, the Wisconsin Student Number system. The workgroup provides guidance and oversight in the continued development of student-level data systems including data elements, definitions, code sets, validation, report design, and the use of data to calculate publicly reported statistics.

In addition, the LDS Project Implementation Team was established specifically to tend to the detail of LDS related objectives and integration issues within the agency. This workgroup establishes the look and feel of the LDS portal and identifies tools that would be useful for future LDS development. With representatives from several different program areas, the LDS Project Implementation Team helps assure that the products of our student data system are relevant and useful to internal and external stakeholders alike. This group reviews plans for training and professional development of DPI staff, teachers, administrators and external LDS users. This implementation team is chaired by a program manager and is attended by representatives from the agency program areas, the IT data collection unit, and IT management.

DPI recognized the importance of managing specific data issues including data ownership, management, confidentiality and access in an open and transparent manner. After DPI received a Data Warehouse Planning Grant, the agency adopted a plan to develop a Data Dictionary of common data elements. This helps to ensure data integration and elimination of redundant and/or inconsistent data. Population of the electronic data dictionary continues in parallel with the LDS development. To address data confidentiality and access, the DPI established a Pupil Data Policy Advisor position in 2007. This position reviews all data access requests and has the authority to approve or deny such requests.

The DPI also has built rigor into our communication with external stakeholders. An entity with historical significance is the State Superintendent's Education Data Advisory Committee (SSEDAC). Chaired by the DPI Chief Information Officer, the SSEDAC includes district superintendents, district assessment directors, district IT directors, and representatives from the Cooperative Education Service Agencies (CESA), Wisconsin Education Association Council (WEAC), and local school boards. Plans and data issues are shared routinely with the SSEDAC, and they directly advise the State Superintendent and her Cabinet.

Additional workgroups are formed for specific LDS topics. For example, one workgroup addressed the issues of LEA-SEA data sharing. Attending to this issue, DPI developed a strong partnership with a local school district specifically for the purpose of conducting a pilot program to investigate sharing local data with DPI, and conversely, the state sharing data with the LEA. The results of this pilot and lessons learned will be used throughout this grant.

Another noteworthy group that handles critical SEA-LEA issues is the IT Directors of Wisconsin's ten largest school districts. DPI routinely addresses and gathers feedback on data,

information systems, integration, and data policy from this group. DPI's Chief Information Officer elicits feedback and works through data obstacles collaboratively with this group.

System Requirements: Technical Requirements

Significant progress has been made in fulfilling the technical requirements. The status of DPI's efforts in relation to federal reporting, privacy protection and data accessibility, data quality, interoperability and enterprise-wide architecture are outlined here, as well as some accolades received for this work.

Federal Reporting

Recently, DPI staff received three awards for excellence and completion of several key data submissions through the federal Educational Data Exchange Network (EDEN) submission system. EDEN is a coordinated system for federal reporting to the US Department of Education, and replaces the need to report directly to specific federal program offices. Federal reporting via EDEN became mandatory for the 2006-07 school year, the same year for which DPI received multiple awards at the EdFacts Coordinators Meeting. The data quality processes that were put in place for EdFacts federal reporting will be replicated throughout the LDS.

All federal reporting efforts use the base technologies put in place during the first phase of the LDS project, specifically: Oracle Warehouse Builder, Oracle development databases, and where possible, LDS production data. The Wisconsin strategy is to leverage all LDS investments in technology and data cleansing to minimize the effort necessary to satisfy federal reporting requirements. Development processes have been documented and are stored in one single repository, allowing for better change management and the development of reproducible processes. For example, the Applications Development team uses the same toolset to create EDEN files that the LDS team uses to build extract, transformation and load routines, reducing the reporting burden on districts. In addition, EDEN job streams are continually modified to take advantage of new data sets stored in the LDS production database.

Recently, Wisconsin built a prototype EdFacts management portal that enables the real-time monitoring of our completion of this federal reporting. (Please see Appendix A, Attachment 2 for a screen shot.) This management tool that was built improved the processes required for EDEN reporting. It was built using Oracle tools, the same platform that is used for the LDS and therefore, we can be confident that the transition of EDEN reporting over to the LDS will be smooth.

Privacy Protection and Data Accessibility

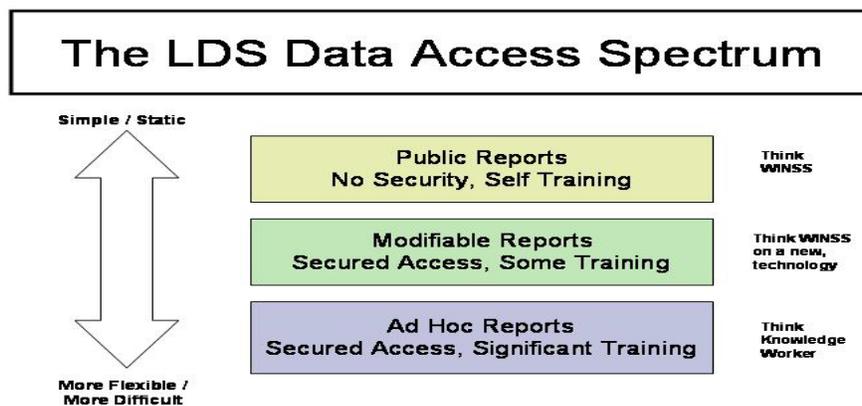
Wisconsin residents have historically regarded the privacy of student records as extremely important. DPI has strict suppression rules and state law provides additional safeguards to student data beyond the federal FERPA mandates. DPI strictly adheres to these student privacy rules and documents this as such in our data systems.

The priority of student privacy has been preserved in the state's Individual Student Enrollment System (ISES). The public does not and will not have access to this confidential database. Only authorized district and school personnel have access to individual student data, or unredacted

data, at the school and district level. Publicly reported data does not disaggregate further than student subgroup, and will continue to be redacted when necessary to protect student privacy.

In ISES, districts use Wisconsin Student Numbers (WSNs) instead of student name or social security number when submitting data about student educational progress. Student performance data, always confidential, are attached to encrypted WSNs rather than to student names, and are then stored in a secure location on the network. WSNs are encrypted before storage at DPI to provide an extra measure of privacy. Confidential data is accessible only to legally authorized persons with legitimate educational interests. Only locally-authorized district and school personnel have access to WSNs with student names and other identifying information attached, for the purpose of registering students. Students are not expected to know their WSNs, nor are these identification numbers released to parents, the public or media.

Security and access to LDS data is role-based with authorization and authentication occurring at the individual user level. Only authorized users have access to confidential data. Role assignments are made at the district level under the supervision of district administrators. DPI has specified three levels of access; two of the three key methods to access the LDS data stores require security solutions. All of these security features are in place today.



The first level of the LDS data access spectrum is public access and requires no specific security beyond the application of Wisconsin’s suppression rules for redacted data. Reports at this level are predefined, simple to use, and include redacted data to protect individual student identities from being revealed.

Applications at the second level of access enable a trained user to manipulate (via Oracle technology) the associated graphs and/or data being viewed. Within the constraints of the application developed by the LDS technical team, a trained user can further explore data by “dragging and dropping” new attributes into the report or, for example, change a pie chart into a bar chart. The security for this level of access was developed in coordination with a technical partner, Zirous LLP, and further builds on the functionality available through Oracle Access Manager. In general, this security is designed to enable trained users from local districts to see their data and only their data.

When creating security solutions for these two levels, DPI focused on the following objectives:

- To ensure the protection of the student's identity and all student-level data made available through the LDS Portal. This protection will prevent people that do not have explicit access from seeing non-redacted summary data or detailed student-level data
- To enable the delegation of security administration, and thus explicit data access, to district level administrators. Delegated administration will push out the responsibility for adding users and managing access to the LDS Portal to the local educational authority responsible for the student
- To simplify the setup and administration of user level security for the LDS Portal.
- To leverage the user identifiers already setup for other State wide data collections. To leverage the existing user account base of accounts used by ISES and WSLs. User provisioning (creation/deletion/password reset) also gets leveraged by this system.

The third level of access is ad hoc and will most likely include users who are adept at accessing and analyzing data electronically. These users are comfortable accessing technology for data mining, and typically comprise the education research community, internal DPI staff and other “knowledge workers” who are savvy with education data. Access at this level requires significant training and an authorized user identifier. Security at this level is database security and will be provided by the Oracle database.

Student privacy is also addressed at a policy level. Within DPI, staff who work with individual student data or staff data receive training on FERPA privacy protections as well as Wisconsin’s stringent state privacy laws. Training is also conducted on how to maintain student confidentiality, outlining the restrictions of data sharing. Access to confidential data is currently managed by a Pupil Data Policy Advisor and the Chief Information Officer (CIO). Access to data is granted only if necessary to the employees work, and only after sufficient training.

Data Quality

DPI has taken several steps to ensure the reliability and validity of data stored in the longitudinal data system. Data quality efforts begin with data collection, continue with agency-wide data verification procedures, and extend to all data collections whether they are collected externally or internally. Great strides were made in this regard in 2004-05 when Wisconsin instituted the unique student identifier and data collection system. Use of the Wisconsin Student Number system has improved data quality, improved DPI service to districts, and consequently, improved agency credibility in districts throughout the state.

As a standard part of every data collection, DPI publishes written documentation defining the data elements for that collection. Documentation includes a list of acceptable values. Automated web applications have built in validation and edit checks to prevent data mismatches from being submitted. This also ensures that data is collected in a consistent manner across the state. Training is provided to districts and schools through a variety of formats, on-site training, user manuals, and multi-media presentations posted on the agency website. Technical Support Staff conduct biweekly teleconferences during the Wisconsin WSN and ISES collection periods in which vendors and districts can ask questions. These efforts are supplementary to the normal

day-to-day Help Desk service. DPI is also developing a data dictionary project that will establish a data language with common definitions across our agency's many data collections.

Also part of DPI's data collection protocols, districts are able to review data submitted prior to final submission. This verification process is completed via summary reports. Some reports allow reviewers to select specific variables to be used in aggregation, allowing administrators to look at the accuracy of data for specific student groups. Internal DPI staff also review summary reports to enhance data quality, looking for reasonability and comparing to prior years data. District's administrators are contacted when anomalies are identified. Districts are given a sufficient window of opportunity to revise the data, and the window of time is announced to districts well in advance of the verification period. With the WSLS and ISES system, DPI also has dedicated staff members who address problem WSNs, including one position devoted to detecting and correcting duplicate student identification numbers.

Additional Agency Wide Data Quality Initiatives

Within DPI, efforts are being made to increase training on the importance of data quality, how data may be used for decision-making, along with efforts to develop and strengthen the data skills of agency staff. The Data Management Steering Committee commissioned a Data Training Workgroup to identify the data skill sets required for particular positions throughout the agency.

To assist in this effort, DPI hired a Training Officer. And surveys were sent to all DPI employees seeking feedback on staff familiarity and expertise with a number of software tools, including tools used for data analysis. Based on the feedback from staff, classes continue to be offered agency-wide at introductory and advanced levels. These courses are helping to build the technical skills of DPI staff in every division of the agency.

In addition, training sessions have been held to give program users a better idea of what data is collected through the ISES system, what data is available for analysis, and how it might be used to evaluate educational effectiveness. The ISES helpdesk and support staff work closely with program area experts, providing summary reports for data quality review.

DPI has also successfully applied for grants specifically targeting data quality. In 2008, DPI was awarded an NCES State Cooperative Special Task Order grant, which was used to create additional summary reports for districts to review and validate data. Given the recognition DPI has received for data quality efforts, we believe Wisconsin is poised to make great progress on developing a comprehensive and effective longitudinal data system that ensures a high level of data quality and effective data governance.

Interoperability

DPI supports and maintains a multitude of web-based data collection instruments that collect data using standard file formats. Most of these applications provide users with two options for submitting data, via file upload or via on-screen data entry. Common data definitions and business rule validations ensure that data collected by one district is comparable to other districts. Except in a few cases, the transfer of data is one way from the school or LEA to DPI. The first student-level data collection utilizing unique statewide student identifiers was

implemented in 2006-07. And in 2007, DPI built on its student-level data collections with a system to capture and report incidents of expulsion and discipline.

Enterprise-Wide Architecture

Wisconsin implemented a unique student identifier system in 2005. The first enterprise, student-level data collection—the Individual Student Enrollment System (ISES)—relied on these unique student identifiers and was implemented in 2006. Subsequent student-level data collections continue to build on this work by consistently using the unique student identifiers, and linking student records across data systems.

To date, DPI has linked student level enrollment data and student level assessment data into a single data repository. An enterprise data model has been created and DPI will continue to build on this rich source of data by adding student-level ACT college admissions test data, career and technical education data, and course completion data, laying the foundation for a PK-16 longitudinal data system.

In addition to district and school master data contained in the Wisconsin LDS, the system has a number of student-level data sets in place today including:

- Wisconsin Knowledge and Concepts Exam Results: 2006, 2007 & 2008
- Wisconsin Alternate Assessment Results: 2006, 2007, & 2008
- Individual Student Enrollment System (ISES) Year End Records: 2006, 2007 & 2008
- Individual Student Enrollment System (ISES) Count Date Records: 2006, 2007 & 2008
- Student Master File: All students enrolled in a Wisconsin school since 2006 and their associated demographics
- IDEA Child Count Data: 2008

Currently in progress:

- Individual Student Enrollment System (ISES) Discipline Records: 2007 and 2008
- English Language Proficiency (ELP) data: 2006, 2007, 2008
- Advanced Placement Data: 2006, 2007, 2008

These data sets will be supported by a newly implemented data dictionary early in 2009.

Working with the state of Colorado, DPI is creating an electronic, web-based data dictionary similar to what is used in Colorado. The work to implement an agency-wide data dictionary is substantial and ongoing. However, once the exchange of technology is secured, DPI will put the dictionary into practice.

(D) INSTITUTIONAL SUPPORT

The DPI has a rich history of providing on-going support for information technology functions. Many of the items described in Section C describe an organizational culture of support along with strong management commitment to sustaining data systems. Two examples in particular reflect this commitment: DPI's project management structure and the Data Management Steering Committee.

The Data Management Steering Committee is chaired by the State Superintendent's Executive Assistant. Various management representatives from program areas are included in the committee's membership, along with the Budget Director. This structure ensures communication with the State Superintendent's Cabinet, the highest level of agency management. The committee has been charged with reviewing and establishing priorities for all data related projects. They established and disseminated the agency's Data Management Vision and Guiding Principles. This document can be found in Appendix A, Attachment 5. The guiding principles outline the critical aspects of data collection (privacy protections, valid and reliable data, minimize reporting burdens), and data reporting (privacy protection, actionable reporting, maximizing access to data reports). The vision that was established by this committee permeates agency data projects:

The Wisconsin Department of Public Instruction will maintain a comprehensive data management system of data collection and reporting to maximize the efficient collection and use of high quality data to improve the educational success of all Wisconsin students and meet federal and state reporting requirements. DPI data collection and reporting systems must be necessary and useful, protect student privacy, and address long-term capacity to develop and maintain.

The DPI project management team recognizes that 60-80% of the cost of a system during the System Development Life Cycle (SDLC) is after the system goes into production. Decisions to support DPI technology projects, therefore, are made knowing the majority of costs are dedicated to sustainability and maintenance.

For a number of years, DPI has had in place a chargeback system that allocates funds from program areas to maintain the hardware and software infrastructure of the agency. This includes DPI's desktop environment, network, database and server environment. Where appropriate, DPI charges back on an hourly basis, in cases such as Application Development time. This is supported by detail project accounting, which tracks development time and is integrated within the Project Management environment.

In addition to those cited in Section C, there are numerous examples of agency support specific to data systems that have been demonstrated in recent years. The Library and Statistical Information team was reorganized into the Data Management and Reporting team. In 2007, a supervisory position—the Section Chief for the Data Management and Reporting team—was authorized for the data management, collection, cleansing and reporting functions of the agency. This position was authorized and funded in recognition of the importance of quality data and customer service. The Data Management & Reporting Section Chief reports to the CIO. In addition to the creation of this high-level position, DPI requested and was authorized to create two application development positions to support and maintain the state's Individual Student Enrollment System (ISES) in the 2008-09 Biennial Budget period. The ISES database includes student demographic and outcome data, and is the basis of virtually all data reporting mandated by state and federal government.

The fact that DPI has established high-level committees that address data issues within the agency points to the level of institutional support the project enjoys and how much of a priority it is to departmental leadership that we have a comprehensive, in-house LDS.

The positive environment of sustainability continues for the 2009-10 Biennial Budget period. In the early stages of the budget preparation, management has supported additional positions for the maintenance and sustainability of DPI data systems. The request specifically supports the LDS development and expansion activities outlined in this proposal.

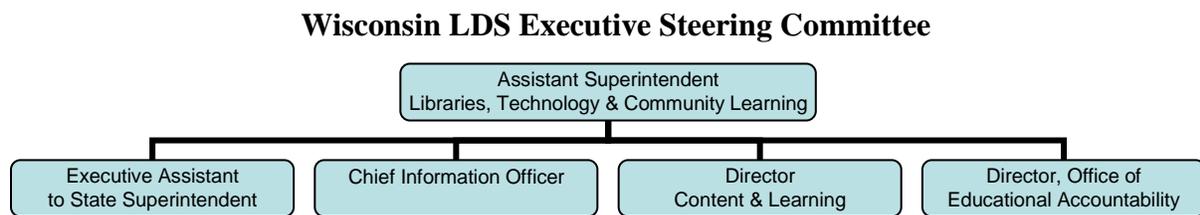
External support for DPI’s proposed LDS plans is evident in the letters of support (Appendix A). DPI has the support of the University of Wisconsin System, the Wisconsin Technical College System, the Wisconsin Association of Independent Colleges and Universities, Madison Metropolitan School District, the Cooperative Educational Service Agency (CESA 1) covering Milwaukee Public Schools, along with CESA 6, the Division of Public Health in the Department of Health Services for the State of Wisconsin and the Division of Enterprise Technology in the Wisconsin Department of Administration.

(E) PROJECT MANAGEMENT PLAN

This grant proposal is prepared with the full approval of all levels of agency management. At the highest level the project is the responsibility of the State Superintendent and by her delegation, the executive sponsor, who is the Assistant Superintendent of Libraries, Technology and Community Learning (see the enclosed resume of Rick Grobschmidt). He is ultimately responsible for the successful creation and completion of Wisconsin’s longitudinal data system. The Executive Sponsor interfaces with the Superintendent’s Cabinet on policy issues. On a daily basis, he actively participates in and facilitates collaborative LDS efforts with other divisions in the agency.

DPI has two key committees that drive LDS structure, governance, data policy and management issues: the LDS Executive Steering Committee and the LDS Implementation Team.

The LDS Executive Steering Committee is led by the project sponsor and made up of direct reports for the State Superintendent as well as other high level DPI staff. Membership of this committee was established under the LDS governance structure, and will remain in place through the next phases of LDS development. The primary responsibility of this Committee is to ensure the project remains aligned with the needs and priorities of educators and children in the State of Wisconsin, as well as to provide strategic oversight of project activities.



The LDS Implementation Team is made up of content experts and program areas representatives who are responsible for executing the work of the project. Prioritizing work, testing new deliverables, communicating to others in the agency, and working with the project teams are the responsibilities of this team. The LDS Implementation Team is led jointly by the Assistant

Director of the Office of Educational Accountability (OEA) and the Chief Information Officer (CIO). Please see enclosed resumes of Phil Olsen and Rodney Packard, respectively.

The organizational teams of Content and Learning and the Office of Educational Accountability are integral to the development of the LDS, and are both represented on the Executive Steering Committee and the LDS Implementation Team. Although the IT organization manages most of the development and project reporting, the LDS is a collaborative effort throughout the DPI. Various program teams shepherd information to the IT team. A Project Framework has been established for all information technology projects in the agency, including the Longitudinal Data System.

Daily project oversight will be the responsibility of the Chief Information Officer, who will assume the role of project director (see the attached resume of Rod Packard). The CIO reports to the Assistant Superintendent of Libraries, Technology and Community Learning. In addition to his role as the project director, the CIO will assign technical resources as appropriate to ensure necessary technical teams are in place to accomplish project work. The CIO is PMP Certified and has a strong track record of managing large technology projects on time and on budget. He is responsible for keeping LDS projects on time and on budget. His direct reports are also PMP Certified or apply project management best practices, as defined by DPI Information Technology methodology.

The Director of the Office of Educational Accountability (OEA) is a key stakeholder and works closely with the project team to ensure they stay aligned with the needs of the agency (see attached resume of Lynette Russell). In particular, the OEA Director is responsible for the majority of public reporting of data, and data analysis necessary to support policy decisions. The OEA Director reports to the Assistant Superintendent of Reading and Student Achievement. In addition to her role on the LDS Executive Steering Committee, the Director of OEA assigns resources to ensure that knowledgeable staff are routinely integrated into LDS planning and design issues, as well as data analysis and reporting teams. The OEA staff has expertise in assessment, accountability, data analysis, public reporting, suppression rules and data warehousing. OEA has assigned three people to the LDS Implementation Team and their membership will continue under this grant (see attached resumes of Phil Olson, Amy Marsman and Susan Ketchum).

Daily project management will be the responsibility of two project managers who report directly to the CIO. One project manager will lead the efforts to build the new data collection for class completion data. This person will be assigned from the IT Applications Development team and has significant experience in web-based technologies and existing DPI data collections (see attached resume of Sarita Jha).

For every IT project, DPI employs a somewhat traditional waterfall methodology, requiring involvement from multiple program areas. One key to this methodology is an Analysis and Design Phase that produces a detailed estimate of costs in addition to a plan for the Execution Phase. With this information in hand, the project team and key stakeholders are better able to determine how to proceed with the project. The Execution Phase does not begin until a meeting is held and all parties agree on a method to proceed.

A second project manager/business analyst will lead a separate team of developers and representatives from the program areas to build the data warehouse and portal portions of this plan. Multiple work teams can be active at one time depending on resource levels, and the size of the effort. The project manager/business analyst is expected to manage time between efforts. These work teams meet routinely with the CIO, and once per month with the LDS Implementation Team to discuss progress and gather input from the cross-agency team.

These efforts will be structured in the same manner as DPI's other LDS activities. That is, a technical team will be partnered with a team of content experts. These content experts typically also serve on the LDS Implementation Team and are familiar with the aims of the longitudinal data system. Given their participation on the LDS Implementation Team, they come vested with a solid understanding of project objectives, history and stakeholder needs.

The grant proposal contains a high level Gantt chart for each of the five major objectives contained in our development plans. (Please see Appendix A, Attachment 4.) Each of the projects will follow the work breakdown structure, and maintain fidelity to the identified budget, resources, and schedule throughout the duration of work.

There will be additional project oversight throughout the duration of the project lifecycle by an Independent Verification and Validation (IV&V) team. This group is an independent team of IT and budget professionals who conduct periodic reviews of project deliverables, schedule, and budgeting. Results are shared with agency management.

A final note on the oversight of the proposed activities: a project of this magnitude is considered "High Profile" as defined by the Wisconsin Legislature and subject to additional monitoring by the state legislature. One of the criteria defining "High Profile" is any project with a budget over \$1 million. DPI has been required, when efforts reach the \$1,000,000 threshold, to submit monthly Dashboard Reports. These reports contain status updates for Schedule, Scope, Budget and Other Issues, and are signed by the Director of Information Technology, Executive Sponsor, Finance Authority, Business Authority and Contract Administrator. Dashboard Reports are sent to the Secretary of the Department of Administration.

(F) PROJECT PERSONNEL AND RESOURCES

The LDS development teams will work with a cross-agency team, which will include staff from the Data Management & Reporting team, the Title I School Support team, Content & Learning, and the Office of Educational Accountability. There is close, direct involvement of a number of program areas in this effort and DPI plans to leverage agency staff's deep knowledge and expertise covering content, assessment, accountability, data management and reporting. For example, the request contains an Educational Consultant (permanent staff members in the agency's program areas), who will bring program expertise and the perspective of a *user* of educational data to the project. This position will be allocated to a number of LDS projects in order to positively influence the development and outcomes of the varied objectives. Staff from many program areas have been involved in LDS projects and committees, and will remain collaborative members of LDS teams throughout the duration of the project.

The DPI management representatives directly involved in the development of the LDS, and this request in particular, have many years of experience within the agency, as well as within their specific discipline. Key project leaders, discussed in Section E, and their qualifications are included in the résumés found in Appendix B.

The DPI has a number of qualified Business Analysts and Project Leaders, each of whom will be allocated half time to two projects outlined in this proposal. These staff members have over three years of experience working with DPI data systems, including Teacher Licensing, ISES, Special Education, Career & Technical Education, and Grant Automation. When needed, a Project Lead function will be filled with a contractor who has the specific qualifications required. For example, we expect that a Project Lead with experience using a specific set of software tools will be required for the development of the next generation reporting tools.

The contingent of Developers will be a combination of DPI staff and contractors, depending on the skill set availability and demands from other projects. A number of DPI Developers have experience with LDS system components, along with the Oracle software tools previously acquired. Developers have been entrenched in the development of the current LDS system. We expect to assign these contractors to the new LDS work in order to build on their experience and institutional knowledge already attained.

DPI has estimated the personnel and required time commitments with regard to the five objectives contained in this request. This breakdown can be found in Appendix A, Attachment 6. Staffing requirements are also displayed via a Gantt chart in Section D-Timeline. The chart specifies staffing requirements for the four year timeline along with the number of staff that will be allocated by year quarter. This depicts the start and end of projects along with the respective quantity of staff by function. Some projects overlap during the four year period and the allocation of staff reflects the timeline.

SECTION C: WISCONSIN LDS PROJECT—BUDGET NARRATIVE

The information included in this section describes the resources necessary for the Department of Public Instruction (DPI) to accomplish the proposed scope of work. Proposed resource costs integrate personnel salaries, projected fringe benefits, travel, equipment, supplies, contractual services, indirect costs, and training-related expenses. All estimates are based on current costs and/or DPI past purchases, and accounting data. Following are the descriptions of the expenses included in each category:

1. Personnel

DPI has instituted a charge back system for all IT development work within the agency. Developers, regardless of whether they are contractors or permanent staff, are charged back to the program area that is developing the application. The chargeback rate takes into account the salary/contracting fee as well as fringe benefits for the permanent staff. DPI anticipates utilizing both permanent staff and contract staff for this project. The IT positions listed include the project manager, developers and a professional trainer.

The educational consultant utilized will be a DPI program area employee and charges to the project will be based on salary and fringe benefits.

Non-development work such as program management, hardware and software support, and database administration work would be considered DPI's in-kind contribution to the project. This is reflected in Section B of the Budget Summary document.

2. Fringe Benefits

Per the above Personnel section, developers are charged back at a fixed rate. Fringe benefit costs are incorporated into this rate. For the educational consultant position the rate will be 43% of salary.

3. Travel

All reimbursements for transportation, lodging, meals, and related costs are included in this category. Travel expense reimbursements are made on the basis of actual and reasonable expenditures. Payments are governed by Wisconsin State Statutes and Travel Regulations. Travel estimates are based on past accounting experience, allowable travel expenses based on the State of Wisconsin travel regulations and travel quotes from Madison travel agencies.

The budget includes travel for DPI to meet with key stakeholders throughout the state of Wisconsin. DPI collaborates with local school districts as well as LEAs and vendors. We also anticipate training travel expenses as we implement a professional development program during this grant period.

4. Equipment

Hardware: DPI will leverage the existing Longitudinal Data Systems production and development environment as we enter the next phase of this project. The production hardware will need to be upgraded as more data is moved to the system. DPI does not currently have a quality assurance environment to allow test users to work with the system before moving to production. This proposal includes a cost estimate to expand the existing development hardware to serve as both development and quality assurance environments.

Software: DPI must continue to pay for the licensing costs of the existing LDS infrastructure. These costs are mainly paid to Oracle for both their database solution as well as their Fusion Middleware Suite of products which includes the security and web portal for the LDS system.

DPI also anticipates the need to purchase next generation reporting tools as the system grows. As more data becomes available on the LDS system, the questions that will need to be answered will be more complex. The tools necessary to answer these questions will need to be purchased as well as the hardware to support them.

5. Supplies

This covers DPI fixed cost allocations and a desktop service fee charged to all full time employees. These charges have been applied to the salaried education consultant position only. As explained earlier, the charge back mechanism covers all other costs for IT resources.

6. Contractual

The budget includes the cost of contractual assistance to manage and implement the proposal. During the creation of the system, DPI discovered that it was not feasible to configure and maintain the complex environment with in-house staff. A request for bid was awarded to a vendor to remotely support this environment. A flat fee structure was utilized to hold these maintenance costs at a constant level.

7. Indirect Costs

This line covers the following project support costs: administration of grants, contracts, subcontracts and agreements; budget consultation and preparation; programmatic accounting; financial reporting/monitoring; fiscal consultation; expenditure audit/review; facility management; telephone installation, rental, and general usage; normal equipment service; normal editorial service; normal graphic service; office supplies; and miscellaneous program support; and facility operation and maintenance, and building usage charge.

8. Training Stipends

Training is budgeted for both internal DPI staff as well as external stakeholder training. The software and hardware being utilized is complex and difficult to master. Developers and technical support staff need to continue to expand their knowledge of the systems in order to obtain the most efficient use of the system. External stakeholders will need to be trained either in-person or via web-based training on how to access the system and utilize the tools that are available.

**Developing a Longitudinal Data System
to Support 21st Century Learning in Wisconsin
BUDGET JUSTIFICATION DETAIL
Revised 02/04/09**

	Year 1 <u>3/09 – 2/10</u>	Year 2 <u>3/10 - 2/11</u>	Year 3 <u>3/11 - 2/12</u>	Year 4 <u>3/12 - 2/13</u>	Total <u>Budget</u>
U.S. DEPT OF EDUCATION FUNDS					
1. Personnel					
Project Manager / Lead	\$156,000	\$208,000	\$208,000	\$0	\$572,000
Developer #1	\$176,800	\$176,800	\$176,800	\$176,800	\$707,200
Developer #2	\$176,800	\$176,800	\$176,800	\$176,800	\$707,200
Developer #3	\$176,800	\$176,800	\$0	\$0	\$353,600
Developer #4	\$88,400	\$88,400	\$0	\$0	\$176,800
Educational Consultant	\$78,300	\$106,488	\$108,618	\$110,790	\$404,196
Professional Trainer	\$0	\$135,200	\$135,200	\$67,600	\$338,000
Total Personnel	\$853,100	\$1,068,488	\$805,418	\$531,990	\$3,258,996
2. Fringe Benefits @ 43+%	\$34,392	\$45,790	\$46,706	\$47,640	\$174,528
3. Travel					
Travel Expenses	\$5,000	\$5,000	\$5,000	\$5,000	\$20,000
4. Equipment					
Production Hardware Upgrade	\$75,000	\$0	\$0	\$0	\$75,000
Quality Assurance Build	\$90,000	\$0	\$0	\$0	\$90,000
Oracle Licensing Costs	\$76,400	\$76,400	\$76,400	\$76,400	\$305,600
HP Licensing Costs	\$9,100	\$9,100	\$9,100	\$9,100	\$36,400
Next Generation Tools - SW	\$0	\$250,000	\$50,000	\$50,000	\$350,000
Next Generation Tools - HW	\$0	\$100,000	\$0	\$0	\$100,000
Total Equipment	\$250,500	\$435,500	\$135,500	\$135,500	\$957,000
5. Supplies					
Fixed Costs Allocation	\$17,748	\$18,103	\$18,465	\$18,834	\$73,150
Desktop Fees	\$6,550	\$6,550	\$6,550	\$6,550	\$26,200
Total Supplies	\$24,298	\$24,653	\$25,015	\$25,384	\$99,350

6. Contractual					
Oracle Contract Support	\$80,000	\$80,000	\$80,000	\$80,000	\$320,000
9. Total Direct Costs	\$1,247,290	\$1,659,431	\$1,097,639	\$825,514	\$4,829,874
10. Indirect Costs					
DPI Indirect Costs @ 14.2%	\$177,115	\$235,639	\$155,865	\$117,223	\$685,842
11. Training Stipends					
Training/Professional Devlpmt	\$6554	\$10,000	\$10,000	\$10,000	\$36,554
12. Total Costs	\$1,430,959	\$1,905,070	\$1,263,504	\$952,737	\$5,552,270

**Developing a Longitudinal Data System
to Support 21st Century Learning in Wisconsin
BUDGET JUSTIFICATION DETAIL**

	Year 1 <u>3/09 -</u> <u>2/10</u>	Year 2 <u>3/10 -</u> <u>2/11</u>	Year 3 <u>3/11 -</u> <u>2/12</u>	Year 4 <u>3/12 -</u> <u>2/13</u>	Total <u>Budget</u>
NON-FEDERAL FUNDS					
1. Personnel					
Program Administrator @10%	\$9,568	\$9,568	\$9,568	\$9,568	\$38,272
Applications Manager @10%	\$8,736	\$8,736	\$8,736	\$8,736	\$34,944
Tech Services Manager @10%	\$8,736	\$8,736	\$8,736	\$8,736	\$34,944
Database Administrator @20%	\$16,640	\$16,640	\$16,640	\$16,640	\$66,560
Security Administrator @25%	\$18,200	\$18,200	\$18,200	\$18,200	\$72,800
Server Administrator @10%	\$7,280	\$7,280	\$7,280	\$7,280	\$29,120
Total Personnel	\$69,160	\$69,160	\$69,160	\$69,160	\$276,640
2. Fringe Benefits @ 43%					
Program Administrator @10%	\$4,114	\$4,114	\$4,114	\$4,114	\$16,457
Applications Manager @10%	\$3,756	\$3,756	\$3,756	\$3,756	\$15,026
Tech Services Manager @10%	\$3,756	\$3,756	\$3,756	\$3,756	\$15,026
Database Administrator @20%	\$7,155	\$7,155	\$7,155	\$7,155	\$28,621
Security Administrator @25%	\$7,826	\$7,826	\$7,826	\$7,826	\$31,304
Server Administrator @10%	\$3,130	\$3,130	\$3,130	\$3,130	\$12,522
Total Fringe Benefits	\$29,739	\$29,739	\$29,739	\$29,739	\$118,955
3. Travel					
					\$0
4. Equipment					
Production Hardware Upgrade					\$0
Quality Assurance Build					\$0
Total Equipment					\$0
5. Supplies					
					\$0
6. Contractual					

Oracle Contract Support					\$0
9. Total Direct Costs	\$98,899	\$98,899	\$98,899	\$98,899	\$395,595
10. Indirect Costs					
DPI Indirect Costs @ 14.2%					\$0
11. Training Stipends					\$0
12. Total Costs	\$98,899	\$98,899	\$98,899	\$98,899	\$395,595

SECTION D: TIMELINE

Initial work for the grant will focus on building a comprehensive data repository, first by integrating additional individual student level data sets followed by the migration of publicly reported aggregate data into the LDS data repository. Focus will then shift to collecting student level course data and developing the next generation of analysis and reporting tools. Throughout this effort the hardware and software technologies of the LDS production and Quality Assurance (QA) environments will be upgraded.

A work breakdown structure (WBS) identifying project outputs or deliverables is provided for each objective below. (Please refer to the WBS in Appendix A, Attachment 3.) The main objective of the WBS is to create a common understanding of project scope and what work will be done. The work breakdown is hierarchical with each lower level providing further breakdown of the higher level. No sequencing or scheduling is implied, however the WBS is a key input to schedule development.

Please note that the timeline does not include the in-kind contributions of DPI staff, but rather delineates the staff time included in this request specifically.

Objective 1: Create a Comprehensive Education Portal & Data Repository

The design of a Comprehensive Educational Portal and Data Repository will begin in the first quarter. Based on analysis completed in 2007, it will take 4 FTE one year to complete. This portal will replace WINNS and satisfy necessary public reporting as well as provide other resources and tools to aid in the development of 21st Century Skills thus providing a new DPI presence on the web. The project team will consist of a ½ time project lead/business systems analyst, ½ time education consultant and three developers. Key technologies are already in place, specifically the Oracle Portal, the Oracle database (including necessary student-level data sets), Oracle Access Manager, Oracle Discover Plus (reporting tool) and a state-of-the-art security solution developed with DPI and Zirous. Other key deliverables of this effort are the aggregate data sets necessary for all reporting but housed today with an outside vendor. As the new datasets are moved into the data repository, it will become the source for federal reporting through EDEN/EDFacts.

Deliverables for the Comprehensive Education Portal & Data Repository include:

- 1.1. DPI Portal and Public Presence
- 1.2. Aggregate Datasets and Public Reports (migrate WINSS to LDS)
- 1.3. EdFacts data sets
- 1.4. Publish Promising Practices to support 21st Century Skills
- 1.5. User training & communication
- 1.6. Upgrade of the Wisconsin LDS production environment
- 1.7. Upgrade Quality Assurance environment

Objective 2: Develop Student-Level Data Collection & Data Set-Course Data

Work on the collection of student level course data is slated to begin in year two. Communications, analyses and planning for the data collection needed to provide student-level course data will begin in the fifth quarter (Q5). This work will take three months and lay the groundwork necessary for the project to succeed. Based on these results, final action steps will be determined to complete the new data collection. In Q6, a team of a ½ time project lead, three java developers and a part-time business systems analyst will be commissioned to build the system. (The business system analyst is an in-kind contribution, and not represented on the resource count of the Gantt chart.)

Based on the experiences of the last data collection project of similar scale, this development effort is estimated to take 3.5 FTE nine months to complete the applications development and implementation work. This team will be independent of the dedicated LDS team. Staffing for this effort will come from the IT Applications Team with experience in building web based collections. Once the collection is complete and the system has gone “live”, a separate LDS team will work to move the data into the LDS database early in year three.

This estimate is based on DPI’s recent effort to develop and implement a new student-level data collection for expulsion and discipline data. This was a new data collection for DPI, and the LDS team has projected time, budget, communication and management plans based on the success of that project. The key program area involved in this effort will be the Content and Learning.

Deliverables for Data Collection & Reporting for Course Completion Data (Grades 6 – 12) include:

2.1 Enhanced Student Level Data Collection

- 2.1.1 On-line data collection for course completion
 - 2.1.1.1 File upload for course completion
 - 2.1.1.2 On-line reports to monitor data quality & collection progress
 - 2.1.1.3 User documentation
 - 2.1.1.4 User training & communication

2.2 Course Completion Data in LDS for reporting

- 2.2.1.1 Data model for course completion data
- 2.2.1.2 ETL (extract, transformation, load) for course data from new data collection to LDS database
- 2.2.1.3 Cubes and summary data sets for course data
- 2.2.1.4 Federal reporting

Objectives 3 & 4: Add Student-Level Data Sets-ACT Data and VEERS Data

In the first quarter, work will begin with the inclusion of new student-level data sets into the LDS database. These data sets will include ACT and VEERS data. This work is similar to the work completed with the first grant and will be performed in a manner similar to the first grant. The team commissioned to accomplish this work will include one developer, ½ time project lead / business analyst, and ½ time educational consultant.

Working together, and with further input from appropriate program areas, this team will determine how to model the data in the LDS database, evaluate current sources of data and design ETL specifications. Based on these specifications the developer will create clean, consistent data sets. Summary and longitudinal data sets are also created as needed to support analysis or public reporting. Completion of both objectives is expected to take six months beginning in Q1 with ACT, and continuing through Q2 with the VEERS data sets. All necessary technologies and processes are already in place to complete these tasks.

Deliverables for Detailed Student Level Datasets include:

ACT College Admissions Tests

- 3.1 2005 ACT Student Level Data Set
- 3.2 2006 ACT Student Level Data Set
- 3.3 2007 ACT Student Level Data Set
- 3.4 2008 ACT Student Level Data Set
- 3.5 2009 ACT Student Level Data Set
- 3.6 ACT Longitudinal Data Cube

Vocational Education Enrollment Reporting System (VEERS)

- 4.1 2005 VEERS Student Level Data Set
- 4.2 2006 VEERS Student Level Data Set
- 4.3 2007 VEERS Student Level Data Set
- 4.4 2008 VEERS Student Level Data Set
- 4.5 2009 VEERS Student Level Data Set
- 4.6 VEERS Longitudinal Data Cube
- 4.7 Federal reporting

Objective 5: Build Next Generation Analysis and Reporting Tools

The Next Generation Analysis and Reporting Tools will be presented to the Wisconsin Educational Community through the portal discussed above. These tools provide a collection of solutions for school districts to analyze their data. A cross functional team of a ½ time project lead / business systems analyst, a ½ time education consultant, and at least one developer will develop these tools. Working in parallel with the portal team, some subset of solutions will go live in the fifth quarter (Q5) along with the portal. Work will continue on the enhancement and further development of these tools through Q6.

Communications and training for the newly created portal and tools will be conducted late in year two and through some part of year three. A qualified trainer familiar with the principles of adult learning will develop and conduct training for internal and external users. Given that the needs of the Wisconsin education community will change over time and new requirements are certain to be discovered, year three and year four of the grant will be dedicated to evaluating and enhancing solutions that enable us to support 21st Century Learning.

Deliverables for the Next Generation Analysis and Reporting Tools include

- 5.1 Longitudinal Achievement Trends Report (for schools)
- 5.2 One-click School Performance Report
- 5.3 Longitudinal Data Sets (view data over time)
- 5.4 Data Downloads (enable school districts to download LDS datasets in a secure manner)
- 5.5 Local Data Supplement (add a new data element A/B/C to standard reports)
- 5.4 User training & communication

Computer Hardware and Software Upgrades

In order to meet the above stated objectives, DPI will need to upgrade the LDS production environment in order to support more data and larger data sets. The production system will be upgraded first, in quarter 4, followed by the QA environment in quarter 6.

Deliverables for Computer Hardware / Software Upgrades include

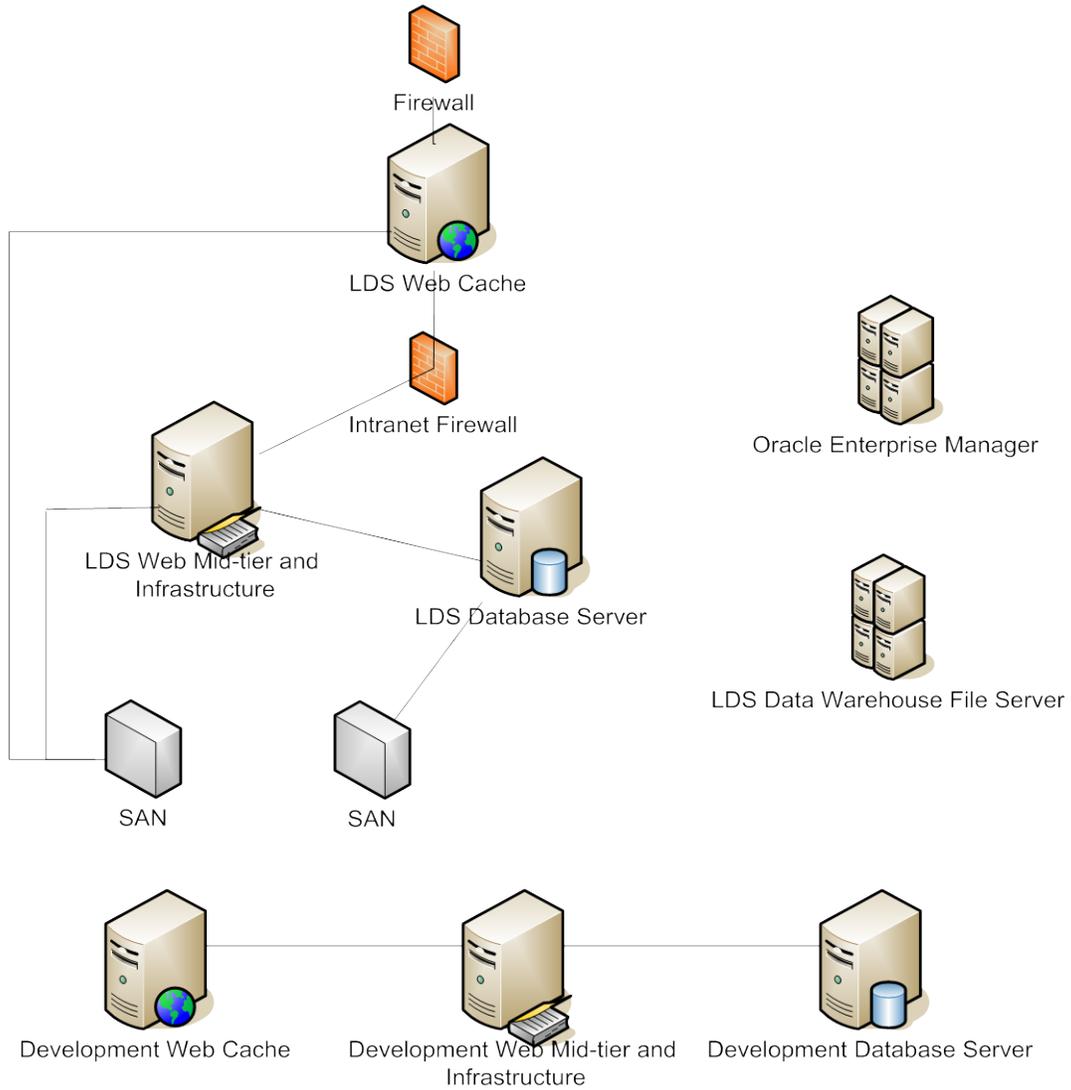
- 5.1 Upgrade of the Wisconsin LDS production environment
- 5.2 Upgrade Quality Assurance environment

Below is a Gantt chart depicting timelines with regard to staffing requirements. This chart can also be found in Appendix A, Attachment 4. Please note that the timeline does not include the in-kind contributions of DPI staff, but rather delineates the staff time included in this request specifically.

Gantt Chart & Staffing Requirements												
<i>Developing a Longitudinal Data System to Support 21st Century Learning in Wisconsin</i>												
			Jul-09	Oct-09	Jan-10	Apr-10	Jul-10	Oct-10	Jan-11	Apr-11	Jul-11	Jul-12
			Year 1				Year 2				Year 3	Year 4
DPI Objective	WBS ID	PROJECT DELIVERABLE	01	02	03	04	05	06	07	08		
	2.0	Build Detail Student Level Datasets										
3	2.2	Build ACT Data Sets	2.0									
4	2.3	Build VEERS Data Sets		2.0								
1	1.0	Build Comprehensive Educational Portal	4.0	4.0	4.0	4.0	Live					
		Implement Wisconsin Education Portal					2.0					
5	3.0	Build Next Generation Analysis and Reporting			2.0	2.0	2.0	2.0				
1-5	4.1	Upgrade LDS Production Environment				Live						
2	2.1	Build Class Completion Data Collection (6-12)										
	2.1.1	Enhance Student Level Collection					1.0	3.5	3.5	3.5	Live	
	2.1.2	Incorporate Class Data into LDS									1.0	
1-5	4.2	Upgrade LDS QA Environment						Live				
1-5	5.0	Evaluate & Enhance							3.0	3.0	3.0	3.0
		Professional Development - User Training						1.0	1.0	1.0	1.0	0.5
		IT Staff Required	4.0	4.0	4.0	4.0	3.0	4.5	5.5	5.5	3.0	2.5
		Project Lead Required	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
		OEA Staff (Educational Consultant)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		Total Staffing Requirements	6.0	6.0	6.0	6.0	5.0	6.5	7.5	7.5	5.0	3.5

APPENDIX A, Attachment 1
Current Production Architecture

LDS Server Environment



APPENDIX A, Attachment 3
Proposed LDS Work Breakdown Structure

The work breakdown structure, or WBS, is a outcome-oriented decomposition of a project. It defines the project outputs or deliverables. The main objective of the WBS is to create a common understanding of project scope and what work will be done. The work breakdown is hierarchical with each lower level providing further breakdown of the higher level. No sequencing or scheduling is implied, however the WBS is a key input to schedule development.

1. Create a Comprehensive Education Portal & Data Repository (see Project Objective 1)

- 1.1. DPI Portal and Public Presence
- 1.2. Aggregate Datasets and Public Reports (migrate WINSS to LDS)
- 1.3. EdFacts data sets
- 1.4. Publish Promising Practices to support 21st Century Skills
- 1.5. User training & communication

2. Develop Detailed Student Level Datasets (see Project Objective 2, 3, and 4)

2.1. Data Collection & Reporting for Course Completion Data (Grades 6 – 12)

2.1.1. Enhanced Student Level Data Collection

- 2.1.1.1. On-line data collection for course completion
- 2.1.1.2. File upload for course completion
- 2.1.1.3. On-line reports to monitor data quality & collection progress
- 2.1.1.4. User documentation
- 2.1.1.5. User training & communication

2.1.2. Course Completion Data in LDS for reporting

- 2.1.2.1. Data model for course completion data
- 2.1.2.2. ETL (extract, transformation, load) for course data from new data collection to LDS database
- 2.1.2.3. Cubes and summary data sets for course data
- 2.1.2.4. Federal reporting

2.1.3. ACT College Admissions Tests

- 2.1.3.1. 2005 ACT Student Level Data Set
- 2.1.3.2. 2006 ACT Student Level Data Set
- 2.1.3.3. 2007 ACT Student Level Data Set
- 2.1.3.4. 2008 ACT Student Level Data Set
- 2.1.3.5. 2009 ACT Student Level Data Set
- 2.1.3.6. ACT Longitudinal Data Cube

2.1.4. Vocational Education Enrollment Reporting System (VEERS)

- 2.1.4.1. 2005 VEERS Student Level Data Set
- 2.1.4.2. 2006 VEERS Student Level Data Set
- 2.1.4.3. 2007 VEERS Student Level Data Set

APPENDIX A, Attachment 3
Proposed LDS Work Breakdown Structure

- 2.1.4.4. 2008 VEERS Student Level Data Set
 - 2.1.4.5. 2009 VEERS Student Level Data Set
 - 2.1.4.6. VEERS Longitudinal Data Cube
 - 2.1.4.7. Federal reporting
3. Next Generation Analysis and Reporting Tools (see Project Objective 5)
- 3.1. Wisconsin Longitudinal Achievement Trends Report
 - 3.2. One-click School Performance Report
 - 3.3. Longitudinal Data Sets
 - 3.4. Data Downloads (enable school districts to download LDS datasets in a secure manner)
 - 3.5. Local Data Supplement
 - 3.6. User training & communication
4. Computer Hardware / Software Upgrades
- 4.1. Upgrade of the Wisconsin LDS production environment
 - 4.2. Upgrade Quality Assurance environment
5. Evaluation & Enhancement

APPENDIX A, Attachment 4
Staffing Requirements

Gantt Chart & Staffing Requirements
Developing a Longitudinal Data System to Support 21st Century Learning in Wisconsin

			Jul-09	Oct-09	Jan-10	Apr-10	Jul-10	Oct-10	Jan-11	Apr-11	Jul-11	Jul-12
			Year 1				Year 2				Year 3	Year 4
DPI Objective	WBS ID	PROJECT DELIVERABLE	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8		
	2.0	Build Detail Student Level Datasets										
3	2.2	Build ACT Data Sets	2.0									
4	2.3	Build VEERS Data Sets		2.0								
1	1.0	Build Comprehensive Educational Portal	4.0	4.0	4.0	4.0	Live					
		Implement Wisconsin Education Portal					2.0					
5	3.0	Build Next Generation Analysis and Reporting			2.0	2.0	2.0	2.0				
1-5	4.1	Upgrade LDS Production Environment				Live						
2	2.1	Build Class Completion Data Collection (6-12)										
	2.1.1	Enhance Student Level Collection					1.0	3.5	3.5	3.5	Live	
	2.1.2	Incorporate Class Data into LDS									1.0	
1-5	4.2	Upgrade LDS QA Environment						Live				
1-5	5.0	Evaluate & Enhance							3.0	3.0	3.0	3.0
		Professional Development - User Training						1.0	1.0	1.0	1.0	0.5
		IT Staff Required	4.0	4.0	4.0	4.0	3.0	4.5	5.5	5.5	3.0	2.5
		Project Lead Required	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
		OEA Staff (Educational Consultant)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		Total Staffing Requirements	6.0	6.0	6.0	6.0	5.0	6.5	7.5	7.5	5.0	3.5

Objective 1: Create a Comprehensive Education Portal & Data Repository

Project Sponsor: Rick Grobschmidt, Assistant State Superintendent/Executive Sponsor of LDS
Resources: 4.0 people for one year (0.5 Business Analyst/Project Lead, 3.0 Developers, 0.5 Education Data Consultant)

Objective 2: Develop Student-Level Data Collection & Data Set-Course Data

Project Sponsor: Michael George, Director of Content & Learning
Resources: 3.5 people for 1+ year (0.5 Project Leader, 3.0 Developers)

Objective 3: Add Student-Level Data Sets-ACT Data

Project Sponsor: Rick Grobschmidt, Assistant State Superintendent/Executive Sponsor of LDS
Resources: 2.0 people for three months (0.5 Business Analyst/Project Lead, 1.0 Developer, 0.5 Educational Consultant)

Objective 4: Add Student-Level Data Sets-VEERS Data

Project Co-Sponsors: Sharon Wendt, Director of Career & Technical Education and Rick Grobschmidt, Assistant State Superintendent/Executive Sponsor of LDS
Resources: 2.0 people for 3 months (0.5 Business Analyst/Project Lead, 1.0 Developer, 0.5 Educational Consultant)

Objective 5: Build Next Generation Analysis and Reporting Tools

Project Co-Sponsors: Rodney Packard, Chief Information Officer
Phil Olsen, Assistant Director, Office of Educational Accountability
Resources: 2.0 people for 12 months (0.5 Business Analyst/Project Lead, 1.0 Developer, 0.5 Educational Consultant)