ORIGINAL

EDD398772

State of West Virginia

Department of Education

Statewide Longitudinal Data System

TECHNICAL RESPONSE

CHOICE SOLUTIONS

Respectfully Submitted
10/09/2013 by
Choice Solutions, Inc.

We would like to collaborate on the SLDS project

to develop a comprehensive system that supports West Virginia student achievement and school improvement by providing educators, policy makers, and researchers with quality access to essential data and data-analysis tools.

CHOICE
SOLUTIONS

October 9, 2013

Dear West Virginia Department of Education,

Thank you for the opportunity to respond to your RFQ #EDD398772 to provide the design, development, and implementation of a Statewide Longitudinal Data System for Pre-K through 12th grade (P-12) that provides educators, policy makers, and researchers with access to essential data, data analysis tools, and professional development to support student achievement and school improvement. Choice Solutions has been providing similar services and solutions throughout the country and are certain that we can provide West Virginia with the best value and performance in regards to their P-12 SLDS/DWRS Project.

Choice Solutions is a company with over a decade of history providing technical services and solutions. We have been and are working with a wide variety of organizations, and Education Data Solutions and Services are our major core competencies. Our experience working in the education space as well as with public and private companies has allowed us to develop superior solutions that will assure accuracy and robustness. Our experience with enterprise SLDS education systems and data is unsurpassed within the country. Our prior experience working on both a state level as well as a district level assures that we will provide you with the level of domain and technical expertise that is demanded in all your critical initiatives.

We have every confidence that we can manage both the service and delivery aspects of projects under this initiative and provide you with the knowledge/training to assure future success.

As VP of Business Development, I am authorized to represent Choice in regards to this opportunity. I would like to also assure you that our solution, as well as company, is in compliance with all requirements laid out in your RFQ. Please contact me at (508) 229-0044 or ztussing@choicep20.com to discuss this RFQ, if needed.

Sincerely,

Zachary Tussing, VP

Choice Solutions

REQUEST FOR PROPOSAL

WV SLDS

RFP # EDD398772

West Virginia Department of Education

Title Page

Technical Proposal

RFP Subject	WV SLDS
RFP Number	RFP # EDD398772
Vendor's Name	Choice Solutions, Inc.
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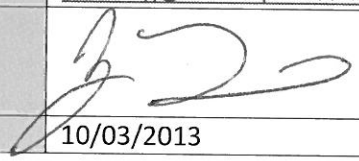
Signature	
Date	10/03/2013

REQUEST FOR PROPOSAL

West Virginia Department of Education
RFP # EDD398772

Table of Contents

REQUEST FOR PROPOSAL

West Virginia Department of Education
RFP # EDD398772

Executive Summary

We are excited to provide an overview of our solution to West Virginia as we feel it aligns perfectly with the vision WVDE has set forth in their 2012 SLDS grant and the RFP for the SLDS project. Our solution, edFusion, is the most complete SLDS solution on the market at to address West Virginia's needs. We would like to collaborate on the SLDS project to develop a comprehensive system that supports West Virginia student achievement and school improvement by providing educators, policy makers, and researchers with quality access to essential data and data-analysis tools.

Choice has spent the last decade working in education and with education leaders to help design, build, and deploy best-in-class solutions which meet your current needs as well as designing to meet those in the future. In our engagements we have led all components of several of the SLDS projects as well as worked as a subcontractor, addressing technology, project management, training and implementation support—unlike most other vendors. Even though SLDS data warehousing solutions are much broader than simple IT initiatives, Choice's expertise and commitment to our client partner's success supports a parallel focus upon technology, project management, security and overall governance issues.

We are the vendor who will be able to successfully partner with West Virginia to provide the comprehensive set of services (Infrastructure and Architecture Development, Hardware Support, Software Development, Network Architecture Services, Technical Support and Integration, Analysis and Reporting, Training, Professional Development, Project Management, and Executive Guidance and Oversight) needed to make your SLDS and DWRS project a success.

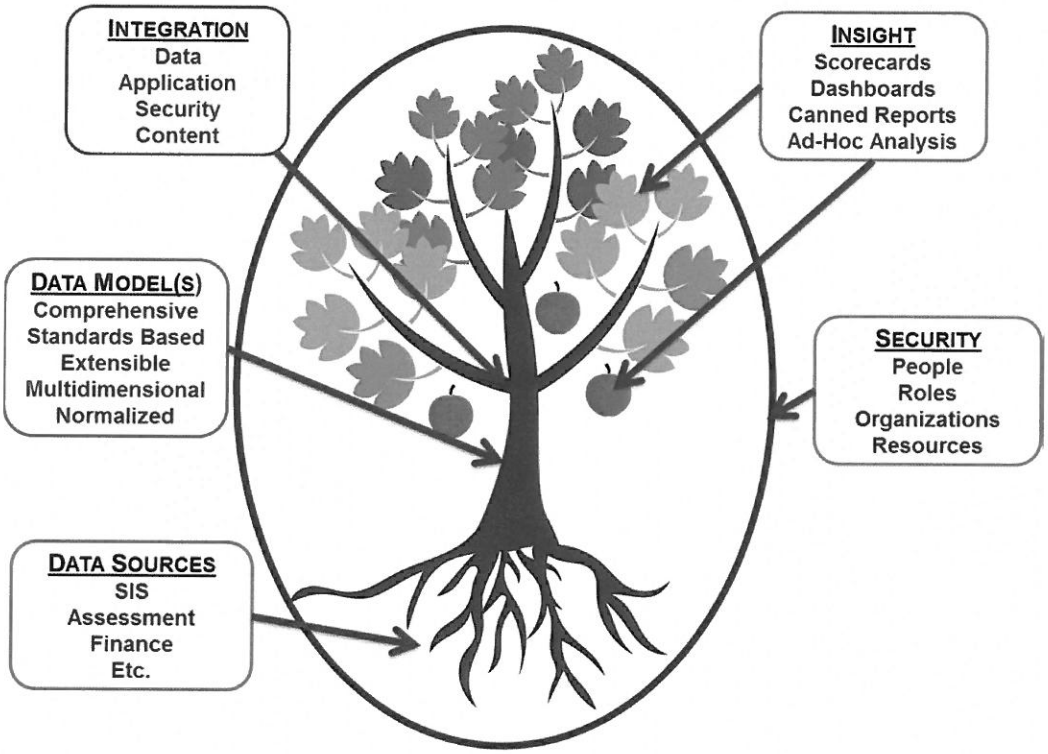
Our Proposed Solution

edFusion is a comprehensive data management and application integration platform connecting people, processes, applications and resources in the education ecosystem securely to transform the data into actionable insights. For this project, we are proposing our edFusion 7 solution, which will be released in October and is currently being implemented in the state of New York. edFusion 7 represents a fundamental evolution of our offering provide richer workflows, reflexive and modern design, a unified CEDS and SIF 3.0 aligned data model, and device independence. We are excited about our upcoming release and know that it will truly benefit West Virginia in the short and long term. There are four key modules that comprise our proposed solution for the West Virginia SLDS Project.

For the West Virginia SLDS solution we will be implementing the following:

- **Foundation:** Set of Data Management Repositories, Master Data Management & Utilities
- **Identify**: Security, Authentication, Authorization, Roles and Identity Matching
- **Integrate**: Integrates Data, Applications, Users and Resources through a Portal Gateway
- **Insight**: Enterprise Education Intelligence Suite of tools to support Reporting, Analysis on Demand, Scorecards and Dashboards

edFusion Conceptually



A successful edFusion data warehouse is analogous to a tree:

- the **ETLs and Web Services (including SIF)** are ***the roots*** that pull data into the system,
- the **data model** is ***the trunk***—just as the trunk of a tree contains xylem and phloem that help move nutrition through the tree, the data model's underlying structures help move the data to where it needs to go
- the **integration and the data marts** are ***the branches*** that partition information in a usable fashion and, finally;
- the **reports** are ***the leaves and fruits*** that provide value to the end users and in turn help nurture the data warehouse in the future.

We are proposing a perpetual use, non-transferable, modifiable license for WVDE which will allow West Virginia to get a best in class solutions while keeping long term cost considerations manageable.

In the following pages, we will overview the key components of the system including:

- Data Model
- Data Store
- Reporting Architecture
- Portal and Security
- Auditability
- Data Marts
- Standards Alignment
- Integration and services

We are presenting a solution that represents and builds upon our previous work with other SLDS states; but we also understand the importance of working with West Virginia and your staff and are adaptable to create a solution tailored specifically to your needs. We would like to collaborate on the WV SLDS project to provide an extensible foundation that will serve to support West Virginia student achievement and school improvement by providing stakeholders with data to answer West Virginia's key educational questions now and into the future.

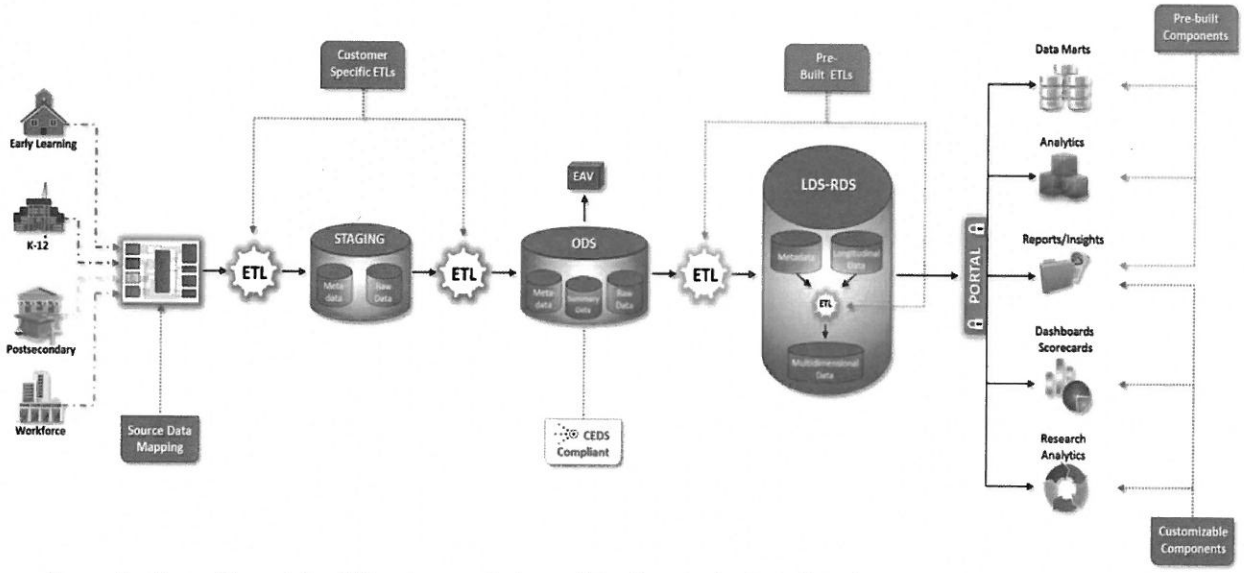
SECTION FOUR: PROJECT SPECIFICATIONS

edFusion – Our Solution for the WV SLDS

The key to the WV SLDS and DWRS as we see it is to provide WVDE with a customizable, off-the-shelf (COTS) solution that has been designed to meet the needs of state educational agencies and can be modified to meet the unique needs of WVDE. The West Virginia SLDS needs to integrate multiple data systems, as well as support the multiple collection timings and modalities associated with State Education Agency (SEA) and Local Education Agency (LEA) data needs. It also needs to be extensible to meet future data management, research, and reporting needs with a focus on sustainability.

The ODS and data model must provide West Virginia with an adaptable and expandable data management, storage, and reporting platform that ensures your future vision can be met with only limited changes to the underlying data structures. The responding team must be committed to and provide national leadership in education standards efforts and best practices which will help position this project as a foundation for future growth.

Our solution provides a zero-client, web based tool for the management of and access to your student level data in a secure manner. The solution we propose is built on industry best practices that will allow for WVDE and their constituents to have a more user-friendly data management and user management platform to drive data informed decision making. This solution is edFusion.



Sample Functional Architecture of the edFusion Solution for the West Virginia SLDS

1. edFusion Foundation for Data Integrity and Quality Management

Data quality, validation, and movement are integral to SLDS deployments. The edFusion Foundation was designed to efficiently manage these processes.

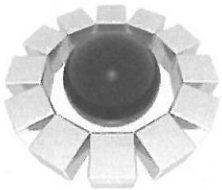
edFusion Foundation manages the movement of data into and out of the edFusion SLDS system. It also manages data transitions between edFusion components. At each transition, validation and transformation rules can be applied (the Transformation step) before the data is moved to the target (the Load step). Validation is critical to ensuring data quality.

Incoming data can be loaded via text files or via database connections (for most commercially available databases). Direct data entry forms and tables are also available for manual data entry processes. In addition, the solution can also accept mainframe data from virtual storage access method (VSAM) files. Advanced real-time technologies such as SIF and Web Services can also be integrated.

We cannot stress enough the need to focus on data quality. Fortunately, edFusion Foundation makes managing data validation and transformation easy and repeatable. Our solution will allow West Virginia to alleviate and control data consistency, quality, and timeliness issues by using metadata to drive validation and transformation. Foundation applies business rules to cleanse, consolidate, and transform the data during a transition. Because the rules are stored in the edFusion system as metadata, West Virginia can repeatedly apply the rules, reuse them across different collections, and readily update them as educational analytical needs change.

2. edFusion SLDS (ODS)

The data warehouse is a cutting-edge Online Analytical Processing (OLAP) system designed around education data expressed in a Star Schema. It leverages cube-based analytic services for accurate, high-performance data retrieval. Choice has worked over the past several years to align our solution to existing and emerging standards. In particular, Choice has focused on the alignment of our solution to the Common Education Data Standards (CEDS) versions 1, 2, and 3.0 specifications. Several members of our team are engaged in the design of the CEDS specification, and we have used their insight to help design our solution.



More than just a storage and archiving facility, the edFusion warehouse focuses on intelligent analytics that support education operational decisions. Choice's experienced services staff will work with West Virginia personnel to determine the proper bases for longitudinal archives and adapt normalization protocols to the specific needs of West Virginia teachers and administrators. The result is actionable SLDS data presented in a way

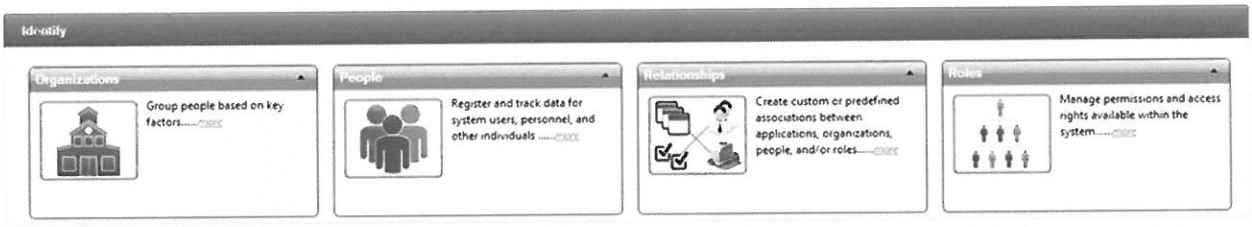
that West Virginia stakeholders will be happy to use. The edFusion Data Warehouse can support virtually unlimited numbers of student files (including historical data) for as many years as WVDE requires. There are no functional limits on the numbers of students or end-users built into the system; expansion is a matter of additional hardware rather than application capacity.

3. edFusion Identify

Central to the solution is robust directory and identity management developed specifically for the U.S. education market. Unlike typical business-oriented computer security systems that assume all relationships are hierarchical, the edFusion Identify specifically represent the complex collaborative relationships typical in education. When we say we provide Role-Based Access Control (RBAC) for people and entities throughout the organization, we mean that our system can fit the roles that WVDE personnel actually have (rather than force-fitting WVDE's users into our software's roles). Our solution makes it easy to add additional roles as needed to ensure users get only the data for which they are authorized. This level of security is required to ensure that our clients remain FERPA-compliant while providing users with the information they need.

The edFusion authorization model is based on four core concepts: Users, Roles, Organizations, and Functions (which can be either Applications or Services). The solution is completely web-based, intuitive, and allows for distributed management of resources. Organization and access policies can be managed at a state, district, school, or even class level, greatly reducing the overall IT burden on a single entity.

The edFusion solution provides access for collaboration with employees, partners, and other organizations as easily as co-workers while protecting sensitive information.



Organizations
- Search Organization
- Create Organization
- Manage Organizations
- Manage Organizational Relationships
-And much more

People
- Search People
- Create Users
- Manage Users
- Manage access, organization relationships and information
-And much more

Relationships
-Create and manage the non-organizational aspects of school and district data
-Create and manage the non-organizational aspects of school and district data
-And much more

Roles
- Search roles
- Create roles
- Manage the types of roles and permissions within the system
-And much more

4. edFusion Insight

The reports outlined by West Virginia will be developed and delivered using the edFusion Insight reporting framework. Choice staff will work closely with WVDE personnel to define the presentation, delivery method, and security requirements for each report.

In addition to the specific reports required, West Virginia will have access to the full capability of edFusion Insight to create new reports or modify existing ones. With our solution, the WVDE will have the ability to create reports in-house, and of course, our experts are available to support WVDE future reporting needs. We also have a library of reports developed with other states that the WVDE may find useful as the system grows.

The Insight framework supports all levels of users. Novices have access to predefined SMART Reports, which include intuitive tools for comparison and filtering. More advanced users often use edFusion Analysis Tools to create new queries and build visually engaging reports. Researchers and power-users can work with edFusion Data Marts and even export the data for use in third-party analysis packages.

The edFusion solution supports a wide variety of reporting capabilities and visual displays. These visual displays include scorecards, dashboards, snapshots, charts, graphs, tables, and various other data visualization methods. Many of these visual displays are canned and ready for consumption by our state education agency clients; however, with every engagement we work with our client partners to define and develop reporting structures that meet their specific needs.

5. edFusion Integrate

edFusion Integrate brings users, resources, and applications together into an easy-to-use and accessible gateway. Any web-accessible application can be integrated into the edFusion portal. As the true core of an enterprise architecture, Integrate is always included with an edFusion deployment. As implied by its name, Integrate is a framework to support the complex integrations required in education. Often this is a highly services driven work; but, with our framework we can leverage existing designs and artifacts to rapidly address common integration requirements.

Integrate tools help customers securely and simply manage their organizations, applications and data. Integrate includes the following high-level features:

- Portal and Application Management
- Application and Data Integration APIs
- Custom and third-party application integration
- Application Integration
- Link Management
- Single Sign On (SSO)
- Provisioning
- Standards support
- Federation: LDAP, SAML, CAS, Shibboleth
- Interoperability: SIF, Web Services

4.3. Qualifications and Experience

We have filled in Attachment A with references to where the responses to requested information can be found throughout our Response Document. Attachment A can be found in the Appendix.

4.3.1 The Vendor's proposal must consist of a detailed narrative that describes its company, including but not limited to

4.3.1.a. The Vendor's origin, mission, historical growth (including when the company was established), and the hours of operation of the Vendor that proposed to perform services required by this RFP.

Firm Name and Address of Corporate Headquarters
Choice Solutions, Inc. 420 Lakeside Ave. Ste. 101, Marlborough MA 01752 www.choicep20.com (508) 229-0044
Type of Business / Legal Form of the Business Organization
Corporation
Origin
Incorporated: Massachusetts, February 10, 2001
Business Ventures
Educational Longitudinal Data Systems for States and Districts – including Early Childhood, K-12, Post-Secondary, and Workforce Data
Mission
In an increasingly global economy, our ability as a nation to compete and thrive relies heavily on the strength of our educational pipeline. To accurately identify and address the many 'leaks in the pipe' we must have a clear understanding of what we're dealing with. Data is a key factor in attaining that clarity; unfortunately, this data is often too difficult to access and understand which makes it difficult to paint a clear picture. **Our mission is to assist education and workforce focused institutions in rethinking their institutional role in life spanning longitudinal education and public service delivery information management.** We are committed to helping these organizations to transform their rich data stores into information and insight that will empower them to strengthen our nation's education pipeline.

Historical Growth

Incorporated: Massachusetts, February 10, 2001

Our Organizational and Strategic Commitment to the Education Industry (3-5 Year Roadmap)

Success throughout all levels of the P through Workforce (P20W) data movement will require collaboration among participants across state and industry boundaries. We are one of those active participants. Not only are we a vendor, our employees send their children to public schools in a dozen states including several of our customers. We see ourselves as equally invested contributors to the future success of the P20W vision.

Our commitment to the education industry and especially to P20W integration is made evident by these four facts:

- **We work exclusively on P20W data systems.** We treat education agencies as our lifelong partners, not as a market into which we occasionally dip. Nobody has worked with a larger or more varied group of education agencies to develop enterprise class SLDS's.

- **We lead the national data conversations.** Many of our technical leaders are, and have been, active participants in the national organizations (like CCSSO, SIFA and PESC) that are shaping the technical landscape of P20W education. We helped architect the Common Education Data Standards (CEDS) and National Education Data Model (NEDM) as well as key parts of SIF and State Core. We lead because we know the data better than anybody else.

- **We facilitate collaboration and sharing among states, even those that aren't our clients.** For example, we host an annual P-20 SLDS Forum where personnel from various states meet to share experiences and designs.

- **We know feedback drives improvement, and we seek it avidly.** For example, we use Microsoft's proven customer satisfaction tools to tell us how clients see our products and services. This data will guide future projects and standards efforts for us and all our P-20 SLDS Forum participants, benefiting districts and states across America.

Year	Corporate Focus/ Achievements	Key Customer Wins	Solution Enhancements
2000 - 2004	Company focused on custom software development and systems integration	Massachusetts	
2005 -2007	Development of E2RP (Enterprise Education Resource Planning) product suite	Connecticut, Wyoming, Rhode Island	*Portal & Directory Management*
	Launched project "K-nect" (mobile phone education application)		
	Continued custom development and systems integration work		
2008	Entered education Data Warehouse market	Alaska, Missouri	*Data Warehouse, Business Intelligence & State Registration System (Student & Staff), Case Management (Error Checking Module), Communities, Collaboration Tools, Content Management - Document Repository, Notification Manager*
	Launched State registration system		
2009	Re-branded products suite edFusion™	Iowa	
	Launched the edFusion™ P-20 Framework product development effort		*Enterprise Reporting Framework, Pre-Kindergarten Information System, Post-Secondary Data Linking, Inter Agency Crosswalk, Data Glossary, Metadata Browser*
2010	Launched District (LEA) product development effort	Hofstra University, Utah, U.S. Virgin Islands, Washington, Maine	*Classroom Tools, NCLB Report Card, Growth Model, Influence Spectrum Management (At Risk Data Mart), School Choice Lottery Application, Research Data Mart, Learner Profile*
2011	Launched Research driven Education Analytics product development effort	Tennessee, Illinois, American Samoa P-20, Utah P-20	*Education Analytics*

	Initiated new version of edFusion™ DM, Foundation, ERF, Analytics & Tools		*Next generation of edFusion framework*
2012	PII Framework, Learning Object Management, Differentiated Learning Framework	Hawai'i P20, Bridgeport Public Schools education analytics	*New Rules Engine Integration. EdFi Alignment*
2013	SIF 3.0 web services development, edFusion7 release October 2013,	Engage NY Portal, Puerto Rico SLDS, St. Lucie Public Schools Data Warehouse	*New PII P20 Framework , SIF 3.0 Alignment, CEDS 3.0 Alignment*

Hours of Operation to Perform Services for this RFP

Choice Solutions generally works on a client's 8-5 schedule.

We also have off-hour support and lengthened days depending upon critical nature of particular project deliverables and timelines. The majority of hours spent on the project are generally remote; however, we deploy local project resources during these key phases to ensure effective understanding and engagement.

4.3.1.b. Prior experience developing and successfully implementing statewide or large-district projects including a data warehouse and reporting solution for a statewide educational agency or major metropolitan school district within the past five years. These projects should be comparable in size or larger than the proposed solution for the WVDE, its 55 Local Education Agencies, and its 600+ schools and 200,000+ student population.

Choice Solutions has been developing enterprise software for state and other educational clients since 2000. As our pioneering edFusion product suite has matured from the earliest SLDS implementations in 2006, we have added increased data elements for entities outside K-12 including Pre-K and Higher Education. We are currently building new P20W data systems for the states of Hawai'i and Utah. Additionally, we recently assisted the Connecticut Department of Labor with their data system modernization project.

We understand that the current vision for the WV SLDS and DWRS project is to address the needs of P-12, but it is critical that your system is extensible for future P20W needs. As you recognized in your SLDS application, the establishment and maintenance of a high-quality P-12 DWRS will not only improve the function of West Virginia's public schools, it will dramatically improve the quality of the data elements that feed the state's P-20W system, a multi-agency initiative spanning pre-K through Workforce. A successful DWRS provides information to help improve student achievement while addressing other key state educational policy questions through the effective use of data warehouse and reporting tools that drive educational decision making. Choice is an ideal partner to work with in pursuit of these goals. Choice has implemented cross-agency integrations in four states. Each implementation used slightly different parameters and scope depending on the state's laws, protocols, and preferences. For example, in Hawai'i and Utah, we implemented data structures to support the pre-k data sets available. We supported Pre-k data collections in Hawai'i and Utah, as well as within Connecticut.

We measure success by a client's ability to connect records and generate reports that answer real-world questions for educators, researchers and policy makers. Ideally, the state will be able to use the data from its early childhood and K-12 education systems to help understand the organizational, demographic and programmatic differences. The differences can be more effectively identified and addressed with a complete and longitudinal view of data, tied in with a mature research agenda.

Improving Public Data Usage through Effective SLDS

When a state buys a solution, they're really buying a team. Our people are our differentiator, and our proposed solution reflects that:

- The edFusion platform has more real-world security, ETL and reporting capabilities for SLDS because our people have more experience than others.
- The edFusion platform is more flexible at integrating other systems—our customers can add new domains of information and data very quickly using customer facing tools.
- The edFusion platform has more advanced capabilities because more of our people are involved in the national technical conversations about SLDS data.
- The Choice service delivery model reflects a close concern for and experience with ensuring state success.

Ask our customers, and they'll tell you that the edFusion suite and the Choice team are best equipped for whatever challenges arise in developing the SLDS for West Virginia.

Keeping Our SLDS Current and Competitive into the Future

Technology and vision are the keys to keeping the WV SLDS and DWRS system current and competitive. Choice's edFusion platform incorporates the scalability and flexibility needed to react to change. This architecture draws on industry best practices including guidance from Microsoft and others on large scale, high importance, high availability systems. Our visionary leadership has a track record of identifying new needs and beginning work on them before most other educators and vendors. What we sell you today, we designed within the last few years, and we're already working on our product vision for 2014-2016. In fact, our ongoing product development is currently being shaped by our clients and industry needs as a whole. **Our technical vision often goes beyond what any client has in mind and as a result, our partners end up with more capability and scalability than they'd thought possible. Today's rapidly evolving education technology industry demands no less.**

4.3.1 .c. Description and methodology of education-related projects.

Choice Solutions is committed to an iterative and agile approach to all of our SLDS Projects. We have found that by implementing a modified incremental and iterative development and implementation model we can rapidly address micro and macro project changes without significant impact on overall project schedule or resources.

Our focus of incremental and iterative model is to support, in a rapid fashion, the needs of our clients. As part of our agile process we work to incorporate changes, software components and customer feedback to shape our future iterations. The incremental model combines elements of linear sequential model with the iterative philosophy of prototyping. Each linear sequence produces a deliverable increment of the software. When an incremental model is used, the first increment is often the infrastructure services and small business functionality - core product. The basic requirements are addressed but many supplementary features remain undelivered.

The WVDE will use the proof of concept to provide the feedback on the core system. Based on the user feedback, plan is developed for the net increment. The plan addresses modifications of the core product as well as the additional features and functionality. This process is repeated following the delivery of each increment until the complete product is produced.

However, we feel it is critical that WVDE understands, regardless of process, when a state buys a solution, they're really buying a team. Our people are our differentiator, and our proposed offering reflects that:

- The edFusion platform has more real-world security, ETL and reporting capabilities for SLDS because our people have more experience than others.

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- The Choice service delivery model reflects a close concern for and experience with ensuring state success.

Ask our customers, and they'll tell you that the edFusion suite and the Choice team are best equipped for whatever challenges arise in developing an enterprise SLDS.

4.3.1 .d. Description of educational expertise, qualifications, certification, etc.

Choice has spent the last decade working in education and with education leaders to help design, build, and deploy best-in-class solutions which meet your current needs as well as designing to meet those in the future. In our engagements we have led all components of several of the SLDS projects as well as worked as a subcontractor, addressing technology, project management, training and implementation support—unlike most other vendors. Even though SLDS data warehousing solutions are much broader than simple IT initiatives, Choice's expertise and commitment to our client partner's success supports a parallel focus upon technology, project management, security and overall governance issues.

Success for the K-12 and P20W movement will require collaboration among participants across state and industry boundaries. We are one of those active participants. Not only are we a vendor, our employees send their children to public schools in a dozen states including several of our customers. We see ourselves as equally invested contributors to the future success of the SLDS vision.

Our commitment to the education industry and especially to SLDS integration is made evident by these four facts:

- **We work exclusively on K-12 and P20W data systems.** We treat education agencies as our lifelong partners, not as a market into which we occasionally dip. Nobody has worked with a larger or more varied group of education agencies to develop enterprise class SLDSs.
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PESC) that are shaping the technical landscape of P20W education. We helped architect the Common Education Data Standards (CEDS) and National Education Data Model (NEDM) as well as key parts of SIF and State Core. We lead because we know the data better than anybody else.

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- **We know feedback drives improvement, and we seek it avidly.** For example, we use Microsoft's proven customer satisfaction tools to tell us how clients see our products and services. This data will guide future projects and standards efforts for us and all our P-20 SLDS Forum participants, benefiting districts and states across America.

4.3.1.e. Any relevant experience that indicates the qualifications of the Vendor, and any subcontractors, in the performance of this contract.

Offering SLDS Solutions to the Education Industry for over 12 Years

Choice Solutions has been developing enterprise software for state and other educational clients since 2000. As our pioneering edFusion product suite has matured from the earliest SLDS implementations in 2006, we have added increased data elements for entities outside K-12 including pre-k and higher education. We are currently building new P20W data systems for the states of Hawai'i and Utah. Additionally, we recently assisted the Connecticut Department of Labor with their data system modernization project.

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2013	SIF 3.0 web services development, edFusion7 release October 2013,	Engage NY Portal, Puerto Rico SLDS, St. Lucie Public Schools Data Warehouse	*New PII P20 Framework , SIF 3.0 Alignment, CEDS 3.0 Alignment*

KEY FEDERAL ENGAGEMENTS

National Education Data Model (2010)

NEDM Website – http://NCES.SIFinfo.org/DataModel/

- Developed website to present information and visualization of upcoming NEDM model
- Developed various reporting structures

CCSSO (2011)

Data Shuttle

- ETL and data migration from edFacts database to the school data direct system

KEY STATE ENGAGEMENTS

Maine Department of Education (2009-present)

- Implemented data warehouse and reporting infrastructure
- Implemented and customized portal for report dissemination
- Implemented and customized reporting infrastructure
- Designed and developed Maine specific reports
- Designed and Developed reporting frameworks for growth model, at-risk-management, balanced scorecard, and edFacts
- Implemented identity management for data warehouse

Connecticut Department of Education (2007-2012)

- Implemented statewide education identity management solution supported by our enterprise directory manager
- Integrated Identity managements solution with state Novel eDirectory
- Developed reporting infrastructure, including NCLB reports
- Developed enterprise education portal
- Developed state wide pre-K information system
- Implemented various data collection and management systems

Wyoming Department of Education (2008-present)

- Designed, implemented, and integrated enterprise education portal
- Implemented assessment data mart and influence spectrum management (ISM)
- Designed, developed, and implemented reporting infrastructure
- Implemented statewide education identity management solution supported by our enterprise directory manager
- Implementing state registration system to manage unique student and staff IDs

New York State Department of Education (2013 – present)

- Developed portal platform to deliver content to all key stakeholders
- Implemented an enterprise Identity Management solution to support all 7.5 million stakeholders
- Implementing SIF 3.0 Web Services Infrastructure
- Creating a federated identity management between multiple vendors
- Creating enterprise directory structure

Utah Department of Education (2010-present)

- Implementing Student record exchange ODS
- Integrating Self-service portal for users

- Implementing state registration system to manage unique student and staff IDs
- Implementing District facing data collection utilities
- UDADS P20 Research Data Warehouse

Massachusetts Department of Education (2001)

- Designed and developed enterprise directory
- Lead the initial data warehouse design and development
- Lead student information system development
- Part of VES architecture and design team
- NCLB report card application design

Hawai'i Department of Education and RCUH (2012-present)

- Implementing P20W SLDS
- Aggregating data from four key data domains
- Providing enterprise security integration between stakeholders
- Providing both public and private reporting and analysis capabiliites

Virgin Islands Department of Education (2010)

- Integrated security infrastructure
- Implementing NCLB report card application which provides self-service approval mechanism for all report cards
- Implemented data quality procedures

Iowa Department of Education (2010-present)

- Implementing education identity management solution
- supported by our Enterprise Directory Manager
- Developing enterprise education portal
- Providing Single Sign-On to various applications via SharePoint

Washington Office of Public Instruction Department of Education (2011-2013)

- Implemented edFusion Directory Manager
- Implemented edFusion Portal
- Implemented Data Warehouse
- Implemented Decision Support framework

4.3.1 f. A list of contracts the Vendor has had during the last five (5) years that relate to the Vendor's ability to perform the services needed under this RFP. List contract reference numbers, contract period of performance, contact persons, telephone numbers, and fax numbers/e-mail addresses. Include a brief summary of each project's goal, deliverables, milestone events, etc., and the role of the Vendor in accomplishing such items.

❖ ***State of Hawai'i – P20W SLDS***
March 2013 – (anticipated) July 2014

Todd Ikenaga
SLDS Program Manager
Phone: (808) 956-6595
Fax: (808) 956-2431
Email: tikenaga@hawaii.edu

We are the prime contractor engaged to build the Hawai'i P20W Statewide Longitudinal Data System. This solution includes:

- edFusion Data Warehouse
- Data Processing and Profiling
- Student Matching
- Unique Identifier
- Access and Security
- Portal
  Reporting

❖ ***State of New York – EngageNY Portal***
January 2013 – present

Amrit Singh
Senior Program Director
New York State Education Department
Phone: (917) 829-1516
Email: asingh2@mail.nysed.gov

We are engaged on the New York Education Data Portal Project, for which we are:

- Designing and deploying a Liferay portal that will become the single point of entry into the NY eco-system
- Developing a shared architecture for the entire NY eco-system
- Developing and deploying shared services, shared functions, and integrate selected applications within the portal
- Deploying a full Identity Data Management solution to be used within the portal (edFusion)
- Providing Identity Management support to the NYSED staff as they move towards their goal of Guardian ID Assignment
- Building out a SIF3 based provisioning infrastructure to support all the data transport

❖ ***State of Maine – Education Data Warehouse and Decision Support System***

February 2009 – present

Bill Hurwitch
Project Director
Maine Department of Education
Phone: (207) 624-6816
Fax: (207) 624-6700
Email: bill.hurwitch@maine.gov

Solutions we have designed, built, and implemented for the State of Maine include:

- Education Data Warehouse/Decision Support System
- Growth Model Data Mart and Reporting
- Balanced Score Cards
- Data Marts
    - State Reporting
    - EDFacts Reporting
    - Early Warning System
    - Research
- Reporting and Analysis

❖ ***Utah State Office of Education – Utah Transcript and Record Exchange (UTREx)***

January 2011 – September 2013

Jerry Winkler
Information Technology Manager
Utah State Office of Education
Phone: (801) 538-7842
Email: Jerry.Winkler@schools.utah.gov

Choice Solutions has implemented an Operational Data Store (ODS) that will gather data submissions up to and including daily submissions through the SIF (Schools Interoperability Framework) vertical reporting framework (VRF). Choices' ODS will then use this data for reporting purposes. Utah State and Local Education Agencies access these reports and other student level data through Choice's edFusion portal solution. Users of this system are able to retrieve and view in an online point and click environment a full student record as well as extract out this record for local consumption. Choice's ODS also publishes a PESC XML file that is be consumed by the National Transcript Center (NTC) for electronic transcript submission and retrieval for educational entities within Utah. The ODS then also via Exchange Transform Load (ETL) submits all student level data to the existing Utah Reporting Data Warehouse for state and federal reporting requirements.

Following is a short outline of the solutions Choice Solutions has or is currently implementing for the state of Utah:

- Architect, design, and deploy Operational Data Store
- Design various users sites and views
- State and local reports are extracted
- Student transcripts are submitted
- SIF VRF and ODS submission and integration
- Data validation procedures are conducted on student level data submissions

❖ ***State of Wyoming – Wyoming Fusion and Assessment Resource Tool (ART)***

2008 – present

Cassie Lallak
Current Position – Senior IT Project Manager, Wyoming State Department of Enterprise Technology Services
Former WDE Employee – Project Manager
Phone: (307) 777-7456
Email: cassie.lallak1@wyo.gov

Our on-going project work with the State represents Wyoming's commitment to building an enterprise architecture statewide despite their not winning an SLDS grant. One of the key projects was to implement an enterprise education portal and security solution information dissemination and application integration.

Here is a short outline of the solutions Choice Solutions has or is currently implementing for the state of Wyoming:

- Designed, implemented, and integrated an enterprise education portal
- Implemented state registration system to manage unique student and staff IDs
- Designed and developed reporting infrastructure using Microsoft BI
- Implemented at-risk early warning system
- Implemented statewide education identity management solution supported by our Enterprise Directory Manager
- Developed community sites around assessment data
- Designed and implemented an Assessment Resource Tool that did Reporting (both pre-defined and Ad Hoc)

❖ ***State of Washington Office of Superintendent of Public Instruction – K-12 SLDS***

February 2011 – May 2013
Peter Tamayo
CIO
Washington State Office of Superintendent of Public Instruction (OSPI)
Phone: (360) 725-6134
Fax: (360) 586-7251
Email: peter.tamayo@k12.wa.us

The solution we built for WA's K-12 SLDS includes:

- edFusion Data Warehouse
- edFusion Enterprise Reporting infrastructure including Snapshots, Data Tables, Analysis, Balanced Score Cards, and Research Data Marts
- edFusion Directory and Identity Manager (now Identify)
- edFusion Enterprise Portal

❖ ***American Samoa – P-16 SLDS***

February 2011 – June 2013

Marty Mamea
ASDOE SMS/LDS Systems Administrator
Phone: (684) 699-2097/2098
Email: martym@doe.as

The solution we designed, built, and implemented for American Samoa includes:

- Statewide Longitudinal Data System with a Unique Yet Anonymous Identifier
- Education Performance Reporting
- Ad Hoc Reporting
- ETL Processes corresponding to Longitudinal Source Data
- Portal
- Data Governance Models
- Data Quality Models

❖ ***Iowa - edFusion Portal and Single Sign On***

September 2010 – present

Jay Pennington
Bureau Chief, Bureau of Information and Analysis Services
Iowa Department of Education
Phone: (515) 281-4837
E-mail: jay.pennington@iowa.gov

We designed, built, and implemented the Iowa EdFusion Portal, a secure, single sign-on web portal that provides access for school district staff, post-secondary institutions, and the Department of Education. The solution includes:

- edFusion™ Directory and Identity Manager (Identify)
- edFusion™ Enterprise Portal
- Single Sign-On to various applications via SharePoint

4.3.2 The successful Vendor must document its knowledge related to the technical aspects of the solution and the capacity to successfully train WVDE staff according to the goals in this RFP,

As demonstrated in this RFP response, Choice Solutions has a proven solution for the SLDS and DWRS that West Virginia is looking for that has been successfully developed and implemented throughout the country, and we will embrace the opportunity to work with WVDE to develop the system and successfully train WVDE staff to use, maintain, and extend it.

4.3.3 The Vendor's proposal must also consist of narrative that describes, in detail, the Vendor's:

4.3.3.a. Experience of staff (list qualifications, educational background, certifications, etc.) who will be assigned to this project, including key subcontractors when applicable.

A Powerful Team

Choice Solutions has developed a team of education data management experts with experience at every level, including the state, district, school, and federal arenas.

Since 1999, Choice Solutions has implemented SEA and LEA data systems throughout the country. Our team includes 7 former SEA employees and these individuals have consulted with over 15 SEAs during the past decade.

A Passionate Team of Professionals from All Levels of the Education Information Management Field

- Our Implementation Leads have all worked on multiple state LDS systems development and deployment projects;
- Our Project Managers all have managed multiple development and implementation projects within the education vertical;
- Our Technical Leads have all worked extensively with education clients;
- Our Senior Business and Data Analysts have all worked with SEA clients and several have worked with LEA clients as well.

National Leaders in Educational Data Systems

Choice's Executive Team are national leaders in educational data systems. Our Chief Architect is Lead of the Technical Board of SIF, the Project Manager of the Common Data Standards Project, and one of the architects of the National Education Data Model. Choice is a member of the SIF Association (SIFA) and a business partner to the Council of Chief State School Officers (CCSSO). Our solutions are powerfully based on open standards and an open, extensible enterprise architecture. One of the compliments that Choice most often receives is on our ability to meet and even predict the specific needs of our customers.

Staffing the WV SLDS Project

In managing an SLDS project, Choice finds it critical to incorporate team members with experience on past SLDS projects. Having a seasoned SLDS staff that understands the business processes, data, and legal requirements (both state and federal) provides a state with a strong baseline for success. **All staff members we are assigning to the WV SLDS project have demonstrated success implementing Data Warehouse and Reporting Solutions of similar size and scope in other SLDS implementations.**

Shadd Schutte, the assigned Project Manager has led projects for Choice Solutions in over 7 states and territories as Project Manager. He is currently working on P20W SLDS work in the states of Utah and Hawai'i. Before working with Choice, he managed several large projects for the State of Wyoming Department of Education including their statewide SIF-based systems for vertical data collection and ID distribution. This insight helps drive Shadd's successful work in the SLDS arena, as he is familiar with the unique challenges of being a Department of Education staff *as well as* contractor staff on such projects.

Aaron Harte, the assigned Implementation Lead, has led cutting-edge projects in the State and District Education space for over six years. He is currently working on P20W initiatives in the States of Hawai'i and Utah, as well as on the New York State Department of Education EngageNY Statewide Portal. Aaron also aligned and mapped CEDS to SIF to create "CEDS-on-the-wire" as the starting point for SIF 3. In the New York project, he is extending that mapping and alignment work as our team defines and implements SIF 3 REST services for data sharing.

All other assigned personnel – Pavan Chilukuri (Technical Lead), Emmanual Stefanakos (Senior Data Architect/Analyst), Tamy Salem (Business Analyst), and Alexander Jackl (Subject Matter Expert) are experienced in multiple state and district wide projects incorporating DWRS (including reports for EDFacts, Early Warning, Growth Model) as well as data collection over both SIF and legacy connections.

It can be a challenge to effectively integrate projects and the right resources to address particular project needs. Choice Solutions is committed to not only supplying resources to a project, but *the right resources at the right time.* We view this application of human capital as "Applying Our A-Team Resources" when required. These resources are made available across multiple projects and we work with our Project Management Office to help identify resource requirements at critical junctures of a project so that we can effectively appoint these resources. As we have a breadth of resources across multiple projects, we will ensure critical project resources that have been previously engaged on an edFusion implementation are also be engaged with this implementation.

The resumes of staff who will be participating on this project can be found on pages 36-41.

4.3.3.b. The amount of time (FTE allocated to the project) each staff is to be assigned to the project.

In addition to the key resources named, we will be utilizing several development, testing, infrastructure, training, and documentation resources; all of whom are experienced in DWRS from working on the projects we have done in over 15 states and territories throughout the country.

Proposed Position	*FTE Estimate*
Project Manager(s)	.50 FTE
Implementation Lead	.50 FTE
Senior Data Architect/Data Analyst(s)	.25 FTE
Technical Lead(s)	.75 FTE
Business Analyst(s)	1.0 FTE
Subject Matter Expert(s)	.25 FTE
Application Developer(s)/Configuration	3.0 FTE
Quality Assurance Analyst(s)	2.0 FTE
Documentation/Tech Writer(s)	.25 FTE
Infrastructure Engineer(s)	.25 FTE
Estimated Total FTEs for Project	*8.75*

4.3.3.c. Experience of staff in completing similar projects. Include specifics regarding the data model, reporting, analytics, and any other key deliverables/components/aspects of the projects.

Our experience is described in the following tables:

Project Manager	
Position Description	The Project Manager is the single owner of each project. This position will be responsible for translating the customer's requirements into reality. They will be responsible for creating the project plan, ensuring the correct understanding is shared by all team members (along with client), that the necessary work is being completed, risks and issues are being identified and mitigated, and all project work is being communicated in a timely manner with the project stakeholders. The Project Manager creates Work Breakdown Structures (WBS), risk plans, communication plans, resource plans, and practices strong communication skills.
Staff Person	**Shadd Schutte, PMP**
Years' Experience	7
Similar Projects	▪ Utah Data Alliance Data Share (UDADS) P20 SLDS ▪ Hawai'i P20W SLDS ▪ Washington State K-12 SLDS ▪ Iowa Education Portal ▪ Utah Transcript and Record Exchange System ▪ US Virgin Island No Child Left Behind (NCLB) Reporting System ▪ Wyoming Integrated Statewide Education Data System

Implementation Lead	
Position Description	The Implementation Lead designs and constructs complex enterprise systems. To accomplish this task, the Implementation Lead works with customer and project teams to develop and gain consensus on vision scope, reviews customer tasks and the development of strategic approaches, and directs the activities of the technical team.
Staff Person	**Aaron Harte**
Years' Experience	6 years' experience with SLDS work; 12 years' experience as a Data Warehousing Professional; 20+ years' experience in software and information technology
Similar Projects	▪ Hawai'i P20W SLDS ▪ Utah Data Alliance Data Store ▪ New York State Department of Education Engage NY Portal (ENYP) ▪ New Jersey Department of Education ▪ NJ SMART Portal ▪ Tennessee Department of Education Data Warehouse / Adhoc Analysis Reporting System ▪ Memphis, Tennessee School District EdPlan, Response to Intervention (RTI) Reporting Data Store ▪ Jobs for the Future (JFF) Early College High School (ECHS) Initiative ▪ Illinois State Board of Education Illinois P-20 Longitudinal Data System ▪ CCSSO State Core Model ▪ AEM CEDS 2.0

Senior Data Analyst/Data Architect	
Position Description	The Data Analyst/Architect is the professional whose focus of analysis and problem solving relates to data, types of data, and relationships among data elements within a business system or IT system. The Data Analyst/Architect gathers requirements, documents business processes, identifies and documents business rules, data formats and metadata elements. The Data Analyst/Architect creates functional requirement documents, technical specifications, and application wireframes to illustrate how a new application will look and act.
Staff Person	**Emmanuel (Manos) Stefanakos**
Years' Experience	6 years' experience in state SLDS work; 18 years' experience in Data Architecture and Analysis
Similar Projects	▪ Maine Department of Education Longitudinal Data System Projects ▪ Washington State Office of Superintendent Of Public Instruction K-12 Statewide Longitudinal Data System ▪ Connecticut Department of Education Longitudinal Data System ▪ Wyoming Department of Education Assessment Resource Tool (Art) Project ▪ National Education Data Model ▪ Tennessee P-12 LDS Early Warning Data System

Technical Lead	
Position Description	The Technical Lead oversees all technical aspects of each project. This role ensures the proper technical solution is being established and oversees the creation of the architecture being created to satisfy the requirements that the analysts document.
Staff Person	**Pavan Chilukuri**
Years' Experience	6 years' experience in SLDS; 13 years' Technical Lead experience
Similar Projects	▪ Utah Data Alliance Data Share (UDADS) P20 SLDS ▪ Hawai'i P20W SLDS ▪ Washington State K-12 SLDS ▪ Maine Department of Education Longitudinal Data System – Education Data Warehouse and Decision Support System ▪ Connecticut Department of Education Longitudinal Data System ▪ Utah Transcript and Record Exchange System ▪ Wyoming Department of Education Assessment Resource Tool (ART) Project

Business Analyst	
Position Description	The Business Analyst gathers requirements, documents business processes, identifies and documents business rules, data formats and metadata elements. The Business Analyst creates functional requirement documents, technical specifications, and application wireframes to illustrate how a new application will look and act. He/she is a chief communication link to the development team, the QA team and other team members.
Staff Person	**Tamy Salem**
Years' Experience	4 years' experience in state SLDS work; 15 years' experience in Business Analysis and Project Management
Similar Projects	▪ Hawai'i P20W SLDS – Lead Business Analyst ▪ Utah Data Alliance Data Store –Lead Business Analyst on the Utah Ongoing P-20 Data system project ▪ Utah UTREx - Lead Business Analyst for the Utah Student Record Exchange project; leading to an on time delivery despite changing requirements ▪ Tripod Project – Business Analyst for part of Gates Foundation Teacher Effectiveness Survey project to create a supportive data system

Subject Matter Expert	
Position Description	The Subject Matter Expert (SME) is the client side personnel the Analysts, Technical Staff, Implementation Lead, and Project Manager will work with within each project strand who knows the subject matter and will be driving the requirements. This person or persons will work directly with the project team to define the requirements, answer any/all questions, and be able to ensure the agreed upon scope of that project strand (what will be built by the developers) is going to meet the needs of the customer.
Staff Person	**Alexander Jackl**
Years' Experience	20+
Similar Projects	▪ Nationally recognized expert of education data standards including SIF, CEDS and PESC. ▪ SIF - Chairman of the North American Technical Board & Lead of the Teaching and Learning Project Team ▪ New York State Department of Education Engage NY Portal (ENYP) ▪ Utah P20W DW ▪ Hawai'i P20W SLDS ▪ Washington State K-12 SLDS ▪ Connecticut SLDS ▪ Maine Education Data Warehouse ▪ Wyoming SLDS Project

4.3.4 The vendor should provide résumés for the key project staff, which include information on the individual's particular skills related to this project, education, experience, significant accomplishments, and any other pertinent information. The Vendor must commit that staff identified in its proposal to actually perform the assigned work. Any staff substitution should have comparable experience and qualifications, and has to have prior approval by the WVDE.

The résumés for the key project staff who will be assigned to the WV SLDS Project can be found on the following pages.

SHADD SCHUTTE | Senior Project Manager

Shadd Schutte has an extensive **history managing projects in the education domain** for statewide education projects. He has led onsite and offsite teams with four various data warehouse projects and multiple collection and reporting systems. Mr. Schutte has focused his career on projects within state education agencies, beginning with three years' work for the Wyoming Department of Education before moving to Choice. Because of this focus, he brings direct knowledge and experience on how best to conduct projects within this sector. He has been involved with statewide K12 and P20W education projects in Iowa, Hawai'i, Utah, Wyoming, Washington, and the Virgin Islands, as well as at the national level with the National Education Data Model (NEDM) Project.

Education:

MPA with emphasis in Public Policy, Walden University

BS, *Magna Cum Laude,* Administration of Criminal Justice, Park University

Certifications:

Project Management Professional (PMP), Project Management Institute (PMI)

SLDS Experience:

Utah Transcript and Record Exchange System – Project Manager

Utah Data Alliance Data Share (UDADS) P20 SLDS – Project Manager

Hawai'i P20 SLDS - Project Manager

Iowa Education Portal – Project Manager

US Virgin Island No Child Left Behind (NCLB) Reporting System – Project Manager

Washington State K-12 SLDS – Project Manager

Wyoming Integrated Statewide Education Data System - Oversaw and managed the statewide data collection project for the WY Department of Education, including:

- the WISE Data Collection Project
- the WISER ID (Student ID) System
- the WISE Staff ID system
- the Wyoming Transcript Center (WTC)
- Wyoming Education Fusion (the single sign-on portal solution for all Wyoming teacher and education resources as provided by the state department of education and its partners)
- Facilitated cooperative interaction between various units within the WY State Department of Education, K-12 school districts, postsecondary institutions and other educational entities to meet state requirements and other educational objectives

AARON HARTE | Database Architect

Aaron Harte is a Database Architect at Choice Solutions, Inc. Mr. Harte has 20 years of experience as an IT Professional and 11 years as a data warehousing architect. Mr. Harte has designed and delivered educational data systems for state and local agencies for 5 years, working with the states of New Jersey and Illinois on their implementation of K12 data warehouses. Mr. Harte is a Microsoft IT professional and prior to starting his IT career he served 8 years in the Army as a special weapons technician and combat medic. He has implemented data warehousing solutions for the manufacturing, investment and healthcare industries prior to joining the education domain. Mr. Harte most recently designed the State Core Model in conjunction with CCSSO and continued this work to develop the CEDS 2.0 logical model.

SLDS Experience:

Hawai'i P20W SLDS

Utah Data Alliance Data Store

New York State Department of Education Engage NY Portal (ENYP)

New Jersey Department of Education NJ SMART Portal

Tennessee Department of Education Data Warehouse / Adhoc Analysis Reporting System

Memphis, Tennessee School District EdPlan, Response to Intervention (RTI) Reporting Data Store

Jobs for the Future (JFF) Early College High School (ECHS) Initiative

Illinois State Board of Education Illinois P-20 Longitudinal Data System

CCSSO State Core Model

AEM CEDS 2.0

EMMANUEL (MANOS) STEFANAKOS | Data Architect/Analyst

Manos Stefanakos brings a great deal of experience to his role as Choice Solutions' **Senior Data Architect**, designing data storage and reporting solutions, from public reporting to CEO-level summaries of major projects. As a senior project manager on several projects in both education and health care, he has excelled at collecting business needs, translating those requirements to technical staff and at building consensus and buy-in with project stakeholders. Since a number of his past projects focused on financial data, Mr. Stefanakos exhibits an attention to detail and thoroughness commensurate with the audit and public reporting requirements of such data.

Education: **Bachelor of Arts, Political Science**, University of Massachusetts Amherst

SLDS Experience:

Maine Department of Education Longitudinal Data System Projects – Project Lead and Data Architect

Washington State Office of Superintendent Of Public Instruction K-12 Statewide Longitudinal Data System - Data Architect

Connecticut Department of Education Longitudinal Data System - Data Analyst

Wyoming Department of Education Assessment Resource Tool (Art) Project - Data Architect

National Education Data Model - Data Architect/Analyst

Tennessee P-12 LDS Early Warning Data System – Data Architect/Analyst

Technical/Relevant Capabilities: Strong understanding of data and data architecture, and extensive experience in working with educational data stewards to determine data and data requirements. Point person for communications between Client and internal development team, project SME working closely with Client to clearly define and understand project details. Strong understanding of data models including mapping to CEDS v2.0.

PAVAN CHILUKURI | Technical Lead

Pavan Chilukuri is an Information Technology (IT) and Business Development Professional who has over 13 years' experience in the design, development, implementation, and maintenance of software applications. Mr. Chilukuri brings a great deal of experience to his role as Choice Solutions' Technical Lead, designing data storage, reporting solutions, and software applications for both the public and private sectors. As a technical lead on several projects in both education and health care, he has excelled at collecting business needs, translating those requirements to technical staff and at building consensus and buy-in with project stakeholders.

Education:

Master of Computer Engineering, University of South Carolina

Bachelor of Engineering, Osmania University

SLDS Experience:

Utah Transcript and Record Exchange System – Technical Lead

Utah Data Alliance Data Share (UDADS) P20 SLDS – Technical Lead

Hawai'i P20W SLDS – Technical Lead

Washington State K-12 SLDS – Technical Lead

Maine Department of Education Longitudinal Data System – Education Data Warehouse and Decision Support System – Technical Lead

Connecticut Department of Education Longitudinal Data System – Technical Lead

Wyoming Department of Education Assessment Resource Tool (ART) Project – Technical Lead

Additional Experience:

National Education Data Model – Technical Lead

Influence Spectrum Management (ISM) - Dropout Prevention/Early Warning System – Technical Lead

TAMY SALEM | Business Analyst

Tamy Salem has over 15 years' Experience in technical projects as both a **Business Analyst** and as a Project Manager. Tamy brings extensive experience in working with both business and technical users in eliciting the requirements to drive projects to a successful completion. Tamy has a unique ability to understand the technology, data and processes required to help project reach successful conclusions. Additionally, Tamy has a deep knowledge of education data by working on both of Utah's enterprise education data systems projects (at the K-12 and P-20 levels).

Education:	**M.B.A.**, Emphasis on **Information Resource Management** (IRM), Westminster College
	B.S., Computer Science, Westminster College
	B.S., Marketing, University of Utah
Certifications:	Prince 2 Project Methodology
	ITIL (Techniques for Managing IT Infrastructure, Development, and Operations)
SLDS Experience:	**Hawai'i P20W SLDS** – Lead Business Analyst
	Utah Data Alliance Data Store – Acting as Lead Business Analyst on the Utah Ongoing P-20 Data system project
	Utah UTREx - Lead Business Analyst for the Utah Student Record Exchange project; leading to an on time delivery despite changing requirements
	Tripod Project – Business Analyst for part of Gates Foundation Teacher Effectiveness Survey project to create a supportive data system

Technical/Relevant Capabilities: Strong understanding of data and data interpretation, experience in requirements gathering, Point person for communications between Client and internal development team, project SME working closely with Client to clearly define and understand project details. Strong understanding of data models including mapping to CEDS v2.0

ALEX JACKL | Subject Matter Expert

Alex Jackl, **Chief Solutions Architect**, has spent over 15 years in the education industry and is considered a national thought leader on many emerging trends related to enterprise education data systems. He is involved with several national bodies in both leadership and consultative capacities. Mr. Jackl has been the Chair of the SIF Technical Board for 7 years. He is the current project director for the Common Education Data Standards Initiative (CEDS) for the Council of Chief State School Officers (CCSSO) and was the lead architect for the National Education Data Model. Mr. Jackl started his career in the education sector in 1998 as the Director of Information Systems at the Massachusetts Department of Education. Since that time he has worked for IMS Global, US eLearning Consortium, CCSSO, and ESP Solutions Group, where he served as Chief Information Officer.

Education: **Graduate Work in Programming**, MIT

BA, Print/Broadcast Journalism, University of Rhode Island

SLDS Experience: Alex has been involved with education based longitudinal data systems since his work as Director of Information System at the Massachusetts Department of Education. Since then, he has worked in strategic and tactical roles as a solution architect for over 12 states' LDS implementations. Alex has also provided executive consulting on national initiatives, particularly SLDS efforts and the Common Education Data Standards for CCSSO. Most recently he has been extensively involved with several of our P20W initiatives.

SIF - Chairman of the North American Technical Board & Lead of the Teaching and Learning Project Team

New York State Department of Education Engage NY Portal (ENYP) - Program Lead Architect

Utah P20W DW – Project Architect

Hawai'i P20W SLDS

Washington State K-12 SLDS

Connecticut SLDS- Chief Architect

Maine Education Data Warehouse – Subject Matter Expert, Architecture lead

Wyoming SLDS Project - Project Director and Architect

Technical/Relevant Capabilities: Expertise in enterprise data architecture and dimensional modeling. Nationally recognized expert of education data standards including SIF, CEDS and PESC.

4.3.5 The Vendor's proposal should provide references that list names, addresses, telephone numbers, and fax numbers/email addresses of three (3) business references for which work (comparable to that required by this RFP) has been accomplished, and briefly describe the type of service provided. The Vendor must grant permission to WVDE to contact the references. Do not include current WVDE staff as references. Contacting references will be at the discretions of the WVDE.

Experience gained from multiple implementations allows Choice Solutions to understand the ongoing needs of P-12 and P20W institutions – interacting effectively with a wide variety of constituencies, developing and providing effective training and professional development to help statewide stakeholders thoroughly understand the solutions and how to use them to achieve the desired results, and applying expert skills and knowledge in creating statewide education technology solutions. The continued involvement of Choice Solutions with education-based initiatives—such as SIF, CEDS, AIF, and PESC — will help the team design WVDE's solutions for maximum scalability while also respecting economic, staffing, and other realities. We take pride in collaborating with our state and district partners, and working with them and the other vendors and contractors in the project to ensure that the final, larger-picture solution successfully meets our partners' visions and is completed on-time and to budget.

We have included three references below; all are highly-regarded state partners with whom we are currently working in engagements that began over the past few years. We encourage you to reach out to them.

Reference #1 -

Maine Department of Education *Statewide Longitudinal Data System*	

Project Description	**Statewide Longitudinal Data System – Maine Department of Education**
	
	Solution includes:
	• Education Data Warehouse/Decision Support System
	• Growth Model Data Mart and Reporting
	• Balanced Score Cards
	• Data Marts
	  ○ State Reporting
	  ○ EDFacts Reporting
	  ○ Early Warning System
	  ○ Research
	• Reporting and Analysis

Contact Name	Bill Hurwitch, Project Director
Contact Phone Number	(207) 624-6816

Reference #2 -

Washington State Office of Superintendent of Public Instruction *K-12 Statewide Longitudinal Data System*	
Project Description	**K-12 Statewide Longitudinal Data System – Washington State** *Solution includes*: • edFusion Data Warehouse • edFusion Enterprise Reporting infrastructure including Snapshots, Data Tables, Analysis, Balanced Score Cards, and Research Data Marts • edFusion Directory and Identity Manager (now Identify) • edFusion Enterprise Portal
Contact Name	Peter Tamayo, CIO
Contact Phone Number	(360) 725-6134

Reference #3 -

Hawai'i P20W Statewide Longitudinal Data System	
Project Description	**Hawai'i P20W Statewide Longitudinal Data System** Solution includes: • edFusion Data Warehouse • Data Processing and Profiling • Student Matching • Unique Identifier • Access and Security • Portal • Reporting
Contact Name	Todd Ikenaga, SLDS Program Manager
Contact Phone Number	(808) 965-6595

4.4. Project Goals

4.4.1. Goal I: Architecture, Infrastructure, and Development

4.4.1.1. For the successful Vendor to provide a DWRS owned and operated by the WVDE and accessible to the WVDE, Regional Education Service Agencies, Local Education Agencies, schools, and the public. Vendors are to provide proof of their ability to meet the specifications associated with goal objectives and required by this RFP, include the following:

The Choice Solutions understands that the vision for SLDS systems and education system in general and has spent the past decade in developing and implementing these systems. This vision includes helping to foster excellence in the state education system and their workforce. Through our SLDS system, West Virginia will be able to use data and transform it into information that informs stakeholders to improve instruction and outcomes and guides policymakers.

In fact, one of WVDE, and therefore our, goals is just that—to develop a LDS longitudinal data platform that will allow stakeholders the ability to gather a rich source of data to make the best decisions concerning education. The term *platform* is important in that, besides supporting the short-term requirements for West Virginia, the platform will need to enable ongoing modification and expansion by state and agency staff. No provider is more experienced than the Choice Solutions in coordinating such projects across a broad range of stakeholders to provide a successful and extendable statewide platform.

Our proposed platform incorporates the following benefits for WVDE stakeholders:

- **A proven company with unparalleled experience and success in multiple statewide LDS implementations:** Choice Solutions has successfully provided over a dozen states with Data Warehouse, unique ID, validation, ETL, business intelligence and reporting solutions. Choice takes pride in its proven track record, project successes, and the deep partnership it has built with its client states. Choice's customers can provide the Department with the references to demonstrate the company's success in deployment and its ongoing partnership with them.

- **A focus on standards not technology:** By including a proven and highly relevant team who is working on other state LDS systems, as well as the guiding standards of those systems, The WVDE ensures their ability to create a system that leverage the best of breed solution and work that is going on throughout the country.

Choice's focus is to shift the conversation away from technology fluency to deeper conversations around the meaning and proper uses of the data that impact educational processes. The edFusion proposed solution ties together systems, creating a data driven ecosystem that unites people, processes and information in a more meaningful way.

- **A focus on education data:** While it is tempting to believe education data systems are no different than any other system, Choice believes that this is not the case. Some system integrators come in and out of education as funding ebbs and flows, and as a result they are never able to grasp the nuances and subtle, but essential, uniqueness of education data systems. Choice Solutions is the United States' leading LDS company. Education is not a sideline for our team—it's our core business.

- **System extensibility:** Once again, the Choice's focus on standards and openness helps to mitigate the risk associated with typical commercial-off-the-shelf (COTS) solutions. Choice Solutions is a leader of the CEDS and SIF standards, and is an active member in PESC and other data and technology standard bodies. This work, coupled with the fact that Choice is engaged with other states in similar LDS efforts, has allowed the company to create a solution that allows for extensibility of components, reducing WVDE's overall project risk and increasing the Department's ability to support new data and users as the system grows.

- **Lessons Learned:** Because Choice Solutions is currently actively engaged with eight states on LDS systems and have done more than a dozen LDSs, Choice will provide a shared knowledge space and collaboration opportunities with other thought-leader states such as Washington, Utah, Wyoming, Maine, New York, Hawai'i, American Samoa, and Iowa.

In short, Choice Solutions provides WVDE with the deep experience and rich insight we have gained into what is being done across the country, builds upon our many past successful projects, radically reduces WVDE's risk, and effectively increases project success. With this proposal, the Choice Solutions offers the WVDE an experienced team to implement a flexible solution; not merely fulfilling the RFP requirements, but also anticipating West Virginia's long-term needs. This integrated platform will connect educators, families, and education stakeholders across West Virginia with the information they need to inform their decisions and direct their actions in a learner-centric model to create the deep and fertile mines of education information.

4.4.1.1.a. a detailed explanation of the process and associated steps taken to implement a DWRS;

We have outlined our approach in the Implementation section of this document; which covers all areas of project administration and delivery.

4.4.1.1.b. a list of all proposed software required to implement the DWRS. List the manufacturer of the software and recommended version levels. If the successful Vendor has developed custom software for components of the DWRS, this software should be described along with details about successful implementations with other customers. Specify whether the software is server side or client side and specify the acceptable browsers and any necessary plugins at the client level;

Most of the code that drives the edFusion applications is written in .NET C# and utilizes Microsoft's SQL Server and SharePoint tools. Certain third-party tools have been selected because those features were more leveraged as "buy" solutions rather than "build" solutions.
The platform-level tools and technologies used by edFusion are:

- *Microsoft SharePoint Server 2010*
- *Microsoft SQL Server SQL Server 2012*
    - *SQL Reporting Services (SSRS)*
    - *SQL Integration Services (SSIS)*
    - *SQL Analysis Services (SSAS)*
- *Microsoft Windows Server 2008 R2*
- *Microsoft Active Directory (AD)*
- *Microsoft Internet Information Services (IIS)*
- *.NET Business Rule and Data Quality Rule Management*
- *Telerik Controls for Web Development*

4.4.1.1.c. the proposed database infrastructure to be utilized for the DWRS. List any unique features of the proposed database which are critical to the implementation of the DWRS. Describe any limitations the database may have related to access using standard SQL. Describe any connectivity options such as Open Database Connectivity [(ODBC)/Java Database Connectivity (JDBC)] the database supports;

As we are SQL Server based, there are not limitations related to access using standard SQL. Our edFusion solution is unique in that it is not locked into a particular system

interface for either data movement or presentation integration. Choice deploys all of its products in the context of true enterprise architecture, making integration a key strength of edFusion.

Many new data movement methods (both inbound and outbound) can easily be integrated with edFusion Foundation. Real time integration via techniques like SIF and Web Services is also well supported. In some cases, platform level integration via ODBC or custom code may be needed, and we support those approaches as well.

4.4.1.1.d. the minimum hardware requirements for all servers used as a part of the DWRS, along with details about hardware required to accomplish load balancing if needed;

The tool requirements (hardware and software) are outlined in the table below.

Tools (including the name of the software and hardware)	Tool Functions	Technical Specs
Web Server/SharePoint Server	The purpose of the web server is to host the web component of the P-12 SLDS.	Web Server HDD • C:\ 80GB - OS Disk • E:\ 150GB - Data Disk RAM • 16 GB CPU • Speed: 2.40 GHz • Count: 2 Operating System • Windows 2008 R2 x64 Enterprise • Version 64 Bit Software • Windows 2008 R2 x64 Enterprise • IIS 7.5, .NET 4.0 • SharePoint 2010 Enterprise • SharePoint Designer 2010 *Notes:* SharePoint Config and SharePoint content databases will reside on ODS Server

Reports Server	The reports server is the central component of a Reporting Services installation. It consists of a pair of processing engines plus a collection of special-purpose extensions that handle authentication, data processing, rendering, and delivery operations. In the current implementation SSRS runs on Native deployment model. This server contains the SSRS component of Insight. The databases specific to this server are ReportServerDB and ReportServerTempDB, which are deployed on the ODS server as a part of the SSRS installation. These databases are used to store report configurations and other things including Caching, Session, and so on, which improve the overall performance.	HDD • C:\ 80GB - OS Disk • E:\ 300GB - Data Disk RAM • 16 GB CPU • Speed: 2.40 GHz • Count: 2 Operating System • Windows 2008 R2 x64 Enterprise • Version 64 Bit Software • Windows 2008 R2 x64 Enterprise • SQL Server 2008 R2 Reporting Services *Notes:* Report Server and Report Server Temp databases will reside on the ODS Server

RDS Server	Reporting Data Stores (RDS), or data marts, consists of the subject area-specific data optimized for reporting. Data is loaded into the RDS from the ODS using ETL. RDLs on the reports server connect to this server to query the data required to populate reports.	SQL Data warehouse and Integration Services HDD • C:\ 80GB - OS Disk • E:\ 1TB - Data Disk RAM • 32 GB CPU • Speed: 2.40 GHz • Count: 4 Operating System • Windows 2008 R2 x64 Enterprise • Version 64 Bit Software • Windows 2008 R2 x64 Enterprise • SQL Server 2008 R2 Enterprise • SQL Integration Services *Notes:* RDS will reside on this Server

ODS Server	The ODS server houses the databases that are optimized for heavy Read/Writes. The kind of data residing on this server is SharePoint configuration& content databases and session-related data, as well as edFusion ODS.	HDD • C:\ 80GB - OS Disk • E:\ 1TB - Data Disk RAM • 32 GB CPU • Speed: 2.40 GHz • Count: 4 • CPU - Core Count Operating System • Windows 2008 R2 x64 Enterprise • Version 64 Bit Software • Windows 2008 R2 x64 Enterprise • SQL Server 2008 R2 Enterprise • SQL Integration Services *Notes:* ODS, LDS and Staging will reside on this server

Analysis Server	The analysis component of edFusion is deployed on this server. Analysis cubes on this server are used for aggregations and analytics which is sourced (data refresh) from the RDS. This provides the ability to perform multi-dimensional analysis, including drill down and rolling up to view data at different levels of detail.	SQL Server Analytical Services HDD • C:\ 80GB - OS Disk • E:\ 1TB - Data Disk RAM • 32 GB CPU • Speed: 2.40 GHz • Count: 2 Operating System • Windows 2008 R2 x64 Enterprise • Operating System Version 64 Bit Software • Windows 2008 R2 x64 Enterprise • SQL Server 2008 R2 Enterprise • SQL Analysis Services *Notes:* Analysis Cubes will reside on this server

Supporting Infrastructure – FTP Server	This server is used for transferring data and codebase required for the edFusion solution. The folder structure is created based on the requirement to perform the following operations: • Code migration • Data upload to serve the batch process	HDD • C:\ 80GB - OS Disk • E:\ 1TB - Data Disk RAM • 4GB CPU • Speed: 2.40 GHz • Count: 1 Operating System • Windows 2008 R2 x64 Standard • Version 64 bit or 32 bit Software • Windows 2008 R2 x64 Standard *Notes:* FTP Server
Domain Controller	A domain controller is a server that is running a version of the Windows Server operating system and has Active Directory Domain Services installed.	HDD • C:\ 80GB - OS Disk • E:\ 80GB - Data Disk RAM • 4GB CPU • Speed: 2.40 GHz • Count: 1 Operating System • Windows 2008 R2 x64 Standard • Version 64 bit or 32 bit Software *Notes:* Used as Domain Controller

4.4.1.1.e. the network requirements of the proposed solution, along estimated bandwidth needs as well as documentation supporting the estimates;

Our experience with conceptual and physical data model, for both "data at rest" and "data in-flight" has been designed to align with the maturing national education data models. The schema normalization levels are commensurate with the data's usage. The transaction and operational data stores are normalized while the data warehouse is de-normalized for efficiency of reporting and extraction. The COTS approach taken with edFusion enables the technical team to evaluate the WVDE's business requirements and modify the data model to accommodate the unique attributes and usage scenarios within the state.

Depending upon the architectural deployment strategy, the platform's hardware requirements are influenced by several planning attributes. Transaction levels, bandwidth availability, storage requirements, session management variability, types of usage and memory caching levels are just some of the factors that contribute to the hardware requirements of deployment.
To determine the bandwidth requirements we would need to better understand your underlying data and usage scenarios. We have implemented solutions in which .5TB has been the dedicated bandwidth to over 10tb of dedicated pipe. Establishing the required performance metrics will help us determine these requirements.

4.4.1.1.f. the methodology used to determine storage capacity requirements of the proposed solution, The initial storage capacity of the proposed solution should allow for ten years of longitudinal that based on a student population of approximately 300,000 students and approximately 40,000 teachers and administrators. Describe scale up strategy for additional storage and its maintenance. Include any cost details in the separate cost proposal;

The Choice architecture team applies two broad categories of scalability: scaling up and scaling out.

- **Scaling up** (or **Vertical Scaling**) adds more resources (storage, memory, CPUs) to a server (or replaces the server).
- **Scaling out** (or **Horizontal Scaling**) adds one or more additional computers, or nodes, to the system. These can be identical to the existing servers, or separately configured to run different components.

Both processes have been successful for Choice customers. Often Choice has recommended a hybrid strategy where "Scaling out" is applied to Portal, Insight, Foundation, and Identify and "Scaling up" is applied to servers running other components. The edFusion™ Suite

gains significant scalability when using virtualized environments, and benefits from "Cloud" deployments.

In every customer implementation, we perform load tests based on customer requirements such as:

- number of concurrent users
- size of the database (based on number of students)
- expected performance measures (Such as less than 2 seconds to present a screen)

Based on the load test results, we will adjust the sizing requirements of hardware. Majority of times our initial recommendation of sizing remains unchanged. Very rarely the sizing changes when the load performance results don't meet the customer expectations. Our solution design is very flexible and can be scaled up or down easily. Our recommended architecture includes clustering of databases. However the clustering/load balancing are optional based on his volumes of concurrent users accessing the system. Our goal is to minimize the customer expenses in maintaining the infrastructure and at the same time meeting the optimal performance levels.

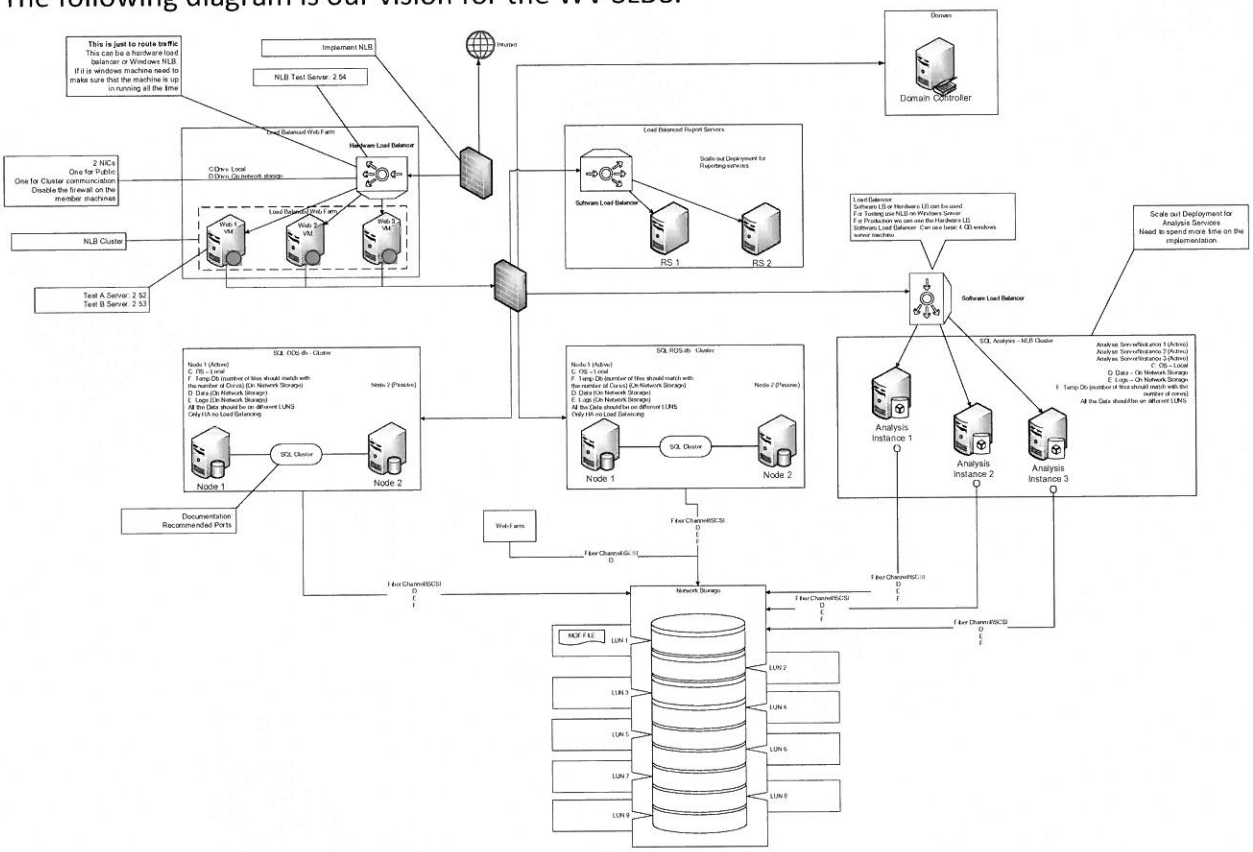
4.4.1.1.g. any additional hardware or software that is required to make the system fully functional which was not listed in the previous sections such as firewalls or minimum requirements for workstations;

Not Applicable. All hardware and software required to make the system fully functional has been listed in previous sections. We have seen your SLDS grant and understand you have a significant budget set aside for Cognos licenses; however, our solutions does not require these licenses and know from our relationships with Massachusetts and Iowa the challenges of scaling Cognos to support data informed decisions across a state.

4.4.1.1.h. a diagram, including notations/descriptions, that shows the system configuration and alternatives for each layer including the need for dedicated hardware or the use of virtualized services. Describe how the Vendor will work with the WVDE to ensure all required hardware and software are in place to successfully develop and implement the DWRS.

While the WVDE intends to purchase required hardware (including servers, backup hardware, network cards, etc.) external to this RFP, the vendor may provide, as an option, a cost proposal for vendor supplied servers and additional hardware as part of the cost proposal as outlined in Section 5.3.;

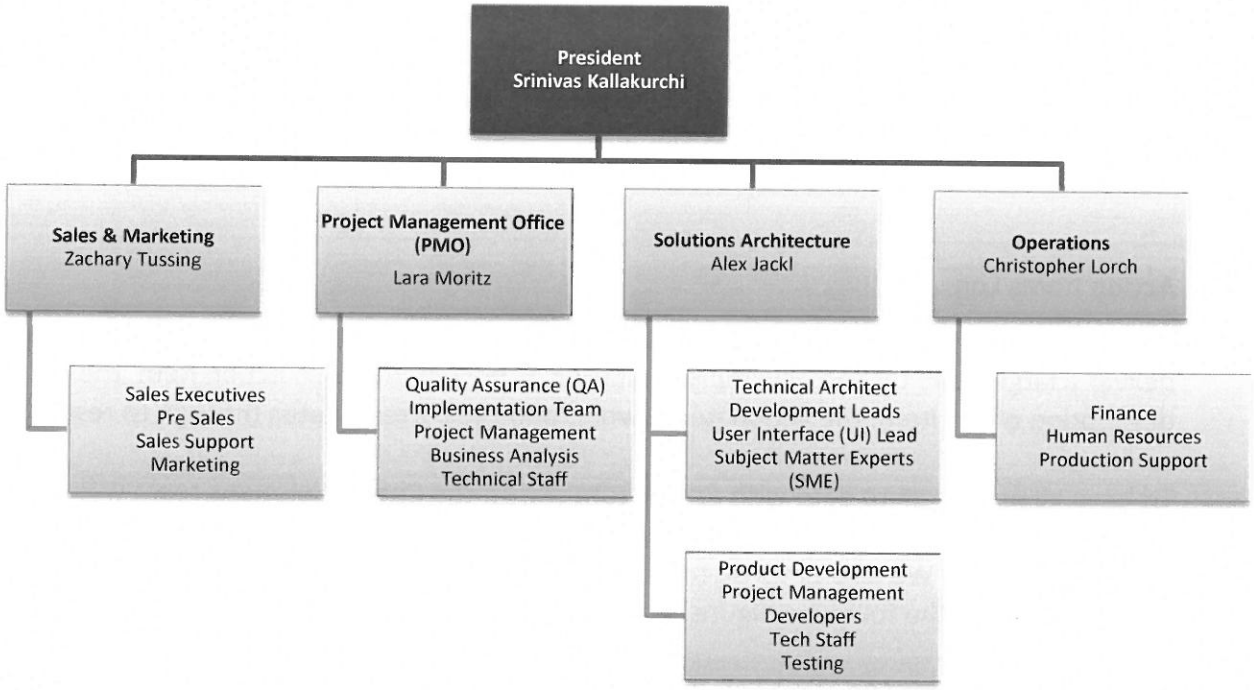
The following diagram is our vision for the WV SLDS.



4.4.1.1.i. how the Vendor will adequately staff this objective. Include a description of the Vendor's organizational hierarchy, the communication protocols and structure to keep the WVDE informed, and the identification of critical issues/problems and how those are escalated and monitored until resolution.

The chart below shows the organizational hierarchy for Choice Solutions. Choice Solutions is divided into 5 core functional areas, each led by Organizational Directors reporting to the President. All projects are represented by at least one member of each functional group to ensure continuity and organizational involvement.

Choice Solutions' Organization Chart



Communication Plan

Frequent communication allows all parties to share an understanding of the WV SLDS Project. Our Project Manager will develop a communication plan that includes weekly conference calls and reports. The Choice Solutions Project Manager schedules a phone conference for each week at a designated time.

Tools to Enhance Communication

Strong project management and communication is critical for successful program planning and delivery. Our role will be to document requirements and implement all of the elements necessary to achieve key milestone dates. To accomplish this goal, we propose the communication tools described in the following narrative to facilitate critical communication between the WVDE and the Choice Solutions team.

Weekly Status Meetings

Upon contract award, our Project Manager will request WVDE's approval to meet at a designated day and time to kick off the project. At approved days/times, our Project Team will meet with the WVDE team to discuss project schedule status, current activities, action items, and any issues.

We develop a weekly meeting agenda to discuss pertinent program details, including requirements, the schedule, issues, and work updates. After each meeting, we distribute meeting minutes to the WVDE and internal workgroups, noting a summary of the discussion, action items, critical information, dependencies, and key dates from the schedule.

Action Items Log

The action items log is a critical tool for tracking the many tasks necessary to plan and deliver a large-scale technology implementation. It documents each action item, the description of the item, the action item owner, and the current status through to resolution.

To keep all parties up to date with action item status, the Choice Solutions team will update this log on a regular basis and distribute it to WVDE representatives and the members of our Project Team. We also propose to use this document as a discussion tool for weekly status meetings. The following figure shows a sample action items log.

Sample Action Items Log. To keep all parties up to date, we will regularly update the action items log and distribute it to WVDE personnel and our Project Team.

Action Item #	Date Opened	Milestone Activity	Topic	Topic Description	Notes	Owner	Due Date
1	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]
2							
3							

Risk Management Plan

Given the complex nature and often aggressive schedules required by large-scale technology deployments, risk management is an essential aspect of the program management methodologies we employ. Acknowledging the inherent presence of risk, the most important component of risk management is the early identification of potential issues so they can be mitigated or avoided whenever possible.

To identify potential risks for the West Virginia Department of Education, our Project Team will create a risk management plan with input from the WVDE's team. The plan describes how risk identification, qualitative and quantitative analysis, response planning, monitoring, and control will be structured and performed throughout the duration of our contract for the WV SLDS Project.

Change Management Plan

Understanding when timely program changes are necessary to enhance effectiveness is critical to project success for West Virginia. To accommodate program changes, the interdependent teams will work collaboratively to review, assess, and implement changes productively and effectively. The Choice Solutions team will work with the WVDE's team to incorporate program changes while identifying and discussing potential impact and risk to the schedule.

The Project Change Control Procedure process, outlined below, will be followed if a change to an existing Statement of Work (SOW) is required:

- A Project Change Request (PCR) will be the vehicle for communicating change. The PCR must describe the change, the rationale for the change, and the effect the change will have on the project.

- The designated Program/Project Manager of the requesting party will review the proposed change and determine whether to submit the request to the other party.

- Both Program/Project Managers will review the proposed change and recommend it for further investigation or reject it. The Project Team will specify any charges for such investigation. A PCR must be signed by authorized representatives from both parties to authorize investigation of the recommended changes. The Project Team will invoice the IDOE for any such charges. The investigation will determine the effect that the implementation of the PCR will have on price, schedule and other terms and conditions of the Contract.

- A written Change Authorization and/or PCR must be signed by authorized representatives from both parties to authorize implementation of the investigated

changes. Until a change is agreed upon in writing, both parties will continue to act in accordance with the latest agreed version of the SOW.

Issue Management – SLA
All support issues, even seemingly small calls, are entered into the production support issue tracker.

Issue Priority Types

Show Stopper: Issues which block critical production tasks

Major: Issues which are highly visible to end users and block important production tasks

Minor: Visible but not critical issues

Trivial: Non-critical issues which need to be addressed

Level	First Response	Subsequent Responses
Show Stopper	Immediate	Immediate
Major	Within 2 hours	Within 6 hours
Minor	Within 48 hours	1-2 days
Trivial	Within 72 hours	3-5 days

Ticket Status Types

In Progress: This status will be used once a ticket has been through initial evaluation and is being worked on. The data that should have been communicated to the client when a ticket has this status is:

- Issue Type
- Estimate to time of completion

Addressed: This status is an internal Choice handoff from development to QA.

Fixed: This status is an internal Choice handoff from QA to the Choice Team Lead and Project Manager

Resolved: This status is a handoff from Choice to the client indicating that the problem has been resolved and is ready for client User Acceptance Testing (UAT).

Closed: This status indicates that the client has accepted the bug fix and that the issue is closed.

First Response: This response is the initial response that the message was received by the support person with a quick estimate (if possible) of review or correction time.

Subsequent Responses: These responses are follow-up responses which could include:

- Additional questions to help solve the problem
- Response that the team is still working on it
- Resolution message

Communication Methods for Reporting Technical Problems with Program Administrators

The Choice Issue Tracker application in the Production Support Website will be used to track issues and manage communications between the client and the production support desk. Entries will be created in Issue Tracker for all support inquiries including those that begin with a phone call or e-mail:

- Customer team members can follow up by phone, e-mail or web support as they choose
- Issue Tracker provides automated e-mail notifications to customer team members every time the status changes on an open issue
- Issues opened by a customer team member can only be closed by the customer (or by HMH team only with customer approval)

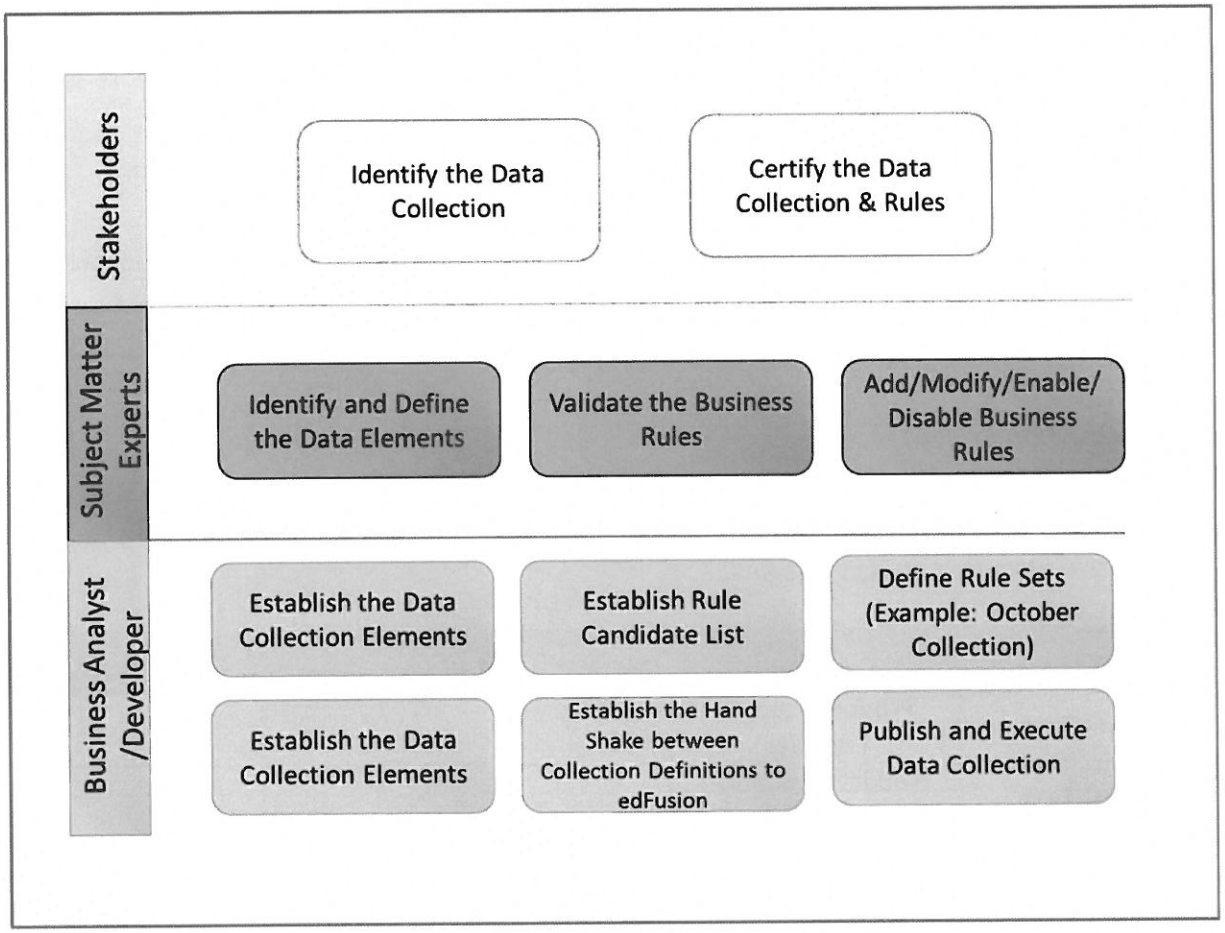
Escalation Process Chart

The following is the escalation path and times in case of issues with the response times or resolutions. The actual team member information will be added to the escalation chart at the time production support begins.

	Escalation	Email Address	Phone Number
Level Two	Product Support Engineer		
Level Two	Production Support Manager		
Level Three	Technical Team Lead		
Level Four	VP Operations		
Exec Level One	Account Manager		
Exec Level Two	Choice CEO		

4.4.1.2. Ensure that the DWRS solution includes appropriate validation processes to ensure consistency from source and each step through which the data travel that result in end-use of the DWRS. Specify the proposed process, timeline, and benchmarks to validate data from source to destination that includes each step through which the data will travel; and identify, repair, and notify WVDE staff with regard to data validation.

Data validation and quality starts with people, and our ability to work with your staff to understand the current as is business rules and processes related to that data is paramount to this process. Only once we have a true understanding on your data can we begin to apply technology to those issues to help ensure consistency, establish benchmarks and other checks and balances are adequately aligned to address the needs of your system.



Our solution provides the following three levels of error-check and validation routines:

- **Incoming Data Validation**

- **Cross Reference Validation:** The routine checks data against data already in the data warehouse to see if it is within expected range
- **Data Warehouse Internal Data Validation**: The team confirms that data already in the warehouse is in the expected location. The error checking routines will occur on a WVDE-approved schedule.

edFusion ETL Console: This provides authorized users a 100 percent web-based management console to upload files, schedule jobs, process uploads, manage errors and replace or append previous data loads. Additionally, we have a robust set of rules built into the solution for three levels of data validation and resolutions.

Rules Management: Central to our solution is the implementation of a robust and comprehensive validation process to manage data validation by establishing easy-to-understand rules. These rules greatly reduce the time to create and manage WVDE's data validation rules.

We will use the rules engine to:

- Validate each file based on the Department's technical specification
- Process each file student by student and run edits based on WVDE's technical specification
- Report back errors/warnings back to UI (and execute Case Management)

In our current implementations, there are approximately 140 business rules against each person record before it goes into the data store. We know of no other solution which can as easily and elegantly manage these rules and processes as the edFusion solution.

Case Management: A critical component of effective and efficient data uploads from the source systems is providing the users with a submission dashboard that calls out several key measures related to that submission. By providing West Virginia users with this dashboard, the WVDE can easily track by batch, date, time, and status or all previous submissions.

We currently have nearly 20 use cases defined for the error management process, each of which provides precise feedback to submitters as to why their data load/submission has failed and where to address that the failure. All errors are displayed in an intuitive and extensible UI that allows for submitters to view the error(s) associated with the submission.

It is usually best practice to always fix errors at the source and the case management tool provides excellent notification services to allow for that to happen. In some cases, that is not optimal and the client may choose to correct the errors in the ETL system instead. A big advantage of the tools in edFusion Foundation is that the client can correct all the errors/ warnings through UI rather than correcting and re-uploading files. In addition, we can provide a detailed e-mail back to the submitting organization with the

error/warning/summary reports of that submission so they can correct the source system off-line.

4.4.1.3. Ensure that the DWRS solution sufficiently encrypts and protects data from their identification in the source database to potential analyses of those data (beginning to end). Provide a detailed description of

4.4.1.3.a. how the proposed solution provides adequate protection of educational student and staff data while adhering to the various requirements of this RFP including, but not limited to those Acts listed in Section 4.2 (i.e., FERPA, COPA, and HIPAA)

Our solution has been designed and developed specifically to support addressing FERPA and HIPAA regulation by providing access only to authorized users. This work, however, requires Choice to work with your staff to understand policies roles and overall interpretation of FERPA regulations.

The project team will deliver our security planning document early in the delivery and work with your staff to align it to existing policies as well as federal mandates such as FERPA and HIPAA. We have also developed a proprietary security plan and documentation to support all the solution which will be implemented but that only take into consideration a small part of the overall risk scenario. To effectively plan for all the potential security issues we need to work with WVDE to create a robust project security and risk management document. This document will address the security issues but also a variety of other issues as highlighted below:

- Management controls
- Risk assessment
- System and services acquisition certification, accreditation, and security assessments
- Operational controls
- Policy Planning
    - Including Personnel, Physical Security, DRBC planning, Configuration management, Maintenance, Awareness training and media protection.
- Technical controls (as part of the edFusion implementation)
- Identification of all potential security and policy driven issues in WVDE as well and FERPA and HIPAA.

- Authorization and Identification
- access control
- audit and accountability
- communications protection
- privacy protection

and

4.4.1.3.b. the proposed solution's data-encryption techniques, and

Approach to System and Data Security

As progress in its mission to leverage its rich education data stores into transformational information and insight, the resulting increased utility and transparency of these same data elevates security risk profiles. As a result, our strategy includes working with those responsible for data management, data governance, security programs/strategies and security governance to insure that WVDE's data privacy and securitization requirements are managed utilizing a comprehensive, coordinated, well-orchestrated approach that does not sacrifice functionality and opportunity.

The Choice Solutions team's approach in achieving these objectives commences with classifying data securitization risks into two high level categories. One category defines risks associated with misuse of data through inaccurate reporting, insufficient training, unimplemented data governance strategies, and lack of data flow controls. The second category of risks is associated with infrastructure architectural weaknesses that potentially invite unwelcome data compromise and exploitation. Each of these data securitization risk categories requires attention for all possible states of data. Data state examples include "data at rest" (data resides in any data storage device) or "data in-flight" (data transmission and transport processes).

Our team and proposed framework will assist the WVDE in managing both categories of risks in all states of data conditioning. Our team's heralded expertise in managing the governance and infrastructure frameworks required to minimize the risks associated with education data misuse and compromise results from years of direct experience. This experience includes infrastructure architectural design, deployment, and monitoring, coupled with the leadership and contributions to the authoring and implementation of related policy, programs, procedures and best practices that support the universal goals surrounding the protection of personally identifiable data of our learners and educators.

Our strategy includes assisting in developing and implementing the mitigating strategies that give transparency into security risk management and provide metrics, measures and indicators that assist in sustaining a secure environment. Specifically, our team brings consultation experience in infrastructure hardening and multi-layer data securitization

strategies that include, but are not limited to, implementation of intrusion protection systems (IPS), sensitive data encryption strategies, OWASP (online web application security program) alignment, SSL (SSH if required) transport layers, security training and awareness programs.

Encryption while Data is in Motion (SSL) - All data in transit is encrypted.

Encryption while Data is at Rest - We can encrypt data at rest but this is often not required and can affect performance. We will work with WVDE to determine your needs and policies and implement based on optimal design.

4.4.1.3.c. successful examples from prior completed contracts, along with issues/shortcomings that had to be resolved in those contracts and the manner in which they were resolved.

Choice Solutions has worked with dozens of SLDS clients to address their needs. All project have challenges that need to be overcome; and, to avoid airing clients' "dirty laundry", we would like to provide you with a few examples of challenges, but first we want to provide a high-level list of our "Lessons Learned" and then we will address some individual cases.

Our Top 10 Lessons Learned

1. **Data Quality**: Up to 65% can be around data analysis and bringing awareness of all nuances and findings internally and within the client team is critical to success.
2. **Business Change**: A huge value add of creating a LDS system is the unearthing of erroneous, redundant, and unnecessary processes around data management. The exercises involved in executing the creation of an LDS give way to unexpected findings that typically are of great value to business operation and often critical to accuracy of reporting. .
3. **User Feedback**: User feedback should and must involve all constituencies. We have learned that small focus groups of end users from public or teacher segments can do a great deal in improving report formats and requirements.
4. **Usability and Self-Assistance:** Usability and self-assistance are critical when exposing granular data elements through complex analysis tools. Sufficient time in training and interface/experience design must be present in any solution.
5. **Roll Out**: The Roll Out of a solution should involve road shows, sharing, and listening, with an evolving constant feedback loop; thus creating ownership at all levels.

6. **Sustainability and Extensibility is Critical**: Business logic, collection formats, and elements often change on an annual basis. Having a solution and underlying structure that supports this change is critical to long term solution viability.

7. **Maintenance should not require deep engagement with the vendor**. Our solution and base code is and can be exposed for use by your support staff, saving untold costs and red tape around deeper vendor engagement. We can train staff where necessary around design or the industry common technologies used.

8. **Training**: Creating a training model in which we focus on ownership of all aspects of the solution is critical. We want your staff, both technical and business, to be a familiar with the solutions and functional components associated with them as members of our team.

9. **TCO**: Total cost of ownership is not just a slogan; there are the long term support and licensing costs associated with this implementation need to be considered. If done correctly you should be able to maintain the solution with less than .5 FTE.

10. **Documentation**: What are the artifacts required for a client to own, use and enhance the project, which require as little support as required. We have learned to integrate documents, videos and other help files to reduce the overall burden and increase the usability of the system.

Connecticut Department of Education:

- Stakeholder engagement early and often is critical for project success
- Understand the entire internal team has to be working towards the same goals

Iowa Department of Education:

- System ownership can cause a significant impact in the project, if the Office of Information Technology and The Department of Education are not effectively aligned it can cause significant impact on what can be done and how quickly those issues will be resolved

Maine Department of Education:

- A strong internal champion can make all the difference in project success and help to quickly remove project barriers

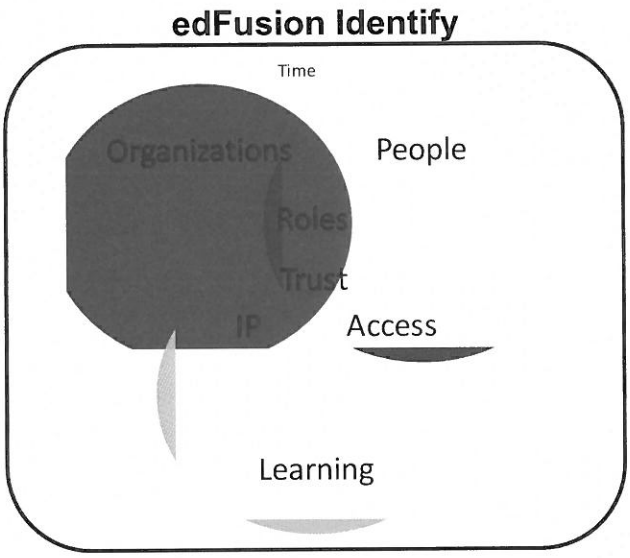
Washington Office of Superintendent of Public Instruction

- Data readiness must be accessed early in the project to address effective project timelines

4.4.1.4. Allow for role-specific access across all levels of the DWRS by providing

4.4.1.4.a. a detailed explanation of the steps to ensure the proposed solution supports role-specific access

Choice Solutions is excited to present to WVDE the **edFusion Identify** solution as we feel it is a critical component to an effective security and management solution especially for states like West Virginia with a vision that has district service ramifications. The key differentiator to this solution, in contrast to other portal and identity management solutions, is that Identify has been developed to meet the unique needs of P20W education clients through unparalleled experience with statewide deployments.



edFusion Identify includes enterprise scale directory and portal management integration customized for statewide education ecosystems. The Identify web-based solution allows for distributed management of resources. Organization and access policies can be managed at a state, district, school, or even class level, which greatly reduces the administrative burden on any single entity.

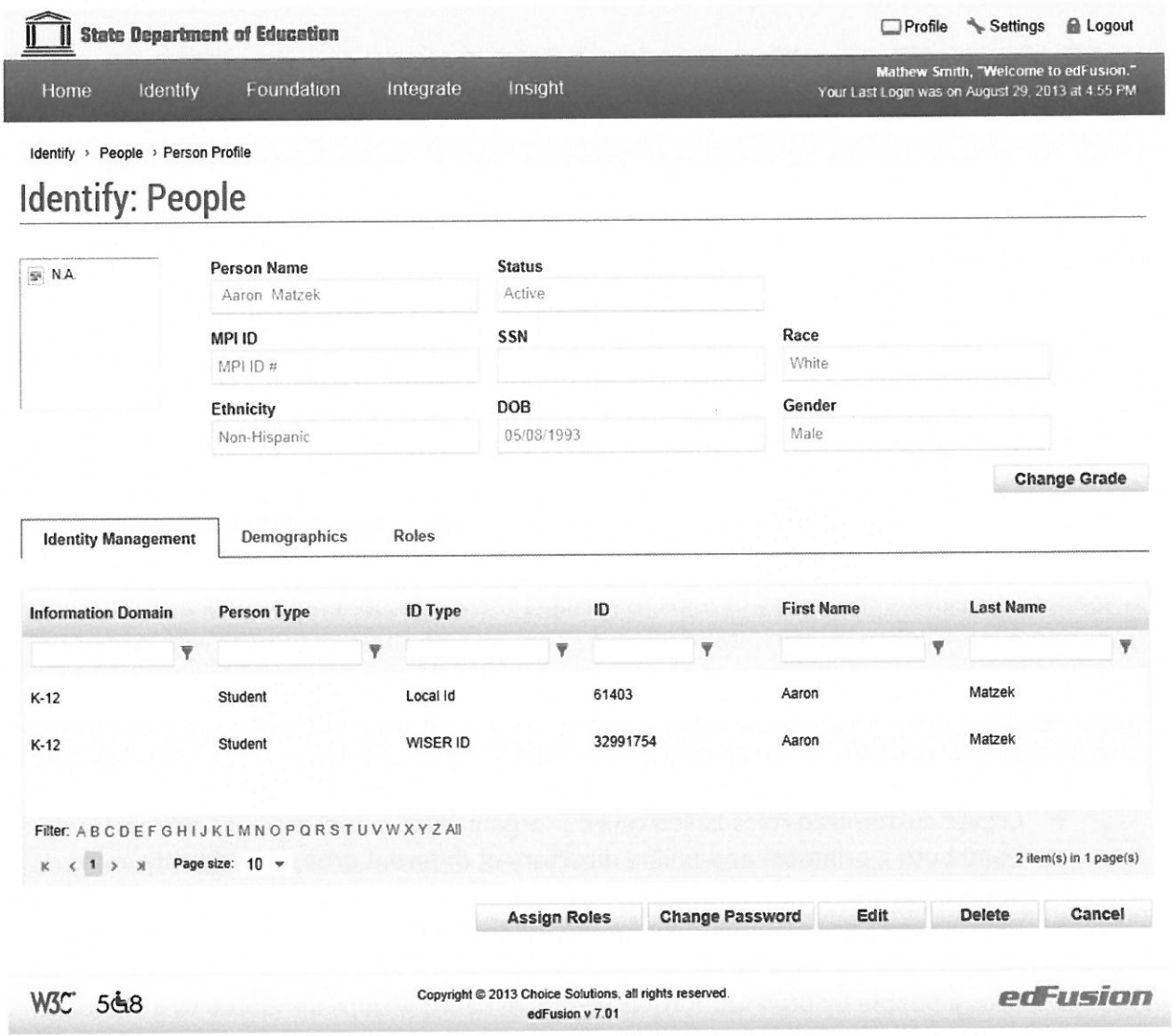
edFusion Identify provides numerous helpful features for the enterprise security management, including the following:

- Enhanced communication with key stakeholders
- Real-time collaboration capabilities for core Microsoft Office programs
- Higher availability and data recovery through Microsoft SQL Server integration
- Collaboration across tools
- Application integration through single sign on and seamless data exchange to various applications
- Customized, built-in online help
- Connection from remote locations
- Instant communication with other organizations
- Enterprise-ready features
- Built on an extensible platform to meet future needs
- Service to all students through 508 compliance

Identify provides a robust set of tools to manage these components as well as a rich set of business intelligence to understand what is going on with these resources within your deployment.

With Identify, you can:

- Create customized roles based on your organization's applications and functions
- Build both a printable and online directory of different groups of Identify users and/or people within the system
- View reports on a variety of topics related to the data within Identify and your online and print directories
- Group people by organizations as well as dynamic groups unrelated to a standard organization
- Access and work with all edFusion portal modules, applications, reports, and third-party tools available through the portal
- Manage security features and set security profiles for users
- Manage login requests, resets and non-authenticated inquiries
- Create customized alerts and notifications based on the action users take within Identify
- Provide an SSO gateway to internal and external applications
- Manage your events and notifications through integrated calendar



Central to our solution is a directory and identity management capability developed specifically for the US education market. This provides role-based access control for organizational people and entities. Our security model provides the WVDE the ability to be compliant with FERPA. Only the users who have a specified need have access to student information.

The authorization model for the identity management capability is based on the following four pillars:

- **Users.** These are the actual people logging into the system.
- **Roles.** These are the duties users have within the system. Roles indicate general system areas that will be available to each user.
- **Organizations.** These provide scope for users because the amount of data available to them is determined based on the organizations to which they belong. For instance, a principal can only see the students in his or her school, while a WVDE administrator may be able to see all student data from the territory.
- **Functions (Applications or Services).** These are the special tasks assigned to particular users regardless of roles. Functions can be assigned specifically to users.

Access to specific data within the system is determined based on user roles and permission requirements established by West Virginia. Through our highly-tested user interface the end user can manage all of these features without any technical staff. Identify puts the policies back in the hands of policy makers. Our staff will work with WVDE to define roles for each of West Virginia's user types. This one-time process is completed prior to implementation. After that point, assigning roles to users and creating new users is work that can be performed on the fly by authorized WVDE staff.

System Roles	
Type	**Examples**
Application	▪ WVEIS User ▪ WoW User
Organizational Roles	▪ Administrator ▪ Principal ▪ Teacher ▪ Student
Membership Roles	▪ Educator ▪ Student ▪ Parent

A core initial subset of these roles is defined in the system upon site build. Defining which rights should be associated with each system role, and assigning these system roles to actual user accounts, is part of the implementation process. WVDE can use institution and role permission to determine which information is made available to users. From that point on the role definition and association can be done by the end-user that has the right permissions.

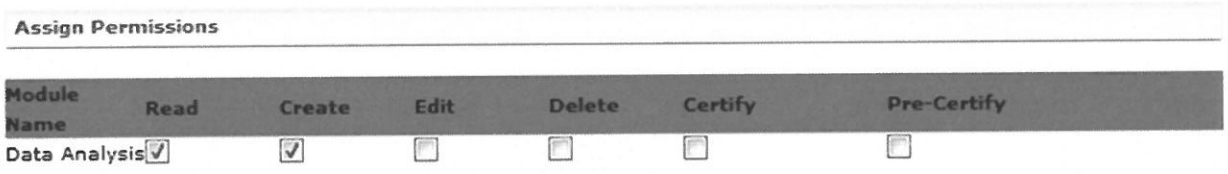
See the below examples:

- A classroom teacher's role allows viewing of information relevant to students enrolled in that teacher's classes
- A principal's role allows viewing of information relevant to the teachers and students in that principal's assigned building
- An administrator's role allows viewing of information relevant to the buildings, teachers and students in that administrator's region
- A specific role might allow them to report data out from their local system into the WV SLDS data structure.

As you can see, we allow administrators through a simple UI to assign data permissions to various data domains including the ability to see the domain, drill into the domain as well as view individual student records within a domain.

Administrator Capability Matrix		
Requirement	**edFusion**	**Description**
NA	Checkbox not checked	Every Page and Module in the System by default is provisioned as "No Access"
R	Read	This permission provides "Read Only" permission to the application page(s) or the entire application(s)
ER	Create/Edit	Create and edit functions on the application page/component
	Delete	Permission to delete the data
	Pre-certify	Permission to pre-certify the content (file uploads/data collections)
	Certify	Permission to certify the content (file uploads/data collections)

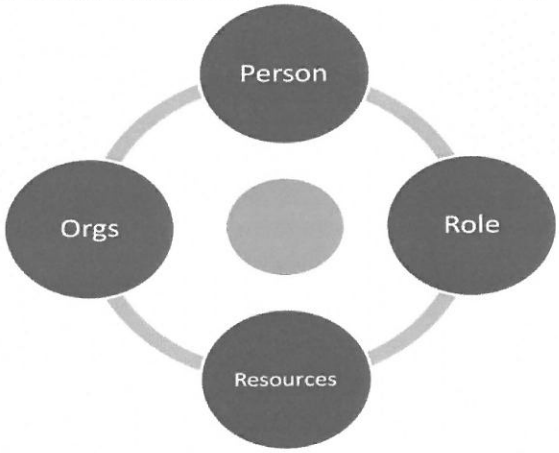
Administrator Control of Role Assignments. edFusion Identify allows administrators to manage the applications and application pages and apply role-based security.



Security Components Built-In to the edFusion Solution. The identity manager framework will provide a consistent security model for all your users.

Security Components		
Logging and Access Rights Security	***Managing Security and Access***	
Robust security infrastructure	Role management functionality	Defined permissions
Password protected system	User roles created according to WVDE preferences	Ability to use relationships between users and organizations
Private passwords	Permanent system roles	Ability to copy roles and defined access rights
Limited number of failed login attempts	A user creation and role assignment process	Streamlined data creation and load process
Password reset function	Functional capabilities for the system administrator	Built-in communications and notification manager
User notification	Ability to assign roles to an application	Controlled access to query results
Define security permissions at any level	Page controls management function	Limited access to individual reports
Comprehensive and integrated identity management	System administration capabilities	Report sharing based on roles and security rights
Individualized access	Ability to associate pages with an application area	Maintains integrity of WVDE records
User authentication stored in Lightweight Directory Access Protocol (LDAP) structures	Centralized administration of security and administrative access	
Efficient management of application-based user access	Organizational hierarchy	

At the core of our solution is our ability to manage all the componts of an enterprise education system People, Roles, Organizations and Resources (applications, content, etc).



Application Management

Identify lets you manage any application or module your users access from the edFusion portal. By creating applications, you give your users access to them. You can also edit and delete applications and modules that already exist in the system.

With Application Management you can:

- Select an application name to view its name, link, description, and associated modules
- Select a module name to view its parent application, name, link, description, and child modules
- Create a new application, module, or child module
- Edit an existing application, module, or child module
- View a list of the permissions associated with an application, module, or child module
- Associate permissions with an application, module, or child module
- Unassign permissions from an application, module, or child module
- View a list of organization strands, types, and/or units assigned access to an application, module, or child module
- Assign organization strands, types, and/or units access to an application, module, or child module
- Unassign organization strands, types, and/or units from an application, module, or child module
- Delete an existing application, module, or child module
- Deactivate an application or module
- Reactivate an application or module

Organization Management

Organization entities allow you to classify and manage the groups to which people in the directory belong. Identify helps you manage which organization entities you use and how you organize them.

Organizations in Identify are arranged in a hierarchy that allows for greater and more precise classification. You can use the organization hierarchy to group organizations by the people within them, their physical location, shared traits, or other methods that are applicable to your workflow.

The organization hierarchy is as follows:

- **Information Domain**: Dictates the organization strands that are available to users, and allows Identify to store and categorize data within multiple domains and disciplines; for example, Identify can maintain data related to the K-12 sphere as well as the State Departments of Labor and Health and Human Services.
- **Organization Strand:** A logical grouping of organization types that are associated with an information domain; for example, the K-12 information domain could contain Public School System and Private School System organization strands.
- **Organization Type**: Groups organization units that have related characteristics, such as Public Schools or Charter Schools.
- **Organization Unit**: The most basic entity within the organizational hierarchy. Organization units group people and/or users with shared characteristics or location, such as by classroom, school, or district.

Within the Organization Management feature, users can:

- Select an information domain to view its name, status, and description
- Select an organization strand to view it name, status, associated organization type(s), associated information domain, and description
- Select an organization type to view its name, level, parent organization type, status, associated organization category/ies, associated organization strand(s), and description
- Select an organization category to view its name, status, associated organization type(s), and description
- Select an organization unit to view its primary, contact, generic, and (if applicable) school information
- Create an information domain, organization strand, organization type, organization category, and/or organization unit
- Edit an existing information domain, organization strand, organization type, organization category, and/or organization unit
- Associate an information domain with an organization strand

- Associate one or more organization types with an organization strand
- Unassign one or more organization types from an organization strand
- Associate an organization type with one or more organization categories
- Unassign one or more organization categories from an organization type
- Associate an organization category with one or more organization strands
- Unassign one or more organization categories from an organization strand
- Associate an organization unit with an information domain, organization strand, organization type, parent organization, and organization category
- Delete an existing information domain, organization strand, organization type, organization category, and/or organization unit
- Deactivate an information domain, organization strand, organization type, organization category, and/or organization unit
- Reactivate an information domain, organization strand, organization type, organization category, and/or organization unit
- Close an information domain, organization strand, organization type, organization category, and/or organization unit
- Reopen an information domain, organization strand, organization type, organization category, and/or organization unit

People Management

A *person* in Identify is defined as a record that describes someone whose personally identifiable information is stored in the system. If that person is assigned a login, they are considered a *user* of the system. If they do not have a login, they can only view information that is available to the public.

Identify manages both the users within the edFusion implementation, as well as any and all records pertaining to the people within the organizations. When you add a record to Identify, you can specify whether or not the person in that record requires an edFusion login.

Within the People Management feature, users can:

- Select a person to view their person profile that includes directory history and demographic, identity, information domain, and roles information
- Create a new person including name, DOB, gender, race, ethnicity, SSN, status, photo, and contact and address information
- Specify whether a person has login information (making them a user)
- Specify whether the person's information should be published
- Edit an existing person
- Assign one or more roles to a user
- Select a start date for an assigned role

- Designate a role as the person's default role (if they are assigned multiple roles)
- Unassign a role from a person
- Assign a person to an information domain
- Assign one or more person types to a person
- Unassign one or more person types from a person
- Enter ID numbers for each of a person's assigned person types
- Enter a grade level and grade entry date for a student
- Enter contact details specific to each of a staff member's roles including a title, email, phone, and address information
- Specify whether or not one or more of a staff member's role contact details should be published
- Delete a person
- Deactivate/reactivate a person

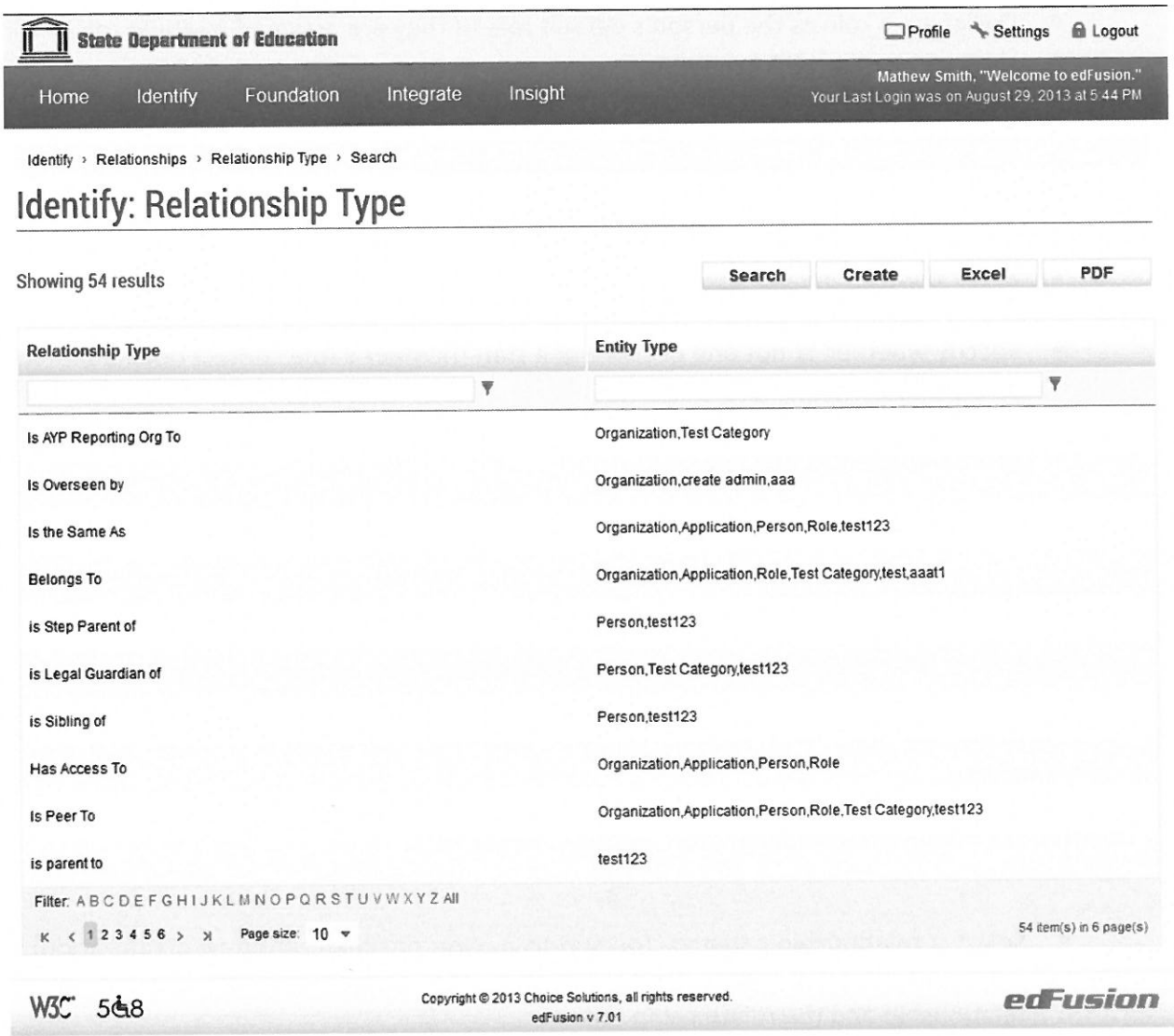
Relationship Management

A *relationship* is a method of associating organizations, roles, and/or users with each other. Identify lets users view a list of all relationships within the system. Users can create relationships between two people or two organizations, as well as edit and delete relationships.

Within the Relationship Management feature, users can:

- Select a relationship category (person-to-person or organization-to-organization) to view a list of all relationships including the people or organizations in the relationship and the relationship type
- Select a person or organization in an existing relationship to view its details
- Create a new relationship between two people or two organizations
- Edit an existing relationship
- Delete a relationship

The relationship manager component of the Identify allows the user to manage complex semantic and sometimes contradictory relationships through the UI, as shown in the example provided below. Again, no development staff is needed.


State Department of Education
Profile
Settings
Logout
Home
Identify
Foundation
Integrate
Insight
Mathew Smith, "Welcome to edFusion."
Your Last Login was on August 29, 2013 at 5:44 PM
Identify › Relationships › Relationship Type › Search
Identify: Relationship Type
Showing 54 results
Search
Create
Excel
PDF
Relationship Type
Entity Type
Is AYP Reporting Org To
Organization,Test Category
Is Overseen by
Organization,create admin,aaa
Is the Same As
Organization,Application,Person,Role,test123
Belongs To
Organization,Application,Role,Test Category,test,aaat1
is Step Parent of
Person,test123
is Legal Guardian of
Person,Test Category,test123
is Sibling of
Person,test123
Has Access To
Organization,Application,Person,Role
Is Peer To
Organization,Application,Person,Role,Test Category,test123
is parent to
test123
Filter: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z All
1 2 3 4 5 6
Page size: 10
54 item(s) in 6 page(s)
W3C 508
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edFusion v 7.01
edFusion

Role Management

A *role* is a set of permissions relating to one or more applications. The role(s) assigned to a user determine which applications and organizational data they can access, as well as the level of data they can view. Identify puts control of your organization's details within your grasp. This application serves as a central access point for the management of your data, people, and organizations with the ability to delegate selected tasks and responsibilities to any user.

Identify lets users view a list of all roles associated with the system. Users can create roles and sub-roles to associate with applications and organizations in the system, as well as edit and delete roles.

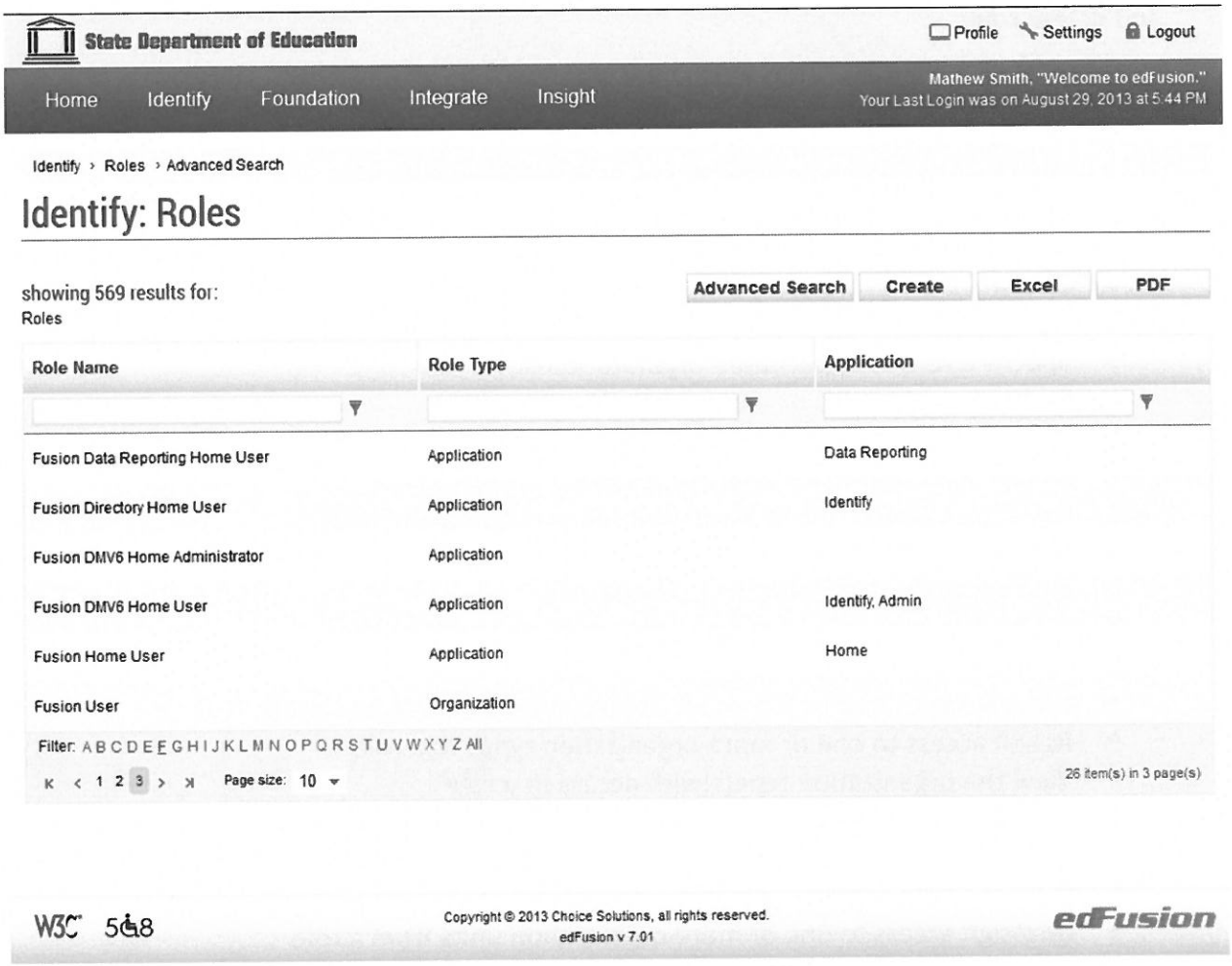
Within the Role Management feature, users can:

- Select a role to view a summary of its details by category
- Print the summary of role details
- Create a new role
- Edit an existing role
- Enter a role name and description
- Specify a role as application- organization-specific
- Assign access to one or more application to a role
- View the application(s) with access to a role
- Unassign access to one or more application from a role
- Select an existing role to serve as a sub-role to another role
- Determine whether the role copies the current permissions of the selected sub-role, or inherits them if/when they change
- Assign access to one or more organization strands to a role
- View the organization strand(s)with access to a role
- Unassign access to one or more organization strands from a role
- Assign access to one or more organization types to a role
- View the organization type(s)with access to a role
- Unassign access to one or more organization types from a role
- Assign access to one or more organization units to a role
- View the organization unit(s)with access to a role
- Unassign access to one or more organization units from a role
- Assign access to one or more organization categories to a role
- View the organization category/ies with access to a role
- Unassign access to one or more organization categories from a role
- Assign data security permissions to a role
- View the available modules and permissions that can be associated with the role
- Select which module permissions should be associated with the role
- Delete a role
- Deactivate/reactivate a role

Roles View Example

Each role allows for the creation of a specific granular set of permissions per resource per role per user per organization. This is driven by the business logic. If, for example,WVDE would add new applications all these functions update without programming needed based on the metadata data added at integration. This allows for rapid movement from inception to production while minimizing the technical staff requirements to manage and maintain this as the customer environment changes over time.

A screenshot of the Role View page follows.

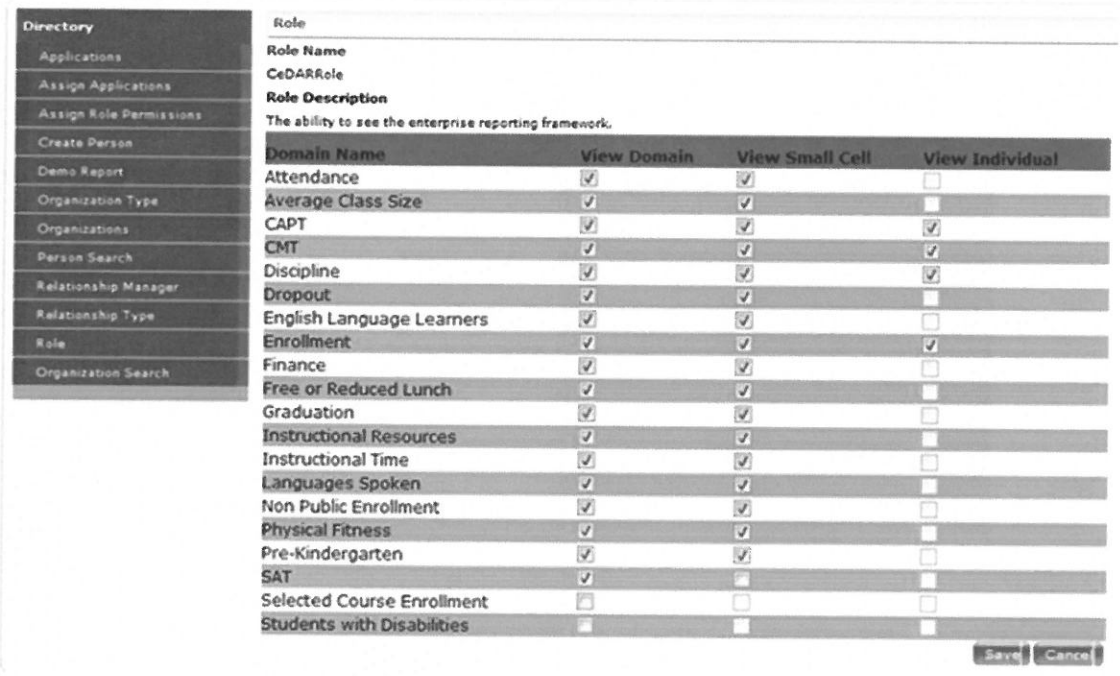


Reporting Tools

Reporting in Identify offers authorized users access to data about users, organizations, and contact information stored in the system. Users can view the following reports:

- User Reports
- Organization Reports
- Organizational Type Reports
- Mailing Lists
- Contact Reports
- Audit reports

Our solution can support fine grain access/permissions to all resources within the system including external application that have a sufficient level of integration (shared security components).



4.4.1.4.b. detailed information on the steps proposed in the solution to support the masking of data, while preserving database linkages, between the source database and any target databases that would be accepted in the DWRS.

Choice Solutions understands the masking requirements by policy such as HIPPA and FERPA and will work with your staff to determine the appropriate approach to masking data. In general, we mask data at both the application as well as the database layer. All users within the system have a set of permissions which dictates that data they can access. This will limit the types of organizational data (State, District, School, Class) they can see within the system. Additionally, we manage the level of grain they can see within that data, i.e. whether they can they see individual student record data.

Field Masking/Scrambling based on Role (Where Appropriate) - edFusion supports security trimmed results or small cell suppression to users or to the public, when and where users can see student or small group level data. This is done both at the application as well as data base layer to help ensure that the system is secure at all levels.

The following figure shows how our solution empowers users to manage small-cell suppression rules in ad-hoc analysis.

			CAPT Num Math Basic	CAPT Num Math Proficient
⊟ 2008	⊟ Bridgeport School District	Bassick High School	134	80
		Central High School	230	340
		Harding High School	240	150
		Park City Academy	*	*
		The University School	*	*
	⊞ Bristol School District		52	282
	⊞ Brookfield School District		*	114
	⊞ Canton School District		*	24
	⊞ Capitol Region Education Council		26	104
	⊞ Cheshire School District		22	116

Any cell containing an asterisk "*" is a value that has been suppressed in the report.

4.4.1.5. For the successful Vendor's solution to function as a seamless component of West Virginia's educational network and public Internet as appropriate.

4.4.1.5.a. Provide detailed narrative of how the proposed solution functions within a privately addressed network, The narrative should include (at a minimum) specific details around (1) any IP translation issues that may need to be addressed by the WVDE prior to implementation; (2) firewall considerations; (3) a comprehensive list of all ports required for every component of the Vendor's proposed solution; and (4) encryption details.

Choice Solutions has developed our solutions to work in a variety of public and private computing environments. We are confident we can address your concerns regarding privately addressed networks.

IP Translation Issues that need to be addressed by WVDE prior to Implementation

Our customers will not/do not encounter any Private IP translation issues when edFusion solution is deployed in customer networks.

Firewall Considerations and a List of Ports Required for Every Component of the edFusion Solution

The edFusion solution requires that DWRS Site http port (IIS) should be open along with Active Directory (Port 389), SMTP (port 25) and SQL (1433) ports in windows firewall.

Encryption Details

At application level, all secured information like passwords and certain field level data are encrypted based on the Policy settings of the Client.

4.4.1.5.b. Provide detailed narrative that describes the installation and contingency plans, and timeline for installation of the DWRS.

Installation Plan for the DWRS

We provide a comprehensive infrastructure design and solution installation plan to our customers when the project is completed. Here is an outline of what the installation includes:

- All Servers have to be configured according the architecture plan.
- In web server IIS has to be configured.
- In Database server SQL server with all services have to be installed.

- Active Directory has to be configured
- edFusion Rule engine (InRule) server has to be configured.

Contingency Plan

1) Customer should plan for backing up following systems/servers at regular intervals for Business Continuity and Disaster Recovery:
    a. database, webserver, Active Directory, and InRule (policy server)
    b. all backups should have a local image as well as a secured storage mechanism remotely;
2) The recovery of systems depends on the actual damage occurred; it would take anywhere between 4 to 6 hours for system recovery depending on the amount of data loss and recovery from the archived storage.

Timeline for DWRS Installation

It usually takes about 24 hours to complete the installation of edFusion solution from start to finish, including all the above mentioned servers.

4.4.1.5.c. Provide detailed narrative of considerations when the Vendor's proposed solution is accessed via the public Internet. The narrative should address (at a minimum) (1) risks associated with public Internet access; (2) how the Vendor will adhere to user-access roles, privacy requirements, and suppression rules throughout public report development; and (3) encryption details.

Accessing Our Solution Through Public Internet

Making the solution available through public internet requires a registered domain with a public IP. The public IP address is mapped with Local IP in firewall. Only information that is scoped out for public access will be made available through the public site.

To reduce risk, only required ports should be opened in network firewall. All other ports should be blocked from external access to protect the application and systems from external threats. We do not foresee any risks as the application is internally built with proper security.

In edFusion, Identity management is fully secured as per the user roles. The role based access will ensure the data exhibition and protection with multiple levels of access throughout the public report development process. We have implemented suppression rules in the reporting frame work and these rules are configurable to protect the field level data shown to different role based users within an organization.

A Public SSL certificate with 128 bit encryption has to be configured for secured data access. The secured site can then be accessed through https. Certain field level data is encrypted based on the FERPA rules and the same encryption can be extended to any field level information that WVDE would like to protect from unauthorized access.

4.4.1.6. For the successful Vendor to provide a DWRS that appropriately load-balances heavy system use and uses automated upgrades. Provide detailed narratives on how the Vendor proposes to implement a system that uses automated upgrades of Operating Systems, software, and database components. Describe the process including planning, implementation, verification, and evaluation.

Choice Solutions has been iteratively improving its longitudinal data systems for education for many years since the first one we built in Massachusetts in 1999. We will have development versions of the new updates available in October 2103. Often these upgrades can/will include updates to underlying operating systems and software. We will be using those development versions until the general release date at which time we upgrade to the general release if there have been any changes. We anticipate that the software necessary for the WVDE project is already 90%+ part of our newest release which leverages the latest OS and Software components. Of that effort on this project will be configuring the system to meet WVDE's needs, and adding the data into the reports, visualizations, and data structures.

Choice Solutions makes general updates available from anywhere between six months to a year between upgrades. At the time that upgrade is available the client can select whether or not they wish to take advantage of the new functionality in the upgrade. Clients not wishing to upgrade at that time can continue to use the old version. If they chose to take advantage of the upgrade the when performing gap analysis between the client's version, any upgrades that have happened since that version, and the newest version. Based upon that analysis Choice will work with the client to execute the upgrade. Upgrades are available to all clients that have active support and maintenance agreements with Choice. Any upgrades made will be tested in our edFusion labs prior to release and all potential issues documented for our clients.

4.4.1.7. For the successful Vendor to provide its robust software and its software problem resolution plan. The specifications associated with this objective include:

4.4.1.7.a. how the proposed reporting tool can handle simultaneous secure authentication from various locations across the state and quantify estimated performance degradation; and

Choice Solutions has developed an extensive testing process and well and a performance metrics to support the scalability of our systems across state educational agencies. Generally this is addressed by establishing baseline performance objectives of the system and testing against those objectives. Our solution was designed to be horizontally and vertically scalable to support the additional usage scenarios common within out SEA clients.

The purpose of Performance Testing is to verify that the solution meets the desired level of real-time response in a production environment. Performance testing is an automated testing activity that includes Load and Stress testing. It is focused on measuring specific system parameters such as throughput or response time under different loads of concurrent users. It is not necessary to have all solution functions fully tested in order to start the Performance Testing phase. The objectives are to verify in a production-like environment that the solution:

- Can process large transactions volumes within the time frame as stated in the requirements and specification design documentation
- Architecture and construction is capable and adequate to process the data volumes and turnaround time as stated in the requirements and specification design documentation
- Operation conformance covering real time and batch jobs, startup and shutdown, recovery and backup

Often, performance tests and load tests are thought of as the same test. However there is a difference between them. Performance Testing consists of activities that attempt to determine the responsiveness of the system in relation to usual workloads. Load Testing is the activity of identifying the limits of the system (beyond usual workloads). Both tests measure and evaluate response times, transaction rates and other time sensitive requirements in conjunction with resource utilization.

Performance test focus the attention on how many requests per hour the system can handle when managing a normal specific business scenario (i.e., with a standard workload for the application). For example: Can we ensure that the response time will be less than 5 seconds when running reports?

On the other hand, the Load test will indicate if the system is capable of managing requests under a specific load. The load test will answer questions such as:

1. The existing database size is 2 million records. Can the system handle a database with 5 million records?

2. Typically 50 users access the same functionality. Can 100 users work concurrently using that same, specific functionality without "breaking" the system?

3. The system has never reached more than 50,000 requests per hour. What will happen if the system should support 60,000 requests per hour?

In order to perform a Performance or Load test, the following activities take place to create the performance/load test environment:

Creation and configuration of the Environment

- Data Population
- Configuration of the performance tool to access the environment
- Recording of the scenarios: record the scenarios that will be repeated upon time execution
- Scheduling of test scenarios: When and how the load will be injected in the test run.

4.4.1.7.b. a detailed narrative of the Vendor's proposed support structure for software development and implementation issues. The narrative should address the levels of software failure and escalation path for issues from identification to resolution; and a proposed plan regarding software issues for issue identification, issue ownership, and issue resolution during development, implementation, and transition to WVDE operation of the DWRS.

Choice Solutions has a solid support structure for software development and implementation issues. We pride ourselves on meeting the needs of our partners throughout all phases of the project. As such, we have the Issue Management protocol described below:

Issue Management – SLA
All support issues, even seemingly small calls, are entered into the production support issue tracker.

Issue Priority Types

Show Stopper: Issues which block critical production tasks

Major: Issues which are highly visible to end users and block important production tasks

Minor: Visible but not critical issues

Trivial: Non-critical issues which need to be addressed

Level	First Response	Subsequent Responses
Show Stopper	Immediate	Immediate
Major	Within 2 hours	Within 6 hours
Minor	Within 48 hours	1-2 days
Trivial	Within 72 hours	3-5 days

Ticket Status Types

In Progress: This status will be used once a ticket has been through initial evaluation and is being worked on. The data that should have been communicated to the client when a ticket has this status is:

- Issue Type
- Estimate to time of completion

Addressed: This status is an internal Choice handoff from development to QA.

Fixed: This status is an internal Choice handoff from QA to the Choice Team Lead and Project Manager

Resolved: This status is a handoff from Choice to the client indicating that the problem has been resolved and is ready for client User Acceptance Testing (UAT).

Closed: This status indicates that the client has accepted the bug fix and that the issue is closed.

First Response: This response is the initial response that the message was received by the support person with a quick estimate (if possible) of review or correction time.

Subsequent Responses: These responses are follow-up responses which could include:

- Additional questions to help solve the problem
- Response that the team is still working on it
- Resolution message

Communication Methods for Reporting Technical Problems with Program Administrators

The Choice Issue Tracker application in the Production Support Website will be used to track issues and manage communications between the client and the production support desk. Entries will be created in Issue Tracker for all support inquiries including those that begin with a phone call or e-mail:

- Customer team members can follow up by phone, e-mail or web support as they choose
- Issue Tracker provides automated e-mail notifications to customer team members every time the status changes on an open issue
- Issues opened by a customer team member can only be closed by the customer (or by HMH team only with customer approval)

Escalation Process Chart

The following is the escalation path and times in case of issues with the response times or resolutions. The actual team member information will be added to the escalation chart at the time production support begins.

	Escalation	Email Address	Phone Number
Level Two	Product Support Engineer		
Level Two	Production Support Manager		
Level Three	Technical Team Lead		
Level Four	VP Operations		
Exec Level One	Account Manager		
Exec Level Two	Choice CEO		

4.4.1.8. Describe the schedule of patches and fixes, and the proposed plan to test components of the DWRS to ensure successful design, development, implementation, and transition to WVDE operation of the DWRS.

Testing Plan

The overall purpose of testing is to ensure the edFusion application meets all of its technical, functional and business requirements. The purpose of this document is to describe the overall test plan and strategy for testing the edFusion application. The approach described in this document provides the framework for all testing related to this application. Individual test cases will be written for each version of the application that is released. This document will also be updated as required for each release.

Test Objectives

The quality objectives of testing the edFusion application are to ensure complete validation of the business and software requirements:

- Verify software requirements are complete and accurate
- Perform detailed test planning
- Identify testing standards and procedures that will be used on the project
- Prepare and document test scenarios and test cases
- Regression testing to validate that unchanged functionality has not been affected by changes
- Manage defect tracking process
- Provide test metrics/testing summary reports
- Ensure the application is certified for release into the University of Minnesota production environment
- Schedule Go/No Go meeting
- Require sign-offs from all stakeholders

Testing Goals

The goals in testing the edFusion application include validating the quality, usability, reliability and performance of the application. Testing will be performed from a black-box approach, not based on any knowledge of internal design or code. Tests will be designed around requirements and functionality.

Another goal is to make the tests repeatable for use in regression testing during the project lifecycle, and for future application upgrades. A part of the approach in testing will be to initially perform a 'Smoke Test' upon delivery of the application for testing. Smoke Testing is typically an initial testing effort to determine if a new software version is performing well enough to accept it for a major testing effort. For example, if the new software is crashing frequently, or corrupting databases, the software is not in a stable enough condition to warrant further testing in its current state. This testing will be performed first.

Quality

Quality software is reasonably defect free, meets requirements and/or expectations, and is maintainable. Testing the quality of the edFusion application will be a two-step process of verification and validation. First, a verification process will be undertaken involving reviews and meetings to evaluate documents, plans, requirements, and specifications to ensure that the end result of the application is testable, and that requirements are covered. The overall goal is to ensure that the requirements are clear, complete, detailed, cohesive, attainable, and testable. In addition, this helps to ensure that all stakeholders agree to requirements.

Second, actual testing will be performed to ensure that the requirements are met. The standard by which the application meets quality expectations will be based upon the requirements test matrix, use cases and test cases to ensure test case coverage of the requirements. This testing process will also help to ensure the utility of the application – i.e., the design's functionality and "does the application do what the users need?"

Reliability

Reliability is both the consistency and repeatability of the edFusion application. A large part of testing an application involves validating its reliability in its functions, data, and system availability. To ensure reliability, the test approach will include positive and negative (break-it) functional tests. In addition, to ensure reliability throughout the iterative software development cycle, regression tests will be performed on all iterations of the application.

Test Methodology

System Test Entrance Criteria

- All business requirements are documented and approved by the business users.
    - Business Requirement Document (BRD) has been developed and approved
- All design specifications have been reviewed and approved.
    - Functional Design Specification (FDS) has been developed and approved

        - Technical Design Specification (TDS) has been developed and approved
    - The development team has completed unit testing.
        - Unit Test Cases will be a deliverable to the project team.
    - All hardware needed for the test environment is available.
    - The edFusion application delivered to the test environments is of reliable quality.
    - The testing team approves initial smoke test of the delivered functionality.
    - Code changes made to the test site will go through a change control process.
    - All the System Test cases reviewed & approved by:
        - Project Manager
        - QA Manager

System Test Exit Criteria

- All test scenarios have been completed successfully.
    - QA - SignOff Report will be delivered with all Test Results
        - Unit Test Cases
        - System Test Cases
        - UAT Test Cases
- All issues prioritized and resolved based on the Defect Triage Meeting Team
    - 100% Showstoppers and Major defects discovered in the System Test must be fixed, tested and closed
    - 90% Minor defects discovered in the System Test must be fixed, tested and closed
    - 80% Trivial defects discovered in the System Test must be fixed, tested and closed
- All outstanding defects are documented in Release Notes to the client.

Test Execution

The test execution phase is the process of running test cases against the software build to verify that the actual results meet the expected results. Defects discovered during the testing cycle shall be entered into the Gemini Defect Tracking tool. Once a developer fixes a defect, the fixed code shall be incorporated into the application and regression tested.

These following testing phases shall be completed:

1. Unit Testing
2. System Testing
    a. Functional (or GUI) Testing
    b. Usability Testing
    c. Data Upload Testing
    d. Transactional Database Testing
    e. Browser Compatibility Testing

f. Performance Testing
g. User acceptance testing (UAT)

Unit Testing

The edFusion application developers testing in the development environment will perform comprehensive unit testing. This testing phase will have a "white box" perspective, which means the application developers know, and will be testing the internal logical structure of each software component.

- The development team will be expected to develop and deliver Unit Test Cases as part of the overall project deliverables.
- Any build failing smoke testing will be returned to the development team with the expectation of expedited resolution.

System Testing

System testing ensures that the entire edFusion integrated software system meets requirements. It tests a configuration to ensure known and predictable results. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

In this type of testing, the software is tested for the business requirements. The tests are written in order to check if the application behaves as expected.

All QA Test Cases will have tests to include the following methods for the EDFUSION application:

1. ***Functional (or GUI) Testing***

Test for – all the links in web pages, database connection, forms used in the web pages for submitting or getting information.

- Check all the links on all pages.
- Test forms in all pages.
  - Checking all the validations on each field.
  - Checking for the default values of fields.
  - Checking wrong inputs to the fields in the forms.

2. ***Usability Testing***

Web site should be easy to use. Instructions should be provided clearly. Check if the provided instructions are correct means whether they satisfy purpose.

- Navigation Checking:
  - Navigation means how the user moves through the web pages, different controls like buttons, boxes or how user using the links on the pages to move to different pages.
- Content Checking:
  - Content should be logical and easy to understand.

- Check for spelling errors.
- All the anchor text links should be working properly.
- Images should be placed properly with proper sizes.

- Negative Checking:
  - Check entering wrong combinations of data and navigating to pages will cause problems to occur gracefully.

3. *Data Upload Testing*

This testing is utilizing test cases that will use data driven files for testing by utilizing the GUI for validation:

- Data populates as expected
- Data does not populate as expected without crashing the system

4. *Transactional Database Testing*

Data consistency is very important in the edFusion application. Check for data integrity and errors while editing, deleting, modifying the forms or do any DB related functionality.

- Creation of Transactional Test Cases
  - These will be utilized to validate that if data is entered on the GUI, it gets properly saved to the database table structure in accordance to the database schema
  - Check if all the database queries are executing correctly, data is retrieved correctly and also updated correctly.

5. *Browser Compatibility Testing*

Some applications are very dependent on browsers. Different browsers have different configurations and settings that your web page should be compatible with. Web site coding should be cross browser platform compatible.

- For the edFusion application **All** user interfaces will be tested and confirmed to operate in both Microsoft IE 8 and Firefox 3.6.

6. *Performance Testing*

Performance testing will verify the load, volume, and response times as defined by requirements. This testing will have to take place based on the availability of automation tools.

- For the edFusion application, the performance testing will focus on these particular areas of functionality:
  - Data Upload of large volumes of records
  - Page loading for reports and searches
- The system will be capable of daily processing the estimated volume of approximately 300,000 students with a typical student record size of 700 bytes of data transmitted per file and e files ranging in size from 1MB – 85MB with an average size of 7MB.

- Staging environment will be comparable to actual WVDE production environments with respect to data quality, data volume, and system performance characteristics.

7. User Acceptance Testing (UAT)

User acceptance testing will be performed by the business users but organized and orchestrated by the Choice QA team. The purpose of this testing will be to ensure the application meets the users' expectations.

- QA will build UAT test cases
  - Based on the FRD workflow
  - Scripted end-to-end testing which duplicates specific workflows that are expected to be utilized by the end-user.

Test Case/Script Development

A test case or script is defined as a written specification describing how a single or group of business or system requirement(s) will be tested. The test case or script consists of a set of actions to be performed, data to be used, and the expected results of the test. The actual results of the test are recorded during test execution. Test cases or scripts will also be updated as testing proceeds.

Test Cases/Scripts written for this project include the following:

- Business requirement ID
- Requirement description
- Any dependencies and/or special set-up instructions required for performing the test
- Test description
- Expected results

Tools

For our client quantity assurance process we utilize a variety of system, load and regression testing tools based on existing software licenses of the client. We also use NEOLoad and Visual Studio Test Professional. Additionally for all system deployments we run a third party vulnerability scanner to determine potential security flaws in the system. We use Acunetix Vulnerability Scanner; analyze the results and supporting documentation and create a remediation plan to address those potential security threats within the prescribed timeline after implementation. We will additionally review the site periodically as part of our ongoing support and maintenance period.

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4.4.2. Goal II: Technical Support

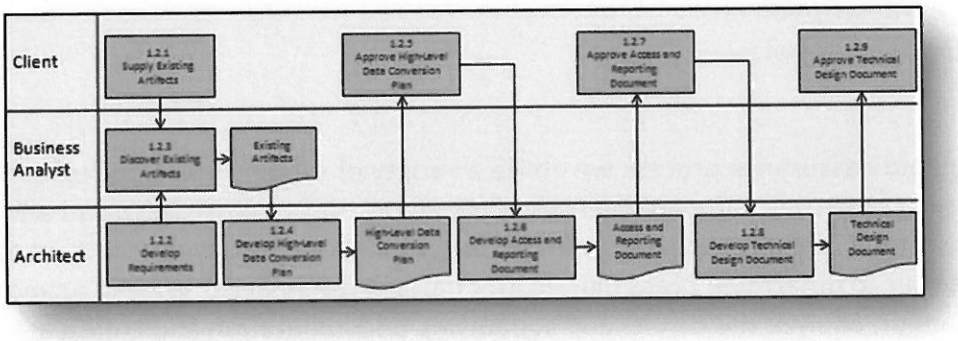
4.4.2.1. For the successful Vendor to provide a solution that allows for the successful data exchange with the WVDE and external data systems to support an effective DWRS. The specifications associated with this objective include the following. Include relevant examples from previous work with statewide or comparable education systems:

4.4.2.1.a. Describe in detail the proposed process to populate the DWRS.

A Solution for Disparate Data Sources

Our solution will provide the WVDE with the ability to receive data from disparate internal and external data sources. The ETL source system connectors provide a metadata-driven extraction process to extract data from heterogeneous data sources and transform the data into layered, targeted data stores.

We recommend that submitting agencies address data quality at the source level, but if that cannot be accomplished, we can establish manual or automated processes to cleanse data. Either way, we will provide the ability to receive data from disparate internal and external data sources, as illustrated below.



The ETL source system connectors provide a meta-data driven process to extract the data from heterogeneous data sources and targets into layered targeted data stores. For the initial source information systems, the targeted data store is the ODS, which is then used as the data source for the analytical (reporting) system. This will enables WVDE to quickly add new data sources both to the system and to the operational and analytical data stores. After the extraction, West Virginia will have the option to transform and load the data, using either the stored procedure language of the underlying database system or a high-end ETL tool, according to preference and data volume needs.

The ETL process uses business rules associated with cleansing, consolidating, and transforming data, but these rules are stored in the metadata to be readily changed as your educational analytical needs change. Our solution was designed to integrate data from any commercially available database and will load data from text files. The edFusion SLDS solution also has numerous data entry tables to integrate and enrich West Virginia data. **Our SLDS solution can load from any source, any database, and any application**.

The edFusion ETL processes support loading and/or updating only the records that have been added or updated since the last iteration. We will work with appropriate client personnel to develop and test the ETL system.

As we have done for other education customers, we will automate the ETL processes in several ways using Microsoft SQL Server Integration Services (SSIS). This process has been customized to meet our existing data structure using the following methods:

- Each SSIS package contains data flow tasks to apply data validation and transformation rules, perform other operations, and move data;
- SSIS packages have exception handling tasks to record data validation and transformation problems by writing rejected data and the corresponding problems to an exception database for reporting;
- SSIS packages are configurable to the environment so that connection strings and other package metadata can be edited to move packages between development, test, and production environments;
- SSIS packages can be managed using the Microsoft SQL Server Agent service to execute packages on a schedule or on-demand basis; and
- The ETL process is based upon standardized practices.

The system can manage any periodicity of data updates and ETLs ranging from Class I (near real-time uploads) and Class II (uploads every few hours) to Class III uploads (which could happen as infrequently as once per day or less). The ability to upload data frequently will not be limited by computing and bandwidth restrictions in our data store and data interfaces but will be based on waiting for remote operational systems to deliver necessary data.
This is a critical component to consider when envisioning the future use cases by WVDE constituents. Although real time data loads may not be envisioned, there are often use cases in which this level of data could be useful.

Historical and Incremental Load Strategies
Our solution framework allows the Implementation team or West Virginia to add additional data repositories to incorporate into the overall data extraction and loading policies. We will work with the WVDE's staff to transfer knowledge as it relates to best ETL processes.

Strategy for Managing Changes to Dimension Attributes

Our design incorporates the principles of dimensional modeling, so the dimension tables and fact tables represent the business data for elated viewing and querying. The dimensional modeling result in a star database schema, which facilitates cube design and reduces the number of multiple-table joins when querying the database to process dimensions and cubes.

The Implementation team will work with the WVDE Project Managers to create the extract specification for each of the source systems. These specifications will define the system configuration and ETL configuration that will be implemented to meet the requirements outlined in this RFP.

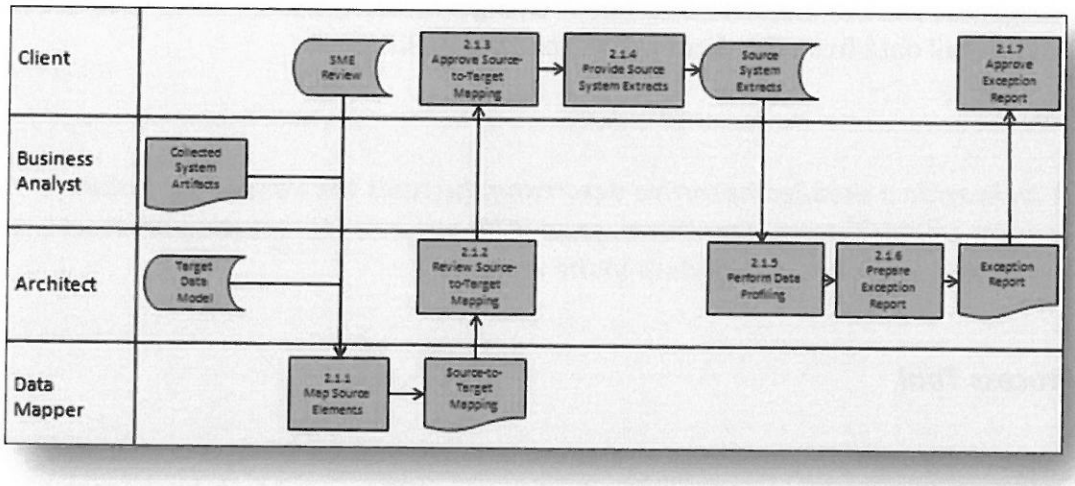
Our solution includes the following elements:

- **Source-to-Target Mappings:** To maintain West Virginia's data integrity, the Implementation Team will develop efficient data mapping processes, as well as create data definitions and data formats that will not change.

- **Physical Design Decisions:** We will develop automated ETL processes using Microsoft SQL Server Integration Services (SSIS) and other integration tools based on our work for other SEA customers. This shapes design of a process that will convert data from West Virginia's existing data systems.

- **Data Cleansing Strategy and Process:** Our solution's metadata-driven approach alleviates and controls data consistency, data quality, and data timeliness issues for West Virginia. The ETL process uses business rules associated with cleansing, consolidating, and transforming the data. However, our approach, coupled with our Data Governance and Data Quality plan, will empower WVDE staff to better address data quality in the future. Because the rules are stored in the metadata, West Virginia can readily change them as educational analytical needs change.

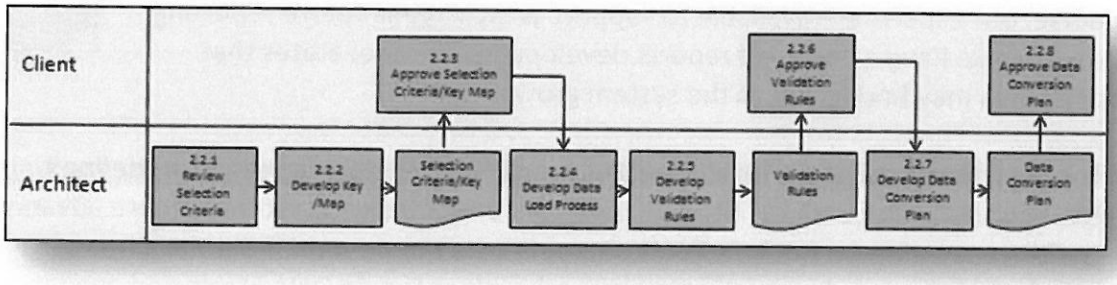
- **Exception Handling, to Provide a System-Wide Database that Records all Instances of Exceptions:** To record data validation and transformation problems, the SSIS packages have exception handling tasks that write rejected data and the corresponding problem to an exception database for reporting. A model is provided below.



Strategy and Process for Extracting from Each Source System

Our ETL solution will be designed to fit West Virginia's existing data structures, as follows:

- To apply data validation and transformation rules, perform other operations, and move data, each SSIS package contains data flow tasks;
- To record data validation and transformation problems, the SSIS packages have exception handling tasks that write rejected data and the corresponding problem to an exception database for reporting;
- Configurable SSIS packages allow West Virginia to easily edit connection strings and other package metadata to move complete packages between development, test, and production environments;
- West Virginia can manage SSIS packages using Microsoft SQL Server Agent service to execute packages on a schedule or on-demand basis; and
- The ETL process is based upon standardized practices.



Archival Strategy: to Remove Detail Data from Database at Appropriate Intervals

Our solution's metadata-driven approach controls issues of data consistency, data quality, and data timeliness. Our ETL process uses business rules associated with cleansing, consolidating, and transforming the data. West Virginia can readily change rules stored in

the metadata as educational analytical needs change. In short, we will write business rules to remove detail data from the database at appropriate intervals.

4.4.2.1 .b. Provide a detailed narrative describing the tools the Vendor's solution leverages for (1) the Extract, Transform, Load (ETL) process, (2) reporting processes, and (3) analysis and interpretation of data in the reports.

ETL Process Tool

edFusion ETL Console
The edFusion ETL Console provides authorized users a 100 percent web-based management console to upload files, schedule jobs, process uploads, manage errors and replace or append previous data loads. Additionally, we have a robust set of rules built into the solution for three levels of data validation and resolutions.

Reporting Tools

edFusion Insight is the Reporting Tool that will be used for the DWRS.

The reports outlined by WVDE will be developed and delivered using the edFusion Insight reporting framework. Choice staff will work closely with WVDE personnel to define the presentation, delivery method, and security requirements for each report.

In addition to the specific reports required, WVDE will have access to the full capability of edFusion Insight to create new reports or modify existing ones. With our solution, WVDE will have the ability to create reports in-house, and of course, our experts are available to support West Virginia future reporting needs. We also have a library of reports developed with other states that West Virginia may find useful as the system grows.

The Insight framework supports all levels of users. Novices have access to predefined SMART Reports, which include intuitive tools for comparison and filtering. More advanced users often use edFusion Analysis Tools to create new queries and build visually engaging reports. Researchers and power-users can work with edFusion Data Marts and even export the data for use in third-party analysis packages.

The edFusion solution supports a wide variety of reporting capabilities and visual displays. These visual displays include scorecards, dashboards, snapshots, charts, graphs, tables, and various other data visualization methods. Many of these visual displays are canned and ready for consumption by our state education agency clients; however, with every

engagement we work with our client partners to define and develop reporting structures that meet their specific needs.

Analysis and Interpretation of Data in the Reports

Outlined below in 4.4.2.2.b is a description of our data glossary tool which allows metadata driven insight into the reports and data contained within those reports. The glossary provides users with deeper insight into that data as well as the ability for users to add additional content overtime.

4.4.2.2. For the successful Vendor to provide a DWRS that has appropriate levels of support and training for the WVDE technical staff. The specifications associated with this objective include the following:

We will apply the same training and transition approaches successfully used in several other SLDS projects led by Choice, with customizations for this project. **Our goal for West Virginia's SLDS Implementation is to provide West Virginia participants with the tools they need to succeed – not just to prepare attendees from the State, RESAs, Districts, or schools to perform required activities, but also to provide them with sufficient understanding of the process so they can effectively train coworkers.**

To this end, all systems training will be hands-on and job-related, led by an instructor with an assistant and focused on the large and small components involved in the Choice solution. In past collaboration with states, Choice has used a multi-faceted methodology, blending online and onsite delivery to accommodate just-in-time training.

We will use a train-the trainer model focused on the West Virginia. We anticipate that designated WVDE and RESA personnel will attend the training. Attendees will receive the latest manuals for the SLDS solution.

Training will cover the functionality of the solution components separately and collectively, and it will provide clear information on how various personnel roles will interact with and govern the system's operation.

4.4.2.2.a. Provide a detailed list of the proposed documentation, the process to develop documentation, and the expected content of the documentation that will be provided to the WVDE as part of the installation and configuration of the Vendor's proposed solution. Describe the necessary software that is required to access the documentation.

Choice will provide training materials for our solution in various formats—PowerPoint presentations with accompanying handouts, checklists or simple process documents, and online synchronous (trainer led) and asynchronous (prerecorded) training modules as

mentioned in previous sections. Most, if not all, training materials are in place, as Choice has deployed a similar solution in several other states. Materials will be customized for the WV SLDS Implementation. Should other technologies or methods be developed and be advantageous in training, they will also be used.

Training materials, as well as documentation, artifacts, and other support materials, will be developed and delivered for the following user levels:

- System Administrator
- State-level Administrator
- State-level End User
- RESA Level Administrator
- RESA Level End User
- District-Level Administrator
- District-Level End User

We will work with WVDE to determine the optimal delivery format of this training and corresponding resources. Our goal is to provide WVDE and stakeholders with sufficient documentation and training to effectively manage the solution, regardless of their technical or operational responsibilities.

Training Materials

Our team has assembled an extensive internal library of best practices documentation and policies covering a variety of implementation scenarios, administrative rules, guidelines, policies, and procedures. Additionally, the Choice team has developed and will provide to the WVDE an Implementation Toolkit, with all training materials necessary for the WV SLDS project:

- User Documentation
    - Outlines all user functions associated with the software
        - Introduction to software
        - Quick-start guide for users
        - Detailed usage guide
        - Screenshots of actual implementation
        - Support contact info
- Administrator Documentation
    - Glossary of Terms

- Installation Guide (for all components)
  - Version Information
  - Installing Guide
  - Operations guide
  - Uninstalling Guide
- Administration Guide
  - ETL Development and Management
  - Data Model
  - Report Management and Development
  - Troubleshooting
  - Portal and Identify administration
  - IDMS Administration
- Release Notes provided for every version update
  - Version Requirements
  - Software and patch requirements
  - Impact analysis
  - System requirements
  - Known issues and work-arounds

Documentation can be viewed whenever you need it at the Choice team Customer Support Center (CSC).

User Guides and Online User Aids

To support the WV SLDS Implementation, the solutions provided by Choice will have quality online user guides available. User guides will be provided in PDF format. Printing charges are not included in this proposal and would be the responsibility of the State, RESA, or District.

As part of our typical deployment and support a wide variety of users, we suggest inclusion of embedded video help files that will allow users to see how to navigate the most commonly-used features and functions within the system. These videos are created directly from the production system and include voice and text descriptions of the most commonly used or desired actions.

The link
http://dw.education.maine.gov/DirectoryManager/Web/Maine_report/MaineLanding.aspx
shows a sample of the type of video we would typically develop for a client. This video requires no additional software or content management systems as it is natively embedded into the edFusion solution.

Documentation Updates

As our solution is a Customizable Off The Shelf (COTS) software solution, Choice will update all documents, online help, and other resources when the software is deployed. When the State chooses to adopt any additional updates to edFusion software, the documentation will be updated to reflect those enhancements.

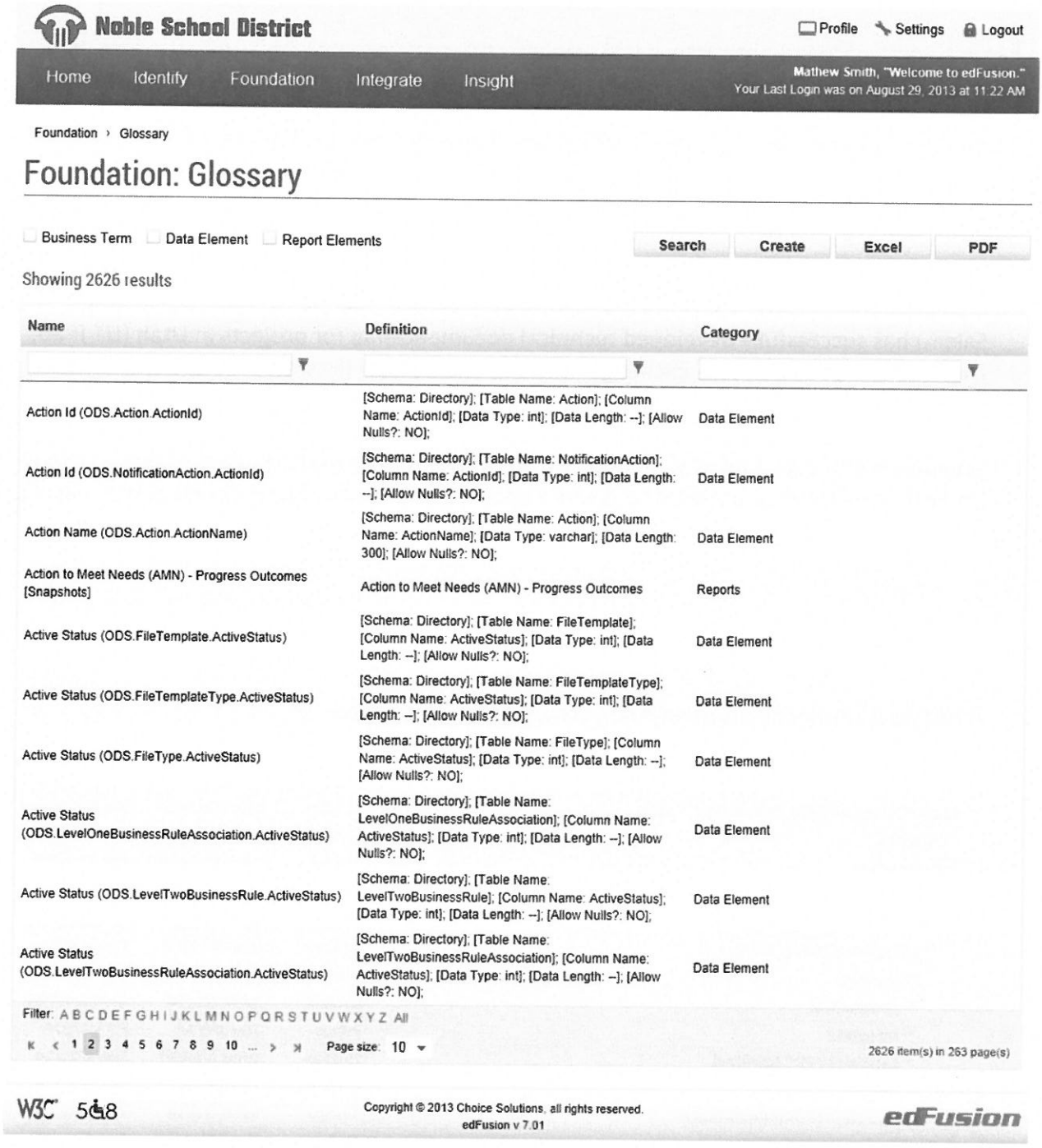
4.4.2.2.b. Describe any Data Dictionary tools (auto generated & updating) included with the vendor's proposed solution.

Data Glossary

edFusion contains a comprehensive data dictionary known as the data glossary, including a lexicon that identifies shared vocabulary for term use and naming conventions. Our solution provides a comprehensive data dictionary based on national standards. The Data Dictionary inventory results in a detailed workbook of metadata associated with those source systems including source, staff, collections, and item level data as well as any known gaps in the data. This data will then be mapped to our data dictionary (based on our data model, which is aligned to the SIF and CEDS data models). As with most efforts in the project, the completion of the data dictionary is an iterative process that might take multiple iterations to get right. The result will both reside in static artifacts and captured within the system.

Our Data Glossary allows users to search for or create business terms, data elements, or report elements. Additionally, users can export this Glossary data to Excel, PDF, and other forms if required.

From the easy administration and maintenance of the data dictionary, data definitions are surfaced within reports containing those data elements, as illustrated in the image that follows.



All the Glossary items are displayed irrespective of the glossary category. When the user clicks on the item under Category Column in the grid user navigates to that corresponding view page respectively.

4.4.2.2.c. Specify which of the Vendor's listed staff or sub-contractors will be responsible for each aspect of the documentation development and knowledge transfer processes. Provide examples of how these staff have successfully developed technical documentation and trained technical staff during transition in prior projects.

Training materials, as well as documentation, artifacts, and other support materials, will be developed by the Business Analyst and Technical Writer. The BA for this project (Tamy Salem) has successfully developed technical documentation for projects in Utah (UT P-20, Utah Transcript and Record Exchange [UTREx]) and Hawai'i (Hawai'i P-20 SLDS).

Most, if not all, training materials are in place, as Choice has deployed a similar solution in several other states. Materials will be customized for the WV SLDS Implementation. Should other technologies or methods be developed and be advantageous in training, they will also be used.

4.4.2.2.d. Provide a detailed narrative of the anticipated installation schedule, including a proposed knowledge transfer plan.

A high-level Project Plan/Installation Schedule looks like this:

Task Name	Duration	Start	Finish
− **West Virginia P-12 DWRS and SLDS Project**	**233 days**	**Mon 12/2/13**	**Wed 10/22/14**
+ **Initiation**	**20 days**	**Mon 12/2/13**	**Fri 12/27/13**
− **Elaboration**	**67 days**	**Mon 12/23/13**	**Tue 3/25/14**
+ **Define the templates for data sources**	**12 days**	**Mon 12/23/13**	**Tue 1/7/14**
+ **WVDE Data Preparation**	**15 days**	**Wed 1/8/14**	**Tue 1/28/14**
− **edFusion Building Blocks**	**40 days**	**Wed 1/29/14**	**Tue 3/25/14**
+ **Identify**	**5 days**	**Wed 1/29/14**	**Tue 2/4/14**
+ **Foundation**	**29 days**	**Wed 2/5/14**	**Mon 3/17/14**
+ **Integrate**	**7 days**	**Thu 3/6/14**	**Fri 3/14/14**
+ **Existing WVDE Manifest**	**15 days**	**Wed 2/19/14**	**Tue 3/11/14**
+ **Insight**	**14 days**	**Thu 3/6/14**	**Tue 3/25/14**
+ **Customization & Implementation**	**95 days**	**Wed 4/2/14**	**Tue 8/12/14**
+ **Quality Assurance & Acceptance**	**30 days**	**Wed 8/13/14**	**Tue 9/23/14**
+ **Training & Knowledge Transfer**	**19 days**	**Wed 9/24/14**	**Mon 10/20/14**
Project Closure	2 days	Tue 10/21/14	Wed 10/22/14

A more detailed Project Plan can be found in the Appendice.

Our Implementation Schedule is outlined in our project plan.

The Choice team has assembled an extensive internal library of best practices documentation and policies covering a variety of implementation scenarios, administrative rules, guidelines, policies, and procedures. Additionally, Choice Solutions has developed and will provide to the WVDE an Implementation Toolkit, with all installation and training materials necessary for the project:

- User Documentation
- Administrator Documentation
- Installation Guides delivered with every major version update
- Release Notes provided for every version update

Documentation can be viewed whenever you need it at the Choice Solutions Customer Support Center (CSC).

Hand-off Procedures and Applicable Training

A primary objective of our proposed solution is to provide WVDE staff and administrative personnel with the tools, education, and support to take ownership of the system. To achieve this, the Choice will deliver a comprehensive program of training, technical support, and consulting services, tailored to the needs of the WVDE and designed to provide a basis for successful ongoing management.

Documentation

Choice Solutions will provide a user manual for the system, including a User's Guide or an Administrators Guide along with an Installation Guide for every major version update, as well as Release Notes for every version update. To permit users to be self-sufficient with the solution, this documentation will be used in both the training process and as ongoing reference material. Documentation will address how the individual LEAs, District software development team, and the WVDE will use and operate the edFusion SLDS and include procedures (with illustrations), troubleshooting, and maintenance issues. The user manuals will be available in both printed copy and posted on the CSC.

Training Development

We believe it is critical to train, then install, then train again. This training will reinforce learning for WVDE users and drive their ownership of the edFusion infrastructure. The Choice training solution will use the tools necessary to assess personnel readiness, create timely and robust learning materials, and determine participant proficiency in applying concepts taught. The plan will provide training tailored to the needs of primary WVDE stakeholders, designed to educate on the day-to-day use and support of the solution.

We have experience delivering a range of training including WebEx, video conferencing, CDs, and web-based training as well as the traditional stand-up training. We recommend a hybrid training approach customized to WVDE and District needs.

Designing Training for WVDE Users

For each user group, the Choice team will provide training tailored to their specific needs—designed to educate users on the day-to-day use and support of the solution. Basic edFusion training includes edFusion installation, configuration, and continued maintenance of the edFusion infrastructure. Training will be customized to the needs of the WVDE.

4.4.3. Goal III: Analysis and Reporting

4.4.3.1. For the successful Vendor to develop flexible reporting tools that can pull from mapped elements within the data model and are integrated with the proposed DWRS solution for the WVDE. To meet this objective, provide responses for the following:

4.4.3.1.a. the proposed development, implementation, and training strategy to provide reporting tools with web-based interfaces;

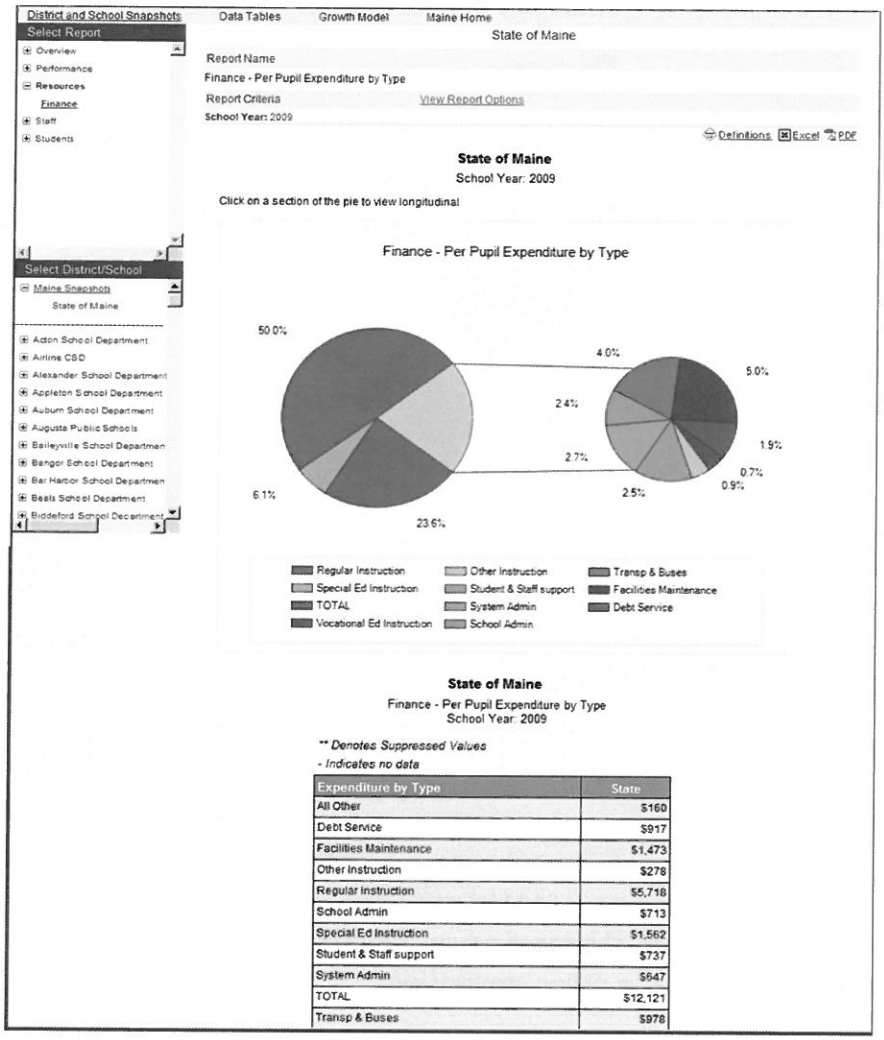
edFusion Insight for Reporting and Analytics

The reporting needs outlined by West Virginia will be developed and delivered using edFusion Insight. Choice personnel will work closely with West Virginia personnel to define the presentation, delivery method and security requirements for each report as well as train staff on how to create new reports through a non-technical interface.

In addition to the specific reports required, West Virginia will have access to the full capability of the edFusion Insight to create new reports or modify existing ones. You will have the ability to create reports yourself, and of course our experts are available for additional reporting. We also have a library of reports developed with other states that you may find useful as the system grows.

The edFusion Insight supports all kinds of users. Novices have access to predefined Smart Reports which include intuitive tools for comparison and filtering. More advanced users use edFusion Analysis Tools to create new queries and build visually engaging reports. Researchers and power users can work with edFusion Data Marts and even export the data for use in third party analysis packages.

Example of Snapshot Report



District and School Snapshots | Data Tables | Growth Model | Maine Home

Select Report

- Overview
- Performance
- Resources
  - Finance
- Staff
- Students

Select District/School

- Maine Snapshots
  - State of Maine
- Acton School Department
- Airline CSD
- Alexander School Department
- Appleton School Department
- Auburn School Department
- Augusta Public Schools
- Baileyville School Departmen
- Bangor School Department
- Bar Harbor School Departmen
- Beals School Department
- Biddeford School Department

State of Maine

Report Name

Finance - Per Pupil Expenditure by Type

Report Criteria | View Report Options

School Year: 2009

Definitions | Excel | PDF

State of Maine

School Year: 2009

Click on a section of the pie to view longitudinal

Finance - Per Pupil Expenditure by Type

State of Maine

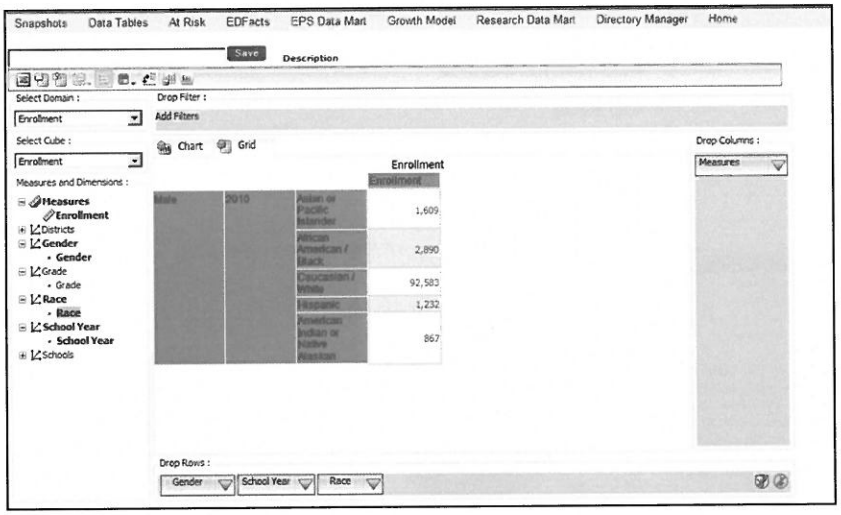
Finance - Per Pupil Expenditure by Type
School Year: 2009

*** Denotes Suppressed Values*

- Indicates no data

Expenditure by Type	State
All Other	$160
Debt Service	$917
Facilities Maintenance	$1,473
Other Instruction	$278
Regular Instruction	$5,718
School Admin	$713
Special Ed Instruction	$1,562
Student & Staff support	$737
System Admin	$647
TOTAL	$12,121
Transp & Buses	$978

Simple Analysis Services functional view



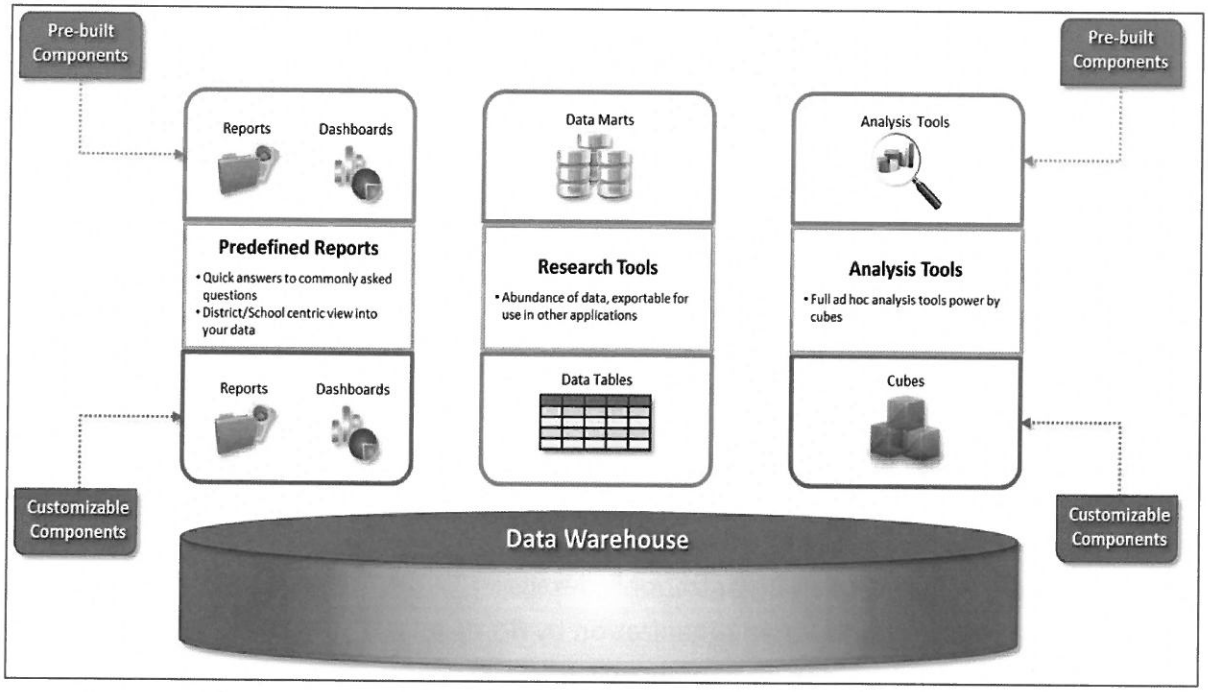
4.4.3.1.b. the proposed reporting tool and its features;

edFusion Insight

The reporting tool we are proposing to WVDE is edFusion Insight. edFusion Insight covers the spectrum of reporting needs, from having pre-defined reports to having the ability to create a particular report using our SMART reports functionality as well as having an ad hoc reporting and analysis tool for the most advanced users. For higher research needs, the data can be exported for use in other applications.

Education Decision Support and Data Dashboards (Pre-Defined Reports)
At the core of our solution is a set of pre-built standard reports and an analysis module that does not require any additional software on the user's computer beyond just a standard browser. The reporting needs of different types of users are met as shown on the figure below.

Design Simplicity and Feature Richness. The simplicity and consistency across our reporting tools greatly reduces training requirements, providing a solution that the West Virginia users will welcome.



Creating New Reports Using SMART Reports

SMART Reports are components that allow users to view data in a variety of standard and custom formats.

The SMART Reports module contains the following sub-modules:

- Manage SMART Reports
- View SMART Reports
- Domain and Subject Areas

Manage SMART Reports Functionality

The Manage SMART Reports sub-module that supports authorized users in managing the details of reports.

Available functionality within the Manage SMART Reports sub-module includes:

- Create a new report
- Edit an existing report
- Delete a report
- Publish an existing report
- Set small cell suppression thresholds on an existing report
- Manage the sort order of reports as they display to users

View SMART Reports Functionality

The View SMART Reports sub-module allows users to view reports and manipulate data within them.

Available functionality within the View SMART Reports sub-module includes:

- View a list of organizations
- View an overview of an organization's details
- View a list of reports for an organization by domain
- View the reports within an domain by subject area
- View each report within a subject area as a chart
- View a tabular version of a report that lists each category and the counts for each category
- Select specific years, districts, and/or schools to create targeted reports
- Select a section of a pie graph to view longitudinal detail
- Export reports as XLS or PDF files
- View definitions of terms used in reports
- Edit a report to view different criteria
- Sort tabular reports by headers
- Drill into longitudinal district and/or school level data

Domain and Subject Areas Functionality

The Domain and Subject Areas sub-module allows authorized users to manage the domains and subject areas available to other users.

edFusion Analysis Services (Ad Hoc Reporting)

The edFusion suite provides a zero client analysis and visualization tool to drive deeper into all West Virginia data, providing users who want to dig deeper the tools and visualization to create, save and share valuable reports with their constituents. Drag-and-drop rearrangement of queries and easy, extensive configuration of display options mean that even advanced users spend less time with the software and more time analyzing and applying results.

This query-based tool allows users to create queries on the data in the system and display customized reports. Users can combine domains, measures, and dimensions to create customized reports that list out only the data they wish to view:

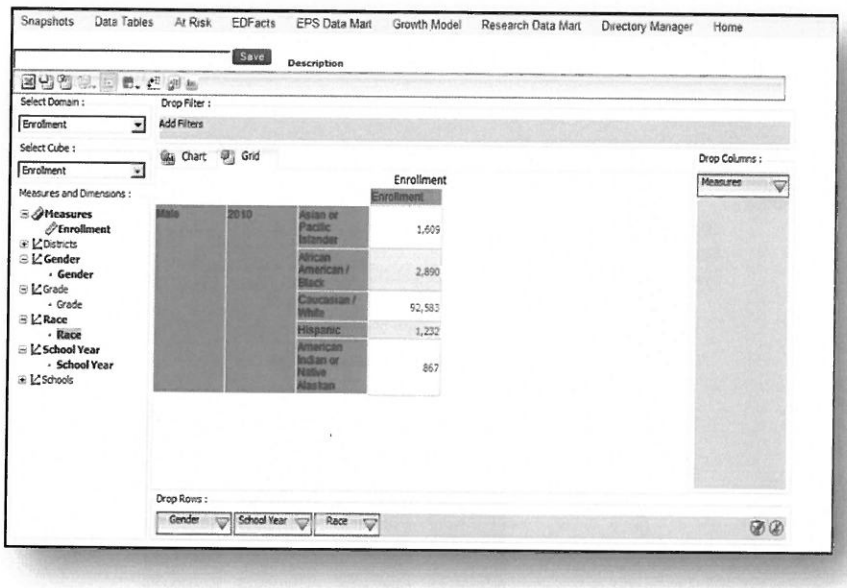
- A *domain* is made up of the available top-level report areas.
- A *measure* is a measurable numeric value associated with a domain.
- A *dimension* is an element that categorizes measures; e.g., users can view attendance rates by dimensions such as districts, grades, and gender. Users must select at least one dimension with each measure in order to provide context for the data.
- A *cube* is created when there are different measures across the same dimensions; e.g., the Average Class Size domain includes a Subject Area dimension lists out subject areas that are available only in Grade 7.

Available functionality within the Data Analysis module includes:

- Select a domain
- Select a cube for applicable domains
- Drag and drop a dimension as a row or column
- Drag and drop a measure as a row or column
- Drag and drop a dimension to slice the result set based on filtered criteria
- Remove all items from a column
- Sort items in a column in ascending alphabetical order
- Sort items in a column in descending alphabetical order
- Drill up to the parent level in the dimension's hierarchy
- Drill down to the child level in the dimension's hierarchy
- Show all parent levels for a column
- Add a dimension to a column
- Remove a dimension from a column
- Display report data that meets a condition (equal to, less than, more than), and minimum and/or maximum values within a specific measure

- Display report data that falls within a selected number of the top or bottom items within a specific measure
- Sort report data in ascending or descending order by a selected measure
- Break the hierarchy of report data filtered by top or bottom items
- Break the hierarchy of report data sorted in ascending or descending order by a selected measure
- Display a report as a grid
- Display a report as a chart
- Display the report in an advanced view
- Display the report in a simple view
- Transpose the data in a grid; i.e., make all report rows into columns and vice versa
- Select the type of chart, including Point, Line, Spline, Step Line, Fast Line, Fast Point, Bar, Stacked Bar, 100% Stacked Bar, Column, Stacked Column, 100% Stacked Column, Area, Spline Area, Stacked Area, 100 % Stacked Area, Pie, Doughnut, Funnel, Pyramid, Rose, and Stacked Rose
- Preview the printed version of a grid or chart
- Print a grid or chart
- Export the report as an Excel spreadsheet
- Reset a report to clear all the dimensions and measures from the report area, except the default year dimension.
- View a menu of available color palettes for a report including names and colors in each palette
- Select a color palette for the report
- View a legend for a report in chart form
- View a menu of all available chart types for a report in chart form
- Select a chart type for a report in chart form
- Save a query in report form with the report options preserved
- Load a previously saved query, including all report options

Simple Analysis Services Functional View



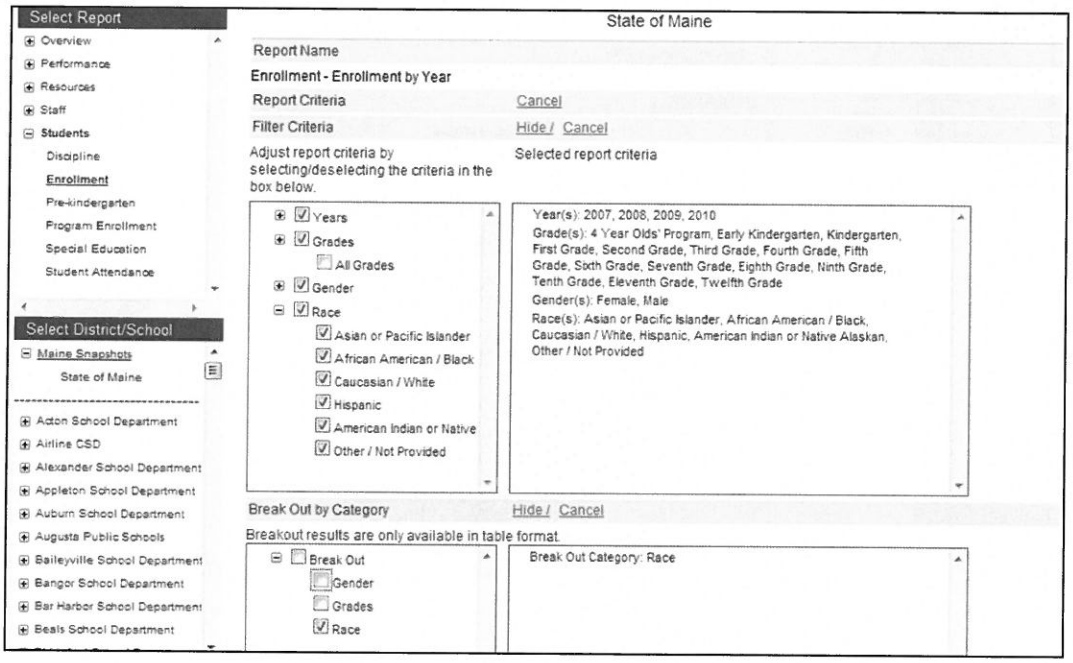
Our reporting stack supports the various data domains requires including academic achievement, grades, Assessments, Attendance, Enrollment, teacher and teacher performance, and organizational data. These reports also allow for different stakeholders to view data at different levels: For the entire SEA, by RESA, by District, by school, programs and even class, Supports FED defined subgroups, Supports grade level reporting as well as other reporting requirements to support the WVDE reports. These reports will have to be configured to support WVDE's exact requirements but the core functionality supports WVDE's needs.

As with all our other reporting examples, we focus on simplicity of design and richness of features. Our simplicity and consistency across our reporting tools greatly reduces training requirements and provide a solution that WVDE users will welcome using.

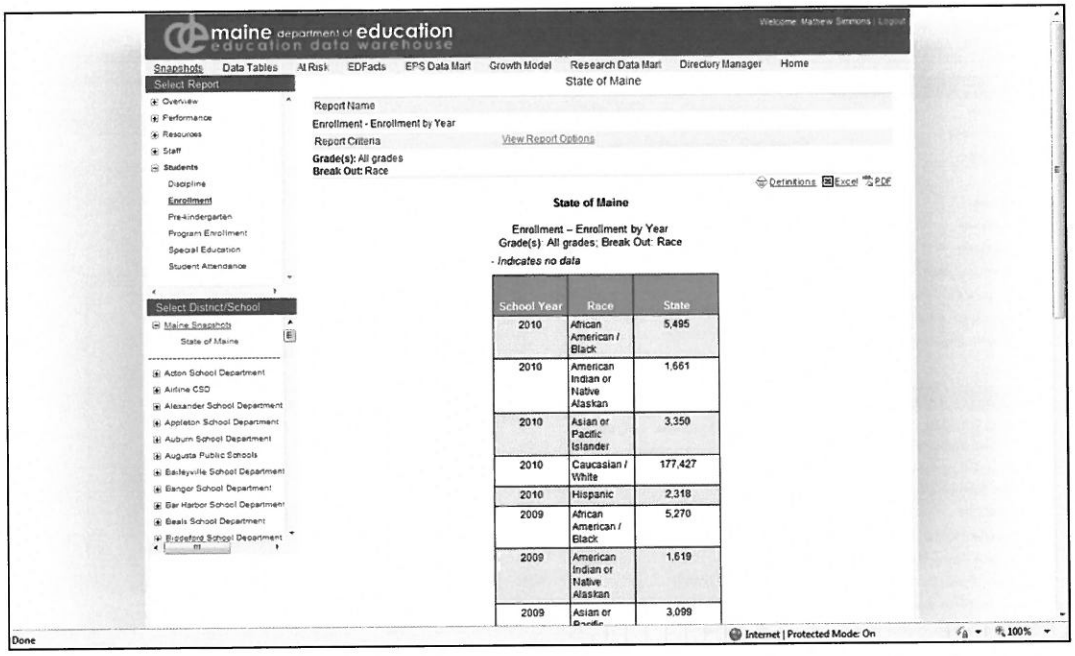
Here are some examples of enrollment reports from the edFusion SLDS in Maine. Although with edFusion 7 we have changed the overall design, the core functional components persist
http://dw.education.maine.gov/DirectoryManager/Web/Maine_report/MaineLanding.aspx.

The following image shows an example of SEA summary enrollment report over four years (configurable by the number of years WVDE would like to include, dependent upon the data the Department has).

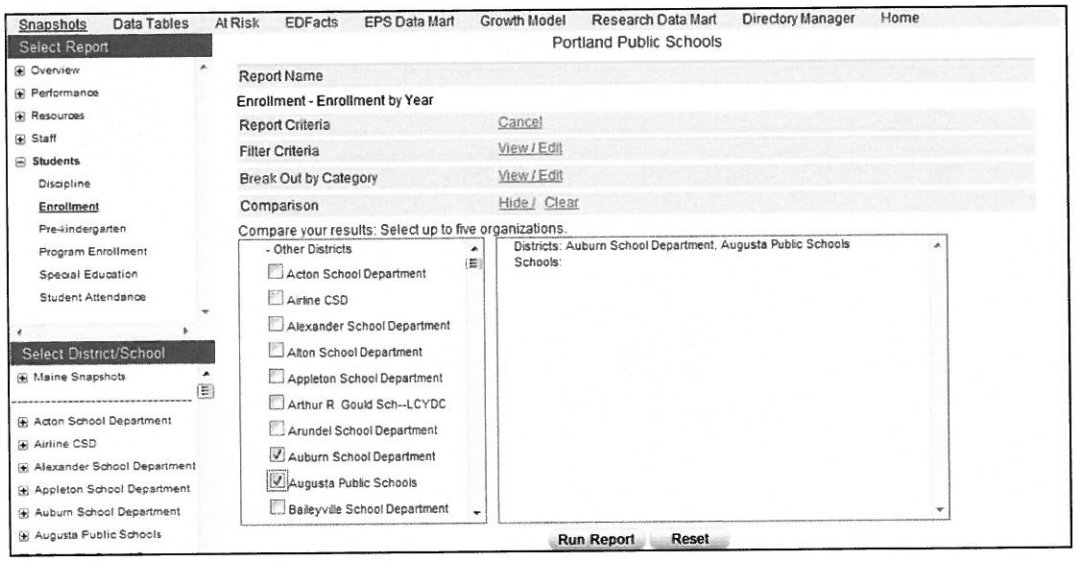
Once a report is run, there are various options the agency or stakeholders can do to filter reports or to breakout the report into various preconfigured categories including FED subgroups, as shown below.



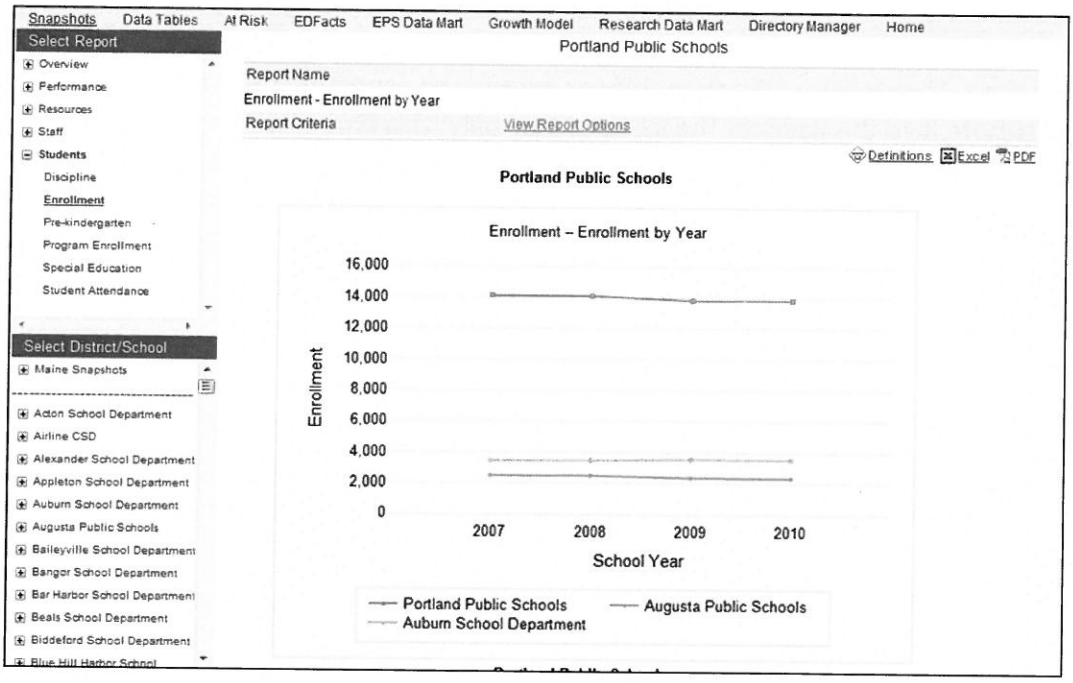
An aggregate state report broken out by race; this report supports the new race and ethnicity codes. The following report is a table view of the data; all reports come with both a visual view and a table view to meet 508 accessibility requirements.



There is also the ability to compare data against other schools or districts, as demonstrated in the figure that follows.



Once the report is run, it shows the report in both a table as well as a simple to read and compare graph.



Framework as the Brain of the System

The DWRS enables the data to be stored and flows through the entire Longitudinal Data Management Strategy. edFusion Insight provides the intelligence to that data by turning the data into actionable, intelligent and user-friendly reports.

edFusion Insight will provide WVDE with a suite of tools to support their reporting and decision support requirements. This framework consists of:

Static Reports

Static Reports are one of the most important reports in the user interaction with the DWRS. This type of a report is a pre-built report where the user may provide simple set of parameters to perform any analysis. This is extremely useful for novice data warehouse users. We can add parameters to these types of reports to manipulate the data the report contains. Report parameters can be used to pass values to an underlying query, to pass values to a filter, or as variables for calculating data within the report. A report parameter text box is usually presented to the user when he or she runs the report, but a report can also use a default parameter without presenting the choice to the user.

Canned Reports

Canned Reports can be simple or complex reports. We understand that the WVDE has several power users of the system. The power users understand the nuances of the state-specific data. They will be able to modify or extend the functionality of the existing report and distribute it to the users of the system. Typically, this type of a report is pre-defined and shows up through the enterprise portal when a user logs in. These reports can be printable reports or online reports or Excel files or PDF files.

OLAP Repots

The OLAP reports can be categorized into Drill-Down reports and Drill-Across reports.

Drill-Down Reports

Our solution provides two different types of Drill-Down Reporting functionality. The first one is built on using SQL Server Reporting Services and the second one is built upon the SQL Server
Analysis Services.

In this implementation, the data is viewed from the dimensional tables to support easy-to-navigate drill down data.

Example: The user can start viewing the data by looking at Enrollment by State, then drill down through the organizational hierarchy. The user can click on the Total State Student Enrollment; the next level is "District Level" data, which then can be drilled into "School Level" data. We can set this up for West Virginia to include the RESAs, if you'd like. Another classic example is to view the Assessment results through the organizational hierarchy of state, district, school, and classroom (where data is available).

Drill-Across Reports

Our solution brings a unique tool set to support the Data Analytics. We have developed a zero-client analysis control to work with SQL Server Analysis Services. This tool is the first of its kind in the market place. These types of reports are very interactive and the user has tremendous flexibility to view the data in across multiple dimensions.

The user will be able to view the summary data by multiple dimensions, such as Enrollment by District/Grade/Race/Gender. Student performance by similar dimensions, but now the user may want to add a *Time* dimension to view the results across the years.

Another example is to view the Cohort data, performance of same set of student across multiple years through their elementary, middle, or high school experiences.

This tool is extremely useful to support the WVDE to create, evaluate and publish "Growth Models" in West Virginia. These reports can be generated by creating comparative reports of similar sized districts/schools, geographically closer districts, similar student population districts, similar spending districts, etc.

Score Cards

The score cards provide deep insight and good context. In our solution the score cards, reports, and charts can be rapidly assembled and connected on web pages through the Enterprise Portal. The score cards:

- Provide immediate access to analysis functionality for drilldown, filtering, sorting, and ranking;
- Insight into transactional data by drilling down through key performance indicators (KPIs);
- Web parts connections drive all-on-one-page interaction; Report View filters work together with score card filters.

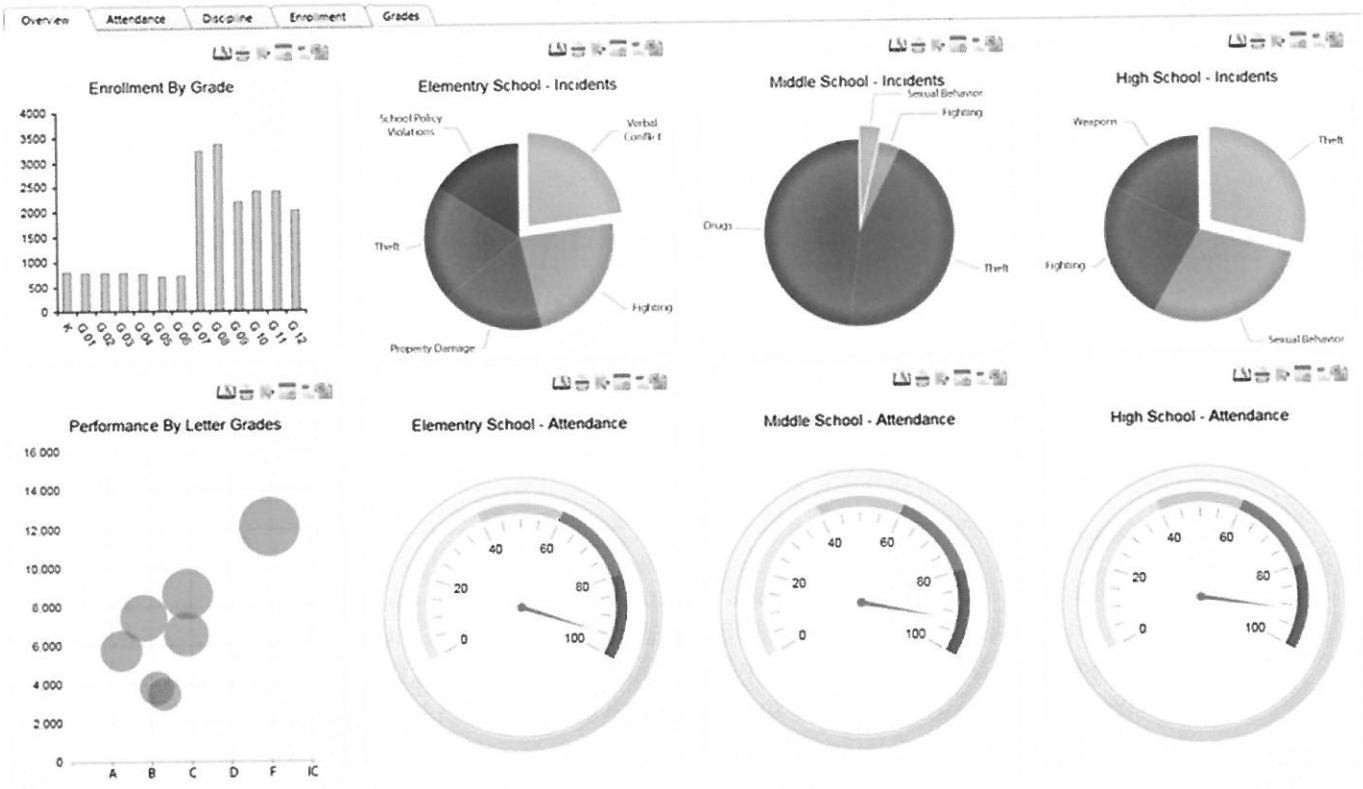
Dashboards

The key goal of portal dashboards is to provide intelligent and relevant data to a specific user in an increasingly interactive dialogue in which the user is in control and the dashboard has insight into the user's needs. For example, we could set this up for a RESA user, a District Administrator, a School Principal, and so on – giving them a one-look view at data that is important and relevant to that user and their goals/priorities. The result is a more informed, capable user who considers actions based on a well-informed decision.

Our dashboards will provide WVDE users with the ability to:

- Map the business uses associated with SharePoint based portal dashboards. We will work with the WVDE to design/customize the role-based dashboard for West Virginia;
- Commit to a process-centric approach where the measures have contextual relevance to users' roles and jobs;
- Develop a quick portal dashboard proof-of-concept using a pilot business function and a representative group of end users;
- Keep the project scope focused, whether we are doing a prototype or full release. Dashboards have the potential to get away from clients and seriously jeopardize an otherwise successful effort; and

- Develop value earlier. Earlier value is better. A thoughtful approach to dashboards doesn't mean a long, laborious design and development cycle. An early-release dashboard can create excitement, generate momentum and provide a clever and intuitive design that can be quickly iterated. Generally speaking, we can get a first phase dashboard up and running within three months after identifying and creating specific and context indicators.



Student Profile

The Student Profile module displays an accumulation of data and statistics that describe a particular student. edFusion pulls information from various modules and compiles it in a profile, which can be used to gain insight into a person.

Person Profile

The Person Profile module displays an accumulation of data and statistics that describe a particular student. edFusion pulls information from various modules and compiles it in a profile, which can be used to gain insight into a person.

Alerts

Alerts are part of the new generation data warehouse and reporting frameworks. We have alerts implemented using e-mail based, text message based alerts (requires additional work efforts to enable WAP gateways or identify specific wireless or cell phone services). We will work with WVDE to understand the need and significance of this type of reporting in the initial phase of the project. By building a solution off of the existing SharePoint framework we can easily integrate with existing messaging technologies, reducing overall costs.

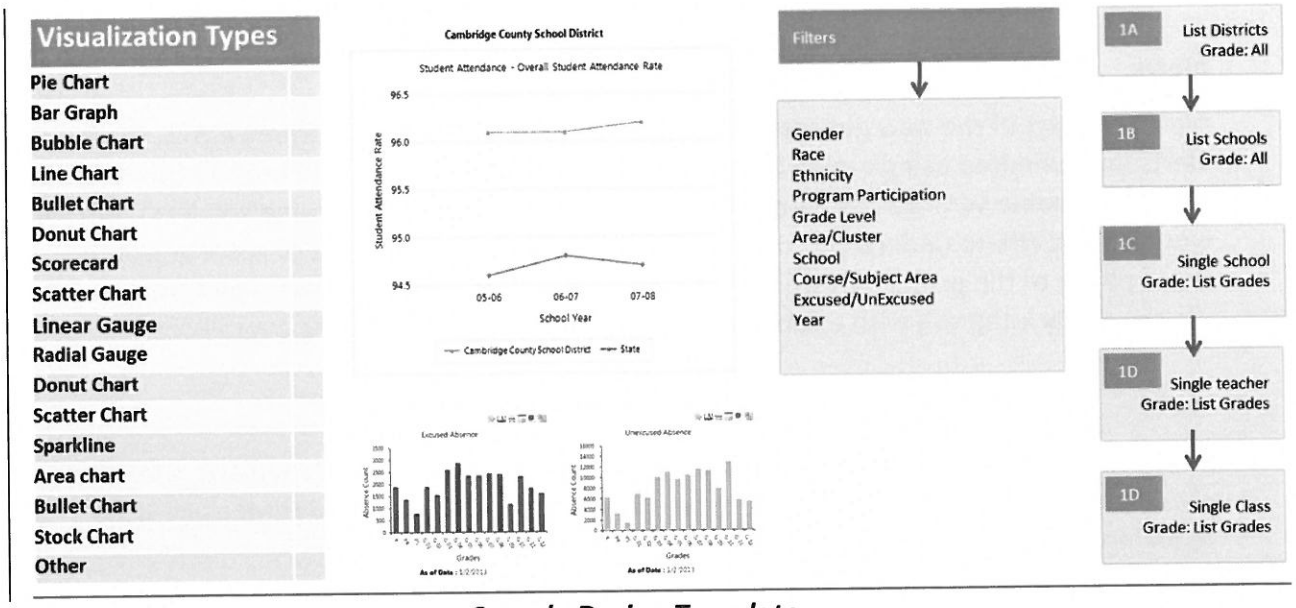
4.4.3.1.c. the steps proposed to develop, test, monitor, support, and revise as necessary, a reporting tool that can support the target number of concurrent and total users while applying suppression rules;

Choice will work with WVDE to configure for the set of WVDE reports that are targeted for transition to the data warehouse. Report design content will include:

- Report layouts, including detail, subtotal and total report lines and report graphics and visualization features (e.g., bar graphs, pie charts, dash boards);
- Americans with Disabilities Act (ADA) presentation of data (if needed);
- Data sources and logic for accessing the data;
- Calculations and aggregations for the reports;
- If applicable, the use of parameters for selecting data subsets;
- Drill through, sorting and filtering capabilities for the reports;
- Execution information – batch, on demand, etc.; and
- Data warehouse portal integration – how the reports are presented and integrated into the portal.

The detailed design will include performance tuning information for those data warehouse components that access or present data. Choice will define and document the security model for the DWRS repository. This includes the approach, including structures and processing, that implements security for DWRS. The model includes security for the data warehouse portal, reports and for the data repositories and processes used to extract and populate them.

Once a design is documented our development team will configure that report which will be reviewed by the WVDE staff for acceptance and signoff. It is a critical path for us to have a formalized process on both the number of reports defined as well and the report design and this can be a significant impact our the project delivery schedule.



Sample Design Template

4.4.3.1.d. how the tool allows all users to build custom reports while also applying privacy requirements, suppression rules, and user-access roles;

Our proposed solution for West Virginia includes edFusion Identify. edFusion Identify, implemented along with edFusion Insight, allows users to build custom reports but applies the user-access roles, suppression rules, and privacy requirements so that *each particular user is only viewing what they are allowed to see.* edFusion Identify is described in detail in the response to question 4.4.1.4, and we discuss it generally here.

Central to our solution is a directory and identity management capability developed specifically for the US education market. This provides role-based access control for organizational people and entities. Our security model provides the WVDE the ability to be compliant with FERPA. Only the users who have a specified need have access to student information.

The authorization model for the identity management capability is based on the following four pillars:

- **Users.** These are the actual people logging into the system.
- **Roles.** These are the duties users have within the system. Roles indicate general system areas that will be available to each user.

- **Organizations.** These provide scope for users because the amount of data available to them is determined based on the organizations to which they belong. For instance, a principal can only see the students in his or her school, while a WVDE administrator may be able to see all student data from the territory.

- **Functions (Applications or Services).** These are the special tasks assigned to particular users regardless of roles. Functions can be assigned specifically to users.

Access to specific data within the system is determined based on user roles and permission requirements established by West Virginia. Through our highly-tested user interface the end user can manage all of these features without any technical staff. Identify puts the policies back in the hands of policy makers. Our staff will work with WVDE to define roles for each of West Virginia's user types. This one-time process is completed prior to implementation. After that point, assigning roles to users and creating new users is work that can be performed on the fly by authorized WVDE staff.

4.4.3.1.e. how the proposed reporting tool can provide varying levels of security access for running reports, creating reports, publishing reports, and any other needed reporting functionality for users;

As described above in 4.4.3.1.d, as well as more in-depth in section 4.4.1.4, edFusion Identify allows the reporting tool (edFusion Insight) to provide varying levels of security access for all reporting functionality.

4.4.3.1.f. how the product is scalable;

edFusion is architected as a highly flexible and extensible platform, providing it with open-ended upward scalability. There are no functional limits on the numbers of persons or end users built into the system. Adding either student/person records or end users is a matter of additional hardware capacity rather than application capacity.

The edFusion Data Warehouse product is thoroughly tested by our internal testing teams for performance. We run our load tests using different concurrent users and analyze the results. We then set certain expectations on CPU usage (Less than 70%) and response times (<= 2 sec) of the reports/screen displays. Until unless each test passes our set expectations, we fine tune the code and environment sizing. Our user load is measured thru an internally defined parameter called edFusion Performance Factor (EPF). Based on our load tests using concurrent users, our solutions are sized for the customers for their end user counts.

The following table is an example of how the sizing of the servers scaled to address the needs of potential concurrent users utilizing EPFs.

Number of concurrent users	edFusion Performance Factors (EPFs)	Web Server		OLTP server		Reporting server	
	EPFs = concurrent users x 100	RAM = EPFs/25,000 (rounded up to nearest allocation unit) (1 allocation unit = 4 GB)	Cores =EPFs/5,000	RAM = EPFs/25,000 (rounded up to nearest allocation unit) (1 allocation unit = 4 GB)	Cores =EPFs/5,000	RAM = EPFs/25,000 (rounded up to nearest allocation unit) (1 allocation unit = 4 GB)	Cores =EPFs/5,000

All our solutions will be load tested for expected performance during UAT at every customer site. Any sizing adjustments required in the environment to meet the performance requirements will be finalized based on load testing results.

We also have specific algorithms that we use to size the storage requirements of each customer. Based on the customer school districts/student counts, storage algorithms will be run to calculate the actual storage requirements.

4.4.3.1.g. the design principles, design elements, proofing process, style guide, and signature sign-off procedures for electronic and print-on-demand reports; and

This requirement was outlined above in our report design section.

4.4.3.1.h. the capacity that the creation and modification of reports can also be carried out via a thin client or thick client. Specify whether the proposed reporting tool includes a thick client as well as a thin client, and if so describe which features are available in each.

Yes. Reports can be managed through typical technical report development features as well as our SMART Reports wizard.

SMART Reports

SMART Reports are components that allow users to view data in a variety of standard and custom formats.

The SMART Reports module contains the following sub-modules:

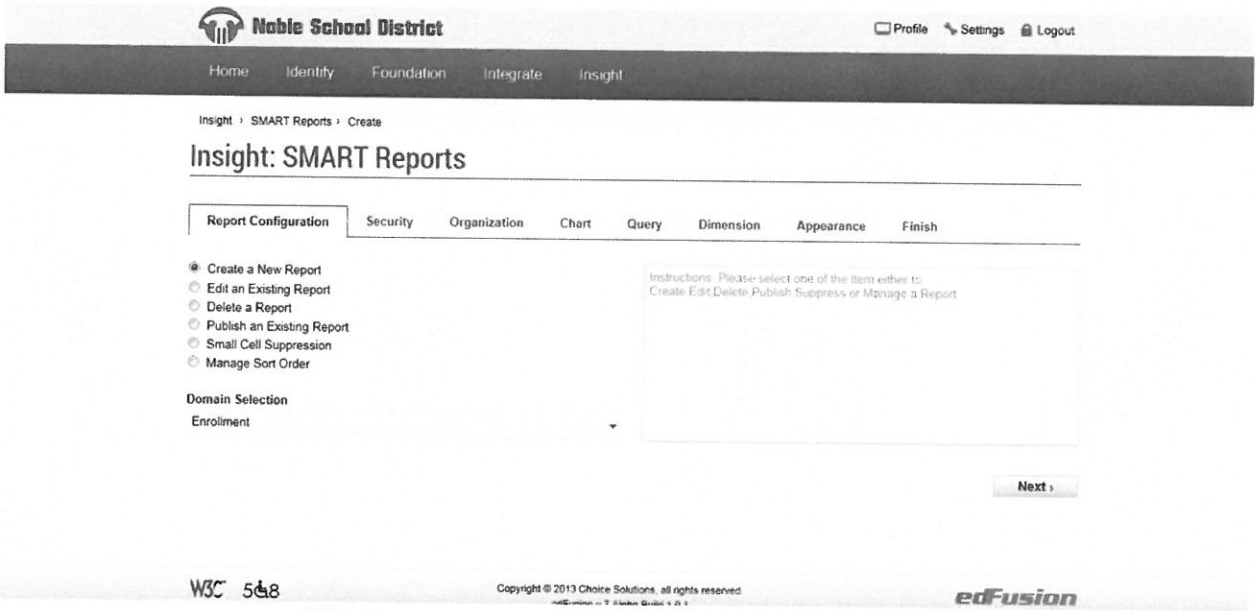
- Manage SMART Reports
- View SMART Reports
- Domain and Subject Areas

Manage SMART Reports Functionality

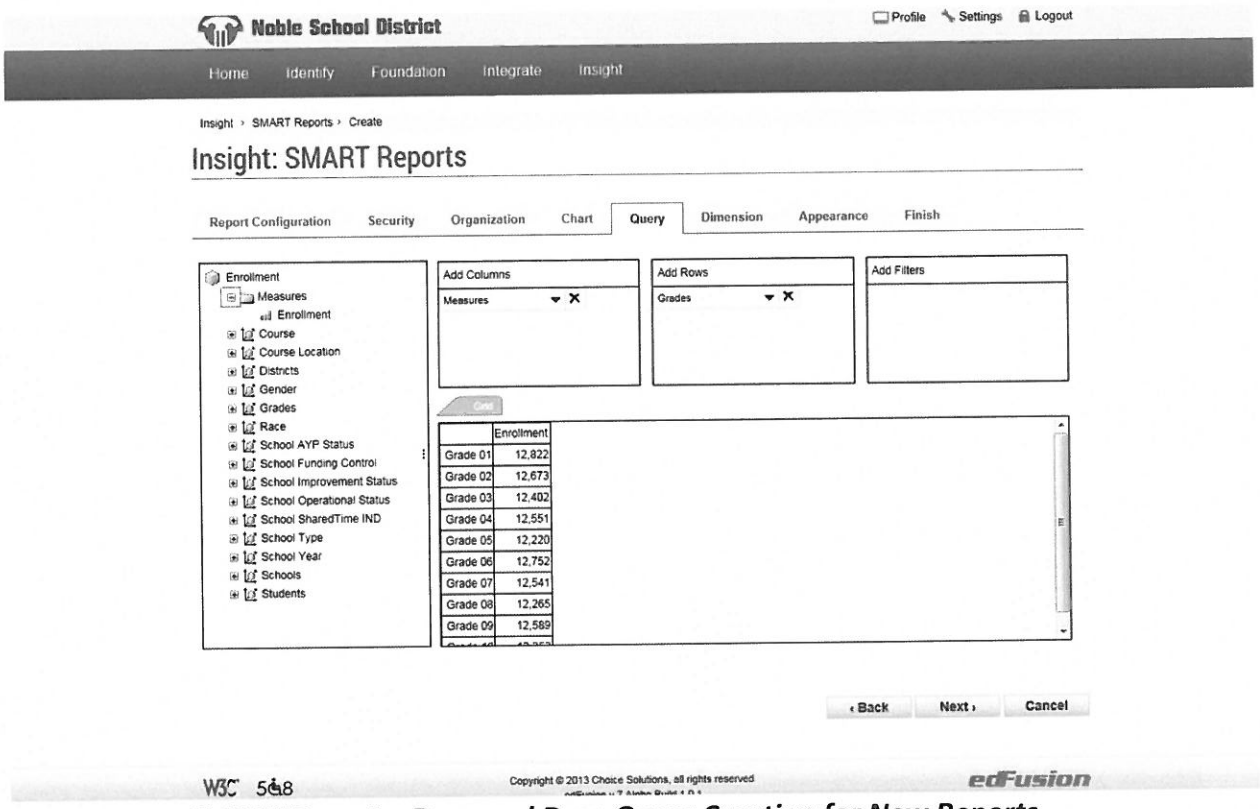
The Manage SMART Reports sub-module that supports authorized users in managing the details of reports.

Available functionality within the Manage SMART Reports sub-module includes:

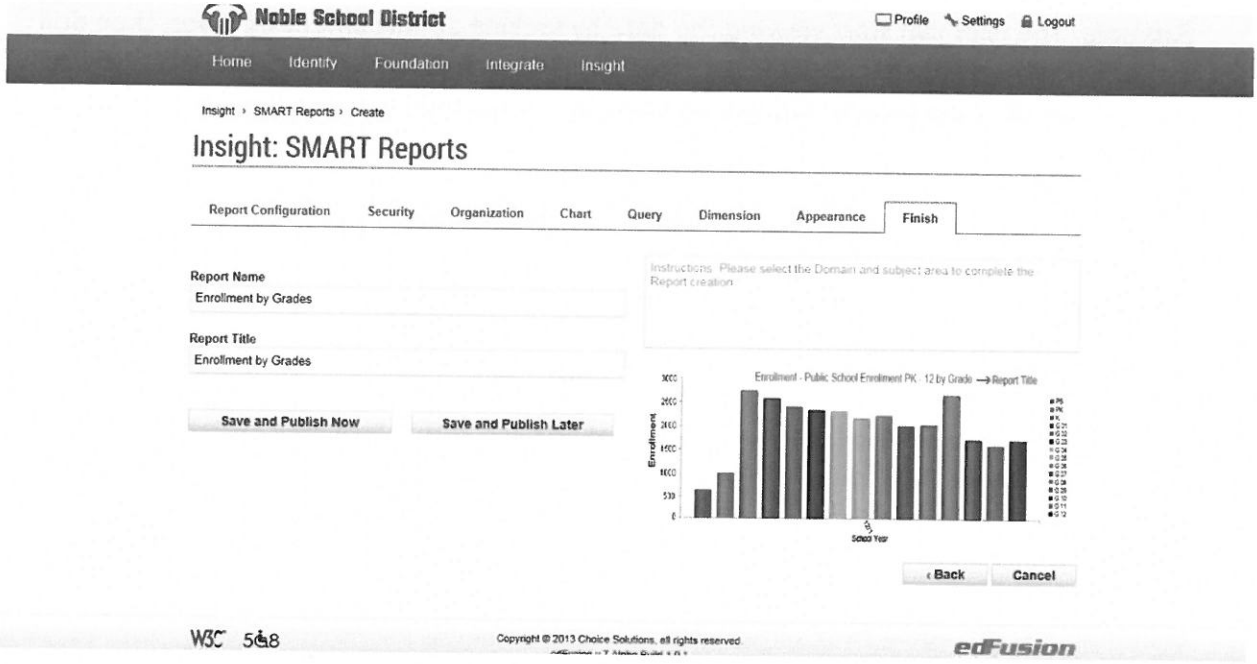
- Create a new report
- Edit an existing report
- Delete a report
- Publish an existing report
- Set small cell suppression thresholds on an existing report
- Manage the sort order of reports as they display to users



SMART Report – Create Report functionality



SMART Report – Drag and Drop Query Creation for New Reports



SMART Report – Preview and Publish Report

4.4.3.2. To provide reports that have drillability up, down, and through data, and export capabilities, based on role-level access, as specified in Goal 1. To meet this objective:

4.4.3.2.a. describe in detail how the proposed solution allows users to drill up, down, and through data in any relevant report while adhering to user access roles, privacy requirements, and suppression rules;

While using the Drilling functionalities, the user will be viewing only data available to them. It will be suppressed and regulated according to the permissions established for that user, which are set utilizing edFusion Identify.

Drill-Down Reports

Our solution provides two different types of Drill-Down Reporting functionality. The first one is built on using SQL Server Reporting Services and the second one is built upon the SQL Server Analysis Services.

In this implementation, the data is viewed from the dimensional tables to support easy-to-navigate drill down data.

Example: The user can start viewing the data by looking at Enrollment by State, then drill down through the organizational hierarchy. The user can click on the Total State Student Enrollment; the next level is "District Level" data, which then can be drilled into "School Level" data. We can set this up for West Virginia to include the RESAs, if you'd like. Another classic example is to view the Assessment results through the organizational hierarchy of state, district, school, and classroom (where data is available).

Drill-Across Reports

Our solution brings a unique tool set to support the Data Analytics. We have developed a zero-client analysis control to work with SQL Server Analysis Services. This tool is the first of its kind in the market place. These types of reports are very interactive and the user has tremendous flexibility to view the data in across multiple dimensions.

The user will be able to view the summary data by multiple dimensions, such as Enrollment by District/Grade/Race/Gender. Student performance by similar dimensions, but now the user may want to add a *Time* dimension to view the results across the years.

Another example is to view the Cohort data, performance of same set of student across multiple years through their elementary, middle, or high school experiences.

This tool is extremely useful to support the WVDE to create, evaluate and publish "Growth Models" in West Virginia. These reports can be generated by creating comparative reports of similar sized districts/schools, geographically closer districts, similar student population districts, similar spending districts, etc.

4.4.3.2.b. describe in detail how the Vendor allows users to configure reports to adjust the parameters;

Report configuration and parameter adjustment are outlined above in section 4.4.3.1.h.

4.4.3.2.c. describe in detail how the proposed solution will allow for exportable files in multiple formats that pull from the DWRS while adhering to user-access roles, privacy requirements, and suppression rules. Specify the formats in which the proposed solution will be able to export files, the development process used to make reports exportable, and the way in which end-users will access tools to export files.

edFusion provides the ability to export data in the standard formats, as well as the ability to print the reports. The system not only exports data, but graphs and charts as well. Supported export formats include:

- Comma Separated Values (CSV)
- Microsoft Excel (XLS)
- Text files, including comma separated or fixed length (CML, TXT, and RTF)
- XML
- Adobe Reader (PDF)

The tools are accessed within the application – there are buttons for exporting to each file type that are found within the edFusion Insight reporting interface.

4.4.4. Goal IV: Professional Development Services

4.4.4.1. To develop a training plan that demonstrates the capacity of the Vendor to deliver the training, demonstrate evidence of enhancing the capacity of training recipients, and to demonstrate differentiated training goals and methods for WVDE developers/programmers, train-the-trainer recipients who will disseminate information/provide training, and end-users.

Developing a Training Plan – Choice Solutions' Education and Training Philosophy

We will apply the same training and transition approaches successfully used in several other SLDS projects led by Choice, with customizations for this project. **Our goal for West Virginia's SLDS Project is to provide West Virginia participants with the tools they need to succeed – not just to prepare attendees from the State, RESAs, Districts, or schools to perform required activities, but also to provide them with sufficient understanding of the process so they can effectively train coworkers.**

To this end, all systems training will be hands-on and job-related, led by an instructor with an assistant and focused on the large and small components involved in the Choice solution. In past collaboration with states, Choice has used a multi-faceted methodology, blending online and onsite delivery to accommodate just-in-time training.

We will use a train-the trainer model focused on the WVDE and the RESAs. We anticipate that designated WVDE and RESA personnel will attend the training. Attendees will receive the latest manuals for the DWRS.

Training will cover the functionality of the solution components separately and collectively, and it will provide clear information on how various personnel roles will interact with and govern the system's operation.

Ongoing Training

For ongoing education and to provide training on updates and enhancements, Choice will design and conduct additional webinars for the DWRS/SLDS. Our base bid includes on-site training as well as a pre-determined number of webinars in the first operational year. All costs associated with online webinar technology (e.g., WebEx, GoToMeeting) and teleconferencing are included in our base bid.

Training Philosophy

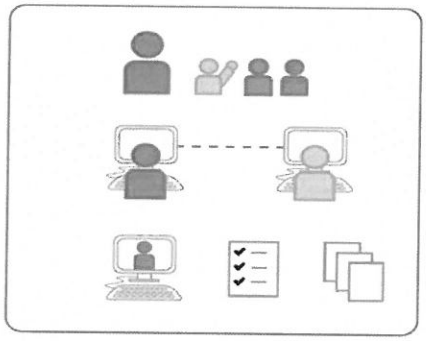
We believe that it is critical to project success for us to train people, install the system, and then train again. Training this way reinforces learning for system users and drives their ownership of the solution.

We assess personnel readiness, create timely and robust learning materials, and determine participant proficiency in applying concepts taught. Our training will be tailored to the needs of primary West Virginia stakeholders, educating them on the day-to-day use and support of the system.

Training and Documentation

Maintaining a process of managed communications and well thought out training leads to greater project buy-in, a deeper understanding of the project by all project members, and a decrease in surprises during roll-out. This process will extend beyond the training seminars to reference documentation.

Our multi-modal system training for West Virginia will focus on confirming that end users will be able to actually use the solution and be able to train others.



Level of Education and Materials Offered

Choice will provide training materials for our solution in various formats—PowerPoint presentations with accompanying handouts, checklists or simple process documents, and online synchronous (trainer led) and asynchronous (prerecorded) training modules as mentioned in previous sections. Most, if not all, training materials are in place, as Choice has deployed a similar solution in several other states. Materials will be customized for the West Virginia SLDS Implementation. Should other technologies or methods be developed and be advantageous in training, they will also be used.

Training materials, as well as documentation, artifacts, and other support materials, will be developed and delivered for the following user levels:

- System Administrator
- State-level Administrator
- State-level End User
- RESA Level Administrator
- RESA Level End User
- District Level Administrator
- District Level End User

The Choice team will design a training plan that empowers West Virginia end users to derive the full value of the DWRS/SLDS solution. We offer a variety of training options that can be tailored to West Virginia's specific needs.

To support the Department's training needs, we use a variety of delivery mediums:

- Face-to-face
- Web-based (online)
- Print and electronic (DVDs, printed materials)
- Video conferencing
- Webinars

The systematic approach of onsite, online, and ongoing training described below helps to allow for early adoption and ensures the sustainability and longevity of the solution. It also highlights our commitment level to bring about success for the project in the short and long term.

System Administration Training

The Choice team will provide up to two weeks of ownership training for system administrators, which cover the following topics:

- Managing security and user access
- LDS maintenance and support
- Adding data sources
- Updating and adding the ETL process with external databases
- Data validation and cleansing
- Fact and dimensional table modeling
- Creating and updating OLAP cubes
- Creating queries, ad-hoc and standard reports
- Creating complex queries
- Exporting tables and data to external databases
- Maintaining and updating training and online help documentation

The ownership training (up to two weeks in duration) for end-user administrators will cover the following topics:

- Using/navigating the decision support system
- Viewing and downloading reports
- Creating and saving ad hoc queries
- Accessing WDE, RESA, District, and school-level reports
- Drill-down techniques
- Using online *help* features

We will work with WVDE to determine the optimal delivery format of this training and corresponding resources. Our goal is to provide WVDE and stakeholders with sufficient documentation and training to effectively manage the solution, regardless of their technical or operational responsibilities.

User Guides and Online User Aids

To support the West Virginia SLDS, the solutions provided by Choice will have quality online user guides available. User guides will be provided in PDF format. Printing charges are not included in this proposal and would be the responsibility of the State, RESA, or District.

As part of our typical deployment and support a wide variety of users, we suggest inclusion of embedded video help files that will allow users to see how to navigate the most commonly-used features and functions within the system. These videos are created directly from the production system and include voice and text descriptions of the most commonly used or desired actions.

The link
http://dw.education.maine.gov/DirectoryManager/Web/Maine_report/MaineLanding.aspx
shows a sample of the type of video we would typically develop for a client. This video requires no additional software or content management systems as it is natively embedded into the edFusion solution.

Documentation Updates

As our solution is a Modifiable Off The Shelf (MOTS) software solution, Choice will update all documents, online help, and other resources when the software is deployed. When West Virginia chooses to adopt any additional updates to edFusion software, the documentation will be updated to reflect those enhancements.

Training Materials

Our team has assembled an extensive internal library of best practices documentation and policies covering a variety of implementation scenarios, administrative rules, guidelines, policies, and procedures. Additionally, the Choice team has developed and will provide to the WVDE an Implementation Toolkit, with all training materials necessary for the West Virginia SLDS project:

- User Documentation
    - Outlines all user functions associated with the software
        - Introduction to software
        - Quick-start guide for users
        - Detailed usage guide
        - Screenshots of actual implementation
        - Support contact info
- Administrator Documentation
    - Glossary of Terms
    - Installation Guide (for all components)
        - Version Information
        - Installing Guide
        - Operations guide
        - Uninstalling Guide
    - Administration Guide
        - ETL Development and Management
        - Data Model
        - Report Management and Development
        - Troubleshooting
        - Portal and Identify administration
        - IDMS Administration
- Release Notes provided for every version update
    - Version Requirements
    - Software and patch requirements

- Impact analysis
- System requirements
- Known issues and work-arounds

Documentation can be viewed whenever you need it at the Choice team Customer Support Center (CSC).

4.4.4.2. To conduct training sessions and create training modules, both initial and follow-up, with differentiated goals for WVDE developers/programmers using face-to-face trainings, supporting documentation, and resources to support this group; train-the-trainer recipients who will disseminate information/provide training within WVDE, to school and district users, and to other public-facing users who wish to access the publicly available portions of the SLDS; and end-users that include both electronically mediated modules and print-ready resources.

As described in our response to 4.4.4.1, Choice Solutions will be conducting training sessions and creating training modules (initial and follow up) for WVDE developers/programmers, train-the-trainer recipients who will disseminate information and provide training throughout West Virginia at all levels, and end users. These training sessions will include interactive, electronically-mediated modules (Webinars) as well as having guides available to print from the sites and on-line help video modules.

4.4.4.3. The contractor should be on-site at WVDE to (1) install and implement the DWRS in a test environment, with the intent of ultimately moving it to a live environment; (2) to train 2-5 technical support staff on installation and maintenance of all components of the DWRS; (3) to train 5-10 functional experts on use of the reporting tool to build, modify and run reports; (4) to train 2-5 technical support staff on use of the ETL tool to modify delivered mappings and create new ones.

We understand and will comply with this requirement. Choice Solutions will be on-site at WVDE for required times, including (1) installing and implementing the DWRS in a test environment with the intent of moving it to a live environment, (2) training 2-5 technical support staff on installation and maintenance of the DWRS, (3) training 5-10 functional experts to build, modify, and run reports using edFusion Insight [the reporting tool], and (4) training 2-5 technical support staff on the use of the edFusion ETL tool to modify delivered mappings and create new ones.

4.4.5. Goal V: Project Management (include an objective about communication strategies with state)

The Choice Solutions/Choice Solutions Project Team is experienced in implementing and managing over 12 statewide education engagements and understands the importance of effective project management and project controls. Like WVDE, we believe that strong project management is paramount to an initiative's success. Accordingly, Choice will utilize its Quality Project Management (QPM) methodology to manage the West Virginia SLDS. QPM is closely aligned with the Project Management Institute's (PMI) standards and is broken into phases to ensure efficient planning, requirements gathering, team alignment, and successful delivery of project objectives. QPM is a methodology that has been developed by Choice and has been specifically designed to bring success to projects within state agencies.

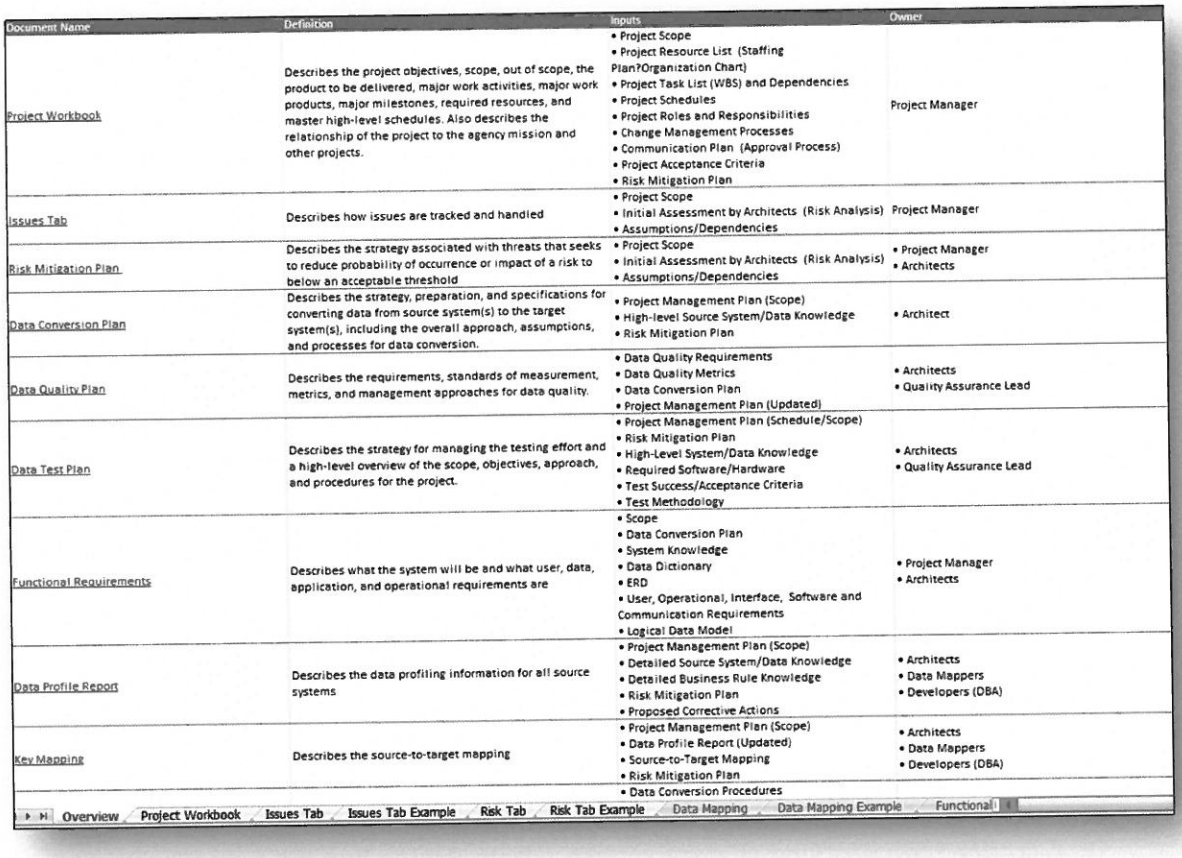
4.4.5.1. To develop a comprehensive project management plan to drive project success in Goals 1 through 5. As part of this project management plan, the vendor should provide a complete description of proposed project management tools, which include samples from previously completed projects, processes, and deliverables that will be used to manage the work of the Vendor and all interactions with the WVDE. It should be clear from the description that the Vendor has the capacity to implement and manage a project of the size and scope of the WV SLDS Initiative.

Choice's substantial investment in implementation strategies and the tactical constructs that are requisite to realizing successful implementations have resulted in numerous notable achievements. Beginning at the executive team level, much of Choice's resources are organizationally under direct leadership of the Vice President of Client Implementation Services. Choice's Client Implementation Services Team, from both a product direction and partner priority perspective, is entirely focused upon delivering the highest quality product both on-time and on-budget. These process priorities, focus, and mission, coupled with Choice's aforementioned client-partner shared success mindset, enable delivery of the most valuable client services.

The West Virginia SLDS implementation process will be operationalized utilizing two primary management tools: the Microsoft Project Plan (Project Implementation Plan: Microsoft Project) and the Implementation Process Workbook. The implementation development process is governed with a rigorous software development lifecycle (SDLC) process suite. Our roadmap toward accurate time/resource allocation planning includes adapting our thoroughly vetted implementation plan to the West Virginia SLDS specific requirements by designing, developing and/or identifying:

1. Measurable, mutually determined project objectives.
2. The inter-/intra-team communication protocol, plan, frequency (many times includes daily 30 minute status calls) and methods. ("Project Workbook")
3. Detailed Project Risk and Issues Management. ("Issues," "Issues Example," "Risk," and "Risk Example")
4. Specific functional strategies and Project Team membership.
5. Role(s) for each Project Team member and delineating their responsibilities and interdependencies. ("Project Workbook")
6. Detailed specific decision making policies and procedures.
7. A project plan including a detailed Work Breakdown Structure (WBS).
8. A security program plan
9. A training and knowledge transfer program implementation plan.
10. An operational day-to-day implementation management detailed workbook. (see screenshot below)
11. A source data conversion plan. ("Data Conversion Plan")
12. A source data quality plan. ("Data Quality Plan")
13. A source data profiling analysis report. ("Data Profile Report")
14. A key mapping set of artifacts including CEDS alignment. ("Data Mapping" and "Data Mapping Example")
15. Data cleansing procedures. ("Technical Design Document - ETL")
16. Data conversion procedures. ("Data Conversion Plan" and "Data Conversion Plan Example")
17. Data validation processes. ("Data Conversion Plan")
18. Logical Data Models. ("Technical Design Document - ETL")
19. Physical Data Models. ("Technical Design Document - ETL")
20. Operational Considerations. ("System Design")
21. System Design. ("System Design")
22. When utilizing our workbook and project plan the following deliverables are consistent in either of the local installation or hosted models.

Choice's SLDS Implementation Workbook serves as an all-encompassing resource for a SLDS system design and implementation project, as shown in the following sample image.



Document Name	Definition	Inputs	Owner
Project Workbook	Describes the project objectives, scope, out of scope, the product to be delivered, major work activities, major work products, major milestones, required resources, and master high-level schedules. Also describes the relationship of the project to the agency mission and other projects.	• Project Scope • Project Resource List (Staffing Plan?Organization Chart) • Project Task List (WBS) and Dependencies • Project Schedules • Project Roles and Responsibilities • Change Management Processes • Communication Plan (Approval Process) • Project Acceptance Criteria • Risk Mitigation Plan	Project Manager
Issues Tab	Describes how issues are tracked and handled	• Project Scope • Initial Assessment by Architects (Risk Analysis) • Assumptions/Dependencies	Project Manager
Risk Mitigation Plan	Describes the strategy associated with threats that seeks to reduce probability of occurrence or impact of a risk to below an acceptable threshold	• Project Scope • Initial Assessment by Architects (Risk Analysis) • Assumptions/Dependencies	• Project Manager • Architects
Data Conversion Plan	Describes the strategy, preparation, and specifications for converting data from source system(s) to the target system(s), including the overall approach, assumptions, and processes for data conversion.	• Project Management Plan (Scope) • High-level Source System/Data Knowledge • Risk Mitigation Plan	• Architect
Data Quality Plan	Describes the requirements, standards of measurement, metrics, and management approaches for data quality.	• Data Quality Requirements • Data Quality Metrics • Data Conversion Plan • Project Management Plan (Updated)	• Architects • Quality Assurance Lead
Data Test Plan	Describes the strategy for managing the testing effort and a high-level overview of the scope, objectives, approach, and procedures for the project.	• Project Management Plan (Schedule/Scope) • Risk Mitigation Plan • High-Level System/Data Knowledge • Required Software/Hardware • Test Success/Acceptance Criteria • Test Methodology	• Architects • Quality Assurance Lead
Functional Requirements	Describes what the system will be and what user, data, application, and operational requirements are	• Scope • Data Conversion Plan • System Knowledge • Data Dictionary • ERD • User, Operational, Interface, Software and Communication Requirements • Logical Data Model	• Project Manager • Architects
Data Profile Report	Describes the data profiling information for all source systems	• Project Management Plan (Scope) • Detailed Source System/Data Knowledge • Detailed Business Rule Knowledge • Risk Mitigation Plan • Proposed Corrective Actions	• Architects • Data Mappers • Developers (DBA)
Key Mapping	Describes the source-to-target mapping	• Project Management Plan (Scope) • Data Profile Report (Updated) • Source-to-Target Mapping • Risk Mitigation Plan • Data Conversion Procedures	• Architects • Data Mappers • Developers (DBA)

Overview | Project Workbook | Issues Tab | Issues Tab Example | Risk Tab | Risk Tab Example | Data Mapping | Data Mapping Example | Functional

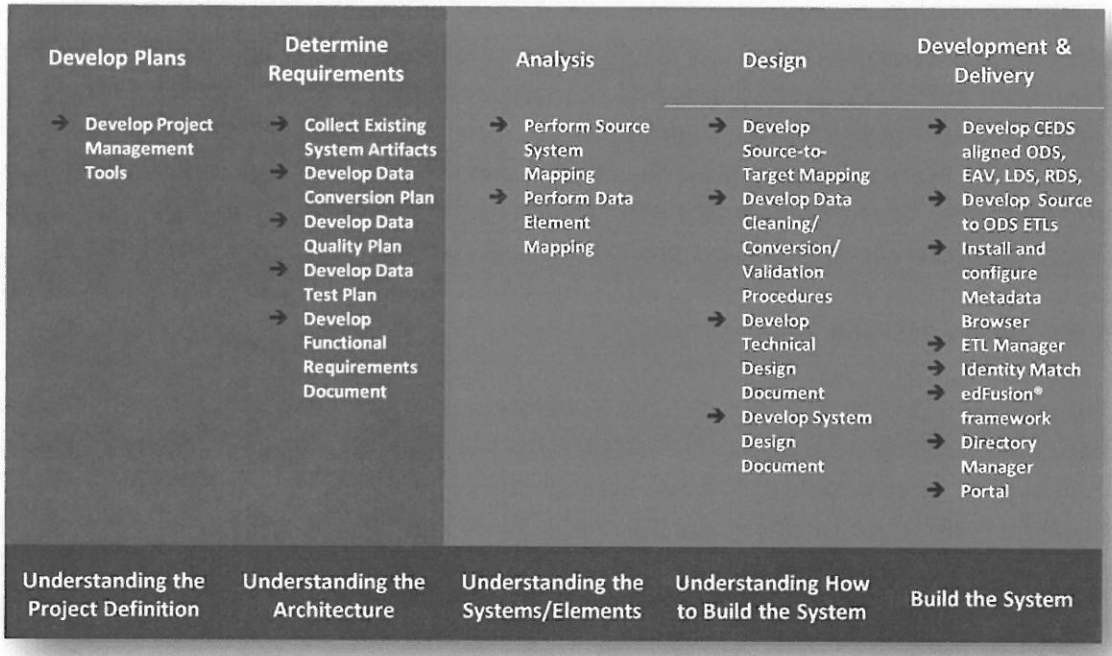
Each of these steps addresses the major pitfalls experienced in the design, development and deployment of SLDS systems. Many with experience in K–12 longitudinal data systems (LDS) who attempt to rapidly leverage that experience into developing SLDS platform that have a vision to support P–20 have the misconceived notion that a P–20 LDS are basically "K–12 plus" systems. Those who have experience in developing K–12 LDS originally founded their solutions framework upon the priorities associated with simplifying compliance reporting. But once they venture into the SLDS solutions space, they are often struck with the reality that the SLDS has a research- and performance-oriented focus that drives different architectural priorities and implementation strategies. *Our experience will help set up the ideal P-12 SLDS for WVDE, and will help it to be easily extensible to P20W in the future.*

Choice's direct multi-engagement experience in creating SLDS systems has demonstrated that SLDS systems have their own unique attributes that have significant effect upon everything from the solution's design and architecture through the system's managed usage. A SLDS requires a systematic emphasis on source data quality management, cross

source domain identity management (especially person and organization matching), transparent and effective policy and governance structures, collaborative mechanisms, and implementable strict security constructs (both from an IT infrastructure and effective data usage perspectives). As a result, Choice SLDS implementation strategies and project plan(s) have an acute emphasis upon source data quality analysis (profiling and analysis), governance structures, policy alignment, collaborative team partnership building, training and knowledge transfer and CEDS alignment. These priorities are foundational to ultimately delivering the kind of outcomes to which both the Choice team and WVDE aspire.

In our implementation strategy, these attributes are emphasized and prioritized because of edFusion's COTS (customizable-off-the-shelf) enterprise class design that enables rapid configuration and deployment enabling the entire partnership to realize a complete success. In our implementation, once West Virginia SLDS domain specific data source(s) are mapped (to the operational data store [ODS]), profiled, quality analyzed, and the extract transform and load code is completed and goes through the QA process, the edFusion framework is designed to rapidly take the ODS transformed data and flow it through the entity attribute value (EAV), longitudinal data store (LDS) and ultimately the research (or reporting) data store (RDS), to deliver extremely powerful information transforming insight. These data will be readily available for approved West Virginia researchers and approved information consumers to extract the rich data requisite to accurately respond to the vital education related questions of the day and to provide transparency to those who are stakeholders in our education institutions.

This project's deliverables and milestones are detailed in the included project plan's work breakdown structure (WBS). Based upon our implementation strategies, the following chart highlights the major deliverables.



The project plan also highlights the type of skills Choice Solutions is planning to provide and the related skills required from West Virginia's resource pool. In our implementation strategies, emphasis is placed upon the need for executive level sponsorship and for subject matter expert Data Stewards capable of working with our business analysts to translate their extensive knowledge about their specific data into requirements that will enable a quality coalescing of these sources into edFusion. Additionally, we request a Data Quality Governor be designated for each source (that may or may not be the same person as the steward) who will work with the Choice Solutions Project Manager and business analysts post source data profiling to approve the quality level of their source data prior to inclusion into the West Viriginia SLDS.

With respect to technical resources, a joint team of database administrators, storage engineers, tech leads and possibly infrastructure engineers (network, systems and virtual) are preferred, but not required. Choice Solutions also requests that West Virginia provide QA staff for UAT and performance stress testing and trainers for the train-the-trainer model. There may be periods, especially in early phases of the project, when we will request some of these key West Virginia staff members be available on average at least half-time, enabling us to quickly socialize and level-set an understanding of the source data metadata and file attributes and to collect and document West Virginia's business requirements. In conjunction with the staffing resource requirements, Choice also requests access to existing documentation on source data files (e.g. ERDs, data dictionaries, system documentation, etc.) that can support the project's source file mapping requirements.

Choice Solutions also believes that as valuable as the edFusion technology stack is to our customers, the real value we brings to our client partnerships is the quality, talent, and dedication of each member of our Choice Solutions team. Consequently, recognizing that being highly dependent upon any single resource is an unacceptable risk, a significant element of our business continuity/risk management plan is the Choice Vice President of Client Implementation Service's commitment to cross-pollinate critical project information to multiple Choice experts in each discipline. Even though individual critical team members are committed to work on specific projects for continuity, level-setting resources across the Choice organization and Choice's project portfolio is essential to minimizing the project's exposure to excessive staffing risks while maximizing the opportunity to effectively utilize all of the talents available to our project.

Choice does work virtually but also firmly believes that there is no substitute for face-to-face conversations. As a result, Choice's traditional implementation plan does include enabling key Choice team members, as frequently as necessary, to travel to our client partner's facilities to be physically present in West Virginia offices to work hand-in-hand with our West Virginia partners.

The true benefit of partnering with Choice Solutions is the opportunity to execute these detailed implementation plan workflows, processes, and oversights, and to live the discipline requisite to generate these prescriptive artifacts. **Partnering with Choice Solutions will result in West Virginia enjoying the benefit of leveraging our direct SLDS experience and expertise to overcome traditional shortcomings often incurred when implementing technical data centric solutions.** Executing these implementation strategies and their associated plans ultimately results in transforming West Virginia P–12 visions into operationally sound and sustainable solutions.

Project Implementation

The Choice Solutions/Choice Solutions Project Team is experienced in implementing and managing over 12 statewide education engagements and understands the importance of effective project management and project controls. Choice will utilize its Quality Project Management (QPM) methodology to manage the West Virginia SLDS. QPM is closely aligned with the Project Management Institute's (PMI) standards and is broken into phases to ensure efficient planning, requirements gathering, team alignment, and successful delivery of project objectives. QPM is a methodology that has been developed by Choice and has been specifically designed to bring success to projects within state agencies.

The WVDE requests a robust technical solution to achieve its needs for the West Virginia SLDS project. To achieve the WVDE's ultimate vision of an easily accessible, user-friendly, data-rich environment, the WVDE needs a strong partner whose proven project management methodologies will help guide and realize that vision.

As this is one of the most critical components of a successful project we have also outlined a SLDS specific set of tasks we will address in the main body of the proposal.

Project Controls

During the Planning Phase of the West Virginia SLDS Project, we will establish the project communication plan, project controls, and governance reviews as requested by the WVDE. Central to these project controls are Risk Management, Issue Management, Change Management, the Communications Management Plans, methodologies, and templates. We ask that the WVDE identify the selected project stakeholders/ participants that will participate in recurring status activities and be provided the recurring project communications.

The following project control activities are recommended to provide project status and oversight throughout the term of the West Virginia SLDS project:

- **Weekly**, on-site status meeting where we will provide the Weekly Work Status Report template and Work Breakdown Structure Weekly Update;
- At the **monthly** West Virginia SLDS Project Governance Board Meeting, we will provide project status and updates to the West Virginia executive attendees;
- **Phase End Final Reports** will be provided to the WVDE Data Systems Steering Committee five business days prior to that meeting so that the Board may participate in a question and answer session regarding the final report submitted for that phase of the project

Project Governance

Choice Solutions recommends at least three oversight groups:

1. **Policy** (legislature, organizations, businesses, superintendents, etc.)
2. **Users/Stakeholders** (Data Domains, Organizations, schools, with participation by vendors)
3. **Project Management** (internal to West Virginia for coordination across departments)

The WVDE must also coordinate among other policy and advisory groups that West Virginia has, such as Data Stewards, policy makers and member states staff. In the project management plan, we will identify these groups and detail their activities. We will rely on West Virginia's guidance and work closely with West Virginia project representatives to attain the right level of participation and interaction from all West Virginia governance entities throughout the term of the project.

Staffing and Project Management

We are looking to bringing the best quality resources to bear for this project. Some of our key human resources are local but others, who are recognized as industry experts and have extensive experience in implementing SLDS data systems, are remote.

One of the most important aspects of successfully implementing this project is to hire a team that know the client's requirements, know the space, and have a solution that can be implemented quickly and reduce overall project risk. The Choice Solutions team is that team.

When we undertake the West Virginia SLDS Project effort, it is critical for us to align ourselves with all the key stakeholders, both internal and external. From our prior experience, we understand what is critical in an education systems architecture, but subtle differences make all the difference in successful implementations. Although we are certain we can implement a solution that meets the majority of the WVDE's needs, our ability to

gather all information and the ongoing feedback from West Virginia users will be critical to create the type of solution that will insure West Virginia's long-term success.

The first two steps we look at in this design are:

1. Establish Stakeholder Communication Channels
2. Stakeholders need to be defined, identified; their vision needs to be introduced.
    a. Stakeholders include the users of the portal (Teachers, Administrators, students, parents, etc.) and the technology staff at WVDE.

Establishing Relationship and Interaction Guidelines

Once the stakeholders are identified, it becomes necessary to develop the interaction guidelines and define peoples' relationships to the project. What we recommend is a committee with at least two members of each user type included.

Result: Every stakeholder's needs and vision are documented.

Establishing a Project Management Office

We will establish a Project Management Office with key management staff from both the West Virginia and the Choice Project Team. This team will oversee the project's progress and assess the results to ensure the project is moving as per the plan.

Our Project Team has the experience in leading wide array of product and project based initiatives. Our Project Managers are experienced in all phases of project execution. We will help the WVDE to execute and achieve West Virginia's technology objectives, not only on time and on budget but are also in line with business objectives.

Choice Solutions' Proposed Project Management Office

Key objectives of the PMO:

- Managing human relationships in the project organization;
- Maintaining the balance between technical, analytical and managerial project functions;
- Coping up with risks associated in managing an enterprise system development; and
- Surviving organizational restraints.

Choice Solutions has integrated our learning and the key elements of several successful project management methodologies into the following Knowledge Areas:

- Scope Management
- Time Management
- Cost Management
- Quality Management
- Human Resources Management
- Communications Management
- Risk Management
- Integration and Change Management

Detailed Project Management methodologies can be provided upon request.

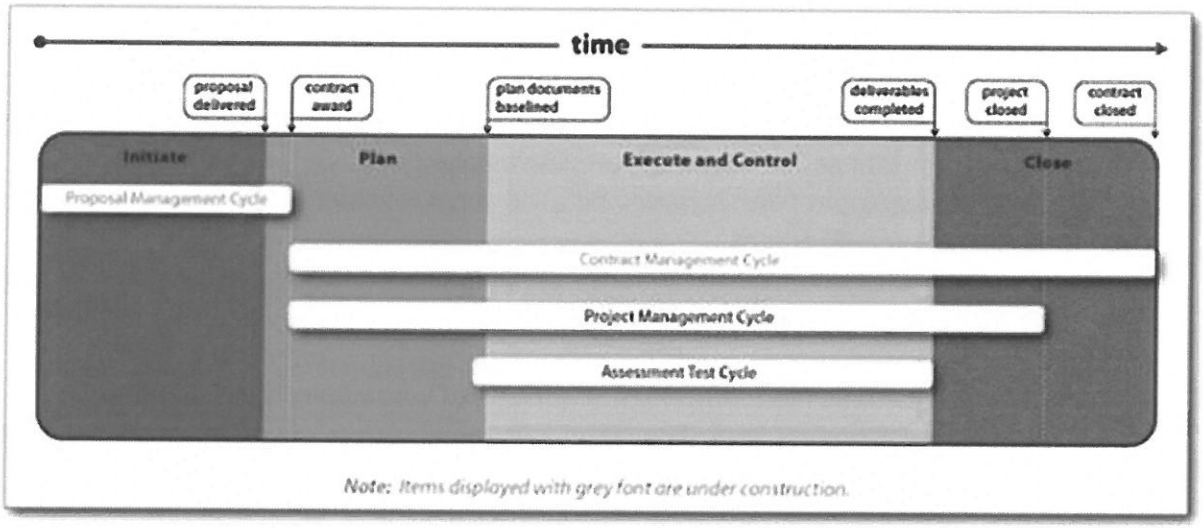
We are committed to providing West Virginia with a highly qualified team that can exceed all expectations while appealing to the WVDE's bottom line for the SLDS project. These resources will have detailed knowledge of the proposed technologies as well as prior experience working on or with similar projects in the education space.

Choice Solutions represents that team, and we have included references that we encourage West Virginia to call, as they will provide WVDE with the insight required to make a truly informed decision. Our clients are referable and we will go the extra mile to guarantee this project is a success.

We apply recognized best practices in every area of our business. We follow the Project Management Institute's principles and practices as laid out in the Project Management Body of Knowledge (PMBOK). The PMBOK provides a consistent framework for managing programs and projects, and our team has a comprehensive set of processes that adapts the PMBOK to uniquely fit the needs of
our customers.

The following figure shows the phases into which our project management processes are divided. These are very similar to, but not the same as, the "Process Groups" defined in the PMBOK. The phases make it easy to determine which processes are performed at different times in the duration of the project. Our knowledgeable Process Engineers tailor the PMBOK to fit the organization, verifying that all PMBOK principles are applied.

Managing Projects with Documented Processes. The phases shown in the following figure allow our Project Managers to determine which processes are performed at different times.



Project Planning

Upon contract award, Choice Solutions will contact the named WVDE point of contact to schedule a kick-off meeting to commence planning for the identification, documentation, and review of the WVDE's requirements for the SLDS Data System. The primary purpose of the kick-off meeting will be to introduce the WVDE/Choice Project Managers and communicate the details of the WVDE/Choice team staffing, review the project schedule and the Customer Requirements Allocation Document (CRAD). Reviewing the project schedule will allow stakeholders the opportunity to review the milestones, their respective tasks, and planned completion dates. The CRAD will document WVDE's requirements and will serve as a foundation for development and implementation efforts.

Methods for Keeping the Program on Schedule

The Choice Solutions team will use our program management experience to deliver the West Virginia DWRS/SLDS. Our Project Managers are equipped with the proper skills and techniques to deliver quality products and services on time and within budget.

Comprehensive Work Plan

We manage every project according to a standardized work plan, consisting of integrated implementation work plan components. This work plan provides the context for the various program components and defines their interdependencies. The work plan helps the Choice

Solutions team to predict outcomes, measure performance, and make appropriate adjustments to achieve desired results.

The West Virginia DWRS/SLDS Work Plan is a comprehensive plan that documents the full project lifecycle, from kick-off meeting to project retirement. The following implementation plans comprise the DWRS/SLDS Work Plan:

- **Project Schedule:** includes detailed tasks, milestones, and dependencies to accomplish project objectives.
- **Quality Assurance Plan:** includes plans for day-to-day supervision and monitoring to confirm that activities are proceeding as planned.
- **Risk Management Plan:** includes detailed plans for risk identification, mitigation, and issues management.
- **Change Management Plan:** includes detailed procedures for effectively managing change within a program, including how changes are reviewed and communicated.
- **Communications Plan:** describes all aspects of communication for the West Virginia SLDS project, including status reporting, review meetings, and scheduled conference calls.

The Work Plan is the keystone of successful project management. We will walk through this plan with WVDE during the kick-off meeting to confirm requirements and expectations. After the Statement of Work has been executed, we will develop a work plan that supports the deliverables and their respective requirements, timeline milestones, and how we will perform quality control.

Work Plan Components

Project Schedule

We use a consistent, standardized approach to make technology projects run according to schedule. We develop project schedules with Microsoft Project® software using a defined and integrated process. All schedules are monitored by the Project Team.

We use our standard, comprehensive work breakdown structure as the basis for every project schedule. The WBS is extensive and detailed, featuring every common element of work that we perform.

The schedule is available to all team members. Project Team members will submit weekly updates to the Project Manager. The Project Manager will immediately see variations in scheduled start dates or projected task durations and takes appropriate corrective action.

Quality Assurance Plan

Everything we do for our clients rests on integrity and accuracy. Our quality control focuses on defining and implementing critical processes so we can deliver products and services to our clients that meet or exceed their requirements.

The Project Management Institute's business model provides processes for quality checks throughout a project's life cycle, from planning and development through implementation and renewal or closeout. We track performance metrics for productivity and quality in our production areas.

Each month, we collect, present, and discuss these metrics at a management team review. Production WVDE managers, process engineers, and members of our quality team use data to identify the causes of errors, barriers to quality and productivity, and areas for process and quality improvement.

Using the PMI model, we have established repeatable processes for project team coordination, formal training on a common process, and complete documentation of program processes. Adhering to the PMI model produces predictable and consistent results.

Quality assurance begins with understanding the WVDE's expectations and objectives. Prior to beginning work on the WV SLDS Project, we will hold planning meetings with the WVDE project team to identify and understand the WVDE's specific requirements and concerns. We use workflow alignment analysis and periodic contract reviews to promote the concept of working from agreement and promote satisfactory outcomes.

Risk Management Plan

Given the complex nature and often aggressive schedules required by large-scale technology deployments, risk management is an essential aspect of the program management methodologies we employ. Acknowledging the inherent presence of risk, the most important component of risk management is the early identification of potential issues so they can be mitigated or avoided whenever possible.

To identify potential risks for the West Virginia Department of Education, our Project Team will create a risk management plan with input from the WVDE's team. The plan describes how risk identification, qualitative and quantitative analysis, response planning, monitoring, and control will be structured and performed throughout the duration of our contract for the DWRS/SLDS Project.

Change Management Plan

Understanding when timely program changes are necessary to enhance effectiveness is critical to project success for West Virginia. To accommodate program changes, the

interdependent teams will work collaboratively to review, assess, and implement changes productively and effectively. The Choice Solutions team will work with the WVDE's team to incorporate program changes while identifying and discussing potential impact and risk to the schedule.

Communication Plan

Frequent communication allows all parties to share an understanding of the DWRS/SLDS Project. Our Project Manager will develop a communication plan that includes weekly conference calls and reports. The Choice Solutions Project Manager schedules a phone conference for each week at a designated time.

Tools to Enhance Communication

Strong project management and communication is critical for successful program planning and delivery. Our role will be to document requirements and implement all of the elements necessary to achieve key milestone dates. To accomplish this goal, we propose the communication tools described in the following narrative to facilitate critical communication between the WVDE and the Choice Solutions team.

Weekly Status Meetings

Upon contract award, our Project Manager will request WVDE's approval to meet at a designated day and time to kick off the project. At approved days/times, our Project Team will meet with the WVDE team to discuss project schedule status, current activities, action items, and any issues.

We develop a weekly meeting agenda to discuss pertinent program details, including requirements, the schedule, issues, and work updates. After each meeting, we distribute meeting minutes to the WVDE and internal workgroups, noting a summary of the discussion, action items, critical information, dependencies, and key dates from the schedule.

Action Items Log

The action items log is a critical tool for tracking the many tasks necessary to plan and deliver a large-scale technology implementation. It documents each action item, the description of the item, the action item owner, and the current status through to resolution.

To keep all parties up to date with action item status, the Choice Solutions team will update this log on a regular basis and distribute it to WVDE representatives and the members of

our Project Team. We also propose to use this document as a discussion tool for weekly status meetings. The following figure shows a sample action items log.

Sample Action Items Log. To keep all parties up to date, we will regularly update the action items log and distribute it to WVDE personnel and our Project Team.

Action Item #	Date Opened	Milestone Activity	Topic	Topic Description	Notes	Owner	Due Date
1	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]
2							
3							

Implementation Plan

The WVDE is planning to implement this project over a period of less than two years. The initial work to develop the request for proposal and the conceptual design started in late January 2014 and delivery of the system will need to be in place by June 2015 (our goal is deliver by December 2014). We understand our work will be primary focused on the Statements of Work during the first ten months after the contract is awarded, and that solutions and processes developed during this time will be the property of the WVDE and used by other agencies during the remainder of the project.

We also understand that more detailed statements of work will be developed for each project to be pursued. As we work through these statements of work, more definitive timelines will be provided from which to develop detailed project schedules. We will submit these project schedules to WVDE staff for review and approval. The approved schedules will become a baseline, and from the project schedules we will monitor and report on status.

As mentioned, we will use MS Project to develop, manage, and track performance on each contract deliverable. Each project schedule will show the milestone tasks, the sub-tasks composing each milestone task, the start/end dates, predecessor/successors, and assigned resources.

Proposed Staffing Plan

Choice Solutions will collaborate with WVDE to successfully plan, implement, and support the SLDS. We have previously provided the proposed organizational and staffing structure, as well as roles and responsibilities to fulfill the requirements of this contract.

4.4.5.2 To engage in effective communication strategies that bring the communication plan to fruition. The specifications for this objective include:

4.4.5.2.a. detailed plans to the WVDE around creating engaging, effective electronic communications for use with the SLDS initiative and camera-ready electronic and print-optimized content for posting on the WVDE's SLDS website; and

Yes. We will support this requirement and will design plans with WVDE to support this requirement.

4.4.5.2.b. a detailed description of how the Vendor prepares and disseminates appropriate communications to personnel identified by the WVDE to ensure that all critical staff members are fully informed about project development and execution.

We will work with WVDE to create a plan to address this requirement.

4.4.6. Goal VI: Transition Strategy

4.4.6.1 To transfer the program and all associated deliverables to the WVDE by project conclusion. The responses to this objective should provide

4.4.6.1.1 Detailed information regarding the duration of the proposed transition plan, including transition meetings, core transition team members, FTEs required for transition team, administrative rights and access to all project deliverables;

Knowledge Transfer to Sustain Continued Success

One of the goals of WVDE is to become completely self-sufficient to sustain the systems and processes at the end of the contract. To accomplish this goal, our focus over the life of the contract will be to transfer accurate and meaningful knowledge to appropriate West Virginia staff members.

To better serve our customers and sustain our rich human resources knowledge base, we employ succession planning processes. From key executives to line managers, we plan ahead to accommodate all circumstances in which an employee may vacate a position. We will follow this same methodology for this contract to prepare West Virginia staff with knowledge transfer throughout the contract period to allow for the eventual end of the contract.

As we plan each project, we will pair a Choice team resource with a WVDE resource to allow for a continuous exchange of ideas, information flow, and knowledge transfer. In essence, we will train a West Virginia resource to serve as a functional backup to the Choice Solutions team resource. By incorporating knowledge transfer throughout the contract, we will develop in West Virginia a strong foundation of knowledge to move forward with the products and services delivered under this contract.

We will deliver this as part of our transition planning and will work with WVDE to make a more detailed transition plan to meet your needs.

4.4.6.1.2 A detailed schedule for the transition that presents a sequential, step-by-step description of the tasks or events and a timeline for the transition of materials and procedures; and

We will deliver this as part of our transition planning and will work with WVDE to make a more detailed transition plan to meet your needs.

4.4.6.1.3 Detailed information on maintenance for the software and hardware, if applicable, to successfully support the DWRS.

This is part of the documentation that we will deliver, which is outlined above.

4.5 Mandatory Requirements

The following mandatory requirements must be met by the Vendor as a part of the submitted proposal.

Failure on the part of the Vendor to meet any of the mandatory specifications shall result in the disqualification of the proposal. The terms "must", "will", "shall", "minimum", "maximum", or "is/are required" identify a mandatory item or factor. Decisions regarding compliance with any mandatory requirements shall be at the sole discretion of the Purchasing Division. Mandatory deliverables are defined as those services/milestones, etc. that the successful vendor shall provide after award and execution of the contract.

4.5.1. All aspects of the proposal must adhere to rules and regulations set forth in the, Child Information Protection Act (CIPA), Family Educational Rights and Privacy Act (FERPA), Child Online Protection Act (COPA), and Health Insurance Portability and Accountability Act (HIPAA).

We agree and will comply. All aspects of our proposed solution adhere to rules and regulations set forth in the Child Information Protection Act (CIPA), the Family Educational Rights and Privacy Act (FERPA), the Child Online Protection Act (COPA), and the Health Insurance Portability and Accountability Act (HIPAA).

THE SOLUTION SHALL NOT BE PROPRIETARY

Choice has proposed a non-transferable perpetual use license of our software; as allowed in Addendum 2 Q&A.

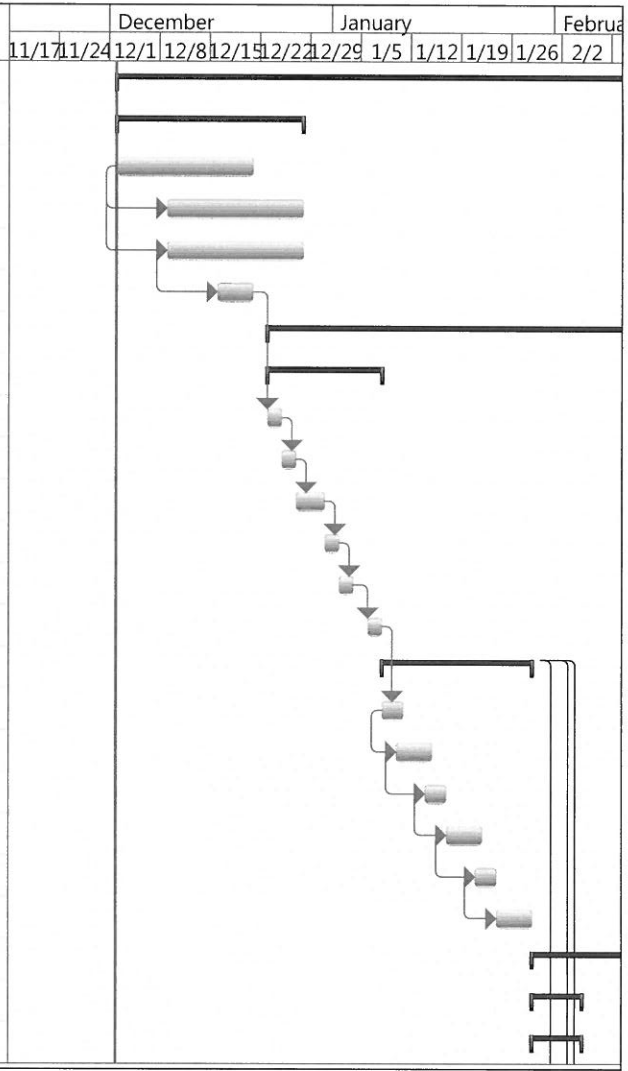
4.5.2. Vendor must agree that the vendor-developed DWRS and all associated deliverables will be owned and operated by the WVDE upon project conclusion.

We agree and will comply. The vendor-developed DWRS and all associated deliverables will be owned and operated by the WVDE upon project conclusion.

4.5.3. Vendor must relinquish ownership of the DWRS to the Agency upon project conclusion.

We agree and will comply. Choice Solutions will relinquish ownership of the DWRS to the Agency upon project conclusion.

ID	Task Name	Duration	Start
1	**West Virginia P-12 DWRS and SLDS Project**	**233 days**	**Mon 12/2/13**
2	**Initiation**	**20 days**	**Mon 12/2/13**
3	Project Planning	15 days	Mon 12/2/13
4	Project Management and Control	15 days	Mon 12/9/13
5	Project Governance and Quality Management	15 days	Mon 12/9/13
6	Software Delivery (Remote)	5 days	Mon 12/16/13
7	**Elaboration**	**67 days**	**Mon 12/23/13**
8	**Define the templates for data sources**	**12 days**	**Mon 12/23/13**
9	Directory Data	2 days	Mon 12/23/13
10	Demographic Data	2 days	Wed 12/25/13
11	Teaching and Learning Data	2 days	Fri 12/27/13
12	Academic Profile Data	2 days	Tue 12/31/13
13	Staff Data	2 days	Thu 1/2/14
14	Operational Data	2 days	Mon 1/6/14
15	**WVDE Data Preparation**	**15 days**	**Wed 1/8/14**
16	Directory Data	3 days	Wed 1/8/14
17	Demographic Data	3 days	Fri 1/10/14
18	Teaching and Learning Data	3 days	Tue 1/14/14
19	Academic Profile Data	3 days	Fri 1/17/14
20	Staff Data	3 days	Tue 1/21/14
21	Operational Data	3 days	Fri 1/24/14
22	**edFusion Building Blocks**	**40 days**	**Wed 1/29/14**
23	**Identify**	**5 days**	**Wed 1/29/14**
24	**Directory**	**5 days**	**Wed 1/29/14**



Project: Plan 10-03-2013
Date: Thu 10/3/13

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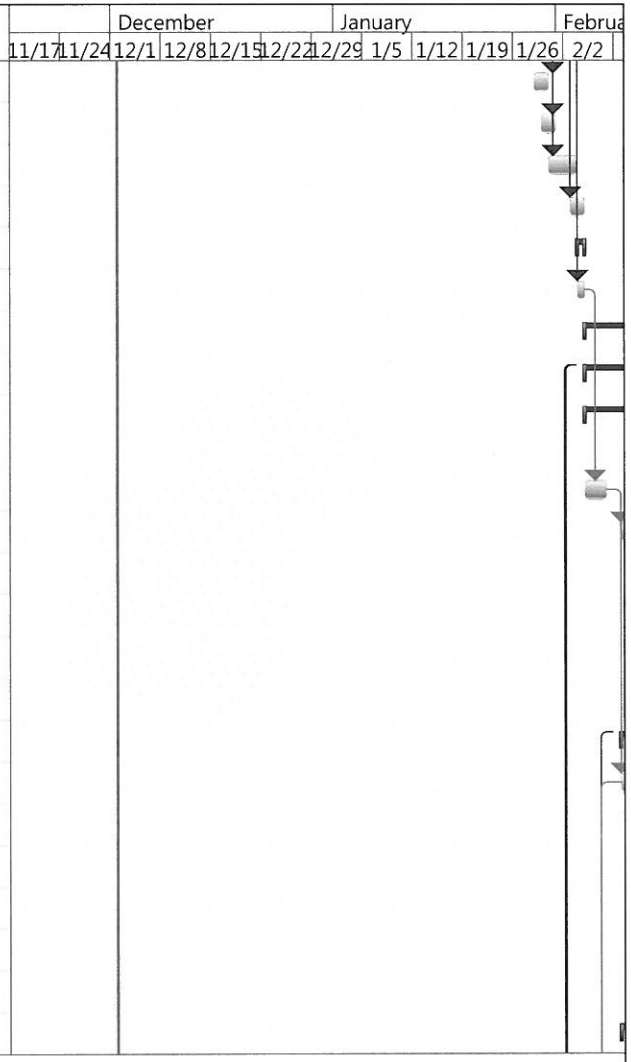
Manual Progress

ID	Task Name	Duration	Start
25	People	2 days	Wed 1/29/14
26	Organizations	2 days	Thu 1/30/14
27	Roles	2 days	Fri 1/31/14
28	Resoures	2 days	Mon 2/3/14
29	**Portal**	**1 day**	**Tue 2/4/14**
30	User Interface & Experience	1 day	Tue 2/4/14
31	**Foundation**	**29 days**	**Wed 2/5/14**
32	**edFusion Data Model**	**21 days**	**Wed 2/5/14**
33	***Staging Database - Driven by WVDE Datasets***	**18 days**	**Wed 2/5/14**
34	Directory Data	3 days	Wed 2/5/14
35	Demographic Data	3 days	Mon 2/10/14
36	Teaching and Learning Data	3 days	Thu 2/13/14
37	Academic Profile Data	3 days	Tue 2/18/14
38	Staff Data	3 days	Fri 2/21/14
39	Operational Data	3 days	Wed 2/26/14
40	***Operational Data Store***	**18 days**	**Mon 2/10/14**
41	Directory Data	3 days	Mon 2/10/14
42	Demographic Data	3 days	Thu 2/13/14
43	Teaching and Learning Data	3 days	Tue 2/18/14
44	Academic Profile Data	3 days	Fri 2/21/14
45	Staff Data	3 days	Wed 2/26/14
46	Operational Data	3 days	Mon 3/3/14
47	***Reporting Data Store***	**18 days**	**Mon 2/10/14**



Project: Plan 10-03-2013
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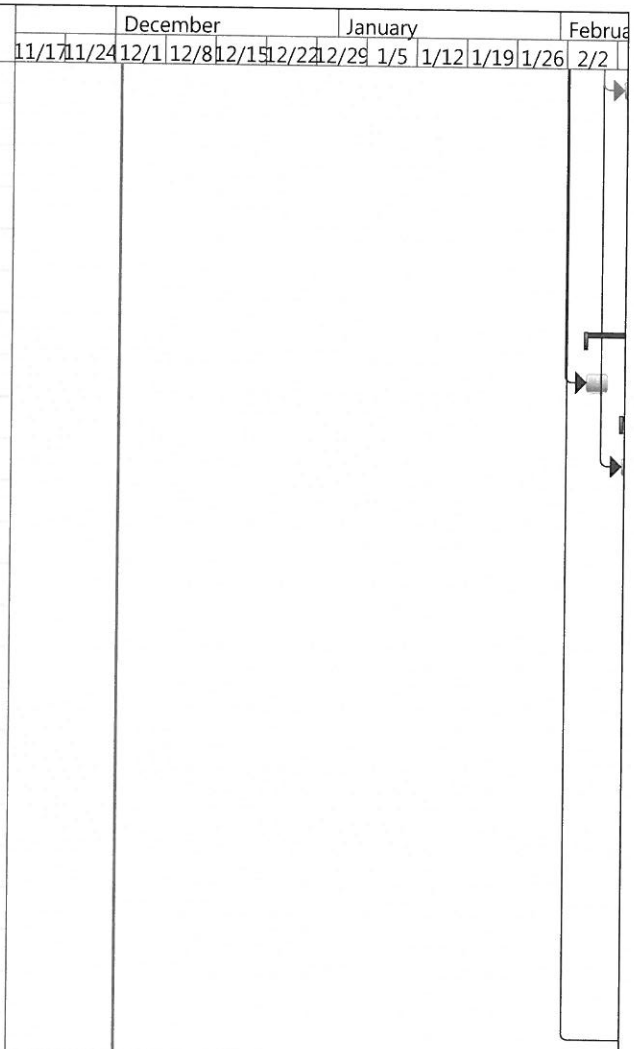
ID	Task Name	Duration	Start
48	Directory Data	3 days	Mon 2/10/14
49	Demographic Data	3 days	Thu 2/13/14
50	Teaching and Learning Data	3 days	Tue 2/18/14
51	Academic Profile Data	3 days	Fri 2/21/14
52	Staff Data	3 days	Wed 2/26/14
53	Operational Data	3 days	Mon 3/3/14
54	**Glossary & Metadata**	**24 days**	**Wed 2/5/14**
55	Data Definitions - CEDS based	3 days	Wed 2/5/14
56	**Business Rules Validation**	**21 days**	**Mon 2/10/14**
57	Level 1 Rules	7 days	Mon 2/10/14
58	Level 2 Rules	7 days	Wed 2/19/14
59	Level 3 Rules	7 days	Fri 2/28/14
60	**Identity Management**	**5 days**	**Tue 3/11/14**
61	Student Identity Management	3 days	Tue 3/11/14
62	Staff Identity Management	3 days	Thu 3/13/14
63	**Data Profiling**	**3 days**	**Mon 3/3/14**
64	Run Data Profiling Reports and Share them with WVDE	3 days	Mon 3/3/14
65	**Integrate**	**7 days**	**Thu 3/6/14**
66	Identify new ETL Plans	3 days	Thu 3/6/14
67	Document new ETL Plans	3 days	Tue 3/11/14
68	Validate new ETL Plans	1 day	Fri 3/14/14
69	**Existing WVDE Manifest**	**15 days**	**Wed 2/19/14**
70	Manifest to Model mapping	5 days	Wed 2/19/14



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Date: Thu 10/3/13

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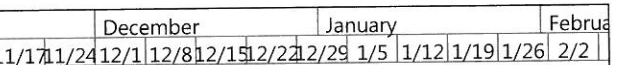
Manual Progress

ID	Task Name	Duration	Start
71	Manifest Data Validation Rules defined	3 days	Wed 2/26/14
72	Manifest Data Validation Rules developed	5 days	Mon 3/3/14
73	Validate Vertical Reporting SIS manifest	2 days	Mon 3/10/14
74	**Insight**	**14 days**	**Thu 3/6/14**
75	**Required Data Mart #1**	**14 days**	**Thu 3/6/14**
76	Directory Data	2 days	Thu 3/6/14
77	Demographic Data	2 days	Fri 3/7/14
78	Teaching and Learning Data	2 days	Mon 3/10/14
79	Academic Profile Data	2 days	Tue 3/11/14
80	Staff Data	2 days	Wed 3/12/14
81	Operational Data	2 days	Thu 3/13/14
82	**Required Data Mart #2**	**7 days**	**Mon 3/10/14**
83	Directory Data	2 days	Mon 3/10/14
84	Demographic Data	2 days	Tue 3/11/14
85	Teaching and Learning Data	2 days	Wed 3/12/14
86	Academic Profile Data	2 days	Thu 3/13/14
87	Staff Data	2 days	Fri 3/14/14
88	Operational Data	2 days	Mon 3/17/14
89	**Required Data Mart #3**	**9 days**	**Tue 3/11/14**
90	Directory Data	3 days	Tue 3/11/14
91	Demographic Data	3 days	Wed 3/12/14
92	Teaching and Learning Data	3 days	Thu 3/13/14
93	Academic Profile Data	3 days	Fri 3/14/14
94	Staff Data	3 days	Mon 3/17/14



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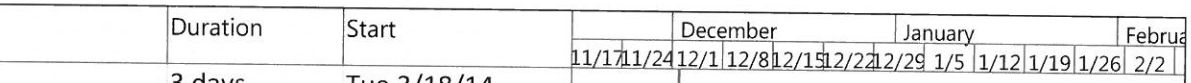
ID	Task Name	Duration	Start
95	Operational Data	3 days	Tue 3/18/14
96	**edFusion Insight Reporting Tool**	**8 days**	**Wed 3/12/14**
97	Directory Data	3 days	Wed 3/12/14
98	Demographic Data	3 days	Thu 3/13/14
99	Teaching and Learning Data	3 days	Fri 3/14/14
100	Academic Profile Data	3 days	Mon 3/17/14
101	Staff Data	3 days	Tue 3/18/14
102	Operational Data	3 days	Wed 3/19/14
103	**Adhoc Reports (Data Analysis Tools)**	**8 days**	**Thu 3/13/14**
104	Directory Data	3 days	Thu 3/13/14
105	Demographic Data	3 days	Fri 3/14/14
106	Teaching and Learning Data	3 days	Mon 3/17/14
107	Academic Profile Data	3 days	Tue 3/18/14
108	Staff Data	3 days	Wed 3/19/14
109	Operational Data	3 days	Thu 3/20/14
110	**Custom Reports - can include Dashboards & Scorecards**	**8 days**	**Fri 3/14/14**
111	Directory Data	3 days	Fri 3/14/14
112	Demographic Data	5 days	Mon 3/17/14
113	Teaching and Learning Data	5 days	Tue 3/18/14
114	Academic Profile Data	5 days	Wed 3/19/14
115	Staff Data	3 days	Thu 3/20/14
116	Operational Data	3 days	Fri 3/21/14
117	**Customization & Implementation**	**95 days**	**Wed 4/2/14**



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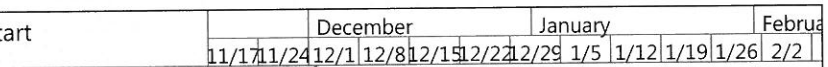
ID	Task Name	Duration	Start
118	Directory	10 days	Wed 4/2/14
119	Data Ingestion	60 days	Wed 4/16/14
120	Data Quality	10 days	Wed 7/9/14
121	Snapshots	5 days	Wed 7/23/14
122	Adhoc Analysis (Data Analysis Tools)	5 days	Wed 7/30/14
123	Custom Reports - can include Dashboards and Scorecards	5 days	Wed 8/6/14
124	**Quality Assurance & Acceptance**	**30 days**	**Wed 8/13/14**
125	Integration Testing	15 days	Wed 8/13/14
126	User Acceptance Testing	15 days	Wed 9/3/14
127	**Training & Knowledge Transfer**	**19 days**	**Wed 9/24/14**
128	Operations Procedures	5 days	Wed 9/24/14
129	Master Data Administration	3 days	Wed 10/1/14
130	Integrate Training	3 days	Mon 10/6/14
131	Insight Training	3 days	Thu 10/9/14
132	End User Training	5 days	Tue 10/14/14
133	Project Closure	2 days	Tue 10/21/14



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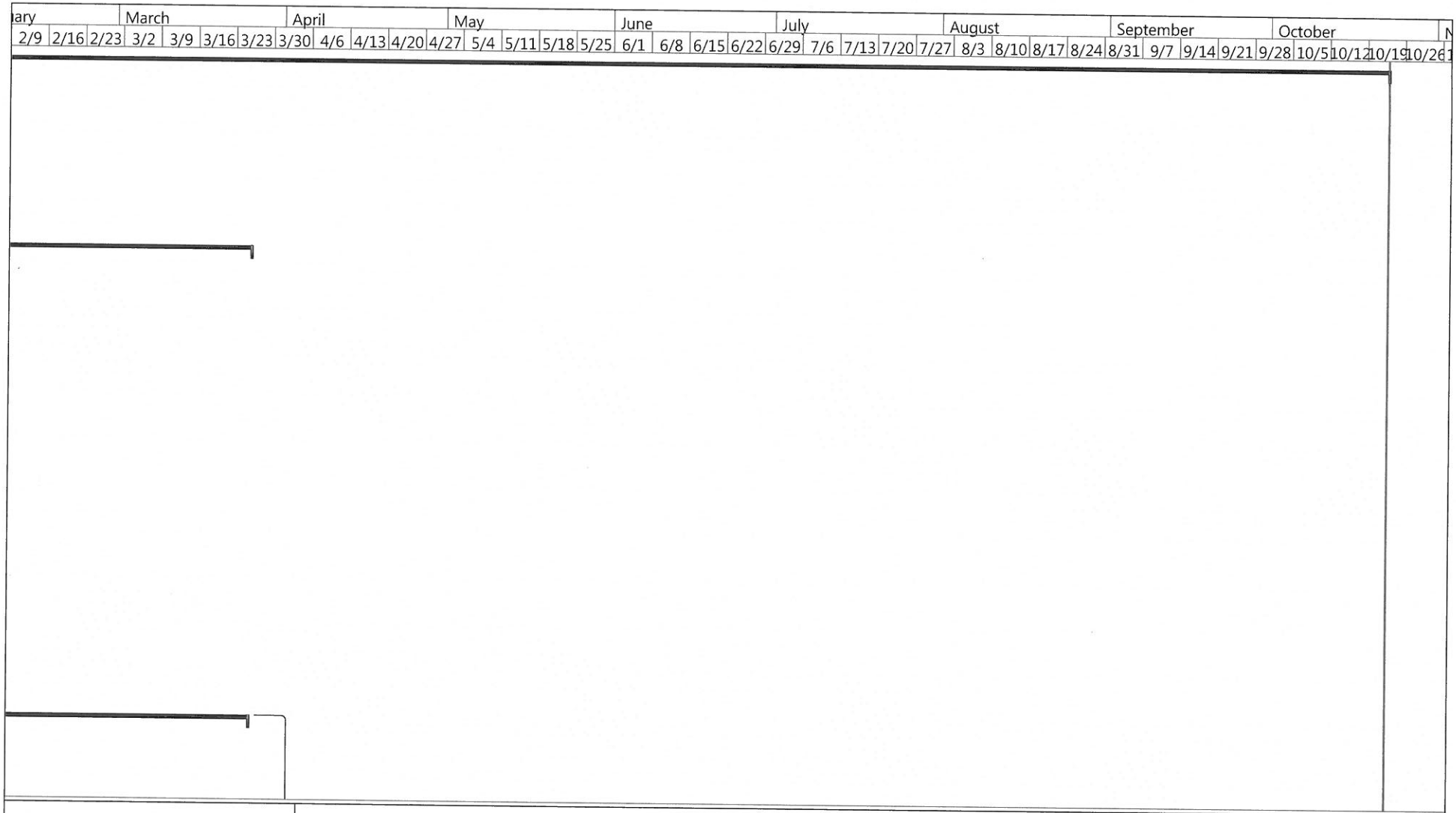
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Project: Plan 10-03-2013
Date: Thu 10/3/13
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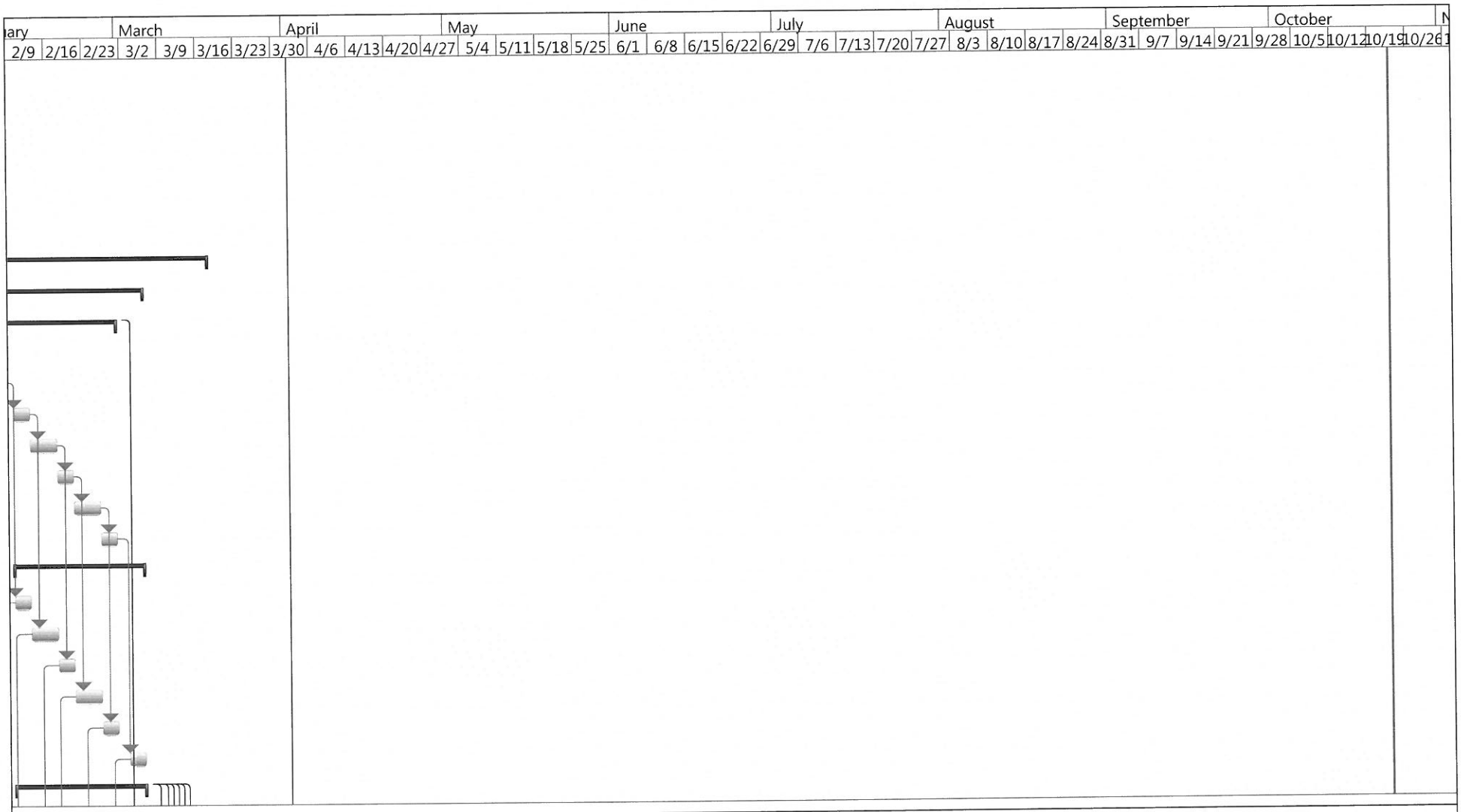

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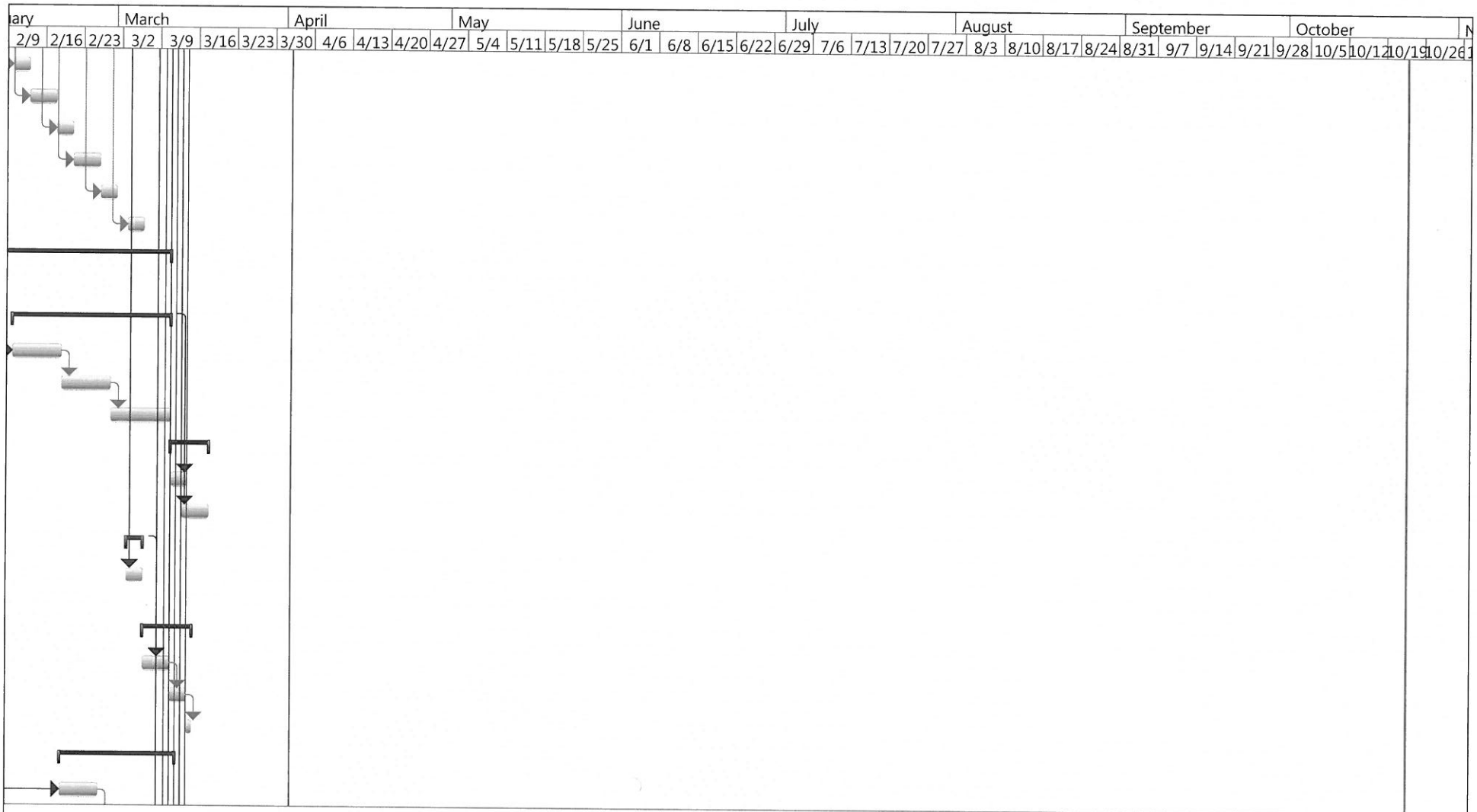

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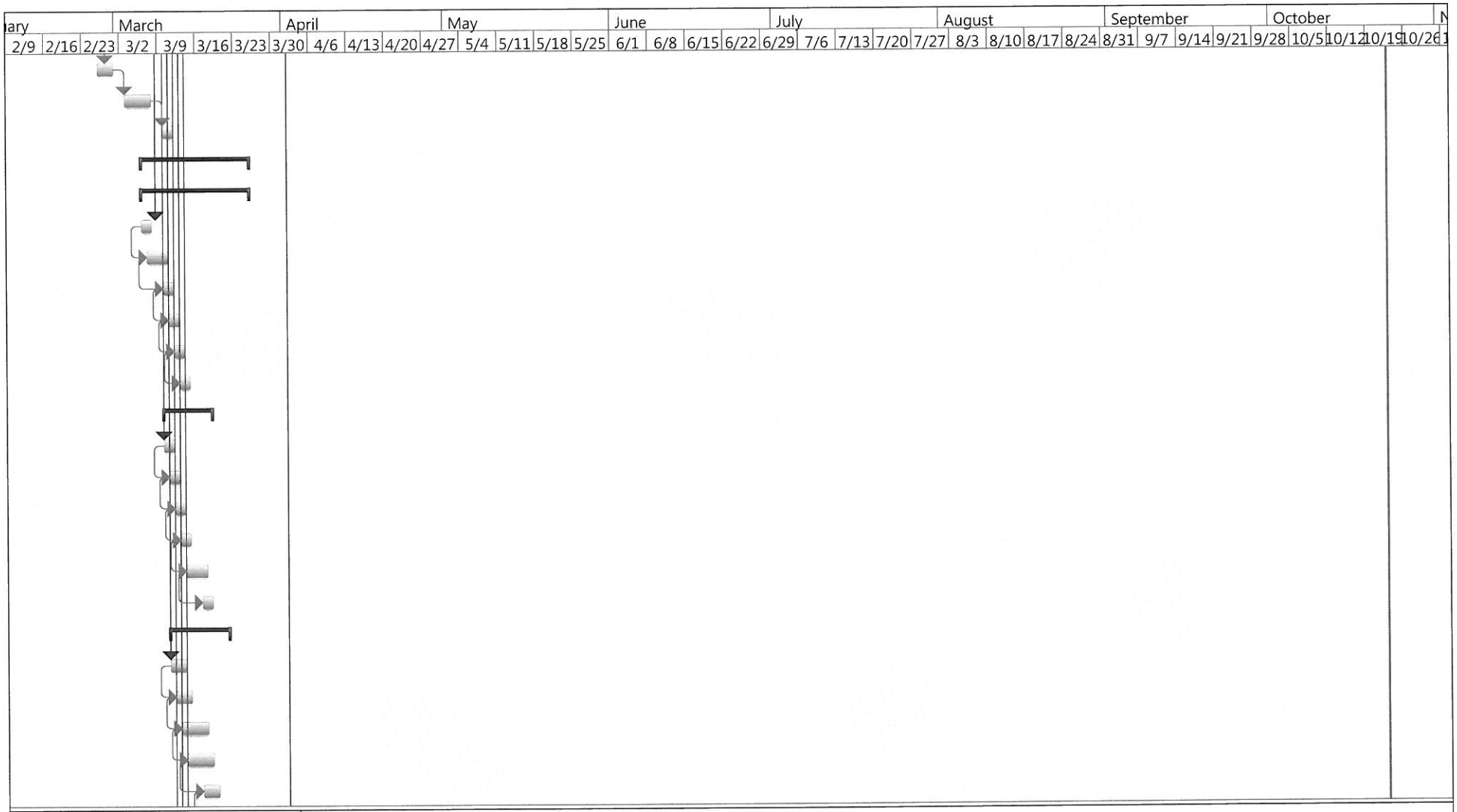
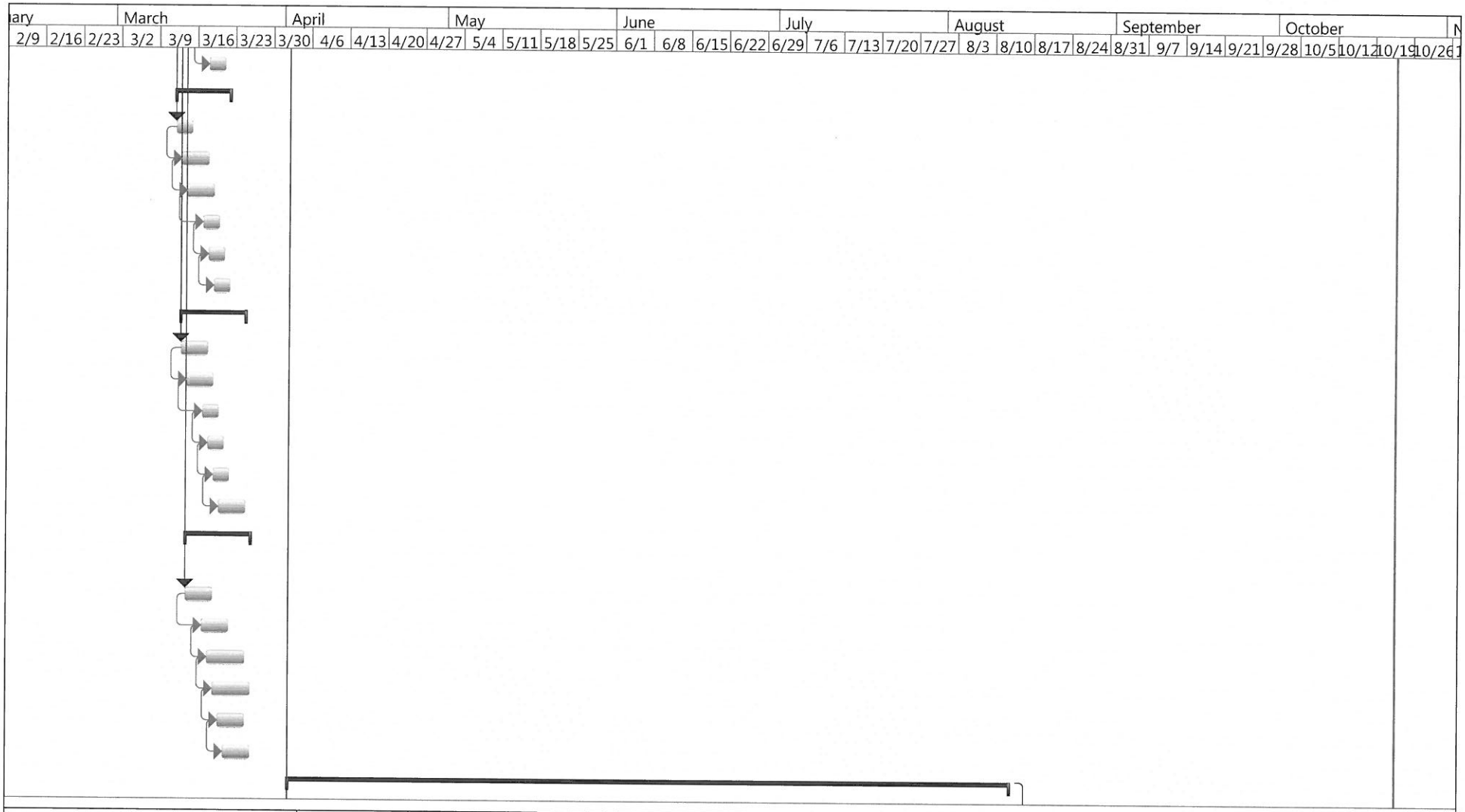
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			



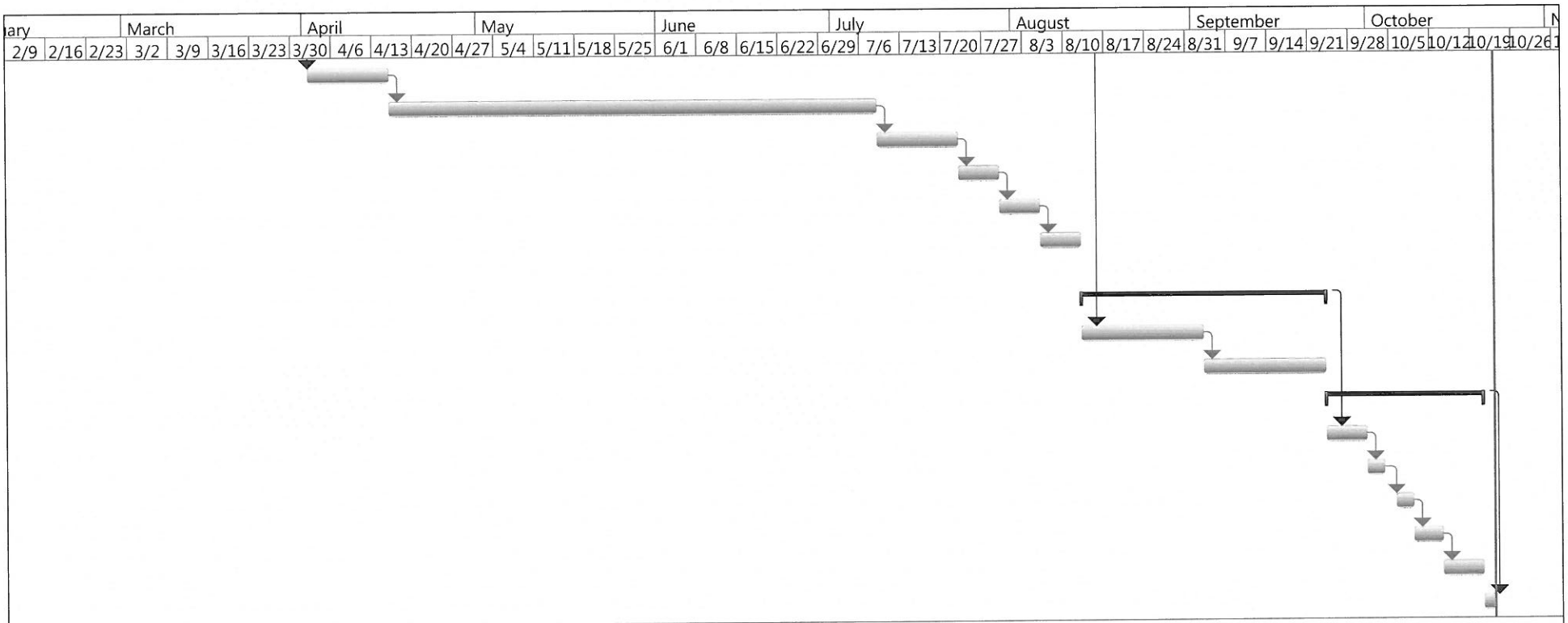
Project: Plan 10-03-2013
Date: Thu 10/3/13

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			



Project: Plan 10-03-2013
Date: Thu 10/3/13

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			



Project: Plan 10-03-2013
Date: Thu 10/3/13

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			

Appendices

Appendix 1 - Attachments

1. Attachment A – Vendor Response Sheet
2. Attachment B – Mandatory Specifications Checklist
3. Attachment D – Addendum for Software
4. Vendor Purchasing Affidavit
5. Certification and Signature Page
6. Addendum Acknowledgment

Appendix 2 – Proposed Project Plan

REQUEST FOR PROPOSAL

West Virginia Department of Education
RFP # EDD398772

Attachment A: Vendor Response Sheet

Provide a response regarding the following: firm and staff qualifications and experience in completing similar projects; references; copies of any staff certifications or degrees applicable to this project; proposed staffing plan; descriptions of past projects completed entailing the location of the project, project manager name and contact information, type of project, and what the project goals and objectives where and how they were met.

Our responses to these questions were more detailed than what would fit in the space allocated on this form. We have given page number references to where they appear in our RFP response narrative. Thank you.

Section 4 - Subsection 4.3 Qualification & Experience:

Vendor Response: pages 10-44

Section 4 - Subsection 4.4 Project Goals: 4.4.1 Goal I: Architecture, Infrastructure and Development

Vendor Response: pages 45-95

Section 4 - Subsection 4.4 Project Goals: 4.4.2 Goal II: Technical Support

Vendor Response: pages 96-108

Section 4 – Subsection 4.4 Project Goals: 4.4.3 Goal III: Analysis & Reporting

Vendor Response: pages 108-131

Section 4 – Subsection 4.4 Project Goals: 4.4.4 Goal IV: Professional Development Services

Vendor Response: pages 131-138

REQUEST FOR PROPOSAL

West Virginia Department of Education

RFP # EDD398772

Section 4 – Subsection 4.4 Project Goals: 4.4.5 Goal V: Project Management

Vendor Response: pages 138-152

Section 4 - Subsection 4.4 Project Goals: 4.4.6 Goal VI: Transition Strategy

Vendor Response: pages 152-153

REQUEST FOR PROPOSAL

West Virginia Department of Education
RFP # EDD398772

Attachment B: Mandatory Specification Checklist

List mandatory specifications contained in Section 4, Subsection .5:

Section 4 - Subsection 4.5:

4.5.1 All aspects of the proposal must adhere to rules and regulations set forth in the, Child Information Protection Act (CIPA), Family Educational Rights and Privacy Act (FERPA), Child Online Protection Act (COPA), and Health Insurance Portability and Accountability Act (HIPAA).

THE SOLUTION SHALL NOT BE PROPRIETARY

We agree and will comply that All aspects will adhere to the rules and regulations set forth in CIPA, FERPA, COPA and HIPAA.

Vendor Response: Choice has proposed a non-transferable perpetual use license of our software; as allowed for in Addendum 2 Q&A.

Section 4, Subsection 4.5:

4.5.2 Vendor must agree that the vendor-developed DWRS and all associated deliverables will be owned and operated by the WVDE upon project conclusion.

Vendor Response: We agree and will comply with this requirement.

Section 4, Subsection 4.5:

4.5.3 Vendor must relinquish ownership of the DWRS to the Agency upon project conclusion.

Vendor Response: We agree and will comply with this requirement

By signing below, I certify that I have reviewed this Request for Proposal in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that, to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

Choice Solutions, Inc.
(Company)

Zachary Tussing, VP
(Representative Name, Title)

(508) 229-0044 Office / (617) 821-1689 Mobile
(Contact Phone/Fax Number)

10/03/2013
(Date)

WV-96A
Rev. 12/12

AGREEMENT ADDENDUM FOR SOFTWARE

In the event of conflict between this addendum and the agreement, this addendum shall control:

1. **DISPUTES** - Any references in the agreement to arbitration or to the jurisdiction of any court are hereby deleted. Disputes arising out of the agreement shall be presented to the West Virginia Court of Claims.

2. **HOLD HARMLESS** - Any provision requiring the Agency to indemnify or hold harmless any party is hereby deleted in its entirety.

3. **GOVERNING LAW** - The agreement shall be governed by the laws of the State of West Virginia. This provision replaces any references to any other State's governing law.

4. **TAXES** - Provisions in the agreement requiring the Agency to pay taxes are deleted. As a State entity, the Agency is exempt from Federal, State, and local taxes and will not pay taxes for any Vendor including individuals, nor will the Agency file any tax returns or reports on behalf of Vendor or any other party.

5. **PAYMENT** - Any references to prepayment are deleted. Fees for software licenses, subscriptions, or maintenance are payable annually in advance. Payment for services will be in arrears.

6. **INTEREST** - Any provision for interest or charges on late payments is deleted. The Agency has no statutory authority to pay interest or late fees.

7. **NO WAIVER** - Any language in the agreement requiring the Agency to waive any rights, claims or defenses is hereby deleted.

8. **FISCAL YEAR FUNDING** - Service performed under the agreement may be continued in succeeding fiscal years for the term of the agreement, contingent upon funds being appropriated by the Legislature or otherwise being available for this service. In the event funds are not appropriated or otherwise available for this service, the agreement shall terminate without penalty on June 30. After that date, the agreement becomes of no effect and is null and void. However, the Agency agrees to use its best efforts to have the amounts contemplated under the agreement included in its budget. Non-appropriation or non-funding shall not be considered an event of default.

9. **STATUTE OF LIMITATION** - Any clauses limiting the time in which the Agency may bring suit against the Vendor, lessor, individual, or any other party are deleted.

10. **SIMILAR SERVICES** - Any provisions limiting the Agency's right to obtain similar services or equipment in the event of default or non-funding during the term of the agreement are hereby deleted.

11. **FEES OR COSTS** - The Agency recognizes an obligation to pay attorney's fees or costs only when assessed by a court of competent jurisdiction. Any other provision is invalid and considered null and void.

12. **ASSIGNMENT** - Notwithstanding any clause to the contrary, the Agency reserves the right to assign the agreement to another State of West Virginia agency, board or commission upon thirty (30) days written notice to the Vendor and Vendor shall obtain the written consent of Agency prior to assigning the agreement.

13. **LIMITATION OF LIABILITY** - The Agency, as a State entity, cannot agree to assume the potential liability of a Vendor. Accordingly, any provision in the agreement limiting the Vendor's liability for direct damages is hereby deleted. Vendor's liability under the agreement shall not exceed three times the total value of the agreement. Limitations on special, incidental or consequential damages are acceptable. In addition, any limitation is null and void to the extent that it precludes any action for injury to persons or for damages to personal property.

14. **RIGHT TO TERMINATE** - Agency shall have the right to terminate the agreement upon thirty (30) days written notice to Vendor. Agency agrees to pay Vendor for services rendered or goods received prior to the effective date of termination. In such event, Agency will not be entitled to a refund of any software license, subscription or maintenance fees paid.

15. **TERMINATION CHARGES** - Any provision requiring the Agency to pay a fixed amount or liquidated damages upon termination of the agreement is hereby deleted. The Agency may only agree to reimburse a Vendor for actual costs incurred or losses sustained during the current fiscal year due to wrongful termination by the Agency prior to the end of any current agreement term.

16. **RENEWAL** - Any reference to automatic renewal is deleted. The agreement may be renewed only upon mutual written agreement of the parties.

17. **INSURANCE** - Any provision requiring the Agency to purchase insurance for Vendor's property is deleted. The State of West Virginia is insured through the Board of Risk and Insurance Management, and will provide a certificate of property insurance upon request.

18. **RIGHT TO NOTICE** - Any provision for repossession of equipment without notice is hereby deleted. However, the Agency does recognize a right of repossession with notice.

19. **ACCELERATION** - Any reference to acceleration of payments in the event of default or non-funding is hereby deleted.

20. **CONFIDENTIALITY** -Any provision regarding confidentiality of the terms and conditions of the agreement is hereby deleted. State contracts are public records under the West Virginia Freedom of Information Act.

21. **AMENDMENTS** - All amendments, modifications, alterations or changes to the agreement shall be in writing and signed by both parties. No amendment, modification, alteration or change may be made to this addendum without the express written approval of the Purchasing Division and the Attorney General.

ACCEPTED BY:

STATE OF WEST VIRGINIA	**VENDOR**
Spending Unit: _____	Company Name: Choice Solutions, Inc.
Signed: _____	Signed: Zachary Tussing
Title: _____	Title: VP
Date: _____	Date: 10/03/2013

Attachment
PO#_____

This agreement constitutes the entire agreement between the parties, and there are no other terms and conditions applicable to the licenses granted hereunder.

Agreed

Signature Date	Signature Date
VP Title	Title
Choice Solution Inc. Company Name	Agency/Division

RFQ No. EDD398772

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

MANDATE: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (*W. Va. Code* §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Choice Solutions Inc

Authorized Signature: _____ Date: 9-18-13

State of Massachusetts

County of Middlesex, to-wit:

Taken, subscribed, and sworn to before me this 19 day of September, 2013

My Commission expires Dec 21, 2018.

AFFIX SEAL HERE

NOTARY PUBLIC _____

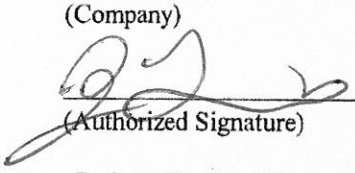
LINDA C. SAVOY
Notary Public
Massachusetts
Commission Expires Dec 21, 2018

CERTIFICATION AND SIGNATURE PAGE

By signing below, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid or proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

Choice Solutions, Inc.

(Company)



(Authorized Signature)

Zachary Tussing, VP

(Representative Name, Title)

(508) 229-0044 / (508) 229-0033

(Phone Number) (Fax Number)

10/03/2013

(Date)

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: EDD398772

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:
(Check the box next to each addendum received)

[X]	Addendum No. 1	[ ]	Addendum No. 6
[X]	Addendum No. 2	[ ]	Addendum No. 7
[ ]	Addendum No. 3	[ ]	Addendum No. 8
[ ]	Addendum No. 4	[ ]	Addendum No. 9
[ ]	Addendum No. 5	[ ]	Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Choice Solutions, Inc.
Company

Authorized Signature

10/13/2013
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.