P-20 Data Warehouse Project
Project Charter
Version 1.5

STATE OF WASHINGTON
## Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Version #</th>
<th>Author</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>04/12/2011</td>
<td>1.0</td>
<td>Chuck F. Shelton</td>
<td>Initial Draft</td>
</tr>
<tr>
<td>4/25/2011</td>
<td>1.1</td>
<td>Chuck F. Shelton</td>
<td>Incorporating Comments from Kelly Ann Landers and Updated Costs spreadsheet using DIS Master Contract rates</td>
</tr>
<tr>
<td>4/27/2011</td>
<td>1.2</td>
<td>Chuck F. Shelton</td>
<td>Incorporating the remainder of Kelly Ann Landers Comments, Updated Costs Spreadsheet, and expanded Roles.</td>
</tr>
<tr>
<td>5/4/2011</td>
<td>1.3</td>
<td>Chuck F. Shelton</td>
<td>Revised Cost Plan and modified one deliverable</td>
</tr>
<tr>
<td>5/10/2011</td>
<td>1.4</td>
<td>Chuck F. Shelton</td>
<td>Revised based upon comments from Dave Pratt (QA)</td>
</tr>
<tr>
<td>5/26/2011</td>
<td>1.5</td>
<td>Chuck F. Shelton</td>
<td>Revised Scope verbiage on page 6 items #4 and #5 along with narrative describing the Budget Estimate on page 27 based on Executive Sponsors’ feedback.</td>
</tr>
</tbody>
</table>
## Contents

Executive Summary ................................................................................................................................................................. 4
  Overview ......................................................................................................................................................................... 4
Background ............................................................................................................................................................................. 4
Purpose ................................................................................................................................................................................... 4
Project Category ...................................................................................................................................................................... 5
Scope ....................................................................................................................................................................................... 6
  Out of Scope ........................................................................................................................................................................ 7
Major Deliverables .............................................................................................................................................................. 7
  Solution Requirements Specification (SRS) Document ................................................................................................... 7
  Proof of Concept (POC) ................................................................................................................................................... 7
  Hardware, Software, and Staffing Acquisitions .............................................................................................................. 7
  Information Hub .............................................................................................................................................................. 7
  Data Warehouse Environments ...................................................................................................................................... 8
Assumptions ........................................................................................................................................................................ 9
Constraints .......................................................................................................................................................................... 9
Goals and Objectives ............................................................................................................................................................. 10
  A. 2007-2009 OFM Strategic Plan ................................................................................................................................. 10
  B. P-20 Program/Project Objectives .............................................................................................................................. 10
    Benefits for the State of Washington ........................................................................................................................... 11
    Benefits for the ERDC (satisfying the grant) ................................................................................................................ 11
How the business will operate after the project is delivered ........................................................................................... 12
Critical Success Factors ..................................................................................................................................................... 12
Risks .................................................................................................................................................................................. 12
Issues ................................................................................................................................................................................. 13
Custom Built ...................................................................................................................................................................... 13
  Benefits ......................................................................................................................................................................... 13
  Risks............................................................................................................................................................................... 13
COTS Solution .................................................................................................................................................................... 13
  Benefits ......................................................................................................................................................................... 13
  Risks............................................................................................................................................................................... 13
P-20 Data Warehouse Project

Transfer Model .................................................................................................................................................................. 14

Benefits ......................................................................................................................................................................... 14

Risks............................................................................................................................................................................... 14

Staging Area (SA) ............................................................................................................................................................... 15

Operational Data Store (ODS) ........................................................................................................................................... 15

Data Warehouse (DW) ...................................................................................................................................................... 15

Data Marts (DM) ............................................................................................................................................................... 16

Business Intelligence (BI) .................................................................................................................................................. 16

Web Portal (WP) ............................................................................................................................................................... 16

Directory Services (DS) ...................................................................................................................................................... 16

Stakeholders ......................................................................................................................................................................... 18

High Level Schedule .............................................................................................................................................................. 19

Start/End Dates ................................................................................................................................................................. 19

Delivery Date of each Major Milestone ............................................................................................................................ 19

Other Major Milestones .................................................................................................................................................... 20

Dependencies on, and interrelationships to, other P-20 projects ........................................................................................ 21

Candidate Resources ............................................................................................................................................................. 22

High Level Roles & Responsibilities of each Resource ...................................................................................................... 22

Advisory Committee.......................................................................................................................................................... 22

Business Intelligence Administrator ................................................................................................................................... 22

Business Intelligence Developer ..................................................................................................................................... 22

Business Owners ............................................................................................................................................................. 22

Business Analyst ............................................................................................................................................................ 22

Chief Information Officer ............................................................................................................................................... 22

Data Modeler ................................................................................................................................................................ 22

Database Administrator ................................................................................................................................................ 22

Enterprise Architect ...................................................................................................................................................... 23

ETL Administrator .......................................................................................................................................................... 23

Executive Sponsors ...................................................................................................................................................... 23

Executive Steering Committee ........................................................................................................................................ 23

IV&V Analyst ................................................................................................................................................................. 23

Management & Oversight of Strategic Technologies (MOSTD) Consultant ................................................................. 23
P-20 Data Warehouse Project

Product Consultant ....................................................................................................................................................... 23
Portfolio Manager ......................................................................................................................................................... 24
Program Manager ......................................................................................................................................................... 24
Project Director ............................................................................................................................................................. 24
Project Manager ............................................................................................................................................................ 24
Project Sponsor ............................................................................................................................................................. 24
Quality Assurance Advisor ............................................................................................................................................ 24
Requirements Analyst ................................................................................................................................................... 24
Subject Matter Experts ................................................................................................................................................. 24
Security Analyst ............................................................................................................................................................. 25
Tester ............................................................................................................................................................................ 25
Web Portal Administrator ............................................................................................................................................. 25
Anticipated in-house or Contract .................................................................................................................................. 25
Initial Project Size Estimate ................................................................................................................................................... 26
Cost/Budget Estimate ........................................................................................................................................................... 27
Project Authorization ............................................................................................................................................................ 28
Project Manager Authorization ............................................................................................................................................ 28
Project Charter Acceptance .................................................................................................................................................. 29
This document will serve as the official agreement among a project manager and executive sponsors. When agreed to and signed by the appropriate individuals, this document authorizes the project by naming the project manager and specifying their level of authority.

Executive Summary

Overview
The purpose of the Evergreen State P-20 Data Warehouse is the construction of a structured P-20 data environment that will include a data inventory spanning systems, the development of a P-20 data dictionary, and the implementation of a data warehouse with a variety of data marts designed to support research and reporting. The goal is to efficiently generate research datasets and summary information and to help ensure data quality.

Background
The U.S. Department of Education’s Institute of Education Sciences under the American Recovery and Reinvestment Act (ARRA) of 2009 awarded Washington State a three (3) -year $17.3 million grant to invest in enhancing the Statewide P-20 longitudinal data system. The resulting P-20 program consists of seven inter-related projects of which the design and implementation of a new P-20 data warehouse is one. While the Education Research Data Center (ERDC) currently collects and reports on P-20 data, the ERDC does not have a data warehouse in place. The other six projects that comprise the P-20 program are intended to enhance data availability from source systems or will provide requirements to the P-20 data warehouse project. Additional information regarding Washington State’s grant application can be found at: http://www.erdc.wa.gov/arraslds2009/application/.

The P-20 program was funded in July 2010. It is a collaborative effort by the Office of Financial Management’s (OFM’s) ERDC, the Office of the Superintendent of Public Instruction (OSPI), the Legislative Evaluation & Accountability Program (LEAP) as well as a variety of other agency partners that provide data to the P-20 data system. A Program office has been put in place to oversee all of the projects funded by the P-20 grant. The Program is lead by a Program Director and a Program Manager and has three executive sponsors consisting of one from OFM’s Forecasting Division, one from OSPI, and one from LEAP. The Program also has an external Quality Assurance (QA) vendor and a Department of Information Services (DIS) oversight consultant. The Program is an Information Service’s Board (ISB) Level 3 Program. Policies and Standards for the ISB Level 3 projects can be found at http://isb.wa.gov/.

In addition to the P-20 ARRA grant, Washington State has received federal funding for a parallel data system for a K-12 longitudinal data system. The K-12 project is managed by the Office of the Superintendent of Public Instruction (OSPI) and focuses on longitudinal data within the K-12 sector. It is envisioned that the P-20 data warehouse will “contain a sub-set” of the K-12 data and will be utilized to answer questions that span sectors i.e., outcomes from preschool to college or high school to workforce. The P-20 data warehouse project team will work closely with the OSPI K-12 project to capitalize on synergies and maximize useful data in the P-20 data warehouse.

Purpose
The P-20 Data Warehouse project intends to plan, design, construct and implement a structured P-20 data warehouse environment that will include a data inventory spanning educational data from pre-school through post secondary and workforce outcomes. In production, the data warehouse will support research and reporting activities of the ERDC with the goal of automating the collection of data from many sources and efficiently generating research datasets and summary information.
At the end of the three (3) year grant period, it is intended that the data warehouse will contain valuable, usable data from the following sources:

- Office of the Superintendent of Public Schools (OSPI);
- Department of Early Learning (DEL);
- State Board for Community and Technical Colleges (SBCTC);
- Higher Education Coordination Board (HECB);
- Employment Security Division (ESD);
- Workforce Training and Education Coordinating Board (WTECB);
- Labor and Industries (LNI);
- Department of Retirement Systems (DRS); and
- Education Research and Data Center (ERDC).

There are numerous additional sources and types of data that could advance the State's capabilities for P-20 research and, as such, the ERDC intends to continue to expand both data sources and types of data available in the warehouse over time. It’s critical that the data warehousing approach proposed in the Study preserves the State's flexibility to continue to enhance P-20 research and reporting capabilities beyond the initial implementation. The ability to preserve data quality and ease of maintenance are also critical success factors for the data warehouse implementation.

ERDC intends to utilize the data warehouse to provide research products, data sets, briefs, and dashboards to a vast and diverse stakeholder group including researchers, legislators, the education sector, and the public at large. ERDC has been working with their stakeholder group to define the expected uses of data from the data warehouse. Additional information on the questions that the ERDC hopes to answer using the P-20 data warehouse can be found at: http://www.erdc.wa.gov/questions/. ERDC expects that the Evergreen State P-20 Data Warehouse Implementation Study Contractor will need time in their work plan to work with ERDC staff to clarify and comprehend the scope of intended data usage.

**Project Category**

The P-20 Data Warehouse Project is categorized as a new development project.
The scope for the **P-20 Data Warehouse Project** is:

1. To deliver a centralized collection of linked educational information spanning the P-20 sectors, capable of: supporting analysis; providing meaningful reports; collaborating on education research; and sharing of data.
2. The data warehouse will contain data from the following sectors:
   a. Preschool (DEL)
   b. K-12 (OSPI)
   c. Higher Education (SBCTC, PCHEES, National Student Clearing House, and HECB)
   d. Workforce Data (ESD)
3. Additional candidate data sources have been identified for inclusion in the P-20 Data Warehouse. These data sources are not assumed to be required integrations for completion of the State’s obligations under the grant. If, upon further investigation, it is found that integrating these sources is possible within the resources and budget allotted for the grant, then the program will consider expanding the P-20 data warehousing project scope to include the integration of these data sources.
4. The P-20 data warehouse project will produce a number of standardized or ‘canned’ reports including some of those identified in the Research and Reporting project.
5. The P20 Data Warehouse will provide the ability for users to obtain data effectively and efficiently based on their needs.
6. The data warehouse environment will be designed to prevent unauthorized access to sensitive information such as personal identification information (PII), social security numbers (SSN), and other information as designated by the State of Washington, and in compliance with State and Federal rules, regulations and standards.
P-20 Data Warehouse Project

Out of Scope

1. Integration with data sources beyond those defined as ‘in scope’
2. Replacement of existing systems providing input to the P-20 data warehouse.
3. Enhancements to source systems that will feed data to the data warehouse.
4. Answering questions that do not require information from at least two P-20 sectors, or that do not address questions of a longitudinal nature.

Major Deliverables

Solution Requirements Specification (SRS) Document
A Solution Requirements Specification (SRS) documents the purpose and environment of the proposed solution. The SRS describes the business problems that the solution is expected to address, what the solution is expected to do and how it will interact with the users. The SRS also includes relevant assumptions, dependencies, risks and design constraints that provide context or guidance for the developers. The SRS defines how an application will interact with system hardware, other applications and human users in the expected range of real-world situations.

The SRS serves four purposes:
1. It provides feedback to the sponsors and business owners.
2. It decomposes the problem into component parts.
3. It serves as an input to the design specification.
4. It serves as a product validation check.

Proof of Concept (POC)
A proof of concept may be developed to prove the effectiveness and viability of the system architecture and may include a subset of the data warehouse tables, as well as functioning ETL, BI and Web Portal components. The database will contain a subset of data needed to demonstrate the functionality of the solution and will include a multi-dimensional cube and at least one report, generated from the cube and displayed on a simple dashboard. The POC will not be throw away, and will serve as training and learning environment for the project. The POC will be built upon existing State capabilities and using State staff, unless the system implementation does not call for internal development, in which case contracted services will provide the POC.

Hardware, Software, and Staffing Acquisitions
These acquisitions will provide resources necessary to implement the data warehouse, and will be dependent upon the implementation strategy used.

Information Hub
A core component of the data warehouse environment is an information hub that is used to capture, transform and load data across the many areas of the data warehouse, from staging area to operational data stores, to the multi-dimensional tables of the data warehouse, to data marts, and into the business intelligence front end. It allows for the automation of the data transformation and movements and provides data management at the metadata layer.
Information Hub

The information hub is a combination of two data warehousing tools managed at the metadata layer. The ETL tool is used for large data transfers and where complex transformations are required. The SOA tool is used to communicate message sized data in near real time. Metadata is shared within the ETL tool metadata manager.

Data Warehouse Environments

*Data warehouse solutions usually consist of three environments:*

1. **DEV** – the development environment that resembles the production environment in terms of components and uses data samples that are not production data. It supports new development and training.

2. **TEST** – the test environment closely resembles the production environment, but only uses a representative amount of production data, and must have the same security as the production environment.

3. **PROD** – the production environment will be designed to prevent unauthorized access to sensitive information and shall be off limits to developers, operations and maintenance personnel, except during periods where there is an expressed need for their intervention, and only through approved requests through the HELP DESK. This environment exists to service the authorized users of the system and provides varying levels of access, based upon an intricate role based security implementation with single sign on capabilities.

All changes, modifications and fixes to the data warehouse will follow a formal promotion process that begins in the DEV environment and is promoted to TEST and finally to PROD.

Once the P-20 Data Warehouse environments are built and initial data loads and data quality checks are complete, a series of focused mini projects will begin. Each is designed to build upon the work of the previous iteration. These focused mini projects can run in parallel and do not have to complete before the next one begins. Each of these phased iterations will begin with a review the work done to date and concentrate of a focus area (e.g. Students, Educators, Programs, Finance) with linkages across sectors (Early Learning, K-12, Higher Education, and Workforce).
Assumptions

1. The P-20 Data Warehouse will meet the requirements set forth in the Department of Education, P-20 Grant for reimbursement of expenditures.
2. The P-20 Data Warehouse shall be operational and in production no later than June 30th, 2013.
3. The P-20 Data Warehouse shall meet the longitudinal data needs of its Sponsors and Stakeholders.
4. The implementation strategy for the P-20 Data Warehouse will be dependent upon the findings and recommendation of an independent implementation study.
5. The P-20 Data Warehouse shall use industry best practices to achieve its goals and outcomes.
6. The P-20 Data Warehouse is not a Critical State of Washington Application.
7. The P-20 Data Warehouse shall be designed to prevent unauthorized access to sensitive information.
8. The P-20 Data Warehouse shall be a traditional data warehouse with the following typical data warehouse components: Staging Area (SA), Operational Data Store (ODS), Data Warehouse (DW), and Data Marts (DM), if implemented internally as a custom built solution.
9. The Presentation Layer of the P-20 Data Warehouse may consist of a Business Intelligence capability that is accessed through a web portal using Role Based Security.
10. The P-20 Data Warehouse shall contain personal identity information, social security numbers and other information necessary to uniquely identify individuals in support of implementing a unique identifier that will allow an individual to be tracked across all sectors from early learning to the workforce.
11. The P-20 Data Warehouse shall not contain health information that would subject the data warehouse to HIPAA compliance.
12. The P-20 Data Warehouse will consist of three separate operating environments. The three environments shall be: DEV – the development environment; TEST – the test/quality assurance environment; and PROD – the production environment.
13. All requests for access to P-20 data shall be approved by the P-20 Program Director.

Constraints

1. Time: The project timeline to complete by 6/30/2013 is very aggressive.
2. Time: The results of the Implementation Study may impact the project timeline as it will identify the means by which the data warehouse will be implemented.
3. Scope: Limited to the implementation of a longitudinal data system, as described by the P-20 Grant
4. Scope: Extended to meet the needs of the project sponsors and stakeholders.
5. Cost: Limited to funds provided through the P-20 Grant
6. Schedule: Dependencies on other active P-20 projects.
7. Schedule: Dependencies on the State of Readiness of internal State staff, if implemented internally.
8. Resources: Shall come from State staff wherever and whenever practical
9. Resources: Data services are being consolidated at the new DIS data center and that process will place a greater burden on key State staffs, which are already over allocated.
10. Resources: No formal ETL capabilities are in place today (Information Hub)
11. Organizational Issues: State legislation has proposed a consolidated Department of Enterprise Services (D.E.S.), which is slated to go into effect on 7/1/2011.
12. Application and Data Security: FERPA compliance is still being developed and not well understood.
Goals and Objectives
This project helps the Office of Financial Management (OFM), meet the following strategic goals and objectives:

A. 2007-2009 OFM Strategic Plan

Goal 3 – Provide information that is accessible, consistent, objective, timely, and accurate to State agencies, the Legislature and the people of Washington.

Objective 3.2: Reduce the inconsistencies within data definitions across OFM systems.

Objective 3.5: Make it easier for a wide range of users to obtain accurate and consistent OFM data to support analysis and decision-making.

Strategy 3.5.1: Enhance OFM data availability via the internet.

Strategy 3.5.2: Establish the use of standard data access tools/protocols for OFM staff and other users.

B. P-20 Program/Project Objectives

1. Delivery of a structured P-20 data warehouse environment that will include:
   a. A data inventory spanning systems and sectors (Early Learning, K-12, Higher Education, and Workforce),
   b. A P-20 data dictionary, and
   c. The implementation of a data warehouse with a variety of data marts designed to support research and reporting,
   d. May include the implementation of a data warehouse interface layer including a business intelligence tool and web portal,
   e. A secure environment that protects the confidentiality of sensitive information from unintentional access.

2. Provide the ability to exchange data between the P-20 Data Warehouse and contributing data systems.

3. Provide linkage of data from preschool, K12, higher education and workforce sources within the data warehouse.

4. Provide the ability to examine student progress over time and across sectors.

5. Facilitate and enable the exchange of P20 data

6. Improve data quality within the data warehouse so that it becomes the sole system of truth for P-20 information, for the State of Washington.

7. Provide unique ID’s for Students and Teachers that are at a higher level of abstraction than those used within sectors.

8. Incorporate enrollment, demographic and program information across all sectors, as it becomes available.

9. Incorporate exit, transfer, drop-out, and completions information across all sectors, as it becomes available.

10. Provide auditability of data.

11. Incorporate selected student transcript information into the P-20 data warehouse.

12. Incorporate college readiness scores into the P-20 data warehouse.

13. Provide the ability to track students as they transition to post-secondary education (including required pre-college courses).

14. Incorporate other information, as needed to support the P20 program.

15. Support the research on educational outcomes of program participants.

16. Incorporate employment data into the P-20 data warehouse.

17. Provide the design and delivery of key performance indicators (KPI), dimensions, and measures.

18. Establish processes and procedures for management of the data warehouse.
P-20 Data Warehouse Project

Benefits for the State of Washington
The new P-20 data warehouse will provide the ability to link P-20 data across all education sectors and into the workforce. This will allow the tracking of students throughout their journey through the education pipeline, out into the workforce and back into the education pipeline. It will provide a similar capability for following teachers, as they progress through their careers, and follow them when they leave and return, and capture their pursuit of more degrees and certifications. It will provide greater insight into the performance of educational environment of the State of Washington and its ability to meet the needs of its student, teachers, supporters, and interested parties.

Benefits for the ERDC (satisfying the grant)
The P-20 Data Warehouse solution will be structured and implemented to meet the requirements of the P-20 Grant and to provide a foundation that will empower the State to participate in other P-20 related grants and programs. By effectively linking P-20 data and providing a business intelligence front end, we will have provided research and reporting capabilities far greater than those required in the grant and with far greater flexibility for future enhancements and evolution of the data warehouse, in support of the business. The creation of an Information Hub will automate and improve the ability to share and cleanse P-20 data and will improve data quality throughout the system with automated processes that enforce business rules consistently. By providing a web portal capability, the intent of the grant to provide transparency and public access can be met and with secure environments and role based security, we will be better positioned to comply with standards such as FERPA, PII and the Red Flag Laws. By using State staff and facilities to the greatest extent practical, the training and services implemented through the data warehouse project will strengthen State capabilities; reduce implementation risks, and lower costs. Business Intelligence will allow researchers to use cubes to define data sets in a fraction of the time it takes today, and will enable them to inspect the resulting data before extracting it use in tools such as SAS or Excel. The processes, standards and improved data can be used to improve the quality of subsequent development projects and as the data warehouse evolves, it may subsume some source systems as a more efficient solution.
How the business will operate after the project is delivered
A data warehouse, by its very nature, is never complete and changes with the needs of the business. It becomes a core enterprise asset and platform for information management, research and reporting. This requires long-term business and IT involvement, management, and oversight.

Following the implementation of the P-20 Data Warehouse solution, there needs to be a joint organization, comprised of business and IT owners, who will oversee ongoing operations.

The ERDC will continue to perform their duties as usual. How they perform those duties, will be affected by the implementation of extended capabilities around the new P-20 Data Warehouse environment (e.g. instead of performing manual linking of data from disparate data sources, they will be able to pull the linked information directly from the data warehouse).

In terms of State P-20 projects, it is expected that the majority of other States will benefit from the accomplishments of our P-20 Data Warehouse and our best practices and lessons learned. This may require staff to carry the message of our success to State and federal forums.

Critical Success Factors
Critical success factors essential for achieving successful P-20 Data Warehouse implementation include:

- Business vision that is agreed upon by the executive sponsors
- Stakeholder consensus around data ownership, data exchange, data usage, and data sharing
- Management support in addressing project risks and issues
- Identification and assignment of dedicated resources with an emphasis on use of existing OFM staff
- Management plan that instills confidence that the project can be delivered successfully
- Prioritized action items that are consistent with the management plan
- Infrastructure support for the implementation, operation and management of the project environments
- Monitoring results
- Feedback mechanism

Risks
Project risks will be identified, rated, prioritized and maintained in a risk register. Risk will be address through a program that uses risk avoidance, risk transference, risk sharing, and risk mitigation as some of its tools for dealing with risks. Project risks are already being identified, such as the following:

- Data center and organizational consolidation during the life of the project
- Limited availability of key IT staff, such as database administrators.
- Lack of a formal Information Hub and the skilled staff to support it.
- Scope Creep – executive visioning continues to expand the scope of the project.
- The Implementation Study may recommend a strategy that would require major changes that may affect when, where, and how the project will be implemented.
- The Federal Government may decide to withdraw funding from the grant at its convenience. While not imminent, it is always a possibility.
- There is no funding in place to continue the operations and evolution of the data warehouse following its implementation.
- The schedule is extremely tight for this project with no slippage to address delays or disruptions.
- Reliance on existing State staff may require additional training which might not occur in step with their scheduled utilization on the project.
• Outside consultants may be needed to fill skill gaps and that would increase project costs and require acquisitions that might add delays to the schedule.
• State austerity measures may affect staffing levels and availability (furlough days and reductions).
• There is no formal ETL capability within State today and this is a key technology for the data warehouse.
• FERPA standards must be met, but are still being developed and qualified, as are Red Flag Laws (identity theft).
• State has only one security CISSIP (Certified Information Systems Security Professional) essential to ensure the security compliance of the data warehouse environment.

**Issues**
Issues will be identified and captured using SharePoint. Issues are not risks, but may become risks if not addressed and managed.

**Approach**
Following an initial requirements gathering process, a third party Implementation Study Team will be brought in to analyze the requirements and recommend an implementation approach. Three possible solutions might be: Custom Built, COTS solution; or Transfer Models (a series of linked COTS products that generate the solution set based upon input and business rules).

**Custom Built**

**Benefits**

• Customized to meet all of the needs of the State of Washington
• Leverages existing State Resources
• Knowledge is learned and retained by State Resources
• New technical capabilities can be leveraged across all State IT solution
• Training will benefit State Resources that can be leveraged to train others.
• All State data is retained and managed by the State

**Risks**

• Higher Risk than proven COTS solutions exist

**COTS Solution**

**Benefits**

• Risk of compliance transfers to the Vendor
• Risk of operational functionality transfers to the Vendor
• Usually faster to deliver
• Usually cheaper to implement
• Usually requires only minimal (less than 40% of the code base) customization

**Risks**

• May not fit the business requirements
• Customization may exceed modification to 40% of the code base (more costly than custom).
• System may not be designed to meet non-functional requirements (costly to operate and maintain)
Requires training across the solution set by staff that may not have knowledge about how and why the system is built the way it is and its internal interdependencies.

Transfer Model

Benefits

- Use COTS tools to generate the Data Warehouse solution
- Faster delivery of the solution
- Use industry standards and best practices
- Can generate everything from the databases to the cubes and dashboards

Risks

- Generic by nature (like code generators)
- Performance is not the primary goal
- Changes may require a new generation of the solution
- Rules used by the generators may not conform to the business needs
- Depend on well defined source systems with high data quality
- Requires training across the solution set by staff that may not have knowledge about how and why the system is built the way it is and its internal interdependencies.

A traditional data warehouse solution is depicted below, with a staging area, operational data store, multi-dimensional data warehouse, data marts, and with a front end that consists of a business intelligence capability and web portal that are accessed through role based security.
**Staging Area (SA)**
This is an intermediate storage area where original input data files are received and stored in their original or near original format, for loading into the operational data store. Once data is loaded into the ODS, the original source file is archived, so that it may be recalled for future reference and to optimize storage used for staging. The SA is used when data is pushed to the DW.

**Operational Data Store (ODS)**
The ODS is a database designed to integrate data from multiple sources for additional operations on the data. The data is then passed back to operational systems for further operations and to the data warehouse for reporting. Because the data originates from multiple sources, the integration often involves cleaning, resolving redundancy and checking against business rules for integrity. An ODS is usually designed to contain low-level or atomic (indivisible) data (such as transactions and prices) with limited history that is captured "real time" or "near real time" as opposed to the much greater volumes of data stored in the data warehouse generally on a less-frequent basis. The ODS is used to improve the quality of data within a DW and is designed to accept data that pulled into the ODS by an information hub (ETL & SOA).

**Data Warehouse (DW)**
Data from the ODS is extracted, transformed and loaded into the multi-dimensional structures of the data warehouse. The DW is where we form dimension tables (e.g. Time, Location, Organization, Demographics, Ethnicity, Facility, Budget, Costs, ...) and fact tables that contain denormalized structures (tables) that let you walk the dimensions down to the facts you want to measure (e.g. student test scores, student assessment scores, teacher certifications, # of students in a class,...). Fact tables usually form the center of a group of dimension table in a design that looks like a star.
Data Marts (DM)
Data from the DW, and sometimes from the ODS as well, are extracted, transformed and loaded into data marts. Data marts are designed to support a business function, business area, or specialized usage and reporting of information to the users of the data warehouse. Data within data marts are used for information sharing, reporting, research, data mining, and to present the data in a specific way. They are often used to feed data into Business Intelligence and Reporting tools.

Business Intelligence (BI)
Business Intelligence tools are the most efficient way to organize and use the data from a data warehouse. Data is loaded into the BI tool from data marts, although they may also source their data from the DW or the ODS as well, or any combination of these sources. BI tools create multi-dimensional representations of the data, called cubes. This means that the data (measures) is placed at the intersection point of all dimensions. By doing this, it becomes easy to see varying degrees of data aggregation by choosing some or all of the dimensions that point to the data. It is common to be able to create hundreds of reports from a single cube. Since reports from cubes are easier to build and maintain, BI tools have been recognized for their unique ability to speed information research and reporting times, while reducing the costs and complexity of more traditional methods. BI tools can be used to minimize the time to ROI (Return on Investment).

Web Portal (WP)
Web Portals may be used to form the presentation layer for the business intelligence tools. Most BI tools integrate with popular web portal products, out of the box.

Directory Services (DS)
Directory Services is the software system that stores, organizes and provides access to information in a directory. They can also keep track of all users that are allowed access to data. By organizing users of data into groups, based upon the data they use and their access rights to that data, the DS can provide role based secure access to data. With this information, the DS can also provide single sign on (SSO) capabilities, so that users of the DW will only have to log in once.
The implementation approach will determine how the P-20 DW will be delivered.

Building a custom data warehouse may be accomplished in phases. While design efforts continue, a Proof of Concept (POS) may be created to demonstrate the capabilities of the DW, using a very small sample of data that is easily defined, controlled and of value to the organization. It will be loaded into a subset of DW tables, and will use all of the DW tools. A POC is intended to demonstrate the movement of data across the entire DW environment, all the way to a simple dashboard with one cube and a handful of reports (generated from that one cube). It may then make this information available through a web portal and will serve as a demonstration and training platform for the DW. This will prove the viability and usefulness of the DW architecture. Intended POS should be designed such that the information and reporting capabilities of the POC will not be throwaway, and will continue to exist and be part of the final solution.

Once the DW definition, design and model are complete, implementation may begin by building out the core system capabilities. This will be followed by a series of spirals (small projects – divide and conquer) that will concentrate on major subject areas of the DW (e.g. Students, Educators, Programs, Early Learning, K-12, Higher Education, and Workforce). Each spiral will build upon the core DW and the spirals that precede it. Spirals may run in parallel and do not have to complete before starting another spiral. This phased approach to implementing the DW will allow us to limit our risks and scope (not a big bang approach where you don’t know what you have until you are done), while providing repeated opportunities to validate the quality and security of the DW. It also provides greater user participation in the development; assessment and testing of the DW, throughout each phase or spiral.

In most data warehouses, data enters by being placed into the Staging Area. The Extract, Transform and Load (ETL) tool transforms the data from the staging area, and moves it into the Operational Data Store. The ETL tool then performs additional data transformations on data in the ODS, before loading it into the Data Warehouse (DW). Finally, the ETL tool transforms DW data and loads it into the Data Marts (DM), where it feeds Business Intelligence (BI) and reporting tools. There is a managed movement of data, from left to right (see image above), through the data warehouse that is defined and controlled at the metadata (information about the data) layer of the ETL tool.
Stakeholders
Internal stakeholders include the following:

Executive Sponsors:
- Marc Baldwin (OFM)
- Bob Butts (OSPI)
- Tom Jensen (LEAP)

P-20 Program Steering Committee:
- Marc Baldwin (OFM)
- Bob Butts (OSPI)
- Tom Jensen (LEAP)
- Jim Schmidt (OFM)
- Lynne McGuire (OFM)
- Bill Huennekens (OSPI)
- Glenn Briskin (Briskin Consulting)
- Connie Michener (DIS)

P-20 Program Guidance Committee
- Marc Baldwin (OFM)
- Bob Butts (OSPI)
- Tom Jensen (LEAP)
- Bob Hamilton (DEL)
- Jan Ignash (HECB)
- Kathy Goebel (SBCTC)
- Mike Riley (COP)

P-20 Program Director
- Jim Schmidt (OFM)

P-20 Project Director
- Jim Schmidt (OFM)

P-20 Program Management
- Christina McDougall, Program Manager (Point b)
- Kelly Ann Landers, Deputy Program Manager (OFM)

DIS Oversight
- Connie Michener

Chief Information Officer
- Lynn McGuire

Quality Assurance
- Glenn Briskin
P-20 Data Warehouse Project

High Level Schedule
Below is an example of the implementation timeline that might be used, if implemented internally.

P-20 DATA WAREHOUSE PROPOSED TIMELINE

Start/End Dates
The P-20 Data Warehouse Project is expected to begin in April of 2011 and complete no later than June 30th 2013.

Delivery Date of each Major Milestone
Note: Dates and milestones are subject to change pending the outcome of the Implementation Study scheduled for completion at the end of August.

05/16/2011 – Project Scope and Sizing Document Complete
08/31/2011 – Implementation Study Complete
11/27/2011 – Proof of Concept Complete
12/27/2011 – Hardware, Software, and Staffing Acquisitions Complete
02/11/2012 – Information Hub Complete
03/06/2012 – Data Warehouse Environments Complete
06/25/2012 – Student Spiral Complete
08/23/2012 – National Student Clearing House Integration Complete
11/01/2012 – Educator Spiral Complete
01/05/2013 – Workforce Spiral Complete
05/08/2013 – Financial Spiral Complete
06/30/2013 – P-20 Data Warehouse Complete
**Other Major Milestones**

<table>
<thead>
<tr>
<th>Milestone/Deliverable Description</th>
<th>Milestone/Deliverable</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kickoff meeting</td>
<td>Milestone</td>
<td>TBD</td>
</tr>
<tr>
<td>Project Scope and Sizing Documentation Begins</td>
<td>Milestone</td>
<td>4/25/2011</td>
</tr>
<tr>
<td>Key Questions (Outputs) Definition Document</td>
<td>Deliverable</td>
<td>5/16/2011</td>
</tr>
<tr>
<td>Conceptual Data Model Definition Document</td>
<td>Deliverable</td>
<td>5/16/2011</td>
</tr>
<tr>
<td><strong>Implementation Study Begins</strong></td>
<td>Milestone</td>
<td>5/19/2011</td>
</tr>
<tr>
<td>Implementation (integrated project management plan)</td>
<td>Deliverable</td>
<td>8/31/2011</td>
</tr>
<tr>
<td>Implementation Decision by Executive Sponsors</td>
<td>Deliverable</td>
<td>8/31/2011</td>
</tr>
<tr>
<td><strong>Design Phase Begins</strong></td>
<td>Milestone</td>
<td>9/1/2011</td>
</tr>
<tr>
<td>Logical and Physical Data Model Complete</td>
<td>Deliverable</td>
<td>11/1/2011</td>
</tr>
<tr>
<td><strong>Proof of Concept (POC) Complete</strong></td>
<td>Milestone</td>
<td>12/1/2011</td>
</tr>
<tr>
<td>POC Database Installed and Data Loaded</td>
<td>Deliverable</td>
<td>TBD - Dependent upon Implementation Study</td>
</tr>
<tr>
<td>POC ETL Installed and Operational</td>
<td>Deliverable</td>
<td>TBD</td>
</tr>
<tr>
<td>POC BI Installed and Connected to Web Portal</td>
<td>Deliverable</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>Hardware, Software, and Staffing Acquisitions Complete</strong></td>
<td>Milestone</td>
<td>TBD</td>
</tr>
<tr>
<td>Information Hub Complete</td>
<td>Milestone</td>
<td>TBD</td>
</tr>
<tr>
<td>ETL Implementation with Metadata Manager Integration</td>
<td>Deliverable</td>
<td>TBD</td>
</tr>
<tr>
<td>SOA Implementation with Metadata Manager Integration</td>
<td>Deliverable</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>Data Warehouse Environments Complete</strong></td>
<td>Milestone</td>
<td>TBD</td>
</tr>
<tr>
<td>TEST Environment</td>
<td>Deliverable</td>
<td>TBD</td>
</tr>
<tr>
<td>DEV Environment</td>
<td>Deliverable</td>
<td>TBD</td>
</tr>
<tr>
<td>PROD Environment</td>
<td>Deliverable</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>Student Spiral Complete</strong></td>
<td>Milestone</td>
<td>TBD</td>
</tr>
<tr>
<td>National Student Clearing House Integration Spiral Complete</td>
<td>Milestone</td>
<td>TBD</td>
</tr>
<tr>
<td>Labor Markets (Workforce) Spiral</td>
<td>Milestone</td>
<td>TBD</td>
</tr>
<tr>
<td>Educator Spiral Complete</td>
<td>Milestone</td>
<td>TBD</td>
</tr>
<tr>
<td>Financial Spiral Complete</td>
<td>Milestone</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>Project Completed</strong></td>
<td>Milestone</td>
<td>TBD</td>
</tr>
</tbody>
</table>
Dependencies on, and interrelationships to, other P-20 projects
The P-20 Data Warehouse is dependent upon the successful and on time completion of the other P-20 Program projects, because they are primary data sources. The Data Sharing project provides the Memorandum of Understanding with source systems for the exchange of data into and out of the P-20 Data Warehouse. The Research & Reporting project defines the outputs of the P-20 Data Warehouse and many of the data linkage business rules to be implemented in the Information Hub, and will be a primary user of P-20 Data Warehouse information. PCHEES integrates SBCTC data with Higher Education data and provides greatly improved data quality. The HECB also provides Higher Education data. DEL ECEAP provides Early Learning data. All of these projects provide critical data to the P-20 Data Warehouse.

Delays in these projects or issues with the quality and reliability of data from these systems will negatively impact the P-20 Data Warehouse project.

Interdependencies under the P-20 Program with other P-20 Projects

Other systems also provide data to the P-20 data warehouse. OSPI provides K-12 data. ESD provides workforce data. WTECB provides workforce and training data. HECB provides higher education data. The NCB provides college transcripts and other Higher Education data.

There are other systems that may contribute to, and enrich, the P-20 Data Warehouse, over time.
Candidate Resources

High Level Roles & Responsibilities of each Resource

Advisory Committee
This Committee is responsible for making tactical project decisions to ensure project progress. The Project Manager collaborates with the Committee concerning the project progress and resources, and mid to lower priority issues, risks, and change decisions.

Business Intelligence Administrator
The BI Admin reports to the BI Lead and provides advice on the installation, operations and management of the BI environment required to support the P-20 Data Warehouse. This includes the definition of the BI technical architecture, to include integration with directory services and the web portal. The BI Administrator is responsible for the operation and maintenance of all BI servers in the DW environment, for server patch administration, server backup and recovery, and server disaster recovery. The BI Administrator manages all access privileges of the BI software and its artifacts.

Business Intelligence Developer
The BI developer reports to the BI Lead and provides advice on developing, testing and maintaining all developed BI objects and artifacts, to include cubes, dashboards, reports, extract data sets, and graphic representation of data.

Business Owners
The Business Owners provide business guidance and requirements to the project team and ensuring detailed information is captured on decisions affecting the project and communicates to the project manager and product consultant.

Business Analyst
The business requirements analyst participates in joint application development (JAD) sessions and captures and documents business requirements, and to develops the “AS-IS” context map, value stream map and business process model, along with the root cause analysis and recommendations document.

Chief Information Officer
The CIO is provides advice on all technology decisions that impact the OFM, and the Governor’s Office, or the State. The CIO will make the final decision on technology choices, standards, and policies.

Data Modeler
The Data Modeler provides advice on creating data models to support system design for database creation, modification, and support, and ensuring compliance with data architecture standards. This includes the creation of entity relationship models that enforce business rules through referential constraints, the definition of data domains, subject areas, entity definitions, and mapping of entities to use cases, and dimensions and measures. The data modeler is expected to have a high level of competency in the use of CASE (Computer Aided System Engineering) software tools and understand the DDL constraints and characteristics of databases for which physical models are be generated.

Database Administrator
A database administrator (DBA) provides advice on the design, implementation, maintenance and repair of an organization’s relational database management system (RDMS). The role includes the development and design of database strategies, monitoring and improving database performance and capacity, and planning for future expansion requirements. The DBA is responsible for database tuning, running database utilities, performing
database backup and recovery operations and for recovering the database from failures and disasters. They also plan, co-ordinate and implement security measures to safeguard the data assets of the database.

**Enterprise Architect**
The Enterprise Architect provides advice on architecture standards and makes technology recommendations for the project’s product.

**ETL Administrator**
The ETL (Extract, Transform, and Load) Administrator provides advice on designing, developing, implementing, operating, and maintaining all data exchanges for the data warehouse. This position is also responsible for maintaining the metadata from which all database DDL is generated. The ETL Administrator will work closely with the DBA (Database Administrator) for all changes to the database objects. The ETL Administrator will also work closely with the Security Analyst to ensure that sensitive information is not exposed during ETL processes. The ETL Administrator will also interface with Data Custodians and Data Stewards of systems with which data is exchanged, to resolve issues, (e.g. Timing and frequency of data exchanges, resolution of data rejected during the ETL processes.)

**Executive Sponsors**
The Executive Sponsors represent the business processes addressed by the project and are ultimately accountable for the project’s success. The Executive Sponsors have budget authority over the project, and are willing to mandate business process alignment within the program and/or Agency where necessary.

**Executive Steering Committee**
This Committee, chair by the Executive Sponsor, provides guidance to the sponsor on resolution of policy and/or program related issues brought before it by the Project Manager. The Committee is composed of executive management and other key stakeholders who can address issues that may span multiple programs and functional areas. The Project Manager reports to the Steering Committee and provides information concerning the project progress and resources, and high priority issues, risks, and change decisions needed.

**IV&V Analyst**
The IV&V (Independent Verification and Validation) Analyst is an outside consultant whose purpose is to check that a product, service, or system meets specifications and that it fulfills its intended purpose. The IV&V Analyst will conduct a quality control process that is used to evaluate whether or not a product, service, or system complies with regulations, specifications, or conditions imposed at the start of a development phase. This person will also conduct a quality assurance process of establishing evidence that provides a high degree of assurance that a product, service, or system accomplishes its intended requirements. This often involves acceptance of fitness for purpose with end users and other stakeholders.

**Management & Oversight of Strategic Technologies (MOSTD) Consultant**
The Management & Oversight of Strategic Technologies (MOSTD) Consultant for the Department of Information Services (DIS), participates in Executive Steering Committee meetings, provides project oversight, monitors project progress, attends team meetings, and is the interface with Information Services Board (ISB). They communicate with ISB members, assist the project manager in compliance with State and Information Services Board (ISB) requirements, reviews documentation as needed to provide advice, evaluate project risks, help develop solutions and mitigation strategies, and provide additional project management expertise.

**Product Consultant**
The responsibility of the Product Consultant is to work with the Business Owners to ensure the product meets policy and business requirements. The Product Consultant will be the end-user advocate and educator, and requirements analyst and owner.
P-20 Data Warehouse Project

Portfolio Manager
The Portfolio Manager understands the overall business needs in systems management, as well as, projects. They provide advice on their respective business units and coordinate application development and support. The Portfolio Manager works closely with business unit leaders to identify how technology can support strategic business needs. They provide advice for ensuring that systems meet user experience expectations and supporting user education. The Portfolio Manager is a key role and active member of the Advisory Committee. The Portfolio Manager is responsible for ensuring the project is adequately staffed and works closely with Project Manager.

Project Manager

Program Manager
The Program Manager oversees the success of a program, grouping related projects together, to realize organizational benefits not available if they were managed separately. The Program Manager defines projects, assigns project managers, and oversees programs. It is the responsibility of the Program Manager to identify and prevent runaway projects and to address project issues and risks that cannot be resolved within the Program Management Office (PMO), to the Executive Steering Committee. The Program Manager is also responsible for fiscal oversight of projects they manage and are expected to communicate information about project interdependencies to the affected project managers. The Program Manager usually participates in CAB (Change Advisory Board) and TAB (Technical Advisory Board) meetings that affect their projects.

Project Director
This position is the lead technical administrator and business manager for the P-20-Workforce statewide longitudinal education data warehouse. This person serves as lead technical administrator for other information systems maintained by or developed for the Education Research and Data Center (ERDC), including the Public Centralized Higher Education Enrollment System (PCHEES).

Project Manager
The project manager is the person assigned to achieve the project goals and objectives and to manage a quality project and deliver a product that meets the cost, time, risk, scope, quality expectations and ultimately to the satisfaction of the customer.

Project Sponsor
Represents the Executive Sponsor on a day-to-day basis; makes most of the decisions requiring Sponsor approval except for decisions regarding scope, schedule, or budget.

Quality Assurance Advisor
Quality Assurance Advisor is a neutral, unbiased party to the project, participates in Executive Steering Committee meetings, provides project oversight, monitors project progress, attends team meetings, and assists the project manager in compliance with State and Information Service Board (ISB) requirements. They review documentation as needed to provide advice, evaluate project risks, and help develop solutions and mitigation strategies, and provide additional project management expertise.

Requirements Analyst
The Requirements Analyst is participates in joint application design (JAD) sessions, and to captures and organizes all project functional and non-functional requirements. The requirements analyst is expected to be knowledgeable in all aspects of the business areas whose needs are being addressed and of the IT organization's enterprise architecture and standards.

Subject Matter Experts
The Subject Matter Experts exhibit the highest level of business expertise and skill within the specific business area.
P-20 Data Warehouse Project

**Security Analyst**

**Tester**
The Tester/Modeler provides advice on understanding product requirements, specifications, and design, discovering ambiguities and issue, and develops and executes appropriate test cases that will ensure the quality, capability, usability, and security of the system. The Tester will begin formulating the testing plan during the planning stages of the project and will actively participate in project design, construction, testing, training, and handoff into production.

**Web Portal Administrator**
The Web Portal Administrator will design, develop, operate and manage the P-20 Data Warehouse information portal. Responsibilities include integration of the web portal with the P-20 Data Warehouse business intelligence front end and the active directory services. The web portal administrator will work with the Security Analyst to ensure that all information presented through the web portal meets State and Federal requirements for security, privacy and compliance.

**Anticipated in-house or Contract**
The degree of participation of State staff will be determined by strategy recommended by the Implementation Study. If implemented internally, the intent is to use State staff to the greatest extent practical. This approach will minimize our risks at implementation time, and make the State staff the focus of project training and the overall learning process that will take place during design and implementation. It is far easier to operate and manage an environment you helped to design and build. This also holds true for DIS staff (may end up being the same staff), who will host the environment, and upon whom we will depend, for infrastructure support (e.g. Storage Area Network, Firewalls, Networks, and Data Center Hosting of hardware and software). The real advantage of internal development is that you own the solution at the end of the day and the funding is used internally to strengthen the internal organization and its capabilities.

Even if hosted internally, there may be expertise that is not available, or in such limited supply, that we may have to seek external resources. Presently, there is no formal Information Hub (ETL- Extract Transform & Load and SOA - Service Oriented Architecture tools with a common metadata management layer). DBA’s (database administrators) are critical to a data warehouse and are always in short supply. Uncertainty surrounding the merger of State staff into the DES organization, and staff utilization and availability makes it even more difficult to assess internal readiness to implement the P-20 data warehouse.

Should the implementation be outsourced to a cloud vendor, SaaS (Software as a Service) vendor, or to a third party (e.g. Choice – used by OSPI), then the reliance on internal resources will be greatly diminished. These approaches may provide faster time to completion while reducing up-front costs. They also introduce new opportunities in areas such as data ownership, data privacy, data sharing and security. In addition, they pose greater complexity and costs downstream of the implementation, when changes and improvements are needed. This is an important point since data warehouses are living systems that grow and mature over time and change in support of business. Finally, this approach changes the manner in which funds are appropriated and used and makes ongoing funding an even more pressing issue, if the solution will only be available through continuous funding.
Initial Project Size Estimate

The initial estimate for the P-20 Data Warehouse Project duration is approximately 2 years, with an optional 1 year extension, and project expenditures of approximately $7,067,470.00 ($5,224,770.00 for DW & $1,842,700.00 for data interoperability). The estimated staff hours to complete the project are 33,522. This is based upon implementing the solution at the DIS data center and using State staff whenever practical. Should a different implementation strategy be used, these cost estimates may have to be revised.
Cost/Budget Estimate

The budget reflected below is a high-end estimate based on a customized solution using contracted resources. The budget used to baseline the project will be tied to the solution recommended by the Implementation Study vendor and could be much different than the amount listed below. The Implementation Study is scheduled to conclude on or about August 19, 2011. A revised budget will be submitted at the beginning of September when the P-20 program submits all project budgets for baseline approval to the Executive Sponsors.

### Role/Person/Hours Planned

<table>
<thead>
<tr>
<th>Role/Person/Hours Planned</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Total Hours</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>Hours</td>
<td>%</td>
<td>Hours</td>
<td></td>
</tr>
<tr>
<td>Project Manager</td>
<td>1</td>
<td>704</td>
<td>1</td>
<td>2080</td>
<td>4864</td>
</tr>
<tr>
<td>Sr. BA/RA</td>
<td>1</td>
<td>350</td>
<td>1</td>
<td>1040</td>
<td>1910</td>
</tr>
<tr>
<td>Data Modeler</td>
<td>1</td>
<td>350</td>
<td>1</td>
<td>520</td>
<td>1390</td>
</tr>
<tr>
<td>Tester</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1020</td>
<td>2040</td>
</tr>
<tr>
<td>Implementation Study</td>
<td>1</td>
<td>160</td>
<td>1</td>
<td>804</td>
<td>964</td>
</tr>
<tr>
<td>ETL Administrator</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1020</td>
<td>2040</td>
</tr>
<tr>
<td>ETL Developer</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1020</td>
<td>2040</td>
</tr>
<tr>
<td>SOA Administrator</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1020</td>
</tr>
<tr>
<td>SOA Developer</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1020</td>
</tr>
<tr>
<td>Sr. BI Lead &amp; Administrator</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1020</td>
<td>2080</td>
</tr>
<tr>
<td>BI Developer</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1020</td>
<td>2080</td>
</tr>
<tr>
<td>Web Portal Administrator</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>520</td>
<td>1540</td>
</tr>
<tr>
<td>DBA</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1020</td>
<td>2040</td>
</tr>
<tr>
<td>SAN Admin.</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1020</td>
<td>2040</td>
</tr>
<tr>
<td>Sr. Security Analyst</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1020</td>
<td>2040</td>
</tr>
<tr>
<td>IV&amp;V Analyst</td>
<td>1</td>
<td>324</td>
<td>1</td>
<td>1020</td>
<td>2364</td>
</tr>
<tr>
<td>Interoperability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtotal</td>
<td>1888</td>
<td>14144</td>
<td>17480</td>
<td>33512</td>
<td>$5,224,770.00</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Hourly costs use blended rates from the DIS Master Contract Rate Table

**Note:** Interoperability funding is included in this estimate. How it is applied is dependant, to some extent, upon the recommendation from the Implementation Study.

<table>
<thead>
<tr>
<th>Object</th>
<th>Category</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Salaries and Wages</td>
<td>0</td>
</tr>
<tr>
<td>B</td>
<td>Benefits</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>Professional Services (Install &amp; Train)</td>
<td>$240,000</td>
</tr>
<tr>
<td>E</td>
<td>Goods and Services</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Travel</td>
<td>$9,000.00</td>
</tr>
<tr>
<td>J</td>
<td>Equipment (Hardware &amp; Software)</td>
<td>$1,408,700</td>
</tr>
<tr>
<td>S</td>
<td>Intra-agency Reimbursements</td>
<td>0</td>
</tr>
</tbody>
</table>
### P-20 Data Warehouse Project

<table>
<thead>
<tr>
<th>T</th>
<th>Inter-agency Reimbursements</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indirect Costs</td>
<td>$185,000</td>
</tr>
<tr>
<td></td>
<td>Total Costs</td>
<td>$1,842,700</td>
</tr>
</tbody>
</table>

*Note: This estimate is based on very limited knowledge of details surrounding this project. The estimate will be updated as the project progresses and is elaborated.*

### Project Authorization

Marc Baldwin, Bob Butts, and Tom Jensen, the Executive Sponsors, and Jim Schmidt, the Program Director, endorse this project charter and formally authorize the P-20 Data Warehouse Project to proceed with planning and implementation of the project, as described herein.

*Note: Once this project charter is approved, development of the project management plan will commence, and upon completion, shall be submitted to the Executive Sponsors for signature.*

Included in the project management plan will be an executive summary, project background, vision, goals, outcomes, benefits, scope, project approach, stakeholders, high-level schedule, dependencies on other P20 grant projects, project organization, resources required, cost and budget estimates, assumptions, constraints, high-level risks, impacts and mitigation strategies, and change process.

### Project Manager Authorization

Chuck F. Shelton is hereby authorized to communicate directly with the executive sponsors, executive steering committee, and management as required. In addition, the P-20 Data Warehouse project manager is authorized to negotiate for resources, delegate responsibilities, and assign activities within the framework of the project, and to communicate with and manage all contractors/vendors and stakeholders as required, to ensure the successful completion of the P-20 Data Warehouse Project. Chuck F. Shelton is responsible for developing the project management plans and managing the project schedule, resources, risks, issues, procurement activities, and stakeholders; controlling project costs, project scope, and project/product change; and ensuring clear and timely communications and product quality; and measuring performance and taking corrective action as needed.
P-20 Data Warehouse Project

Project Charter Acceptance
The following signatures indicate approval to proceed with the above-described action for this project.

This charter will be reviewed, communicated, and revised by Jim Schmidt, and Chuck F. Shelton if the scope, goals and objectives, project authorization, or project manager authorization change.

Marc Baldwin
Executive Sponsor – Office of Financial Management,
Associate Director, Forecasting Division
Date:

Bob Butts
Executive Sponsor – Office of Financial Management,
Associate Director, Forecasting Division
Date:

Tom Jensen
Executive Sponsor – Office of Financial Management,
Associate Director, Forecasting Division
Date:

Jim Schmidt
P-20 Program Director – Office of Financial Management,
Education and Research Data Center
Date:

Chuck F. Shelton
Project Manager – P-20 Data Warehouse
Date:

cc: Jim Schmidt, Office of Financial Management, Education and Research Data Center, P-20 Program Director
Lynne McGuire, Office of Financial Management, Chief Information Officer
Megan Pilon, Office of Financial Management, Project Management Office Manager
Dan Cole, Office of Financial Management, Varied Interdepartmental Portfolio, Manager
Christina McDougall, Point b, P-20 Program Manager
Kelly Ann Landers ISD, P-20 Deputy Program Manager
Connie Michener, Department of Information Services, Oversight Consultant
Glenn Briskin, Briskin Consulting, External Quality Assurance
Executive Guidance Committee, P-20 Program