October 9, 2013

West Virginia

Statewide Longitudinal Data System (P-12)

RFP EDD398772

Submitted by:
Missi Poynter
Senior Account Executive
SAS Institute Inc. (SAS)
100 SAS Campus Dr
Cary NC 27513-8617
919-531-0467
missi.poynter@sas.com

For signature, please refer to the Letter of Transmittal beginning on the following page.

§.sas.

THE POWER TO KNOW.

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Ssas | THE POWER TO KNOW.

October 9, 2013

Connie Oswald
Department of Education
Building 6
1900 Kanawha Boulevard, East
Charleston, WV 25305-0330

Thank you for inviting SAS Institute Inc. (SAS) to respond to your request for proposal entitled, *Statewide Longitudinal Data System (SLDS) and the Data Warehouse and Reporting Solution (DWRS)*. The attached RFP response describes how SAS can provide the West Virginia Department of Education with a comprehensive, integrated quality solution for the specific requirements set forth in the RFP and subsequent discussions.

SAS is dedicated to establishing a working partnership that will help WVDE build a sustainable SLDS that provides stakeholders access to secure, quality data to drive better student outcomes. We look forward to applying our unique ability to enable your vision.

In our fourth decade of service to the education space, SAS has the specific knowledge and experience that will provide WVDE expertise and direction to enable the data warehouse and reporting capabilities that are required. We are dedicated to strong business relationships with our customers. As the leader in data transformation tools and methodologies, our proven methodology, quality projects and solutions, and the ability to quickly respond to customers' needs set SAS apart from other service providers.

SAS is the market leader in providing a new generation of business analytics and business intelligence (BI) software and services that create true enterprise intelligence. SAS solutions are used at more than 65,000 sites in more than 135 countries – including 90 of the top 100 FORTUNE Global 500® companies. SAS is also used by more than 30 State Education Agencies across the country to enable better, more accurate, and informed decisions. SAS is the only vendor that completely integrates leading data warehousing, analytics, and traditional reporting applications to create intelligence from disparate amounts of data. For more than 37 years, SAS has been giving customers around the world THE POWER TO KNOW®.

Terms and Conditions
The response is valid for installation of SAS software only in the United States upon the hardware configuration indicated in the response. SAS looks forward to putting in place a mutually agreeable contract for the services and software license described in SAS' response to the RFP. Please note SAS' response does not constitute a contract and is contingent on the parties' agreement to separately negotiated, mutually acceptable contract requirements and terms should SAS be selected as the vendor. The contract terms and requirements of the RFP along with SAS'

Master License Agreement, Software Supplement and Services Supplement, will serve as the basis for establishing a contract with such additions and changes mutually agreed to by the parties. Neither the RFP, nor SAS' response shall be deemed to constitute an agreement between SAS and State of West Virginia Department of Administration.

SAS will provide the $250,000 performance bond subject to mutually agreeable terms and conditions related thereto.

Title to all SAS software and any work product produced and delivered as a result of the performance of any services shall remain with SAS and its licensors.

Fees

All fees set forth in the response are based on 2013 U.S. license fees and service rates. The fees do not include applicable taxes. Please note that unless specifically stated otherwise in the attached response, all fees for services are quoted on a time and materials basis. SAS' time and any computer code and related documentation resulting therefrom are the only service deliverables. All fees for software are exclusive of fees that may be assessed for third party access to SAS software in a services environment such as facilities management, outsourcing, time-sharing or service bureau, or for the right to process third party data using SAS software.

SAS Contacts

For questions concerning this submission, scheduling demonstrations of the solution, or making arrangements for reference calls, please contact your Account Executive or Sales Manager:

Missi Poynter, Sr. Account Executive
SAS Institute Inc.
SAS Campus Dr. Rm S1090
Cary, NC 27513
919-531-0467
919-677-4444
missi.poynter@sas.com

Rob Harper, Sales Manager
SAS Institute Inc.
SAS Campus Dr. Rm S1082
Cary, NC 27513
919-531-0506
919-677-4444
rob.harper@sas.com

For questions regarding negotiations, software license agreements, and legal matters, please contact:

Valencia Kinnaird
Contracts Negotiation Specialist 3
SAS Campus Drive
Cary, NC 27513
919-677-8000
919-677-4444
valencia.kinnaird@sas.com

Proposal Validity, Confidentiality, and Ownership

The response, including all fees set forth therein, shall be valid until Friday, December 20, 2013. The response is based on SAS' current understanding of your requirements as set forth in the RFP and subsequent discussions. As such, it is subject to change based on changes in hardware configuration and additional or different information regarding your requirements and infrastructure.

The response and all materials attached hereto remain the confidential proprietary property of SAS Institute Inc. and shall be provided only to WVDE's personnel with a need to know in connection with your evaluation of SAS as a potential vendor. All copies provided and any duplicates shall be returned to SAS or destroyed upon request. Such information shall not be disclosed outside WVDE without the express written consent of SAS.

As SAS learns more about the details of this project, it may be appropriate to consider the participation of SAS partners. We would, however, approach any such participation only with your full knowledge and consent.

SAS appreciates the opportunity to provide you with information concerning your software licensing and service needs. We look forward to continuing discussions regarding this project.

Sincerely,

§.sas.   Kevin Farrell
Manager
Contracts Administration
SAS INSTITUTE INC.

Cc: Valencia Kinnaird
Rob Harper
Missi Poynter

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

Vendor Response: The Solution will consist of Vendor's proprietary software that will be licensed by WVDE.

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: Vendor will grant WVDE a nonexclusive, nontransferable, non-assignable, royalty free license to use the deliverables and any documentation, computer code or other materials included in any deliverables that are delivered by Vendor in connection with the services (collectively "Work Product") only with the software with which the Work Product operates and only for as long as WVDE maintains a license for such software.

Section 4, Subsection 4.5:

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

Vendor Response: The Agency will own the DWRS upon project completion. Vendor will maintain ownership in the deliverables and Work Product as stated above.

By signing below, I certify that ~~Vendor has~~ reviewed this Request for Proposal in its entirety; understand the requirements, terms and conditions, and other information contained herein; that ~~Vendor is~~ 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.

SAS Institute Inc.
(Company)

[signature]
(Representative Name, Title)

§.sas Kevin Farrell
Manager
Contracts Administration
SAS INSTITUTE INC.

[stamp: VK LEGAL]

919 677-8000   919 677-4444
(Contact Phone/Fax Number)

SEP 2 7 2013
(Date)

Revised 7/8/2013

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: __SAS Institute Inc.__

Authorized Signature: _____   Date: __9/27/13__

State of __North Carolina__

County of __Wake__, to-wit:

Taken, subscribed, and sworn to before me this __27th__ day of __September__, 20__13__.

My Commission expires __May 17__, 20__15__

AFFIX SEAL HERE   NOTARY PUBLIC _____

Purchasing Affidavit (Revised 07/01/2012)

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:

- ◆ Addendum No.1 (9/25/13)
- ◆ Addendum No. 2 (9/30/13)

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.

SAS Institute Inc. will provide the $250.000 performance bond subject to mutually agreeable terms and conditions related thereto.

§.sas. Kevin Farrell
Manager
Contracts Administration
SAS INSTITUTE INC.

_____
Company

_____
Authorized Signature

October 3, 2013
_____
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.

CERTIFICATION AND SIGNATURE PAGE

┌ SAS Institute Inc.
│ ┌ has
By signing below, I certify that ~~I have~~ reviewed this Solicitation in its entirety; understand the requirements,
┌ SAS is
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.

SAS Institute Inc.
(Company)

(Authorized Signature)

§.sas. Kevin Farrell
Manager
Contracts Administration
(K SAS INSTITUTE INC.

(919)677-8000   (919)677-4444
(Phone Number)   (Fax Number)

SEP 2 7 2013
(Date)

VK
LEGAL

Revised 07/25/2013

October 9, 2013

Connie Oswald
Department of Education
Building 6
1900 Kanawha Boulevard, East
Charleston, WV 25305-0330

Thank you for inviting SAS Institute Inc. (SAS) to respond to the request for proposal number EDD398772, Statewide Longitudinal Data System (SLDS and the Data Warehouse and Reporting Solution (DWRS)).

SAS looks forward to partnering with the West Virginia Department of Education to continue and grow our long standing relationship that started over nine years ago. The attached response describes how SAS can provide a comprehensive data warehousing and reporting solution for the specific requirements outlined in the Request for Proposal.

In our fourth decade of service to the Education field, SAS has the specific knowledge and experience that will provide expertise and direction to enable the SLDS platform the WVDE requires. As the leader in data management, predictive analytics and data visualization solutions, our proven methodology, quality projects and tools, and the ability to quickly respond to customers' needs, all of which set SAS apart from other service providers.

Since our beginning as a research project more than 37 years ago at North Carolina State University, SAS has remained committed to serving Education by delivering software solutions and strategic services that spark innovation and expand educational opportunities. SAS delivers the latest technology in SAS software and solutions to more than 3,000 educational institutions worldwide.

SAS' most highly visible contribution to the education field came with SAS CEO Jim Goodnight's 2008 announcement that "SAS® Curriculum Pathways® (Web-based curriculum resources in all the core disciplines in grades 8-14) is now a free resource from SAS to our nation's children. West Virginia was one of the first to adopt Curriculum Pathways statewide!

Thank you again for the opportunity to participate in this proposal process. All of us at SAS look forward to partnering with WVDE as we move to the next stage.

Sincerely,

Missi Poynter
Senior Account Executive
SAS Institute Inc. (SAS)
100 SAS Campus Dr
Cary NC 27513-8617
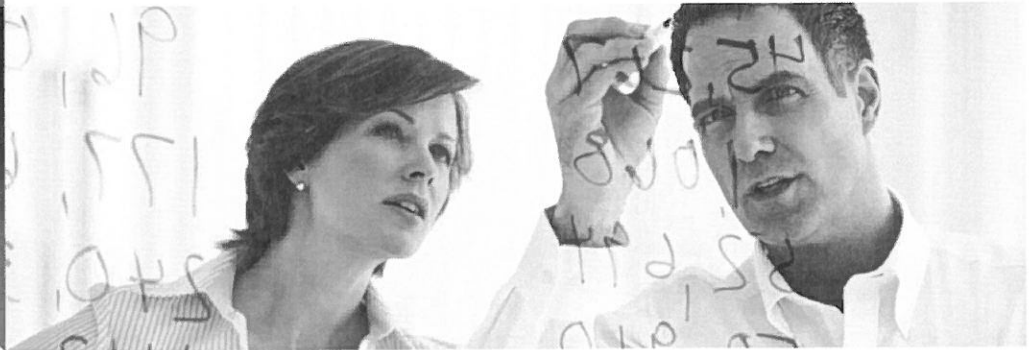919-531-0467
missi.poynter@sas.com

Table of Contents

The <u>Response Index</u> beginning on page 134 provides an index of responses to your questions.
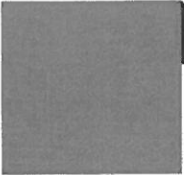
Rapid Changing Education Landscape

America's education landscape is changing rapidly. Within the next two years, most states will test students on Common Core-aligned curricula, evaluate teachers and administrators largely based on the results of these tests, and implement new accountability systems, driving attention and resources to a state's lowest performing schools. All will occur within the context of pre-existing financial and political pressures, as well as the looming specter of Elementary and Secondary Education Act (ESEA) reauthorization. If passed, this legislation might further strain State Education Agencies (SEAs) capacity and resources.

Extraordinary Changes

The nature and pace of these changes are extraordinary, and the stakes have never been higher. Teacher/ administrator retention and school funding decisions will be based largely on student outcomes—student data. This places new and growing demands on the West Virginia Department of Education (WVDE) to provide more data, more quickly so decisions can be made on the basis of valid, reliable and insightful information. A stable and secure statewide longitudinal data system (SLDS) is crucial here—an SEA cannot function effectively without one.

Inaccessible Data

The WVDE has access to vast amounts of data within its existing WVEIS and P-20W systems. If the WVDE is anything like other SEAs, the agency struggles to pull this data together to paint a complete, compelling and accessible picture of past and current student outcomes, and certainly struggles to uncover hidden insights or try to answer what might happen in the future. Given the right technology and tools, the WVDE will be able answer these critical questions—

what was, what is, and most importantly, what can be—and consequently, add tremendous value to educators, legislators and the public, moving the agency from a more compliance-oriented model to a transparent, service-oriented one.

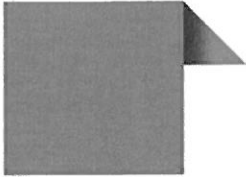## Must Improve Student Outcomes

SAS is uniquely positioned to help. With 37 years of experience and a philanthropic focus on Education, SAS can provide world class tools and services at a fraction of the cost. Our tools and services are fully integrated and solution focused. We address issues around data quality and governance, master data management (i.e., a single version of the truth for students, teachers, facilities and financials), as well as data visualization and analytics with the end in mind; how can the insights derived from data be used to improve student outcomes? SAS starts with the key questions your agency needs to answer and builds solutions to answer those questions. We also train agency staff on how to use the solutions, so they become embedded within your agency, not reliant on an outside vendor.

Enable a Single Source of Truth for Students, Teachers, and Facilities

SAS understands that the WVDE would like for skilled staff to use those skills fully (e.g., allow analysts to analyze, not spend an inordinate amount of time cleansing data or fulfilling data requests). SAS Data Management technology will allow WVDE staff to automate manual tasks associated with data collection, data quality and data integration and maintain a single source of truth for students, teachers and facilities – one place to go to pull all state-level data for the purposes of reporting and analysis and one mechanism through which the WVDE's new Data Governance Committee can propagate and enforce data discipline. SAS reporting tools will allow internal and external stakeholders to access information through a dynamic interface, significantly reducing the burden of requests, so analysts can focus on finding hidden insights to support proactive decision making.

New Challenges Ahead for WVDE

The next couple of years will present many new challenges for the WVDE, making it that much more important for the agency to become proactive – to intervene and direct limited resources as early as possible to drive the most impact for students. A stable and secure SLDS will provide the agency with a better picture of the past and present condition of education in the state. A SLDS

can be much more than that, though, much more than a restatement of the obvious (e.g., which schools perform well and which do not). Attached to the right analytical tools, a SLDS can point to why some schools perform better than others, where new teachers need to be hired to preempt population growth and which policies have had the most impact on indicators outside test scores.

Provide Insights for Educators and Policy Makers

SAS meets all requirements in the RFP #EDD398772. We are able to deliver on these requirements through years of experience in and outside the Education space. We are confident we can deliver technology and tools, which the WVDE will be able to use on an ongoing basis to support its mission. In addition and perhaps more importantly, we have a deeply rooted desire as part of our philanthropic mission to support states as they build out SLDS solutions, because we want educators and policy makers to have the insights needed to improve the quality of education across the country.

We look forward to the opportunity to help the WVDE as it takes on this significant initiative.
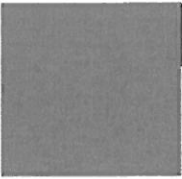
Educators, policy makers and researchers need valid, reliable and insightful information to serve as the basis for making decisions that support improved student outcomes. This is highly reliant on the ability to maintain a single source of truth for students, faculty, facilities and financials. . At every level, SAS software and professional services ensures a single-point-of-reference for you to ensure transparency of the data, master and metadata management, and project/program management.

Integrating data sources used to be relatively simple exercise, because states brought fewer, local data sources together. Now, managing school, district and state-level data is much more complex, requiring communication between local databases and other shared data outside traditional information flows. In West Virginia, these requirements have expanded to include interfacing with other state-level data systems (e.g., the WV P-20W Data Warehouse, WVEIS, and private data from the WVDE data partners and sources), The WVDE wants to build a foundation for integration, which will allow staff to derive insights from connected data sources, but also desires to build a system with the power to grow and change with future needs.

SAS' goal in the following documentation is to provide this foundation of technology and user friendly tools to meet the challenges of today and tomorrow. We have bundled together key strategic technologies for data management, reporting and analysis: SAS® Data Management, SAS® Visual Analytics, and SAS® Office Analytics. These key, public and private sector-leading technologies will provide you with the ability to access your data, analyze, manage, and report on it with the ultimate goal of giving you an informed platform to provide better decisions and opportunities for your students, faculty and community while squarely addressing requirements around FERPA, HIPAA and other security needs.

SAS has a long history of providing technologies to meet the challenges of turning data into actionable information. Rather than purchase disparate

technologies and package them together, SAS' tools all originate at SAS and build upon our past success ensuring consistency and compatibility. This philosophy has produced the industry's strongest set of solutions for data quality, data management, reporting and analytics. As part of an integrated framework, all of these components are managed from a single point of control, reducing the administrative and maintenance effort associated with managing your solution. Data consistency and reliability is assured through common metadata and systems integrity and security are handled by our common environment management tools. The result is the ability to transform disparate data first into information, then into insight, allowing effective decisions to be made, and appropriate actions to be taken, with confidence.

Vendors should provide responses in the format listed below.

- *Title Page*
- *Table of Contents*
- *Attachment A*
- *Attachment B*
- *Attachment C*
- *Oral Presentations*

Title Page

State the RFP subject, number, Vendor's name, business address, telephone number, fax number, name of contact person, e-mail address, and Vendor signature and date.

Please refer to the Title Page on page ii and the Letter of Transmittal beginning on page iii.

Table of Contents

Clearly identify the material by section and page number.

Please refer to the *Table of Contents* beginning on page xi and the *Interactive Response Index* beginning on page 134.

Attachment A

Within the attached response sheet (Attachment A: Vendor Response Sheet), provide 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 were and how they were met.

Also, describe the approach and methodology proposed for this project. This should include how each of the goals and objectives listed is to be met.

> Please refer to *Response to RFP Attachment A: Vendor Response Sheet* beginning on page 8.

Attachment B

Complete Attachment B: Mandatory Specification Checklist. By signing and dating this attachment, the Vendor acknowledges that they meet or exceed each of these specifications as outlined in 4.5 of Section Four: Project Specifications. The State reserves the right to require documentation detailing how each is met at its discretion.

> Please refer to *Response to RFP Attachment B: Mandatory Specification Checklist* beginning on page 112.

Attachment C

Complete Attachment C: Cost Sheet included in this RFP and submit in a separate sealed envelope. Cost should be clearly marked.

> Please refer to *Response to RFP Attachment C: Cost Sheet* provided as specified.

Oral Presentations

If established by the Agency in the Schedule of Events (Section 1.3), all Vendors participating in this RFP will be required to provide an oral presentation, based on the criteria set in Section 4.6. During oral presentations, Vendors may not alter or add to their submitted proposal, but only to clarify information.

> SAS will provide an oral presentation as required.

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.

- *Section 4 - Subsection 4.3 Qualification & Experience:*
- *Section 4 - Subsection 4.4 Project Goals: 4.4.1 Goal I: Architecture, Infrastructure and Development*
- *Section 4 - Subsection 4.4 Project Goals: 4.4 .2 Goal II: Technical Support*
- *Section 4 - Subsection 4.4 Project Goals: 4.4.3 Goal III: Analysis & Reporting*
- *Section 4- Subsection 4.4 Project Goals: 4.4.4 Goal IV: Professional Development Services*
- *Section 4 - Subsection 4.4 Project Goals: 4.4.5 Goal V: Project Management*
- *Section 4 - Subsection 4.4 Project Goals: 4.4.6 Goal VI : Transition Strategy*

Section 4 - Subsection 4.3 Qualification & Experience:

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.

The SAS mission is to deliver proven solutions that drive innovation and improve performance. "SAS" once stood for "statistical analysis system" and began at North Carolina State University as a project to analyze agricultural research. As demand for such software grew, SAS was founded in 1976 to help all sorts of customers - from pharmaceutical companies and banks to academic and governmental entities. Education is a high priority of co-founder Dr. Jim Goodnight. He has created the Education Practice within SAS to function as a

philanthropic division to support the needs of SEAs, K-12 Districts and Higher Education. SAS education customers receive the same benefit of world class technology and 24x7 technical support as commercial customers.

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 .

SAS has successfully worked with several State Education Agencies (SEA) in the past five years to implement a statewide data warehouse and reporting solution. In some instances, SEAs had used funds with another vendor and were unable to deliver upon outcomes. Instead of continuing with the original vendor, SAS was chosen because of our integrated platform and lower cost. The Connecticut State Department of Education is one such agency that switched vendors, and subsequently have quickly gotten their project back on track with greater capabilities & functionality.

SAS is heavily involved with the North Carolina, South Carolina, Florida, Michigan, Texas and Connecticut SLDS projects, and some tie into their P20 projects. SAS also works closely with many school districts, and more than 80% of the higher education market.

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.

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

SAS has been implementing reporting and analytics technologies for 37 years, we know what you need to succeed. Through an optimized SAS environment, you can manage server hardware, reduce demands on networking and storage, and provide a single version of the truth to support faster decision making. Our enterprise platform will provide the WVDE with the ability to collect and combine high quality data for analysis and presentation.

SAS utilizes a rapid deployment strategy to adapt to each customer's needs to enable our customers to quickly turn large volumes of disparate data into easily understood reports, gain actionable insight through user-friendly advanced analytics and communicate to a wide range of stakeholders using powerful visualizations. In addition to our rapid deployment strategy we utilize the following Best Practices:

- Three-Tier Enterprise Model Architecture
- Big Bang and Iterative approach data warehousing methodologies
- The 14 Phase, SAS Intelligence Platform Implementation Methodology

These Best Practices have been used to successfully implement a CEDS compliant data warehouses within our technologies at other state agencies.

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

Since its inception in 1976, SAS has been helping education customers get the answers they need. Through our Education Practice SAS has uniquely positioned itself to serve education customers in the same way that we serve Fortune 500 companies: by offering account executives, consultants, and strategists with years of professional experience in the education industry who know and have had to answer the same questions West Virginia is looking to address.

SAS' Global Certification Program allows its employees, customers, and SAS Alliance Partners like Pinnacle Solutions to achieve accredited, globally recognized certifications that prove not only experience but an in-depth knowledge of the products that you will be using.

As an Alliance Member, Pinnacle has been certified as providers of the same high standards of market knowledge, vision, integrity and customer satisfaction that SAS Institute sets for itself. Their experience, combined with SAS software and solutions, gives you access to extensive domain, industry, and technology expertise.

Each year, Pinnacle renews their alliance status by meeting or exceeding the following criteria:

- Providing SAS Institute with references from their customers
- Keeping dedicated consultants with SAS software expertise

- Demonstrating a commitment to maintain and develop SAS software implementation skills and expertise by attending SAS User Group Conferences (http://support.sas.com/usergroups/namerica/allregconf.html), attending SAS training classes, and participating in the SAS Certified Professional Program (http://support.sas.com/certify/)
- Co-developing a business plan with SAS Institute that describes the partnership goals and anticipated measurable results

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

For more than 37 years, SAS has been helping education customers get the answers they need. Through our Education Practice, SAS has uniquely positioned itself to serve education customers by offering account executives, consultants, and strategists with years of professional experience in the education industry who worked in education and with education customers. The following list represents a small portion of SAS Education Practice customers:

- Connecticut State Department of Education
- Louisiana Department of Education
- Louisiana State University
- North Carolina Department of Public Instruction
- Broward College
- Florida Department of Education
- South Carolina Department of Education
- United States Department of Education
- Liberty Public School System
- University of North Carolina
- Slippery Rock University
- North Carolina State University
- Winston Salem Forsyth School District
- Baylor University
- Pace University
- Western Kentucky University
- William Patterson University
- University of Central Florida

- Blue Valley School District
- U.S. Census Bureau
- Enlarged School District of Middletown, New York
- New York City Board of Education
- Texas Education Agency
- Michigan Department of Education/CEPI
- Central Michigan Institute for Health and Business Insight
- Duke University
- Kennesaw State University
- Sinclair Community College
- Plano Independent School District
- Des Moines Area Community College
- Valencia Community College
- University of Arkansas
- Kaplan University
- Capella University
- University of Kansas
- University of Victoria, BC
- UT System

As an Alliance Member, Pinnacle has been certified as providers of the same high standards of market knowledge, vision, integrity and customer satisfaction that SAS Institute sets for itself. Their experience, combined with SAS software and solutions, gives you access to extensive domain, industry, and technology expertise.

Each year, Pinnacle renews their alliance status by meeting or exceeding the following criteria:

♦ Providing SAS Institute with references from their customers
♦ Keeping dedicated consultants with SAS software expertise
♦ Demonstrating a commitment to maintain and develop SAS software implementation skills and expertise by attending SAS User Group Conferences (http://support.sas.com/usergroups/namerica/allregconf.html), attending SAS training classes, and participating in the SAS Certified Professional Program (http://support.sas.com/certify/)
♦ Co-developing a business plan with SAS Institute that describes the partnership goals and anticipated measurable results

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.

Due to customer privacy, SAS does not release contract information regarding our customers without their permission. SAS has provided three customer references upon request of WVDE in section 4.3.5. The customer references are alike in nature to the goals set forth by WVDE in this RFP response. For example:

♦ The Michigan Department of Education/CEPI chose SAS because of our ability to provide a data management and reporting solution with integrated metadata.
♦ The Connecticut State Department of Education originally chose another vendor for their SLDS solution and have since turned to SAS to rebuild with our integrated platform to meet the required outcomes for their grant.
♦ The Texas Education Agency (TEA) has been utilizing SAS for over 20 years to provide data management, reporting and analysis in several departments such as Assessment, Accountability & Data Quality, and State Funding.

In 2012, TEA licensed SAS reporting to improve their ability to develop dynamic, easy to use internal and external facing reports. TEA is currently rebuilding their Research reporting system, known as TPEIR, using SAS Enterprise Business

Intelligence. Public launch of the redesigned TPEIR system is scheduled for late 2013.

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.

SAS believes that training is an essential part of your business solution. We deliver training using a wide range of teaching methods to accommodate various kinds of learning styles. Our goal is to transfer both knowledge and skills that can be directly applied to addressing the diverse and often complex challenges faced by our customers. Our training provides formal explanations of the functionality and best practice techniques, reinforced by practical hands-on exercises and informal discussion.

Training options include the development of a comprehensive training program adapted to our customers' specific needs through computer-based, and/or instructor-based courses, as well as trainers' kits. Training is available at our main training center in Cary, NC, as well as at facilities throughout the U.S., Canada, Europe, and Asia. We can also provide formal classroom training on-site at your facility depending on WVDE's specific training needs and resource availability. For a complete list of training locations, please refer to support.sas.com/edu/country.

Types of training that SAS offers include:

♦ Public Training
♦ On-site Training
♦ Knowledge Transfer
♦ Computer-based Training
♦ Web-based Training

Though SAS provides comprehensive descriptions of training curricula and paths in our *Training* catalog and elsewhere (such as support.sas.com/training/us/); a lot of training required for implementing our solutions occurs as the natural result of knowledge transfers during consulting services. As we learn more about WVDE's requirements, we can develop specific recommendations for specific types of training. The ideal time for such recommendations is upon completion of the Assessment phase.

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.

SAS approaches each development project as a partnership with customers. Therefore, we anticipate that the project team will include people from both SAS and WVDE, who will have direct involvement with the project.

SAS team members performing implementation services have received extensive training on relevant SAS practices and procedures. When possible, SAS attempts to build teams using consultants who have previously worked together or who share specific domain knowledge relevant to the project expected work products. This further extends the benefits of the SAS team approach.

Once the details and schedule for this project are finalized, the assembled team usually includes an account manager, a project manager, one or more technical consultants, and the applications developers subject to the project requirements. At appropriate points throughout the project as indicated by the project schedule, the SAS team may expand to include additional resources.

All nominated SAS staff allocated to any agreed project role possess the required skills, experience and knowledge required to meet assigned duties or expected work products. SAS strives to hire and retain the best employees in the industry. Many SAS consultants have bachelors, masters, and doctoral degrees in such areas as computer science, statistics, operations research, and business administration. SAS consultants are also experienced in performance management, detailed consulting operations, applications development, system analysis and design, and project management.

SAS will partner with Pinnacle Solutions to provide comprehensive project management for this project. Pinnacle Solutions is a SAS Alliance Consulting Partner. As an Alliance Member, they have been certified as providers of the same high standards of market knowledge, vision, integrity, and customer satisfaction that SAS Institute sets for ourselves. The experience of Pinnacle Solutions, combined with SAS software and consulting services, provides for all the necessary project management components to drive the success of this endeavor. Pinnacle Solutions and SAS will administer this project utilizing the SAS Project Management Methodology.

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

The amount of time each staff is to be assigned to the project will be mutually determined during project planning.

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.

Please refer to our response to question 4.3.3.a.

4.3.4 The vendor should provide resumes 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.

Specific consultants allocated to any project are assigned based on the actual requirements of the proposed project and availability at the time of contract commencement.

SAS team members performing implementation services have received extensive training on relevant SAS practices and procedures. When possible, SAS attempts builds teams using consultants who have previously worked together or who share specific domain knowledge relevant to the project expected work products. This further extends the benefits of the SAS team approach.

When beginning the project, SAS assembles the initial project team. The team usually includes one or more members of the sales/proposal team along with an allocated account manager or director, a project manager, and a technical lead. At appropriate points throughout the project as identified in the project plan, the SAS team may expand to include other resources as applicable.

All nominated SAS staff allocated to any agreed project role possess the required skills, experience and knowledge required to meet assigned expected work products. SAS strives to hire and retain the best employees in the industry. Many SAS consultants hold bachelors, masters, and doctoral degrees in such areas as computer science, statistics, operations research, and business administration. SAS consultants are also are experienced in detailed consulting operations, applications development, system analysis and design, and project management.

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.

Education is a high priority of co-founder Dr. Jim Goodnight. He created the Education Practice within SAS to function as a philanthropic division to support the needs of SEAs, K-12 Districts, and Higher Education. SAS is currently used by more than 30 SEAs and 3,000 education institutions globally.

SAS customers include 90 of the FORTUNE 100 companies (overall, 90% of 2012 FORTUNE Global 500® companies). Our customers include many multi-national companies using our software worldwide across disparate systems with hundreds of users. A large number of these customers consider their use of SAS software to be a competitive advantage. Therefore, non-disclosure agreements prevent us from revealing customer names and project details unless we receive permission to do so.

Many of our customers, however, do often welcome reference calls from potential SAS customers. To ensure effective use of everyone's time and efforts, they ask that we coordinate such calls after proposals have been reviewed. Once you have reviewed the information contained in this response, we will be happy to arrange for appropriate reference calls after receiving permission from our customer contacts.

Several customer success stories are available at www.sas.com/success. The following represent customers with whom we are prepared to arrange reference calls on your behalf:

- Ajit Gopalakrishnan
  Bureau Chief of Data Collection, Research and Evaluation
  Connecticut State Department of Education
  165 Capitol Avenue
  Hartford, CT 06106
  Phone: (860) 713-6888
  Email: ajit.gopalakrishnan@ct.gov
- Mike McGroarty
  Longitudinal Data Manager, CEPI
  State of Michigan Department of Education
  Phone: (517) 241-7430
  E-mail: McGroartyM@michigan.gov
- Nina Taylor
  Manager,Information Analysis
  Texas Education Agency
  1701 N. Congress Avenue
  Austin, TX, 78701
  Phone: (512) 475-2085
  E-mail: Nina.Taylor@tea.state.tx.us

Section 4 - Subsection 4.4 Project Goals

4.4.1. Goal I: Architecture, Infrastructure, and Development

Integrated Platform

SAS is the only vendor with an engineered platform to seamlessly deliver data integration, reporting, and analytics through a single unified system that can easily be extended, customized, and scaled within the agency to meet growing data needs to deliver new insights that drive optimal decisions. All of these capabilities can be leveraged to improve performance and manage change throughout the WVDE SLDS.

Key Features

SAS® Data Management

SAS offers a comprehensive data integration environment that will enable the WVDE to integrate data from any source and in any format, from homegrown to

ERP to popular desktop applications such as Microsoft Office tools. SAS will meet the requirement of interacting with the P-20W and WVEIS. This is possible because SAS Data Management is vendor-neutral with regard to operating systems, hardware and platforms. With SAS Data Management, there is no need to create custom interfaces or processes—SAS can do it all, which greatly simplifies the data integration processes for the WVDE. This level of integration also ensures that data used in analysis is complete, sequenced and properly cleansed—without excessive proliferation of metadata (a common problem in legacy business intelligence architectures). As a result, the WVDE will be able to maximize technology and information assets so they can address critical educational issues right away by leveraging a single, consistent, reliable version of the truth.

The WVDE currently has access to data in WVEIS and P-20W data warehouses. Having data around traditional students, as well as non-traditional students, can be especially impactful because new questions can be posed and analyses can be conducted that inform policy decisions.

SAS Data Management supports:

- Data access/connectivity
- Data warehousing
- Data quality
- ETL/ELT
- Data migration
- Data synchronization
- Data federation
- Data governance
- Master data management

SAS Data Management helps you analyze, improve and control data in one platform. The result? Better data governance. More collaboration between programs and IT. And more consistent metadata and security services. It's as complete and robust as it sounds.

Leading industry analysts, such as Gartner and Forrester, consistently recognize SAS as a leader in Data Management.

Data integration processes can take place on the platform where the data resides, as SAS can read and extract data from virtually all disparate, heterogeneous platforms. This greatly reduces network traffic, processing time, and data duplication and simplifies hardware configuration, which all help to lower total cost of ownership.

In addition to providing the database structure, SAS offers prebuilt, high-performance capabilities for data manipulations, analyses, data quality, and integration. Desktop data cleansing tools provide the ability to quickly and effectively analyze and resolve data quality problems and integrate the transformations into the data integration environment.

SAS Data Management not only enables data integration with any source, but also provides an easy-to-navigate graphical user interface for designing integration processes and accessing the data itself for analysis and reporting. All of these capabilities enable a single version of the truth that:

♦ Brings together clean, accurate record-level student data
♦ Eliminates data silos across many different organizations
♦ Saves time and money by eliminating the need for add-on data access and connectivity products

- Ensures data integrity and reliability
- Automates and simplifies common data access tasks

SAS® Data Quality, included with SAS Data Management

Turning insights into actions throughout the entire data cleansing process

Key Features

- Powerful, easy-to-use graphical user interface
- Data profiling capabilities
- Data cleansing, de-duplication and standardization
- Match code generation
- Householding
- Customization of parsing, standardization and matching algorithms
- Identification analysis
- Internationally capable with many language and country-specific constructs
- Leverages SAS' powerful data integration capabilities
- Extends the value of SAS business and analytic intelligence solutions
- Address verification (CASS and SERP certification)

Powerful, easy-to-use graphical user interface

- Windows-friendly environment lets users analyze data, define business rules, and create data standardization and data matching/integration specifications for IT users

Data profiling capabilities

- A robust environment analyzes enterprise data to determine nuances, discrepancies, and inaccuracies in data
- Provides an easy-to-use interface to determine areas of poor data quality and the amount of effort required to rectify them

Data cleansing, de-duplication and standardization

- Provides the ability to eliminate or reduce inconsistencies in data
- Allows duplicate records to be removed from a student, teacher, or facility database

Match code generation

- Creates unique key values by using fuzzy logic to group together information with similar values (for example, Robert, Bob, Bobby, etc.) across one field or multiple fields

Householding and site identification

- Allows the creation of householding or site ID based on one or more conditions

Customization of parsing, standardization and matching algorithms

- Allows personalization of parsing, matching, and standardization algorithms
- Create or enhance the rules used to parse the parts of the names, addresses, e-mail addresses, product codes and other education data
- Add rules to matching algorithms about which part of a data string weighs the heaviest in a match

Identification analysis

- Determine the gender of an individual for targeted analysis purposes
- Determine whether a value is a person or something else

Internationally capable with many language and country-specific constructs

- Understands the differences in various languages, including names, addresses, organizations, and other areas where data parsing and matching is required

Leverages SAS' powerful data integration capabilities

- By integrating with SAS capabilities, SAS Data Quality can be part of the overall ETL or data integration strategy
- SAS data quality capabilities can be applied to any data source supported by SAS on any supported platform, which ensures enterprise scalability
- Provides an interactive approach to data quality that eliminates duplication of effort when creating business rules

Extends the value of SAS business and analytic intelligence solutions

- Integrating data quality capabilities within business intelligence solutions creates high impact results, ensuring increased return on investment

Key Benefits

- ◆ Profile, monitor, and actively manage the quality of enterprise data.
- ◆ Integrate and standardize data across multiple systems and business units.
- ◆ Easily define data correction rules to reflect organizational changes and cleanse data
- ◆ Data Dictionary, included with SAS Data Management

Profile, monitor, and actively manage the quality of enterprise data.

The SAS Solution provides the ability to analyze and assess the quality of data across the enterprise. Profiling allows you to quickly determine the areas where potential gaps exist and what efforts will be required to rectify them. This enables agencies to focus on improving key data areas and business processes for better planning and project execution.

Integrate and standardize data across multiple systems and agency units.

With the SAS Data Quality Solution, agencies can incorporate data quality business rules across data sources and platforms. End-to-end audit capabilities highlight system-related quality issues by applying data quality algorithms and analytics. Through the implementation of standard and custom processes, data from different systems can be regulated and standardized into a unified, accurate view.
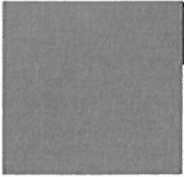
Easily define data correction rules to reflect organizational changes and cleanse data.

Specialized interfaces make it easy for business analysts and data stewards to create data standardizations and visualize the impact of business rules and data cleansing efforts. State-of-the-art data quality tools enable both business and technical users to cleanse, standardize, integrate and augment data, and can be customized to meet the individual requirements of each organization.

Data Dictionary, included with SAS Data Management

In modern agencies, the need for a common understanding of programmatic terms is critical to effective data governance. Users and IT staff often use multiple definitions for common business terms. Any of the definitions might be correct, depending on the context and usage. The ambiguity of programmatic definitions is due to the absence of an enterprise-wide data dictionary – a common "glossary" of business terms.

As part of SAS Data Management, the solution powers data governance initiatives through a web-based technology that helps create and manage a

common business data glossary – delivering a single enterprise definition for business-critical terms.

With the SAS Solution, users and IT staff can utilize a browser-based interface to collaborate on the creation and management of business, operational and technical data. The user can create a description and associated requirements of a term, helping give technical staff guidance on how to create business rules in the application.

Program, technical and support staff can collaborate more effectively when the terms that each of them use are managed by a common program data repository. The SAS Solution enables access, sharing and exchange of terms and attributes by providing views of:

- Descriptions
- Source systems
- Owners
- Related terms and processes (data management services, data workflows and applications)
- Access permissions that allows only specific users to access and control data

Data stewards, IT staff and enterprise architects can leverage the unified glossary of business terms to align proper data across projects or agency units. So, whether your staff is located in the next office or in elsewhere in the state, you have a consistent set of terminology, or a common language for program data, driving data management strategies.

The SAS Solution allows users to collaborate on the creation of programmatic terms, establish links to the term in a hierarchy of reference data and examine related data elements.
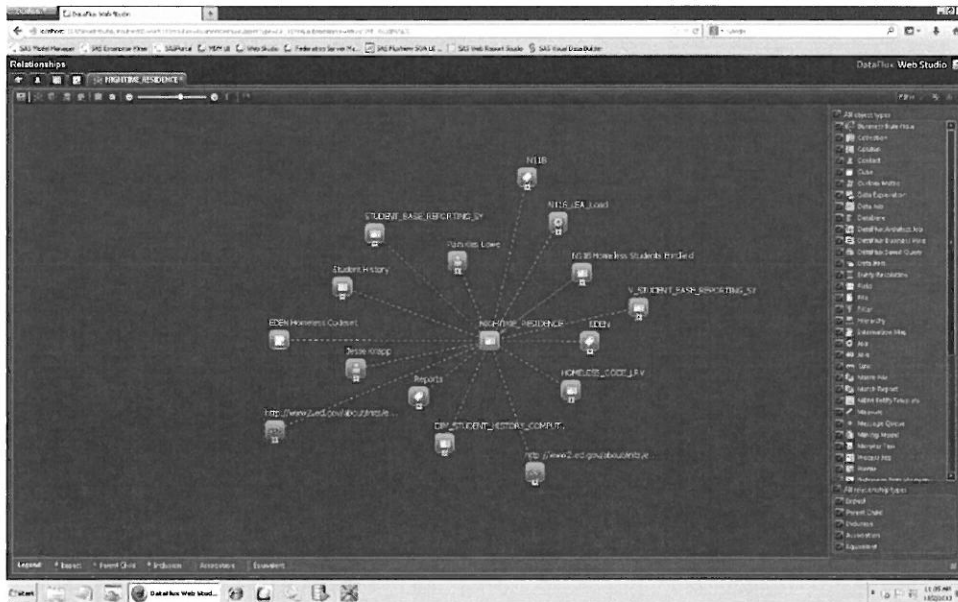
By diagramming terms and their owners, the SAS Solution makes it easy to see the relationships of terms across the enterprise – and the impact of a change within the entire glossary of programmatic terms.

Additional features of the proposed SAS® Solution

SAS Office Analytics

SAS Add-in for Microsoft Office provides seamless access to the power of SAS for data access, reporting and analytics directly from Microsoft Office via integrated menus and toolbars. You can also use familiar Microsoft Office functionality to distribute results to others using native Office functionality.

Applications Received by Type

Legend: Applied Single, Applied Dual, Applied Multiple

Enrollment by Application Type

Campus	Enrolled Single	Enrolled Dual	Enrolled Multiple	Enrolled Total
Bakersfield	333	98	107	538
Channel Islands	101	72	79	252
Chico	397	355	475	1,227
Dominguez Hills	201	170	198	569
East Bay	347	223	192	762
Fresno	817	294	262	1,373
Fullerton	890	637	491	2,018
Humboldt	376	146	147	669
Long Beach	747	596	423	1,766

SAS allows users to interact with SAS reports and data from within Microsoft Office applications

SAS Enterprise Guide software is a simple-to-use wizard-driven Windows application designed to enable quick and easy access to the SAS System. SAS Enterprise Guide software leverages the power of SAS across the enterprise, all from your local PC. SAS Enterprise Guide software enables you to access, manage, transform, analyze, and summarize your data, deliver reports utilizing the highest-quality SAS graphics, and then easily publish your results.
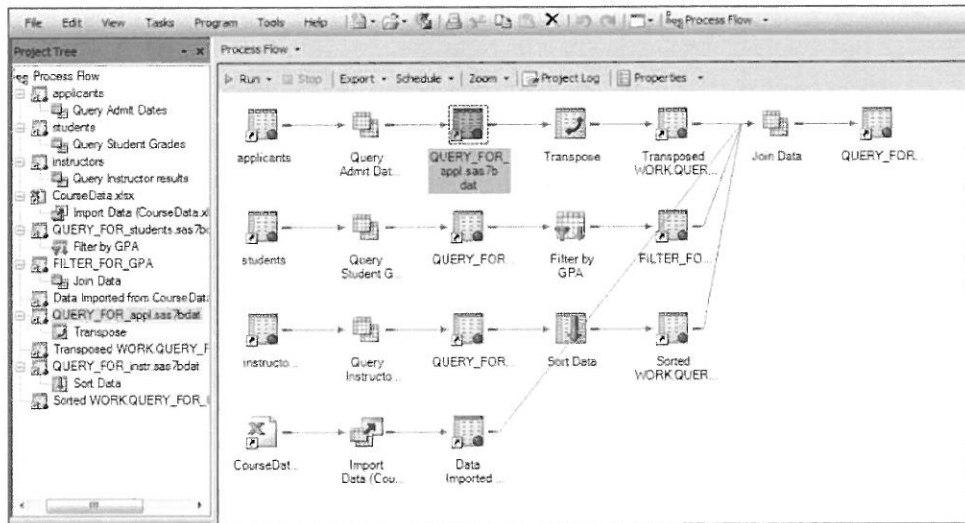
The point-and-click interface in SAS Enterprise Guide guides users through the analytical process, making it easy to create reports, graphs and charts

SAS® Software Foundation Administration

SAS® Management Console enables the enterprise to support technologies across the Intelligence Value Chain from a single point of administration. This client application utilizes an extensible plug-in architecture, allowing you to customize the console to support a wide range of administrative capabilities. By leveraging one management interface, you:

+ Require less time to train
+ Reduce the number of steps involved in administration
+ Ease the implementation of an enterprise security strategy
+ Provide an opportunity to uphold standard operating procedures and minimize manual work by enabling repeatable processes

All of which ultimately results in a lower cost of ownership.

Building analytical competence through SAS®

Building the WVDE's analytical competence
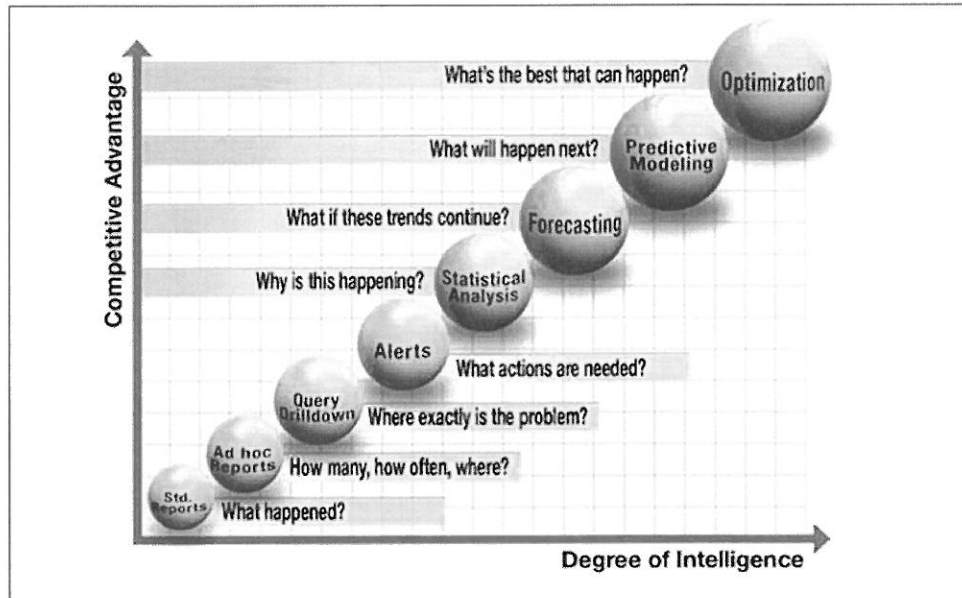
Most software vendors can only help customers answer questions in the green area – a reactive way of making decisions. With SAS, the WVDE will be much more effective if decision makers can ask and gain insights into proactive questions such as "What will happen next?" and "What is the best that can happen?" SAS will take the WVDE through the entire lifecycle from data to information to actionable insights.

SAS® Visual Analytics

The larger vision of a SLDS is to have a data system that is the basis for informed decision making. To achieve this goal, the longitudinal data warehouse must:

♦ Make compliance reporting accurate and straightforward

♦ Include provisions for users without significant statistical skills to access and explore the data they need to make critical decisions, when they need it

♦ Quickly integrate new data and provide access to pre-written summative and predictive reports and queries for users

♦ Include multiple levels of security

♦ Require minimal software overhead for end users (for example, Web access through any browser)

♦ Enable access for multiple kinds of users, including analysts, educators and policymakers

The reporting capabilities delivered through the SAS framework meet all of these needs and then some. SAS solutions can make compliance reporting straightforward, complete with backup data in which users can have confidence. They also empower all users by giving them self-service access to reports on a need-to-know basis while respecting the need for IT control of the underlying data and access controls. Data can be shared across departments and districts from a centralized repository, eliminating the need to maintain data, security, and metadata in several places and formats encouraging collaboration among policy analysts, administrative leadership.
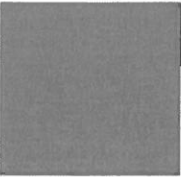
SAS also provides a full breadth of reporting capabilities, including interactive visualization and advanced data exploration, to meet differing user skill levels and needs. Across state and local education departments, users can even generate their own answers and produce their own reports while IT retains control over the quality and consistency of the data. At the same time, these reporting capabilities enable researchers to use data contained in the LDS to identify opportunities and best practices that may improve educational outcomes.

SAS Visual Analytics is a high-performance, in-memory analytic solution for exploring data very quickly. It enables users to spot patterns, identify opportunities for further analysis, and convey visual results via Web reports or tablets for iPad® or Android. This solution goes well beyond simply providing results of a query or OLAP functionality by generating actionable content that drives better decision making.

SAS Visual Analytics quickly reads data into memory for fast processing, and data visualization. Users can explore all data, rapidly execute analytic correlations on very large data volumes, and visually present results. This helps quickly identify patterns, trends, and relationships in data that were not evident before.

SAS Visual Analytics empowers users of all types to visually and interactively explore data to gain insights, and discover patterns and trends for further analysis. The interactive, Web-based exploratory analysis application delivers many capabilities that enable users, including those without analytical expertise, to extend their use of analytics to gain more precise insights.

Non-technical users will find it easy to create and change queries by selecting items to be displayed from a sidebar, or dynamically filtering and grouping data items. Other features that broaden the audience for understanding data and gaining analytic insights are, the easy to use and intuitive drag-and-drop capabilities, and auto-charting. The result is the ability to provide approachable

analytics to business users that were once only the domain of senior analytic professionals.

Auto-charting automatically selects the chart that best suits the type of data that is chosen. The "what does it mean" balloons provide explanations of complex analytic functions and data correlations in a way that empowers everyone with a confident understanding of the data, and enables approachable analytics. In addition, analytically savvy users can spot trends more quickly, and more easily find meaning from huge data volumes. This eliminates much of the everyday trial-and-error process when trying to define areas for further analysis.

Automated forecasting capabilities eliminate the need to decide on the best forecasting algorithm. Instead, SAS Visual Analytics creates the forecast dynamically and automatically selects the most appropriate forecasting method for the data that is chosen. Forecasts can then be enriched via the use of "what-if" scenario analyses.

For everyone, there are many compelling options available for displaying, analyzing, and understanding results, including decision trees, geographic maps, and animated bubble charts. With a comprehensive suite of graphical data presentation options, users can create and easily incorporate charts and plots in reports, while enabling end-user self-service capability. Furthermore, it is easy to design and produce business graphics, apply design standards, and publish the reports to a Web-based viewer, or iPad.
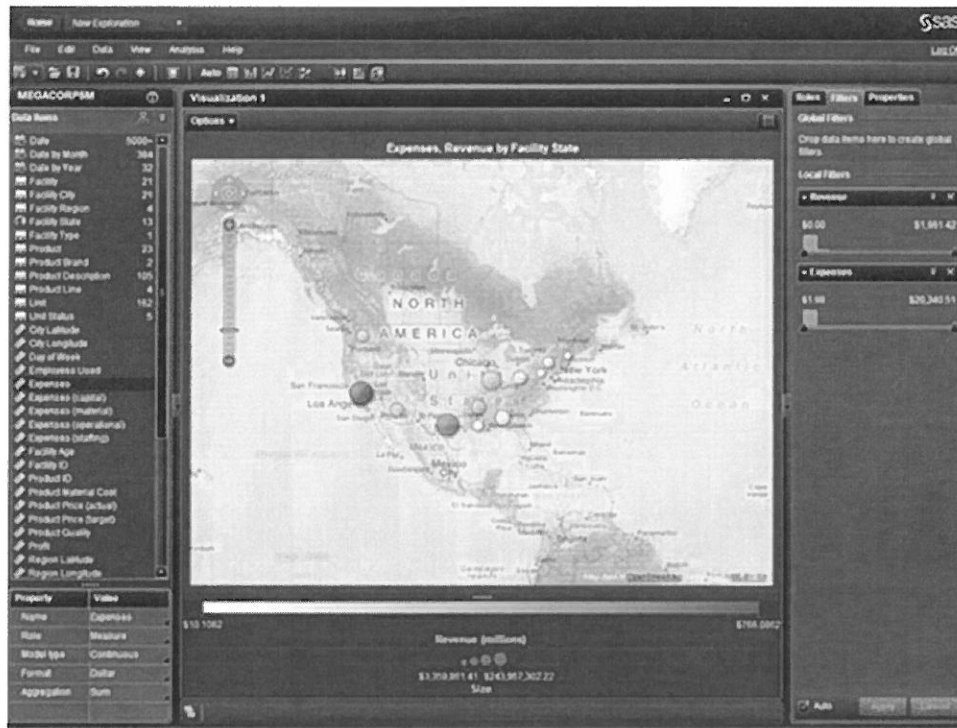
With SAS Visual Analytics, users of all types can easily explore huge amounts of data at unprecedented speeds to understand their data and quickly discover new patterns and trends.

Large numbers of users can quickly open, view, and interact with reports from the Web, via an Adobe PDF file, or from an iPad or Android tablet. The SAS Mobile BI app is available for free download from Apple's iTunes store and from Google Play. Advanced analysts can view large volumes of data quickly from multiple angles and interact with the data in many ways; users may also comprehensively examine all factors under review. Easy-to-use collaboration capabilities promote idea sharing while saving valuable time. Users can annotate screen captures of reports and then share them with others, who can add their thoughts as well.

Primary advantages of SAS Visual Analytics include the following:

♦ Benefit from easy-to-use, end user-focused, visual explorations with guided analytics
♦ Empower all users with data exploration techniques and approachable analytics to drive improved decision making
♦ Answer complex questions faster

- Improve information sharing and collaboration
- Liberate IT by giving users a new self-service way to access the information they need

Architecture

SAS adheres to, and is fully compliant with, the Common Warehouse Meta-model standard (CWM). This allows SAS to work compatibly with all other CWM compliant tools and applications. This means that SAS can import existing CWM compliant models that may exist or be developed at some time in the future into the common SAS Platform libraries and use them as if they were native with very little need for further description. At SAS we believe in a three-tiered architecture with data staging, persistent warehousing and data mart production. Typically the three-tiered architecture will be a combination of physical implementations and logical models held in the SAS metadata repository. The combination of the physical storage and a logical index of where the data are stored for their historical relevance and the logical descriptors applied through the same metadata repository will provide for both security in knowing that the data is available, and confidence that changes and new work can be accommodated in a timely manner.
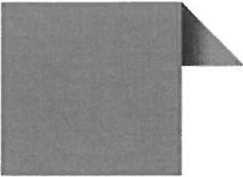
Actionable data is the goal in all SAS projects. The quality of the data marts and stores that are used depends heavily on the attention to detail at every step, including the collection of both technical and descriptor metadata. Our three-tier architecture approach ensures a high degree of quality from the acquisition of data to its distribution, and it will help organize your operations in a tried and true way to allow for sustained efforts in these areas.

Three-Tier Architecture

The three-tier architecture can be described in its simplest form as follows:

- Staging: Extract source data into a staging area (see Step 1: Extract and De-normalize Source Data)
- Data Warehouse: Cleanse extracted data and populate a central data warehouse (see Step 2: Cleanse, Validate, and Load)
- Data Marts: Create dimensional data that reflects important business needs (see Step 3: Create Data Marts or Dimensional Data)

As each of the steps is undertaken, SAS automatically collects technical processing metadata information for all steps. In addition, the descriptor metadata can be added in-line with ETL processing or through direct user management.

The three-tier enterprise model represents best practices for producing a robust and flexible enterprise model. A more detailed explanation of the three stages of the enterprise model is as follows.

Stage 1: Data Staging; Extraction and Conformation of Source Data

The extraction step consists of a series of SAS processes created in the Graphical user interface that capture data from across the source systems for storage in a persistent or non-persistent data staging area.

SAS data access capabilities enable you to extract data without changing your existing systems. Extraction processes de-normalize enterprise data for central storage. Normalized data (many tables, few connections) is efficient for data collection. De-normalized data (few tables, more connections) is more efficient for a central data warehouse, where efficiency is needed for the population of data marts.

Stage 2: Cleanse, Validate, and Load

After loading the staging area, SAS cleanses the data in the staging area, validates the data prior to loading, and loads the data into the data warehouse. Data quality techniques remove redundancies, deal with missing data, and standardize inconsistent data. They transform data as needed so that the data fits the data model. Data validation ensures that the data meets established standards of integrity. As a result, the data is fully de-normalized and cleansed, and that primary, user, and foreign keys are correctly assigned. To complete this stage of the process, SAS loads that data into the central data warehouse.

Stage 3: Create Data Marts

After the data has been loaded into the data warehouse, SAS processes extract data from the warehouse into SAS Visual Analytics which can analyze data on the fly and generate, format, and publish reports throughout the enterprise. SAS provides a zero-footprint, web-based interface for point-and-click report building using drop-down boxes for parameter selection. SAS can produce output in a variety of formats and files, including HTML, PDF, RTF, Microsoft Office files (including direct integration with Microsoft Office applications), SAS data files, and database files (via SAS' ability to directly read from and write to more than 60 leading data sources). This output capability is available to users through client-server, web based and mobile devices/ interfaces.

As part of the WVDE's PK-12 SLDS initiative, the first goal is to contract with a vendor that can provide the necessary components and identify the necessary architecture, infrastructure, and software deliverables needed to build and train on a Data Warehouse and Reporting System (DWRS), either through the Vendor's own resources and/or through subcontractors. If using a subcontractor, the WVDE will only sign a contract with the successful Vendor that will act as the single point of contact for the WVDE and who retains responsibility for the performance of this contract and the work performed by its subcontractors.

As part of goal I, the WVDE seeks to ensure that the successful vendor is able to provide a stable environment for the DWRS. This includes assuring that (1) all proposed hardware meets all needs of the DWRS and maintains a high level of availability (available at least 22 hours daily); (2) software is developed or maintained to address issues in a timely fashion; and (3) network issues result in as few outages as possible (historical performance of no more than one per quarter).

The project objectives for 4.4.1. are:
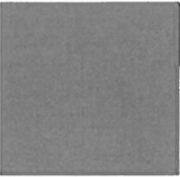
4.4.1.1. For the successful Vendor to provide a DWRS owned and operated by the WVDE-- and accessible to the WVDE, Regional Education Service Agencies, Local Education Agencies, schools, and the public. Vendors are to provide proof of their ability to meet the specifications associated with goal objectives and required by this RFP, include the following:

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

For many SEAs, "do more with less" has been the mantra, as economic pressures constantly require agencies to get lean—focus on increased productivity from limited resources. When it comes to data, the focus is simply "do more". Stakeholders have to make sense of this data to uncover the knowledge within it and make better and better decisions to move forward.

This is no small task; furthermore administrators, legislators, researchers, and analysts want more than access to data and simple reporting. . They want hands-on data visualizations that they can manipulate and explore. They want to ask questions and get their own answers – from a PC, web browser or mobile device – and they want to get immediate results from ever growing and complex data sources.

To do this, data silos must be broken down while maintaining security/ privacy and improving performance. SAS has developed a platform that blends data visualizations, analytics, dashboards, and mobile reporting with a focus on in-memory performance and affordable scalability. The result? The agency gets robust data visualization and reporting functionality along with analysis capabilities.

After implementing reporting and analytics technologies for 37 years, we know what you need to succeed. Through an optimized SAS environment, you can manage server hardware, reduce demands on networking and storage, and provide a single version of the truth to support faster decision making. Our enterprise platform will provide the WVDE with the ability to collect and combine high quality data for analysis and presentation.

SAS utilizes a rapid deployment strategy to adapt to each customer's needs to enable our customers to quickly turn large volumes of disparate data into easily understood reports, gain actionable insight through user-friendly advanced analytics and communicate to a wide range of stakeholders using powerful visualizations.

Data Warehouse Development

SAS recommends a rapid, iterative data warehousing methodology which focuses initially on providing the necessary data model components to support key reports and the analysis necessary to answer critical questions on which the WVDE is focused today. For example, SAS recently created a CEDS data model within our technology for a state department of education. A successful data warehousing effort will begin with good planning, design and understanding of the objectives for the warehouse. It is also important to understand that a data warehouse in an ongoing effort because new data is constantly being created, and the needs of that data are constantly changing. While this responsibility rests with the WVDE's IT organization, the most successful projects are a collaborative engagement between both IT and the business users who will be interacting with the data warehouse for reporting and analysis. In this sense a data warehousing effort should be viewed as a program-driven project where IT is a critical enabling component during design, validation, and ongoing management.

The Process of Developing a Data Warehouse

Data warehousing involves the entire information delivery process – from access and transformation of data that resides in different operational stores, through the organization process that makes the data available for decision making, and to surface the data for exploitation via a range of reporting and analysis tools.

Methodologies

Several warehousing methodologies are used throughout the warehousing community. All of these fall into one of two categories:

- Big bang approach
- Iterative approach

Big Bang Approach

A big bang methodology approach tries to solve all known problems by creating a huge data warehouse before it is released for evaluation and testing. Many people believe that this process is necessary to deliver on objectives. Creating a data warehouse in this approach involves planning, evaluating, and installing the necessary software and hardware, collect business requirements, and becoming familiar with the corporate data. While these tasks are taking place:

- The business goals of a company can change due to changes in the market or technology
- Management supporters can lose interest in the project if they are not involved and see rapid results
- The data sources could change
- New releases of a chosen software may become available

Any one of these changes could cause a project to fail because of the inability to quickly respond the necessary changes. Because of this, SAS recommends the iterative approach to warehouse development. Therefore, all references to warehouse development in this document assumes an iterative approach.

Iterative Approach

With an iterative methodology, customers break a warehousing project into small, manageable chunks, referred to as projects. The customer performs the same planning tasks that are required in a "big bang" approach, except evaluating all of the expected work products up front is unnecessary. Customers must design their overall architecture, but in the planning phase, concentrate is focused only on the first project or iteration. A review of the architecture, development process, and business requirements takes place after each project.

The value of smaller projects within the larger warehousing process is:

- A faster return on investment because they deliver one solution quickly. This keeps management supporters involved and interested in the project
- Customers can adjust to changes in business requirements faster
- Early involvement by the user community provides real-situation testing, which provides user needs and defect reports. Users offer better feedback when they can see the system than when they have to envision it from a slide presentation

SAS Intelligence Platform Implementation Methodology

The methodology is an integrated framework that supports the multiple objectives of projects today. While there are a total of 14 phases in the methodology, the main phases used in the creation of a data warehouse project include:

- **Assess and Define** – Gather technical and program requirements for undertaking the data warehouse
- **Analyze and Evaluate** – understand the customer's detailed requirements and agree on the project expected work products
- **Analyze Data Quality** – understand the data, highlight issues in the data, and define the business and cleansing rules that will be applied
- **Resolve Data Quality Issues** – Cleanse the data to ensure it is fit for use
- **Design** – Design the intelligence platform based on the requirements
- **Construct** – Construct the platform and ensure it complies with the program and technical requirements identified in the Analyze and Evaluate phase
- **Load** – Load the data in the warehouse and initiate knowledge transfer to the customer
- **Final Test** – Perform system testing and finalize formal acceptance test preparations ensure that the system meets its functional requirements
- **Deploy Platform** – Deploying the platform to production, taking care of all necessary optimizations and exploitation applications, training members of the customer's staff according to the training plan, and formally releasing the entire intelligence platform to the customer
- **Review** – Determine the impact of the intelligence platform on the agency in terms of tangible/intangible benefits, acceptance across the agency, and return on investment (ROI) benefits

Report Development

During the data warehouse development, reports are developed in order to validate the warehouse design and accuracy of data loaded into the warehouse. Once the fundamental components of the warehouse are established and

verified additional user training and report development can begin. Report development is performed by the business users who know what they are trying to achieve with the report. The SAS Solution's user-friendly reporting interface will provide the WVDE users with the ability to quickly acclimate to the reporting environment to enable them to quickly produce the reports they need.

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;

The proposed SAS Solution comprises SAS Visual Analytics, SAS Office Analytics, and SAS Data Management, all of which are part of the current SAS 9.4 release.

SAS Visual Analytics, SAS Office Analytics and SAS Data Management all consist of a server-side and a client-side component.

For SAS Visual Analytics, the client-side is accessible via a Web browser and/or via a mobile device.

Supported browsers include:

◆ Microsoft Internet Explorer 9 and 10 (native mode)
◆ Mozilla Firefox 6 and higher
◆ Google Chrome 15 and higher

Adobe Flash Player 11.1 or newer is also required

Mobile requirements include:

◆ iOS: SAS Mobile BI for iPad is a free application for iOS available in the iTunes App Store:
  − Platform/OS: Apple iOS v6.0 and above
  − Devices: iPad 2, 3, 4 and Mini
◆ Android: SAS Mobile BI for Android is a free application for Android available from Google Play:
  − Platform/OS: Android v 4.1 and above
  − Devices: Android tablets 10.1" with 4

The supported client-side operating system for all of the above software components include:

- Microsoft Windows x64 (64-bit): Windows 7 and Windows 8

Supported operating systems on the server include:

- Red Hat Enterprise Linux 6
- SuSE Linux Enterprise Server 11
- Oracle Linux 6.1
- Windows (only for non-distributed deployments): Windows Server 2008 R2 Enterprise SP1, Windows Server 2008 R2 Datacenter SP1, Windows Server 2012 Standard, Windows Server 2012 Datacenter

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;

Many agencies have chosen to implement their enterprise data warehouse in database appliances. Using ETL processes can be resource intensive and time-consuming. The configuration of the SAS Solution deployment can be extended to allow asymmetrical connectivity to these database appliances in a way that provides a more efficient high-speed data load capability into the SAS multi-node data and compute cluster.

The SAS Solution exploits native data access tools available form SAS. Flat files, relational databases, data warehouse appliances, non-relational databases, and access to distributed file system data are among the native engines available. Data can be read from and written to many industry standard formats.

In a distributed (MPP) implementation, the data will typically reside on the Hadoop distributed file system, or on the Terradata or Pivotal Greenplum appliance.

In a non-distributed (SMP) implementation, the data typically resides in a DBMS, SAS data sets or CSV files.

SAS supports industry standard SQL for data retrieval. SAS interfaces translate SQL queries originating from SAS into the native SQL of the associated target database.

SAS interfaces include:

- DB2
- Informix
- Microsoft SQL Server
- MySQL
- ODBC
- OLE-DB
- Oracle
- Sybase
- Sybase IQ
- Teradata
- Aster nCluster
- Greenplum
- Informix
- Microsoft SQL Server
- PC Files (Microsoft Excel, Microsoft Access, dBase, Lotus, SPSS, JMP and Stata)

- MySQL
- ODBC
- OLE-DB
- Oracle
- Sybase
- Sybase IQ
- Teradata
- Aster nCluster
- Greenplum
- Microsoft Parallel Data Warehouse
- Netezza
- ParAccel
- Vertica
- HDFS
- Sun Oracle Database Machine (Exadata)

Your data sources can be:

- Stored on disk local to the master head node
- Stored in a shared storage area network (SAN)
- Connected with high-performance Fibre Channel/HBA technology
- Stored as network attached storage (NAS) mounted as a network file system (NFS)
- Stored in a distributed analytical framework such as HDFS for aggregated bandwidth across a cluster
- Stored in database management systems and relational database management systems such as DB2 and Oracle
- Stored in an enterprise data warehouse/appliance such as Teradata or Pivotal Greenplum

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 SAS Solution provides the ultimate in deployment flexibility, letting you right-size your installation. Choose traditional on-premises deployment with a single-server or distributed computing environment, private clouds (on-site or at SAS) or public clouds. SAS has provided cloud service to other customers and maintains the highest security standards to support/ comply with FERPA and HIPAA.

Traditional on-premises deployments:

♦ Single server (SMP) with support for Windows servers is appropriate for small to midsize organizations or for departmental instances within larger organizations.

♦ The distributed mode (MPP) is easily expandable to support growing data demands (on either database appliances or commodity hardware).

Deployment configurations provide the ability to scale from a single-server environment for department and work groups initiatives up to a massive blade infrastructure with hundreds of nodes for a high-performance, big data solution. The ability to use dedicated appliances, commodity hardware or cloud deployments provides cost-effective growth opportunities for performance and scalability. You select the deployment option that makes the most sense for your agency.

For a distributed implementation, the minimum hardware requirements are:

♦ 4 nodes or 64 cores (16 cores for master head node + 3 x 16 core data nodes)

♦ E5 dual 8 core Intel-Xeon 2670 Sandy Bridge, 2.6 GHz, and higher

♦ 1600 MHz clock speed

♦ 256 GB RAM per node

♦ SAS distribution of Apache Hadoop 0.23.1 (included) or Cloudera CDH 4.2 (customer provided).

♦ 2 x 600 GB (RAID 1) local disk per node. Minimum requirements are 10K RPM RAID configuration

For a non-distributed implementation, the minimum requirement is 16 cores, E5 dual 8 core Intel-Xeon 2670, 2.6 GHz, 256 GB RAM, 2 x 600 GB local disk, on either Windows or Linux.

*Note: These requirements are for commodity hardware and do not include appliances such as Teradata and Pivotal Greenplum. SAS Visual Analytics and high-performance analytics products can be upgraded in increments of 16 cores after the initial 64-core configuration.

In the commodity hardware space, there is a growing global demand for locally available brands. These variants are built from the same sources as the flavors SAS has benchmarked. While SAS does not have testing resources to test every variant, we understand the need to support market-specific hardware choices as well as local service and support for the hardware. The SAS support policy for these alternative hardware environments is on a commercially reasonable basis.

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

While SAS generally recommends I/O throughput of approximately 75MB to 100MB per core for SAN and NAS storage, all compute tiers should be connected via 10GB Ethernet or higher for optimal performance.

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 data 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;

Sizing your environment is critical. Key considerations include response time, largest data set size, total data in memory and user mix. Ensuring there are enough compute nodes, memory and disk to achieve performance objectives is crucial.

SAS uses five-second response times for basic tables and graphs and 10-20 seconds for subsetting box plots and correlations. To achieve these response times, SAS recommends having 500MB to 1GB of data per core. Reduce data per core for faster response times.

While total data load affects the size of your memory, the size of the single largest table determines the number of cores you should have in your environment. This is because all calculations are run on a single table. Determining the number of cores is based on a calculation of size of the largest table divided by volume that an individual core can process in your desired response time. To achieve the response times above, you have to distribute 500MB to 1GB of that largest table on every core. You need to take into account the growth of that table; otherwise response times begin to shrink.

Knowing the total amount of data to be loaded into memory at any one time is a key consideration and defines one aspect of the total memory needed. The second component for determining total memory is overhead. SAS recommends an additional 30 percent for overhead. Finally, the third component is growth.

Number of users and potential functions of the users impact the overall existing architecture.

We recommend that you work with SAS to ensure the exact size of your environment. We offer a sizing service that not only ensures you can meet

today's needs but that your growth objectives can be met in a cost-effective manner.

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;

The SAS Solution is designed for scalability and high performance. Users are able to define their needs and IT has a flexible framework that is easy to manage and maintain. This supports the business community while maximizing the use of the compute resource investment.

The following are all inherent components and capabilities of the SAS Solution that were not specifically described above.

Clients

SAS provides many intuitive client applications to simplify access to powerful analytic and reporting capabilities. These interfaces serve a wide range of users, from administrators doing reporting and scorecarding to researchers looking for answers to questions and analysts trying to identify areas for further data exploration.

SAS clients are interactive, Web-based, applications that are designed to provide fast, self-service, ad-hoc exploration and visual data discovery. They provide intuitive interfaces that help users create on-the-fly data calculations, drill down and explore data without help from IT. Visualizations are produced and results can be shared via the Web and mobile devices. With a variety of standard, predefined report types, you are able to present data immediately.

SAS Mobile BI, part of the SAS Solution, enables you to access and interact with reports and report elements such as graphs, tables, KPIs and data grids. Currently supported devices are iPad® and Android-based tablets. The SAS Mobile BI application is available for download from iTunes and from the Google Play store.

Other Key Components

The SAS Metadata Server provides an open, centralized repository for storing and managing enterprise metadata including information about servers, users, user access authorizations and data sources. When metadata is shared there is no need to redefine users, groups, servers and data. The SAS Metadata Server can be installed on the same hardware as other SAS servers or on its own dedicated hardware.

SAS Web Application Server and SAS Web Applications are the middle-tier for the SAS Solution. SAS Web Server provides HTTP services for the platform. SAS Web Application Server is a lightweight server that provides enterprise-class features for running SAS Web applications. The implementation of these servers allows for vertical and horizontal clustering as well as HTTP load balancing.

Clustering

SAS offers out-of-the-box clustering for standard components of the application.

Many customers have requested robust hot failover or cluster support for high availability. While the primary goal of this feature is automated failure recovery, clustering also provides a scalable metadata server that can address large deployments with very large user counts.

The SAS Web Application Server can be installed in either a single Web application server instance, or multiple instances of Web application servers so that the demand for resources can be distributed (load balanced) among multiple server instances. This is typically needed if there are large numbers of users and a single instance of a Web application server is unable to keep pace with the number of requests. Distributing multiple instances of the Web application server on the same piece of hardware might be sufficient, or if there is sufficient load on the CPU resources of the system, Web application servers can be deployed on separate pieces of hardware. If this design choice is made, there is the additional benefit of redundancy. The SAS Web Application Server is "node aware" in that it will only route requests to Web application server instances that it knows are "alive".

4.4.1.1.h. a diagram, including notations/description s, 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 intend s 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.;

- ◆ Single server (SMP) with support for Windows servers is appropriate for small to midsize agencies or for departmental instances within larger SEAs

HIGH LEVEL ARCHITECTURE
NON-DISTRIBUTED DEPLOYMENT ON COMMODITY HARDWARE
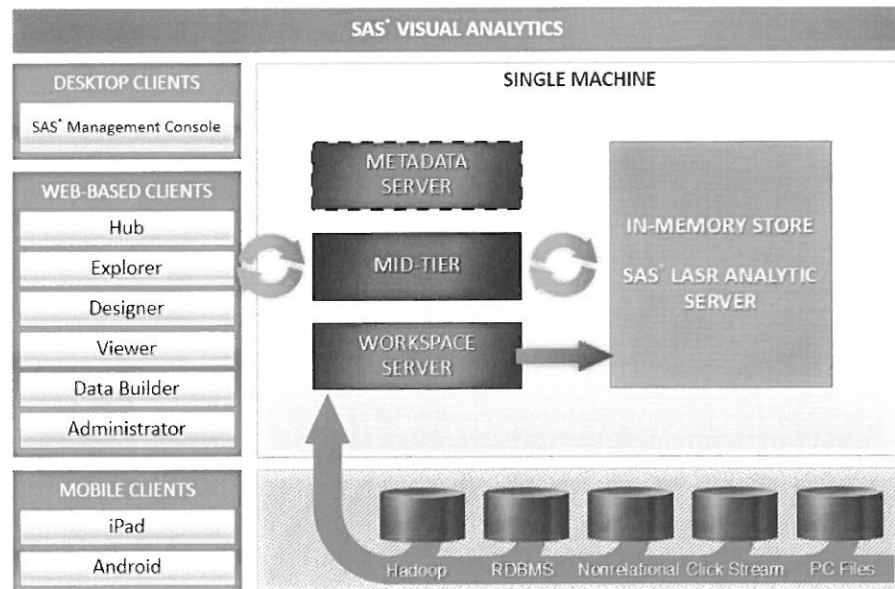
- The distributed mode (MPP) is easily expandable to support growing data demands (on either database appliances or commodity hardware).

HIGH LEVEL ARCHITECTURE
DISTRIBUTED DEPLOYMENT ON COMMODITY HARDWARE
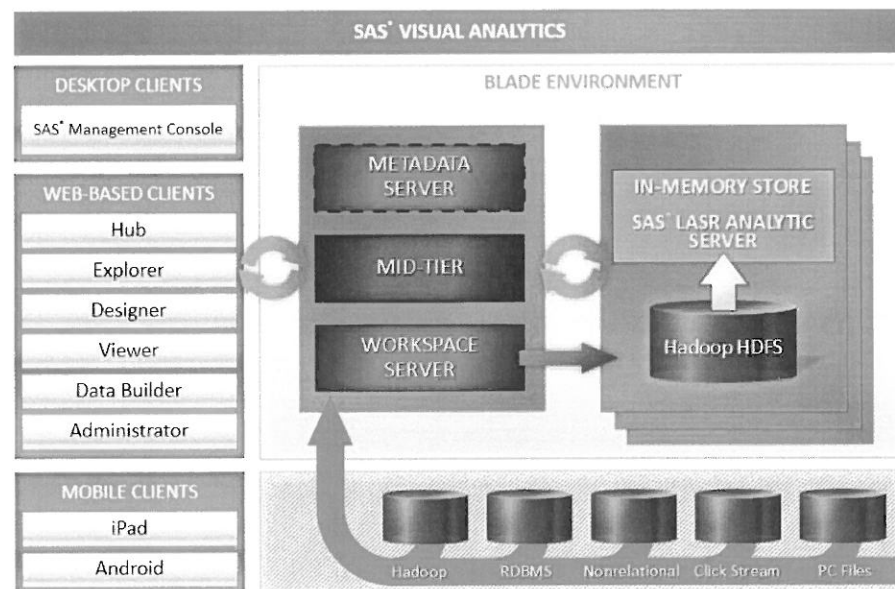
As mentioned earlier, we recommend that you work with SAS to ensure the exact size of your environment. We offer a sizing service that not only ensures you can meet today's needs but that your growth objectives can be met in a cost-effective manner.

Summary

In the effort to bring disparate data together in order to know "what was", "what is" and "what will be", the WVDE will want to ensure it has an analytic environment that gets answers and do so in a timely manner. SAS is able to build on top of infrastructure already in place at the WVDE to do just that.

It is also important to note that SAS can make data quality and data governance an integral part of the new DWRS and easy to maintain.

- ◆ SAS information assets, including users, servers and data, are easily managed
- ◆ User authentication and information authorization supports data governance

Consulting Support Services Overview

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.

SAS uses a project management methodology along with a technical (or, solution-specific) methodology, depending on the implementation. The standard SAS methodologies, detailed below, are fully flexible, and can be tailored to fit the specific requirements of any customer project and can also be blended with standard customer project management practices, to ensure that the project will match customer requirements.

The SAS Project Management Methodology (PMM) is based on best industry standards including the Project Management Institute's Body of Knowledge (PMBOK), PRINCE2, and Keane's methodology. The SAS PMM has been developed to incorporate project management best practices related to all Business Intelligence and Analytic projects.

The SAS PMM contains a collection of common project management processes, a set of embedded rules and guidelines for running projects of any size, and is based on SAS' collective experience in the field.

The main goal of this methodology is to provide a set of processes and a common language for all project team members, both technical and non-technical, to help the project staff to deliver on time, within budget, and within agreed scope.

While the methodologies employed by SAS include some of the core principles that SAS believes must be incorporated, it is considered that the Customer and SAS work closely together during the planning phase of the project, as much as during the execution phases, in order to apply the principles in a way that fits the project circumstances.

Along with PMM, the SAS Intelligence Platform Implementation Methodology (IPI) addresses the technical aspects of the project and facilitates the development of high-quality projects and applications.

PMM and IPI are described in more detail here along with SAS' industry solution methodologies.

SAS Project Management Methodology (PMM)

PMM is based on a collection of common project management processes, a set of embedded rules and guidelines for running projects of any size, and SAS collective experience in the field. The main goals for this methodology include:

- Provide a set of global processes and a common language for all technical and non-technical team members
- Help the project staff deliver on time, within budget, and within agreed scope
- Encourage and promote a spirit of teamwork among sales and services, consultants, developers, business partners, management, and other members of the extended team

PMM supplies the basis on which all SAS projects are executed. Based on industry standard project management principles, it takes into consideration the specific requirements of a SAS project. The phases of PMM are aligned to and integrated with the phases of with the IPI methodology, which specifies the technical details. In short, PMM:

- Supports the delivery of the project within the agreed time frame, budget, and required features (project scope)
- Helps set and maintain the right expectations with all stakeholders
- Provides the necessary techniques and tools to monitor and control the project

SAS Intelligence Platform Implementation Methodology (IPI)

The IPI methodology is a versatile implementation methodology, applicable to any combination or all of the following:

- Data quality evaluation and resolution of issues
- Data integration or creating a data mart or warehouse
- Data mining, forecasting, and other analytics
- Business intelligence (BI) delivery, such as query and reporting or OLAP solutions

Covering a complete implementation of the SAS Business Analytics Framework, the methodology contains the quintessential knowledge and best practices of SAS' more than 34 years of experience.

SAS Global Professional Services and Delivery uses IPI to facilitate the delivery of high-quality services to SAS customers. Comprehensive by design, IPI is customizable to be adapted to projects with a narrow focus, such as data integration, data quality, data mining or pure-play business intelligence projects. In such projects, only a subset of phases, activities, and tasks applies, thus avoiding unnecessary overhead.

Customer projects increasingly require the deployment of multiple solutions. To address this, IPI is designed as an integrated framework with multiple branches.

- Tasks that are common to all types of projects are executed together
- Tasks that are unique to a type of project are separated into an independent branch

SAS Industry Solution Methodology

SAS industry solutions have been developed to meet the highly-specific, yet significant problems facing organizations, which, by the nature of their business, fall into a particular vertical market.

SAS, with the foundation of an intelligence architecture and a history of thriving in data complexity, is well-positioned to offer assistance. The industry solutions have come about through the practical experience of working with customers in key market sectors, to understand needs and requirements from a business intelligence point of view.

ISI features the following key components, with their respective benefits for project planning and execution to deliver superior projects:

♦ Detailed work breakdown structure that allows the project team to create project plans faster based on a common approach
♦ Roles and responsibilities matrix allows determination of resources for each task, and for the establishment and management of faster and better teams
♦ Questionnaires and templates shorten time for project planning, assessment, and documentation

How the Methodologies Work Together

The phases of PMM and IPI are aligned and integrated. These methodologies:

♦ Represent global standards that promote the consistent delivery of high-quality services worldwide
♦ Capture the best practices of SAS Services staff in the field
♦ Use an iterative approach that gives SAS customers a rapid return on their investments

The PMM and IPI methodologies feature the following key components:

♦ Detailed work breakdown structure allows the project team to create project plans faster based on a common approach
♦ Roles and responsibilities matrix allows determination of resources for each task and for the establishment and management of faster and better teams
♦ Questionnaires and templates shorten time for project planning, assessment, and documentation
♦ Estimation, communications, and risk assessment tools help to increase overall delivery and customer satisfaction

Efficient and effective communication is the key to project success. SAS project managers prepare a communication plan during the planning phase of the project and then review the plan with the customer ensure agreement prior to distribution. The basics of this plan include the following:

♦ Identifying who needs information about the project
♦ Identifying what information needs to be communicated
♦ Determining the best methods for communicating the information
♦ Determining the required timeliness of the information
♦ Designating responsibility for documenting and communicating the information

In order to facilitate effective communication, SAS recommends that an agreed-upon project governance process is utilized throughout the full project life cycle.

SAS' recommended approach to governance is outlined below and is integral to the SAS Project Management Methodology.

Project Governance

The purpose of project governance is to secure predictability and avoid unpleasant surprises. Project governance ensures clarity of roles through a formal project organization and outlines shared project expectations. Project governance is facilitated through a formal commitment to the project charter among all stakeholders.

Clarity of Roles: Project Organization

SAS suggests that a formal project organization that clarifies each role is established for the project. An example is shown in the figure below.

Project Governance: Roles

Steering Committee

The steering committee represents the interests of the business (from both a user and supplier perspective) and is responsible for setting the overall direction of the project. The steering committee normally signs off a key project governance document, a project charter, or similar document at the end of the project planning phase.

With its sign-off to the project charter, the steering committee:

♦ Sets the shared expectations for the scope and timelines that the project team will meet
♦ Controls the project by exception
♦ Requires further action to be taken only when events occur or changes are requested that deviates from the agreed project charter

Project Management

The project managers are responsible for planning the project and presenting a draft project charter to the steering committee for its review and sign-off. SAS recommends that the project charter be developed by both SAS and customer project managers in partnership. Developing the project charter should be conducted in close liaison with the various experts in the project team. This ensures that the estimated timelines are realistic and takes into account the complexity of tasks.

When the project charter is signed off by the steering committee, the project managers have the authority to run the project on a day-to-day basis, according to agreed-upon reporting routines. Typically, steering committee meetings are organized at the end of each project phase to facilitate status reporting and verify the continued validity of the plan for the next phase.

Project Team

The project team plays a crucial role during the planning cycle. It provides expert advice regarding the complexity and duration of tasks. During the project execution phase, the project team is responsible for the various project expected work products according to the agreed-upon specifications.

Communications are always customized to meet the jointly agreed-upon information needs of the project and of the stakeholders.

Agreements are made with the customer regarding status reports, team meetings, site visits, and virtual team meetings using technology such as video and online conferencing.

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.

The SAS Solution employs a three-tier architecture. The three-tier enterprise model represents best practices for producing a robust and flexible enterprise model.

The three-tier architecture can be described in its simplest form as follows:

- **Staging:** Extract source data into a staging area (see Step 1: Extract and De-normalize Source Data).
- **Data Warehouse:** Cleanse extracted data and populate a central data warehouse (see Step 2: Cleanse, Validate, and Load).
- **Data Marts:** Create dimensional data that reflects important business needs (see Step 3: Create Data Marts or Dimensional Data).

Stage 1: Data Staging; Extraction and Conformation of Source Data

The extraction step consists of a series of SAS jobs created in the Graphical user interface that capture data from across the source systems for storage in a persistent or non-persistent data staging area (depends heavily business requirements not yet known).

SAS data access capabilities in the jobs enable you to extract data without changing your existing systems. The extraction jobs de-normalize enterprise data for central storage. Normalized data (many tables, few connections) is efficient for data collection. De-normalized data (few tables, more connections) is more efficient for a central data warehouse, where efficiency is needed for the population of data marts.

Stage 2: Cleanse, Validate, and Load

After loading the staging area, a second set of SAS jobs cleanse the data in the staging area, validate the data prior to loading, and load the data into the data warehouse. Data quality jobs remove redundancies, deal with missing data, and standardize inconsistent data. They transform data as needed so that the data fits the data model. Data validation ensures that the data meets established standards of integrity. Tests show that the data is fully de-normalized and cleansed, and that primary, user, and foreign keys are correctly assigned. When the data in the staging area is valid, SAS jobs load that data into the central data warehouse.

Stage 3: Create Data Marts or Dimensional Data

After the data has been loaded into the data warehouse, SAS processes extract data from the warehouse into smaller data marts, OLAP structures, or star schemas that are dedicated to specific business dimensions, such as products, customers, suppliers, financials, and employees. From these smaller structures, additional SAS processes generate, format, and publish reports throughout the enterprise.

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)

Information technology is undergoing constant change. Integrating security across multiple systems, applications, technologies, and delivery mechanisms to keep up with innovations is a huge challenge. Chief security officers (CSOs) and chief information officers (CIOs) are expected to deliver a security framework that allows employees to perform their jobs while also protecting an Agency's information assets.

Growing acceptance and use of the Web and the need to adhere to government security regulations have heightened awareness of the need to protect computing resources and information assets from unauthorized use or misuse by employees or outside parties. This need to protect information resources has resulted in more careful selection of software vendors to ensure that software meets the security requirements of the Agency.

SAS security capabilities will be viewed differently depending upon the policies, standards, or regulations of a specific organization, department, government or corporation. The most common requirements of companies are:

♦ **Authentication:** Validation of user identification through user ID and password credentials.
♦ **Authorization:** Defining what information users can access and what they may do with the information.
♦ **Auditing:** Logging what users did with the information.
♦ **Encryption:** Protecting information from being read as it is transferred over a network or stored in a data set, table, server or application.

Security is an integral part of the SAS Intelligence Architecture, enabling centralized authentication and authorization management, supporting industry-

standard encryption algorithms and creating customizable audit trails. These security capabilities can be leveraged from the underlying layers in the Intelligence Architecture to reduce the cost of ownership and give customers choices of various levels and combinations of security to meet their specific requirements.

The SAS Solution honors security provided by a database management system (DBMS). While the SAS Solution formulates queries to database management systems, it does not override or alter security provided by the database or by the operating system. Since the SAS Solution preserves the data security, provided by both the DBMS and the operating system, the database administrator controls who has access to DBMS tables. A user cannot use DBMS facilities through any SAS procedure or the interface view engine unless the user has the appropriate DBMS privilege or authority. The SAS Solution also honors security, such as ACF2 or RACF, provided by the operating system. Networked software also honors network security.

The SAS security model enables users to restrict access to any member of a SAS data library, except a catalog, by assigning passwords to them. Users may specify three levels of protection: READ, WRITE, and ALTER. Once the password is assigned for a certain level of protection, the password must be specified to perform any operation that level of protection prevents.

Users are empowered to better manage who gets access to what data to ensure sensitive information is always protected. Securing data at the disk and network levels for storage or data delivery provides a highly secured environment that protects the integrity of data, one of WVDE's most important assets.

Please also refer to our following responses regarding encryption.

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

SAS provides encryption in two contexts:

+ On-disk encryption protects data at rest. The emphasis is on protection of passwords in configuration files and in the metadata repository. You can also choose to encrypt SAS data sets.
+ Over-the-wire encryption protects data in transit. The emphasis is on protection of passwords in transit. You can also choose to protect all traffic in transit among SAS Integrated Object Model (IOM) servers and SAS desktop clients.

Two classes of encryption strength are available:

- In a low security environment, we use "SASProprietary" encoding and MD5 hashing. These methods are available in all deployments, are appropriate for preventing accidental exposure of information, and have minimal impact on performance.
- In a medium or high security environment, use industry-standard encryption and hashing algorithms. These methods provide stronger protection and are available in all deployments, except where prohibited by import restrictions.

Additional considerations:

- Passwords in configuration files and the metadata are encrypted or encoded. Most other metadata is not encrypted.
- Passwords in transit to and from SAS servers are encrypted or encoded. You can choose to encrypt all such traffic, instead of encrypting only credentials.
- Industry standard Advanced Encryption Standard (AES)
- Encrypts SAS data on disks
- Enforce metadata-layer permission requirements for physical tables—regardless of how user requests access

A bundled product, SAS/SECURE, provides additional encryption algorithms besides the SAS proprietary algorithm. SAS/SECURE is FIPS-140-2 compliant and supports 1024-bit RSA keys for encryption algorithms including: RC2, RC4, DES, TripleDES, AES, MD5, SHA1, and SHA256. SAS provides network traffic encryption through support for HTTPS/SSL (for web traffic) and SAS/SECURE for network traffic between SAS servers and clients and encrypts SAS data on disks. SAS provides encrypted payloads through SAS/Secure and SAS Proprietary. When encrypting network traffic, the payloads are also encrypted. Any attempts to intercept the payload will remain encrypted.

*Note that US export regulations on encryption software restrict access to SAS/Secure software and related technical data.

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.

Successful Work Samples

Within this section are three work sample examples from three organizations/companies. Areas within the screen shoots that are blurred have been redacted purposely per arrangements and or obligations with our clients.

Work Sample 1

Work Sample 1 is from an Education organization that utilizes SAS EBI Tools to track multiple parameters for various groups. These reports were created using SAS Web Report Studio, SAS BI Dashboard and SAS Enterprise Guide and are distributed through the organization using the SAS Portal.

ServiceLines

Readmission Rates

Interactive Bar Line
2007-01-01

rate

18.0%
12.0%
6.0%
0.0%

On target
Above target

0.6
0.3
0

2007-01-01   2008-01-01   2009-01-01   2010-01-01   2011-01-01   2012-01-01

Year

+1

Length of Stay by Service Line

Summary of

Year	Service Line	Volume	Length of Stay	ALOS
2010	Women's & Children's Services	5966	28566	4.7881
2011	Women's & Children's Services	7675	37620	4.9016
2012	Women's & Children's Services	1833	8790	4.7954
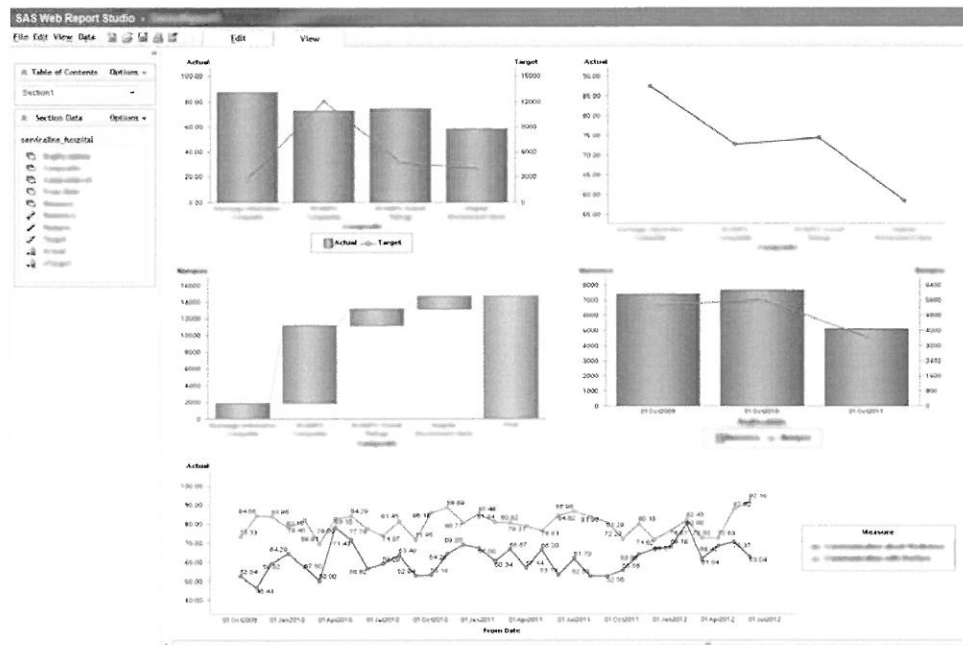
SAS Web Report Studio

File Edit View Data   Edit   View

«   Applied filters: None

⌃ Table of Contents   Options ▾

Section1 ▾

⌃ Section Data   Options ▾

- Dimensionheirarchy
- Sum Of Dep Bal Eom
- Sum Of Deposit Balance Eoy

Group	Sum Of Dep Bal Eom	Sum Of Deposit Balance Eoy
⊞ ⊞ Commercial	1365	4798
⊞ ⊞ Retail	19857	5752

SAS® Portal

Applied filters: None

SERVICE LINE	CATEGORY	MS-DRG GROUP	Average Legth of Stay	Average LOS FY12	Average LOS FY13
			4.09	5.10	3.27
			43.75	50.80	34.60
			5.97	6.60	4.78
			9.78	10.10	7.82
			3.25	3.50	2.60
			3.23	3.10	2.58
			4.92	4.20	3.94
			19.00	17.40	15.20
			8.00	5.00	6.40
			9.24	8.00	6.60
			6.39	7.50	5.11
			4.38	5.60	3.50
			3.44	3.60	2.75
			2.29	2.30	1.83

Work Sample 2

Work Sample 2 is from a company that requested trending reports using dynamically generated Statistical Process Control charts and interactive OLAP cubes to track the quality of their product performance. SAS Enterprise Guide, SAS Web Report Studio, SAS OLAP Server and the SAS Portal were used to generate and deliver the reports.
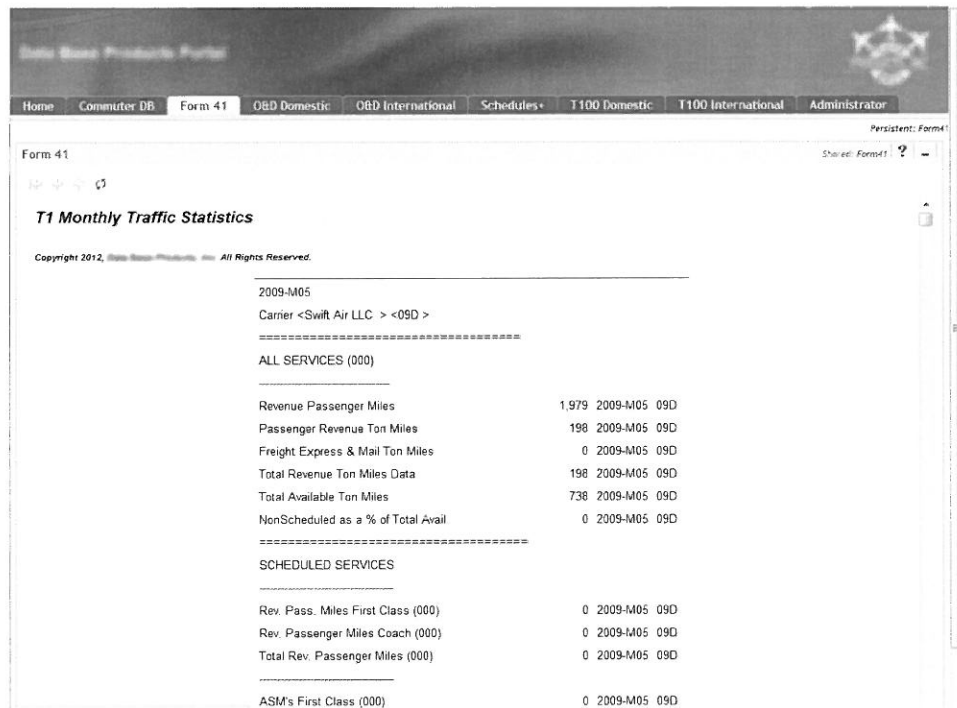
Work Sample 3

Work Sample 3 is from a company that provides custom reporting of airline industry data. SAS Enterprise Guide and the SAS Portal are used here to perform manipulation of large amounts of regularly updated data and deliver an array of highly customizable reports to airline industry customers.

Work Sample 4

Work Sample 1 is from a Higher Education organization that utilizes SAS EBI Tools to track multiple parameters for various groups. These reports were created using SAS Web Report Studio, SAS BI Dashboard and SAS Enterprise Guide and are distributed through the organization using the SAS Portal.

Demographics for ▓▓▓▓▓▓ **Cohort** [2000 ▾]

Peli Eligible 9%

62%

URM 19%

0%

0% 0%

0%

Remediation Needed

Legend:
- Peli Eligible
- URM
- Remediation Needed
- Both Peli Eligible & URM
- Both URM & Remediation Needed
- Both Peli Eligible & Remediaton Needed
- All

Historical Ethnicity Trend

— Amer Ind — — Asian — ·· Black/Af Amer
— Hisp/Lst — ·— White — · — Multi Races

Ethnic Distribution

Black/Af Amer 42%
Asian 5%
Amer Ind 0%
White 5%
Hisp/Lat 39%
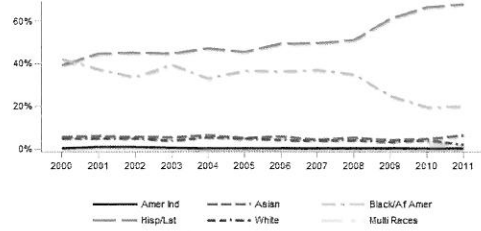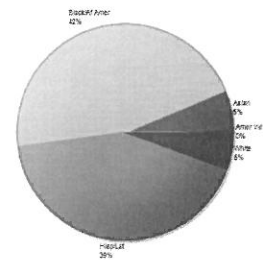
6YR Graduation Goal:	**55.00%**	
6YR Predicted Graduation Rate:	**62.77%**	
Achievement Gap Goal:	**5.00%**	
Predicted Achievement Gap:	**6.35%**	

Forecasted Retention Rates

Years in Cohort

○ Actual   ——— Predicted   Confidence

(6 Year Forecast is Graduation Rate Only)
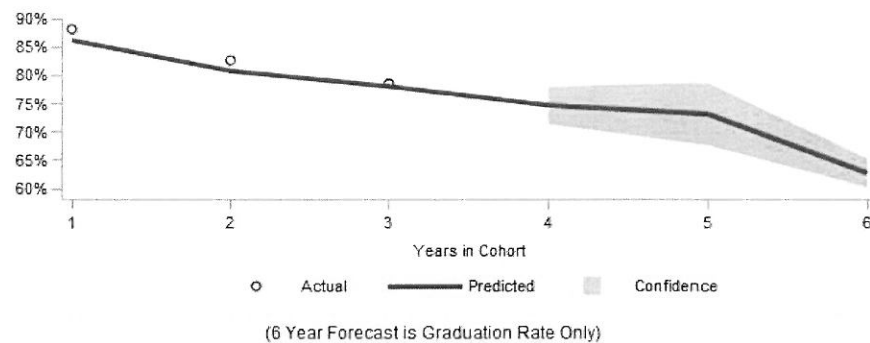
Retention Rates (URM vs Non-URM)

Non-URM   URM
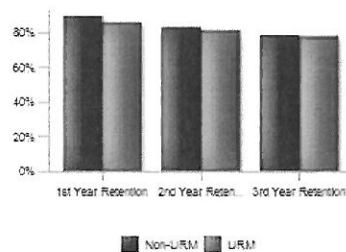
Predicted Retention Rates

Graduation   Retention
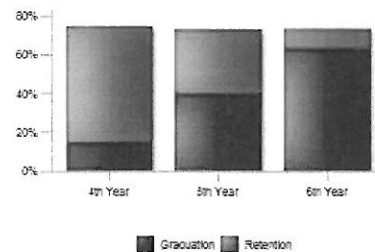
4.4.1.4. Allow for role-specific access across all level s of the DWRS by providing

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

Defining and administering permissions is accomplished through a centralized interface that enables you to:

◆ Set security on individual objects such as reports and report folders
◆ Define users and groups and grant access permissions

- Define the authentication infrastructure (host, LDAP or Active Directory)
- Role support enables the application of user roles. Depending on their roles, users will see different feature sets

Please refer to the response to item 4.4.3.1.e. for detailed information about how the SAS Solution supports permissions by users, groups, and roles.

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.

The masking of data is accomplished through the configuration of one of our encryption options that are described in our response to question 4.4.1.3.b.

4.4.1.5. For the successful Vendor's solution to function as a seam less 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.

(1) any IP translation issues that may need to be addressed by the WVDE prior to implementation;

SAS solutions do not typically require any IP translations. If WVDE requires IP translations for some reason we are compatible with third party tools which support it.

(2) firewall considerations;

Regarding firewall considerations, all SAS components reside behind the firewall. Depending on the configuration certain ports will need to be accessible through the firewall and it might be appropriate to configure the mid-tier within a DMZ.

(3) a comprehensive list of all ports required for every component of the Vendor's proposed solution;

Default Ports for SAS		
Server or Spawner	Default Port	Data Direction
E-mail server	25	Outbound
HTTP server	80	Inbound and outbound

Default Ports for SAS		
Server or Spawner	Default Port	Data Direction
HTTP server (secure port)	443	Inbound and outbound
SAS Remote Services application	5091	Inbound
SAS OLAP Server	5451	Inbound and outbound
SAS Deployment Agent	5660	Inbound and outbound
Event Broker administration	6051	Inbound
SAS Web Application Server JMX Port	6969	Inbound
SAS Environment Manager	7080	Inbound and outbound
SAS Environment Manager (secured)	7443	Inbound and outbound
SAS/CONNECT server and spawner	7551	Inbound and outbound
Web Report Studio In-Process Scheduling UDP Port 1	7570	Inbound and outbound
Web Report Studio In-Process Scheduling UDP Port 2	7571	Inbound and outbound
Web Report Studio In-Process Scheduling UDP Port 3	7572	Inbound and outbound
Event Broker HTTP	8111	Inbound
Operating System Services scheduler	8451	Inbound
SAS/SHARE server	8551	Inbound
Multicast (UDP port)	8561	Inbound and outbound
SAS Metadata Server	8561	Inbound and outbound

Default Ports for SAS

Server or Spawner	Default Port	Data Direction
SAS object spawner: operator port	8581	Inbound
SAS Workspace Server	8591	Inbound
SAS Stored Process Server: bridge connection	8601	Inbound
SAS Stored Process Server: load balancing connection 1 (MultiBridge)	8611	Inbound
SAS Stored Process Server: load balancing connection 2 (MultiBridge)	8621	Inbound
SAS Stored Process Server: load balancing connection 3 (MultiBridge)	8631	Inbound
SAS Pooled Workspace Server	8701	Inbound
SAS object spawner: pooled workspace server port bank 1	8801	Inbound
SAS object spawner: pooled workspace server port bank 2	8811	Inbound
SAS object spawner: pooled workspace server port bank 3	8821	Inbound
Web Infrastructure Platform Database Server	9432	Inbound and outbound
SAS Deployment Tester server	10021	Inbound
SAS Information Retrieval Studio	10651	Inbound and outbound
Cache Locator Port	41415	Inbound and outbound
JMS Server Port	61616	Inbound and outbound

(4) encryption details

For a description of encryption options please refer to our response to question 4.4.1.3.b.

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

For this set of SAS software, we believe it will take two weeks to conduct the installation and configuration services. Below is the installation and configuration process that will be followed:

Before Installation

- Utilize Pinnacle Pre-installation Checklist to collect installation specifics (server, OS, Access Engines, server accounts, etc)
- Follow-up call to client with AE to review status, confirm choices of media/download, provide guidance for depot download process.
- Subsequent follow-up with client to confirm successful download of depot, server readiness; schedule installation, set up remote access.

Installation Process

- Establish remote access
- Create appropriate accounts and perform necessary pre-installation tasks
- Perform and validate server (and if appropriate, client) installations
- Set up and demonstrate data connectivity for client
- Set up client-requested user accounts, demonstrating the appropriate process and introducing clients to basic permissions management
- Answer any remaining client questions

Following Installation

- Follow-up up with client on any difficulties they may have had reproducing demonstrated steps/techniques
- Prepare and deliver package containing detailed information about client's installation SAS software package, environment, accounts, directories, ports, and validation results and data connectivity.

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.

The obvious risk involved with enabling public access is that some unauthorized user gains access to information that should not be available to that user. There are several strategies which can be employed to mitigate this risk. Standard SAS security protocols, including those described in this document and others, create an environment in which data security is handled as a top priority. The strongest controls against inappropriate access include:

♦ The obvious risk involved with enabling public access is that some unauthorized user gains access to information that should not be available to that user. There are several strategies which can be employed to mitigate this risk. Standard SAS security protocols, including those described in this document and others, create an environment in which data security is handled as a top priority. The strongest controls against inappropriate access include:

♦ Configuration of data and communication encryption.

♦ Careful assignment and review of data security and functional authorization settings.

♦ Careful design of server configurations to maximize security.

♦ Summarization of data to be presented to the public (unchallenged) users so that they are unable to gain access beyond what has been granted to them. There has never been a case where unauthorized access to SAS data has been achieved but some customers choose to use a separate server configuration for public access and only load summarized data into that environment. In this was if all layers of data/application security and functional authorization are bypassed the user can't gain access to anything of value.

Enabling Unchallenged Access

About Unchallenged Public Access

With SAS you can enable unchallenged public access to web applications. When unchallenged access is enabled, users can access and interact with selected content without providing a user ID and password. When the SAS application receives this request, it does not display a logon page. Instead, it creates a user session with the identity of a special user that you set up specifically for this purpose, referred to here as the Unchallenged Access User. The user is then able to view and interact with any web pages and content that the Unchallenged

Access User is authorized to access. Some capabilities which are available to named users are not available to the Unchallenged Access User.

Security Considerations for Implementing Unchallenged Portal Access

Overview of Unchallenged Access Security

The SAS Web Infrastructure Platform provides a common security architecture that is used by all SAS Web applications. The cornerstones of this security architecture are (1) prompting users for credentials and (2) routing requests through Web application filters that validate the user's security token before allowing access to content. When unchallenged access is enabled, the first of these cornerstones is removed. Therefore, you should enable unchallenged access only if your requirements cannot be met through other methods.

When unchallenged access is enabled, the SAS administrator assumes a larger share of the burden for ensuring the security of data. The administrator must thoroughly review the content that is to be surfaced, understand how the content uses SAS servers, and make sure that the content and its behavior are appropriate for unchallenged users. In addition to the SAS web application, these security considerations also apply to SAS solutions that use the portal architecture.

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.

The SAS Web Application Server and SAS Web Applications are the middle-tier for the SAS Solution. SAS Web Server provides HTTP services for the platform. SAS Web Application Server is a lightweight server that provides enterprise-class features for running SAS Web applications. The implementation of these servers allows for vertical and horizontal clustering as well as HTTP load balancing.

The SAS Web Application Server can be installed in either a single Web application server instance, or multiple instances of Web application servers so that the demand for resources can be distributed (load balanced) among multiple server instances. This is typically needed if there are large numbers of users and a single instance of a Web application server is unable to keep pace with the number of requests. Distributing multiple instances of the Web application server on the same piece of hardware might be sufficient, or if there is sufficient load on the CPU resources of the system, Web application servers can be deployed on separate pieces of hardware. If this design choice is made, there is the additional benefit of redundancy. The SAS Web Application Server is "node aware" in that it

will only route requests to Web application server instances that it knows are "alive".

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

When a user launches a SAS client, the following process occurs:

In the verification phase, the system ensures that the user is who he or she claims to be. For example, this credential-based host authentication method might be used:

- The client prompts the user for an ID and password.
- The user enters credentials that are known to the metadata server's host.
- The client sends the credentials to the metadata server.
- The metadata server passes the credentials to its host for authentication.
- If the host determines that the user has a valid account, the host returns the authenticated user ID to the metadata server.

In the SAS identity phase, the system resolves the authenticated user ID to a particular SAS identity. In this phase, SAS examines its copies of user IDs in an attempt to find one that matches the authenticated user ID. If a matching user ID is found, so a connection is established under the owning identity. The owning identity is the user or group whose definition includes a login with the matching user ID.

By default, SAS web applications use the form-based authentication that is provided by the SAS Logon Manager application. When credentials are provided to SAS Logon Manager, the credentials are sent to the SAS Metadata Server for authentication. The metadata server then authenticates the credentials against its authentication provider. The default provider is the host operating system. As an alternative, you can configure the SAS web applications to authenticate on the middle tier. When users log on to a SAS web application, SAS Web Application Server handles the initial authentication for container-managed security.

Performing web authentication facilitates single sign-on. Most likely, your organization has several applications behind a common set of reverse proxy and HTTP servers. By having a common server handle authentication, users do not need to re-authenticate for access to each application.

SAS also supports authentication via host, LDAP, Integrated Windows Authentication and Kerberos protocols and 3rd party web authentication mechanisms such as WebSeal and CA SiteMinder.

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.

SAS strives to provide major and interim releases on a regular basis to ensure customers will continue to receive new capabilities in addition to addressing software quality issues. Customer requirements for those releases are collected through interactions with consultants, technical support, sales teams, user groups and others.

The SAS Product Management team reviews and validates the requirements. Product Management then works with R&D to design releases that are focused on themes. Common themes include Usability, Fit for IT, Interface or Process Simplification, Performance Improvements and Innovation. Once requirements and general scoping around a theme are completed for a release plan, Product Management and Research & Development assign a release date.

Product planning is generally determined for up several years in the future, although adjustments can be made based on new factors. We will be happy to arrange for discussions between WVDE and our Product Management team to review specific product plans.

SAS provides fully integrated support services including:

♦   24/7 Technical Support (included at no additional cost)
♦   Training
♦   Documentation
♦   User Groups and Conferences
♦   Customer Loyalty Team

SAS makes it easy for our customers to get help by including telephone, email, and online support as part of the annual licensing fee. Customers are encouraged to access Technical Support options in the manner in which they feel most comfortable to ensure their requests are dealt with efficiently and effectively.

Through our global resources, **we provide 24/7 technical support**. Users with questions and problems relating to SAS software may contact Technical Support by phone or electronically 24 hours a day, 7 days a week. In addition, we provide customers with an array of resources that they may use to solve problems without having to contact Technical Support.

Our telephone support, free of additional charge, is *real time*. Unlike technical support systems that require callbacks, we route all incoming calls to analysts on duty. **We resolve more than 60 percent of incoming problems on the first contact.**

The average hold time for customers who call us is less than 30 seconds, and more than 70 percent of questions that come in are resolved within 24 hours.

According to the time of day and problem severity, we route calls to appropriate global support centers. Less severe off-hour calls are routed to our Cary Data Center that can resolve the majority of off-hour problems.

This *follow-the-sun* strategy for priority calls offers strong advantages over staffing a single center 24 hours a day:

- Customers talk to Technical Support consultants during their normal work hours
- The full staff offers more diverse technical skills and experience than typical late night skeleton crews
- *Follow-the-sun* enables us to work on problems continuously 24 hours a day, if necessary

We route problems that cannot be immediately resolved to appropriate specialists and prioritize problems upon the severity of the problem. For example, our specialists strive to call back within two-hour for severe problems, and up to a maximum of 24 hours for less severe problems.

Technical resources available to our Technical Support staff enable us to provide reliable and responsive support. Our state-of-the-art problem tracking system, fully developed in-house, helps us achieve extremely high levels of performance. Our advanced phone system enables us to route incoming calls with optimal efficiency and minimize hold times. Our data warehouse consolidates performance data and customer input and allows management to respond quickly to any changing conditions.

Technical Support consultants may involve developers in the process, but they still retain ownership of the problem. Whenever the user is contacted or

additional information is required, the consultant updates the problem, creating an up-to-date audit trail on all problems. The tracking system automatically sends *red flag* signals to the designated owners when callbacks are due or problems have not been updated within a defined length of time. For more information, please refer to our SAS Technical Support Services and Policies (support.sas.com/techsup/support.html).

In addition to telephone support, our customers can report problems and ask questions electronically, free of charge. Through our website (support.sas.com) users can report problems to Technical Support and receive a response via e-mail or phone, update existing problem entries, and review problem status. Our Electronic Mail Interface to Technical Support (EMITS) is available for users without Web access to report problems, obtain information, update problems, and check on problem status through e-mail. Once a problem is reported to Technical Support electronically, a tracking number is assigned, and the problem is handled in the same manner as problems reported by telephone, except most correspondence about the problem is conducted via e-mail.

While we pride ourselves on fast and accurate responses to questions and problems reported by our customers, a key goal of Technical Support is to empower our users with the tools they need to find answers and resolve problems on their own. We do this by including a variety of self-help resources as part of our licensing agreements. A full range of electronic support services gives users access to almost all resources used by our Technical Support staff. We even notify users when we find bugs in SAS software and assist them before a problem might arise.

We establish partnerships early in our customer relationships by encouraging organizations to designate local SAS Support Representatives. These representatives are provided with online documentation, training materials, and various self-help tools. Some of the support tools that we provide with the software include our SAS Notes (knowledge base), the SAS Sample Library, and an extensive online help system. The SAS Support site representative can make these tools easily available to all SAS users at the site.

Our online Customer Support Center, support.sas.com, provides a complete set of support tools. In addition to using our website to report problems to Technical Support, users can:

- Search our knowledge base, FAQs, technical documents, sample programs, and system requirements and easily download relevant information
- Download files (including fixes, updates, and documentation) from our FTP server, or request maintenance updates

- Enter suggestions for software enhancements
- Obtain documentation on all of our technical support services
- Obtain information about local, regional, and international user group activities

Our FTP server lets users download fixes, documentation, maintenance, sample programs, and knowledge base entries, as well as upload files relevant to tracked problems.

Our mailing list (TSNEWS-L) enables subscribers to automatically receive problem alert notifications and other Technical Support announcements.

The Internet mail list (SAS-L) and Usenet News Group (COMP.SOFT-SYS.SAS) enable SAS users to exchange information about SAS software, or post questions about SAS software, and get responses from SAS users around the world. These services are not maintained or moderated by SAS, but are administered exclusively by our users.

Our electronic services are integrated with our problem tracking system. Problems reported through our website and EMITS are automatically transferred to our tracking system, and our representatives respond to those problems directly from the tracking system.

General Support Services

Technical support for SAS software includes:

- Unlimited telephone support
- Access to support resources on our <u>SAS Customer Support</u> Web site
- E-mail support

Some of the ways in which we can help you successfully use our software are:

- Suggest the appropriate SAS procedure, language feature, or products for the particular type of analysis or functionality that is requested
- Answer questions about specific details of procedures, such as discussing available features, options, and limitations
- Provide references for formulas and statistical techniques that our algorithms use, where possible
- Provide limited guidance and references to help you interpret the output that is produced by statistical procedures
- Isolate, document, and find circumventions for reported software defects

- Work with SAS software development staff to provide safe hot fixes for our software, as we deem appropriate
- Provide limited and general statistical advice on a case-by-case basis; however, it is your responsibility to determine which type of statistical analysis is appropriate for your needs
- Address concerns with printed or online documentation by providing additional examples, if necessary, or explanation for concepts that require clarification
- Provide guidance during SAS software installation
- Provide limited assistance with programming logic
- Provide a broad overview of hardware tuning, operating system modifications, SAS system performance enhancements, and methods of efficient programming for achieving optimal performance; however, we do not provide benchmarking for specific hardware or operating systems
- Provide support for the interaction between the SAS system and any third-party software that ships with the SAS system
- For other third-party applications, we are glad to convey any knowledge that we have, but we cannot provide comprehensive support for another vendor's software

Due to limited resources and knowledge of any particular customer's data analysis situation, we cannot provide customized consulting services. Nor can we provide customized SAS code, for example, CONTRAST, ESTIMATE, or TABLES statements; macro, JSL, SCL, DATA step, or IML code. You can visit the SAS Consulting Web site (www.sas.com/consult) to learn more about the consulting services that are offered by SAS. Your Account Representative can also assist you in engaging the appropriate professional services.

SAS Technical Support applies only to SAS licensed software products. Work Product from SAS consulting services engagements is supported under warranty from SAS consulting services. Visit SAS Consulting web site (www.sas.com/consult) to learn more about the consulting services that are offered by SAS. Your Account Representative can also assist you in engaging the appropriate professional services.

Support Services for Current and Prior Releases of Software

SAS continues to support licensed users for every product released in our 37-year history. Three levels classify support for SAS on platforms for which the software is currently being developed:

◆ **Level A** – Currently generally available release
◆ **Level B** – Release prior to currently generally available release
◆ **Level C** – All other releases

Level A – SAS provides support for the current generally available (GA) release of SAS (SAS 9.4) and the immediately preceding GA release. When SAS ships a new software release, the level of support that customers receive extends through the end of the year and then 12 months after that time period. Level A support includes the following services:

◆ Free support is available by phone, e-mail or Web interface
◆ Our Technical Support staff investigates all reported problems and provides circumventions, where possible
◆ Executable modules or hot fixes are provided for selected critical problems

Level B – SAS provides Level B support for the release prior to those described above. Level B support includes the following services:

◆ Free support is available by phone, e-mail or Web interface
◆ Our Technical Support staff investigates all reported problems and provides circumventions where possible
◆ Executable modules or hot fixes might be provided for selected critical problems

Level C – SAS provides Level C support for all other releases. Level C support includes the following services:

◆ Free support is available by phone, e-mail or Web interface
◆ Our Technical Support staff investigates reported problems on a limited basis and provides circumventions, where possible, and fixes where already available
◆ No new executable modules or hot fixes are provided

Note: SAS provides Level C support for releases of Solutions and products that are no longer generally available and that were developed on platforms that SAS no longer uses for current product development.

Software Maintenance and Bug Fixes

SAS provides maintenance for the SAS system through replacement executable modules, or hot fixes, that might be supplied individually or in bundles. The availability of hot fixes is announced on the Technical Support Hot Fixes Web page (ftp.sas.com/techsup/download/hotfix/hotfix.html) and via e-mail by subscribing to our TSNEWS-L mailing list (support.sas.com/community/rss/).

While we attempt to provide fixes for serious problems, there might be cases where it is impractical or impossible to generate a fix, due to compatibility issues or the potential for introduction of unwanted side effects.

Problem and Product Change Notifications

SAS documents Alert Priority issues, as well as problems that are not of alert status, in the form of SAS Notes. You can search for Alert Priority issues in our Samples and SAS Notes database (support.sas.com/kb/?ct=51000).

SAS lists product change notifications on the Web page for Product Advisory Notices from SAS (support.sas.com/techsup/pcn).

Technical Support Policies

Support Eligibility

Technical support is available to all customers who license SAS software. However, you are encouraged to engage your designated on-site SAS support personnel (support.sas.com/techsup/onsite.html) as your first support contact. If your on-site SAS support personnel cannot resolve your issue, have them contact SAS Technical Support to report your problem. When you contact SAS Technical Support, you might be required to provide information, such as your SAS site number, company name, e-mail address, and phone number, that identifies you as a licensed SAS software customer. Failure to provide this information might preclude SAS Technical Support from taking action on your issue.

Support Cost

For most SAS products and solutions, there is no additional charge for technical support. Support of our software is considered a part of the license agreement. Technical Support services and their charges are outlined in your license agreement.

If you need a third party to do any of the following, your request (www.sas.com/apps/forms/index.jsp?id=ge1) will be routed to an appropriate fee-based resource:

- Write custom code
- Design a SAS application
- Select an appropriate statistical methodology
- Design experiments
- Debug a complex application

You may visit the SAS Consulting Web site (www.sas.com/consult/) to learn more about the consulting services that are offered by SAS. Your Account Representative can also assist you in engaging the appropriate professional services.

Support Hours

For Customers in North America during Normal Support Hours:

- Support is provided in English from our corporate headquarters in Cary, North Carolina
- Support hours for new questions are Monday through Friday 9:00 a.m. to 8:00 p.m. Eastern time
- Limited support for new questions is available Monday through Friday 5:00 p.m. to 8:00 p.m. Eastern time
- Support hours for questions with an assigned tracking number are Monday through Friday 9:00 a.m. to 5:00 p.m. Eastern time

For Customers Outside of North America:

- Local-language technical support is provided through the local office in your country. If you are outside of North America, contact your local SAS office for specific support hours

For Critical Problems after Normal Support Hours:

- Calls to Technical Support for critical problems after normal support hours are directed to one of our world-wide support centers in North America, Europe, or Asia/Pacific, thus providing 24-hour "follow the sun" support
- After-hours support is available only in English and is limited to critical problems
- In addition, you can access the SAS Customer Support Web site and e-mail support services 24 hours a day

Problem Response Time

For Problems Reported by Phone

All problems reported to Technical Support are initially handled by a consultant who works with you to identify and (in many cases) solve your reported problem. If the problem is not resolved during the primary contact, the consultant assigns a tracking number to the problem and does additional research or might pass it to a specialist.

The following table displays the targets for initial follow-up and frequency of updates for problems with different severities and conditions. The goals for initial follow-up after a problem with production software is first reported are based on the nature and severity of the problem. The Technical Support consultant makes every attempt to contact the customer who reported the problem within the response time goals described below.

Severity Level	Condition	Initial Follow-up*1	Frequency of Updates
1	A critical SAS production system is down or does not function at all, and there is no circumvention for the problem; a significant number of customers are affected, and a production business system is inoperable.	2 hours	Every business day
2	A component of SAS is not performing, creating a significant operational impact.	4 business hours	Every 2 business days
3	A component of SAS is not performing as documented; there are unexpected results; problems are circumventable; there is moderate or minor operational impact.	24 hours2	Every 3 business days
4	Questions pertain to usage questions or clarification of documentation.		Every 10 business days
5	Customer offers suggestions or requests for new product features and enhancements.		Every 30 business days

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[1] For problems that are assigned to a Technical Support consultant, "initial follow-up" is defined as the time between when the problem is initially reported and the specialist contacts the customer. For problems that require further research by the consultant who initially received the problem, "initial follow-up" is defined as the time between the initial contact with the consultant and a follow-up call.

[2] Does not include weekend or other non-business days.

For Problems Reported Electronically

Priorities are assigned to problems reported via the Web or e-mail, based on the guidelines above. All problems reported electronically receive an immediate automated e-mail confirmation and a problem tracking number. A Technical Support consultant will respond to the customer who reported the problem by phone or e-mail within 24 hours, with the exception of problems that are reported on weekends and holidays. Because SAS cannot guarantee less than 24-hour response on problems tracked electronically, you should report Severity 1 or 2 problems by phone (support.sas.com/techsup/contact/).

Escalating Problems

If the normal support process does not produce the desired results, or if the problem has changed in priority, the problem can be escalated as follows.

Sites that are served by Cary World Headquarters

- First contact the consultant who is working on your problem and request that the priority of the problem is escalated
- You may request to speak with a Technical Support manager if additional escalation is required
- You may request to speak with the Vice President of Technical Support if continued escalation is required

Sites that are served by International offices

- First contact the Technical Support staff who are working on your problem and request that the priority of the problem is escalated
- You may request to speak to the Technical Support Manager
- You may request to speak with the Professional Services Director if additional escalation is required
- You may request to speak with the Country Manager if continued escalation is required

The SAS Customer Loyalty team is another resource for customers that need additional support. The team's primary job is to help customers get the most out of their SAS investment. They often serve as a liaison to various other support service teams at SAS to help facilitate problem resolution. The Customer Loyalty team is committed to respond quickly to customers' urgent needs and make certain that long-term needs are addressed in an acceptable timeframe (support.sas.com/promise).

Resolving Problems

Due to the complex nature of software development and operating environments, SAS cannot guarantee the time that it will take to resolve a problem. We make our best effort to resolve problems as expeditiously as possible.

Archiving Problems

A problem is archived upon mutual agreement between the consultant that is responsible for the problem and the customer who reported the problem. In cases where the consultant is awaiting further information from the customer, the consultant makes at least one attempt either by phone or e-mail to contact the customer within a few business days. During this contact, the consultant communicates a timeline for archiving the problem if further information is not provided.

Information is not lost when a problem is archived. If for any reason in the future you need to discuss the specific problem that is documented in an archived track, a new problem will be opened with a new tracking number, and all information will be carried forward into the new tracking entry.

SAS Software Support when Third-Party Vendors Drop Support

In some instances, SAS software is supported for an operating system, Java application server, Java Development Kit (JDK), or Java Runtime Environment (JRE) level, even though the third party vendor of that software has withdrawn support. SAS reserves the right to move support to Level C or these third-party software levels at our discretion.

Training

SAS believes that training is an essential part of the WVDE solution. We deliver training using a wide range of teaching methods to accommodate various kinds of learning styles. Our goal is to transfer both knowledge and skills that can be directly applied to addressing the diverse and often complex challenges faced by our customers. Our training provides formal explanations of the functionality and best practice techniques, reinforced by practical hands-on exercises and informal discussion.

Training options include the development of a comprehensive training program adapted to our customers' specific needs through computer-based, and/or instructor-based courses, as well as trainers' kits. Training is available at our main training center in Cary, NC, as well as at facilities throughout the U.S.,

Canada, Europe, and Asia. We can also provide formal classroom training on-site at your facility depending on West Virginia's specific training needs and resource availability. For a complete list of training locations, please refer to support.sas.com/edu/country.

Types of training that SAS offers include:

- Public Training
- On-site Training
- Knowledge Transfer
- Computer-based Training
- Web-based Training

Though SAS provides comprehensive descriptions of training curricula and paths in our *Training* catalog and elsewhere (such as support.sas.com/training/us/); a lot of training required for implementing our solutions occurs as the natural result of knowledge transfers during consulting services. As we learn more about West Virginia's requirements, we can develop specific recommendations for specific types of training. The ideal time for such recommendations is upon completion of the Assessment phase.

Documentation

SAS supports our products and services with a wealth of authoritative, easy-to-read documentation. Technical writers preparing the documentation work directly with the software developers. Much of our documentation is provided for no additional charge at support.sas.com/documentation/onlinedoc.

In addition, the award-winning SAS Publications Division maintains a wide variety of paper-based and online materials that support our software users at every level and stage of experience. SAS publications include material developed by SAS employees and SAS users, such as:

- Books
- CD-ROMs
- Technical Reports
- White Papers
- Catalogs
- Magazines
- Newsletters
- Online Samples

- Code Samples
- Tutorials and E-learning Modules

SAS publications may be ordered online from support.sas.com/publishing.

Users can also explore SAS Communities on the Web at support.sas.com/rnd/intro.html. SAS Focus Areas provide you an in-depth look at new and existing SAS products and solutions, including:

- White Papers
- Tips
- Code Samples
- FAQs
- Preproduction Software and Documentation
- Recommended Reading

Finally, a wealth of additional documentation is available to users, including:

- Technical Papers
- Technical Presentations
- SAS Global Forum Papers
- SUGI Papers
- Magazines
- Newsletters
- White Papers

Additional information regarding SAS documentation is available at support.sas.com/documentation.

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.

SAS provides maintenance for the SAS Solution through replacement executable modules, or hot fixes, that might be supplied individually or in bundles. The availability of hot fixes is announced on the Technical Support Hot Fixes Web page (ftp.sas.com/techsup/download/hotfix/hotfix.html) and via e-mail by subscribing to our TSNEWS-L mailing list (support.sas.com/community/rss/).

While we attempt to provide fixes for serious problems, there might be cases where it is impractical or impossible to generate a fix, due to compatibility issues or the potential for introduction of unwanted side effects.

4.4.2 Goal II: Technical Support

As part of the WVDE's PK-12 SLDS initiative, goal 2 is to assure that the Vendor's DWRS proposal has sufficient technical support available to facilitate a smooth knowledge transfer to the WVDE. The successful Vendor's solution is expected to interface with critical WVDE data systems, West Virginia's P-20 Data Warehouse, and other data sharing partners.

The project objectives for this goal are as follows:

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:

Due to the contractual obligations concerning the confidential nature of customer data and work product with our customers, we are not allowed to share work product with other institutions.

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

During the Design phase, SAS will work with WVDE to define all of the underlying data formats required to unify WVDE data streams (e.g. spreadsheets, flat files, database tables), as well as the type of information they contain. Based on these findings, SAS will structure the DWRS to ensure that it is scalable and that data from disparate sources can integrate with the DWRS. Furthermore, SAS will create a data warehouse plan to document the best way to unify WVDE data.

The steps to create the DWRS include:

- Assess the current WVDE Architecture design
- Capture detailed documentation on data schema, data dictionary and reporting table design
- Identify structure required to support desired reporting design and system
- Develop a data warehouse Plan
- Create the data warehouse with reporting tables
- Populate the data into the data warehouse

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

SAS Data Management Advanced offers a collaborative design environment promoting object reuse and sharing, administrative controls, wizard-driven design process workflow, and ease of use and maintenance. This flexible, reliable solution can access data from virtually any system in any form, transform and cleanse data in real time, and handle data migration, synchronization and

federation projects all through a versatile services environment that is easy to deploy and maintain.

SAS Data Management Advanced includes an intuitive point and-click Design Editor window that allows developers to easily build logical process workflows, quickly identify the input and output data stores, and create business rules in metadata. This enables the rapid generation of data warehouses, data marts and data streams. Users can also choose to have many transformations and processes take place inside a connected database, data warehouse or storage system. This Extract Transfer Load Process (ELT) can substantially speed up overall processing times by reducing unnecessary data movement. SAS Data Management Advanced uses visual SQL push-down to select the optimal processing approach.

SAS Office Analytics provides a wide range of statistical methods – from traditional analysis of variance to exact methods and dynamic visualization techniques. Using statistical software can help you uncover new information for improving processes, driving development and revenues, and retaining valued and satisfied customers.

The SAS Office Analytics solution includes SAS Enterprise Guide, which gives advanced users access to more sophisticated types of analyses, data manipulation and visualization. You can incorporate these custom analyses and results into Web-based reports or Microsoft Office documents seamlessly because almost everyone has some familiarity with Microsoft Office, businesses often use it as a standard for management reports. SAS Office Analytics lets you easily create reports and share findings. You can publish and distribute Microsoft Office documents with embedded SAS Analytics to relevant decision makers using native Microsoft functionality. Recipients can update the embedded results from the Microsoft Office documents on demand, as needed.

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:

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.

SAS establishes partnerships early in our customer relationships by encouraging organizations to designate local SAS Support Representatives. These representatives are provided with online documentation, training materials, and various self-help tools. Some of the support tools that we provide with the

software include our SAS Notes (knowledge base), the SAS Sample Library, and an extensive online help system. The SAS Support site representative can make these tools easily available to all SAS users at the site.

SAS supports our products and services with a wealth of authoritative, easy-to-read documentation. Technical writers preparing the documentation work directly with the software developers. Much of our documentation is provided for no additional charge at support.sas.com/documentation/onlinedoc.

In addition, the award-winning SAS Publications Division maintains a wide variety of paper-based and online materials that support our software users at every level and stage of experience. SAS publications include material developed by SAS employees and SAS users, such as:

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- White Papers
- Catalogs
- Magazines
- Newsletters
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- Technical Presentations
- SAS Global Forum Papers
- SUGI Papers
- Magazines
- Newsletters
- White Papers

Additional information regarding SAS documentation is available at support.sas.com/documentation.

Our online Customer Support Center, support.sas.com, provides a complete set of support tools. In addition to using our website to report problems to Technical Support, users can:

- Search our knowledge base, FAQs, technical documents, sample programs, and system requirements and easily download relevant information
- Download files (including fixes, updates, and documentation) from our FTP server, or request maintenance updates
- Enter suggestions for software enhancements
- Obtain documentation on all of our technical support services
- Obtain information about local, regional, and international user group activities

Our secure FTP server lets users download fixes, documentation, maintenance, sample programs, and knowledge base entries, as well as upload files relevant to tracked problems.

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

As part of SAS Data Management, the Data Dictionary powers data governance initiatives through a web-based technology that helps create and manage a common business data glossary – delivering a single enterprise definition for business-critical terms.

With the SAS Solution, users and IT staff can utilize a browser-based interface to collaborate on the creation and management of business, operational and technical data. The user can create a description and associated requirements of a term, helping give technical staff guidance on how to create business rules in the application.

Program, technical and support staff can collaborate more effectively when the terms that each of them use are managed by a common program data repository. The SAS Solution enables access, sharing and exchange of terms and attributes by providing views of:

- Descriptions
- Source systems
- Owners
- Related terms and processes (data management services, data workflows and applications)
- Access permissions that allows only specific users to access and control data

Data stewards, IT staff and enterprise architects can leverage the unified glossary of business terms to align proper data across projects or agency units. So, whether your staff is located in the next office or in elsewhere in the state, you have a consistent set of terminology, or a common language for program data, driving data management strategies.

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.

The Technical Lead(s) for Pinnacle Solutions under the direction of both the Pinnacle Solutions Project Manager and SAS Project Manager for this project will be responsible for all the documentation development and knowledge transfer processes for the WVDE technical staff. Pinnacle Solutions Technical staff has extensive background in developing technical documentation and training technical staff as part of the transition phase of projects. Pinnacle Solutions has on staff documentation and technical writers who put technical information into easily understandable language. These resources have provided the following skills and services on numerous SAS installation projects:

- Preparing operating and maintenance manuals, catalogs, part lists, and installation procedures.
- Documenting engineering and design specifications.
- Knowledge planning and editing technical materials and overseeing the preparation of illustrations, photographs, diagrams and charts.
- Providing customized SAS knowledge transfer and SAS technical training.

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

For this set of SAS software, we believe it will take two weeks to conduct the installation and configuration services as well as the knowledge transfer workshop. Below is the installation and configuration process that will be followed.

Before Installation

- Utilize Pinnacle Pre-installation Checklist to collect installation specifics (server, OS, Access Engines, server accounts, etc)
- Follow-up call to client with AE to review status, confirm choices of media/download, provide guidance for depot download process.
- Subsequent follow-up with client to confirm successful download of depot, server readiness; schedule installation, set up remote access.

Installation Process

- Establish remote access
- Create appropriate accounts and perform necessary pre-installation tasks
- Perform and validate server (and if appropriate, client) installations
- Set up and demonstrate data connectivity for client
- Set up client-requested user accounts, demonstrating the appropriate process and introducing clients to basic permissions management
- Answer any remaining client questions

Following Installation

- Follow-up up with client on any difficulties they may have had reproducing demonstrated steps/techniques
- Prepare and deliver package containing detailed information about client's installation SAS software package, environment, accounts, directories, ports, and validation results and data connectivity.

Pinnacle Solutions recommends holding ongoing a 2 to 4 hour Knowledge Transfer workshop with WVDE staff via web conferencing.

During the Knowledge Transfer Workshop, The SAS/Pinnacle Solutions team will:

- Follow-up up with client on any difficulties they may have had reproducing demonstrated steps/techniques
- Show how connections can be made to additional datase
- Review best practices for setting up and configuring WVDE SAS environment
- Prepare and deliver package containing detailed information about client's installation SAS software package, environment, accounts, directories, ports, validation results, and data connectivity

4.4.3 Goal III: Analysis & Reporting

As part of the WVDE's PK-12 SLDS initiative, the WVDE seeks to enhance stakeholders ' abilities to make informed, data-driven decisions from a single, valid source of information to improve West Virginia's education system. One way to do this is through clear, informative, and intuitive reports that use the state's vetted, certified education data accessible to stakeholders at all levels of the system, while adhering to all required security and privacy requirements set forth in this RFP.

The reports created through the DWRS will meet multiple purposes, including but not limited to:

- *Federal and state reporting*
- *Supporting policy decisions*
- *Informing program development and evaluation*
- *Within and cross-state comparisons*
- *Linking validated data that are collected within and outside the WVDE's transactional system*
- *Providing on-the-fly and static reporting*

Reports should be designed in such a way that they provide information about students, schools, counties, and the state using data available in the DWRS to help inform decision-making. The WVDE seeks, through the use of an interoperable electronic platform, to produce data-based reports that are timely, relevant, and usable to stakeholders including students, teachers, parents, administrators, policymakers, and the general public in traditional, as well as, innovative formats. Interpretability of this information will be enhanced through innovative graphic displays and print-optimized files.

The project objectives for this goal are as follows:

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;

> SAS utilizes a rapid deployment strategy to adapt to each customer's needs to enable our customers to quickly turn large volumes of disparate data into easily understood reports, gain actionable insight through user-friendly advanced analytics and communicate to a wide range of constituencies using powerful visualizations.
>
> Please refer to item 4.4.1.1.a for detailed information about the SAS data warehouse development and implementation process.

Training Strategy

> Once the fundamental components of the warehouse are established and verified additional user training and report development can begin. As described in the *Training* section above, several options are available to our customers to provide a training program that is as effective as possible. Report development is performed by the program users who know what they are trying to achieve with the report. The user-friendly reporting interface will provide the WVDE users with the ability to quickly acclimate to the reporting environment to enable them to quickly produce the reports they need.

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

> With SAS Visual Analytics, users can enhance the analytic power of their data, explore new data sources, investigate them, and create visualizations to uncover relevant patterns. Users can then easily share those findings in reports. Beyond traditional reporting, data discovery invites you to explore the data, its characteristics, and its relationships.
>
> SAS Visual Analytics:
>
> ♦ Enables users to apply the power of SAS analytics to massive amounts of data
> ♦ Empowers users to visually explore data, based on any variety of measures, at amazingly fast speeds
> ♦ Enables users to share insights with anyone, anywhere, via a Web browser or a mobile device

Key Features

- Easy set-up and data administration for IT
- Visual data exploration
- Self-service approachable analytics

Easy set-up and data administration for IT

- SAS information assets, including users, servers and data, are easily managed
- User authentication and information authorization is persisted across all solution components to support data governance and IT policy implementation
- Data is provisioned to in-memory servers based on volume, frequency of required updates and scalability requirements
- Data can interactively be prepared for analysis, including joining tables, defining custom calculated columns and creating custom expressions
- A single Web-based interface is provided to manage SAS information assets, including users, servers and data
- The SAS Solution is designed to enable a user self-service environment. No longer forced to respond to the incessant demand for new views of data or one-off reports, limited IT resources can now focus on more strategic tasks

Visual data exploration

- Web-based, interactive data exploration mode for all types of users
- Auto-charting capability helps determine the chart best suited to display data based on items selected for analysis (e.g., one measure yields a frequency chart, two measures yield a scatter plot, three measures yield a bubble chart, etc.)
- Geographical map views provide a quick understanding of geospatial data
- "What does it mean" capabilities identify and explain the relationships between variables and describe/explain the types of analytic procedures applied to the data
- Exploration capabilities are provided for in-memory server data sources
- Graphical skins can be applied for 3-D appearance and light effects on visuals
- Compelling visuals include box plots, heat maps, bubble charts and more
- The toggle feature displays grid lines and lets you adjust axes to optimize viewing
- Queries can be changed by selecting items to be displayed from a sidebar or by dynamically filtering and grouping

- A resizable overview bar lets you visually subset a portion of data sets with many records (high cardinality)
- Viewable descriptive statistics, such as min, max and mean, enable you to gain an overall sense of a particular measure

Self-service approachable analytics

- Explore and seek correlations on data using in-memory server sources for any size analysis
- Query data from a seamless set of viewing modes
- Slice and dice multidimensional data by applying filters on any level of a hierarchy
- Drill up and down through hierarchies, or expand and collapse entire levels
- View descriptive statistics, such as min, max and mean, to gain an overall sense of a particular measure
- Calculate new measures and add them to any view
- Generate forecasts on the fly with forecasting confidence intervals included
- Know that the most appropriate forecasting algorithm for specific data will be automatically selected
- Use new scenarios analysis capabilities to test the impact of using different variables in your forecasts
- Use decision trees to find out what is happening and visually depict the most likely outcome for the future
- Accomplished through a point and click/drag and drop graphic user interface to promote ease of use and to enable approachable analytics
- Save views as report packages to share with other advanced data exploration users in Web reports, images or SAS mobile apps
- Remove complexity of data structures for nontechnical users

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;

SAS conducts extensive scenario testing on our products to determine the factors that impact performance. SAS consultants will work with the WVDE to develop a hardware sizing that is appropriate for your specific requirements. The factors include the data volumes, number of peak and average concurrent user sessions, and anticipated growth over a period of years.

The SAS Enterprise Excellence Center (EEC) provides architectural expertise and a rigorous evaluation template that will allow SAS architects to work directly with your preferred hardware vendor. The result of this collaboration is a detailed recommendation that will include a recommended hardware sizing to support

appropriate performance over time. This service is provided at no cost to the WVDE.

Sizing your environment is critical. Key considerations include response time, largest data set size, total data in memory and user mix. Ensuring there are enough compute nodes, memory and disk to achieve performance objectives is crucial.

SAS uses five-second response times for basic tables and graphs and 10-20 seconds for subsetting box plots and correlations. To achieve these response times, SAS recommends having 500MB to 1GB of data per core. Reduce data per core for faster response times.

While total data load affects the size of your memory, the size of the single largest table determines the number of cores you should have in your environment. This is because all calculations are run on a single table. Determining the number of cores is based on a calculation of size of the largest table divided by volume that an individual core can process in your desired response time. To achieve the response times above, you have to distribute 500MB to 1GB of that largest table on every core. You need to take into account the growth of that table; otherwise response times begin to shrink.

Knowing the total amount of data to be loaded into memory at any one time is a key consideration and defines one aspect of the total memory needed. The second component for determining total memory is overhead. SAS recommends an additional 30 percent for overhead. Finally, the third component is growth.

Number of users and potential functions of the users impact the overall existing architecture.

We recommend that you work with SAS to ensure the exact size of your environment. We offer a sizing service that not only ensures you can meet today's needs but that your growth objectives can be met in a cost-effective manner.

Defining and administering permissions is accomplished through a centralized that enables you to:

- Set security on individual objects such as reports and report folders
- Define users and groups and grant access permissions

- ◆ Define the authentication infrastructure (host, LDAP or Active Directory)
- ◆ Role support enables the application of user roles. Depending on their roles, users will see different feature sets

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;

The SAS solution provides the WVDE to control access by different users and groups of users. SAS uses a combination of functional authorization and data security to manage what a user is permitted to view. Functional authorization controls what things a user can do within the solution – for example, load data, create a report, or perform some advanced analytical function such as a forecast. Data security controls which data elements a user can see. These concepts are described further in our response to 4.4.3.1.e.

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;

The SAS Solution provides a single point of control for managing the enterprise intelligence creation process, including data integration, storage, reporting and analytics. By leveraging one administrative interface, the console requires less training time, reduces the number of steps involved in administration and provides an opportunity to uphold standard operating procedures and minimize manual work by enabling repeatable processes.

The SAS Solution allows the WVDE to create, manage and maintain authorization information for your users and groups in one place. This authorization facility ensures that access to metadata resources is controlled centrally, easing the implementation of a corporate security strategy.

The SAS Solution enables easy management of metadata resources across multiple platforms. Centrally managing repositories with one tool allows the WVDE to provide a common method of searching and managing distinct collections of metadata while enabling sharing of metadata across applications.

Users, groups, and roles can be used in conjunction with metadata folder security to provide security access for running reports, creating reports, publishing reports, and any other needed reporting functionality for users.

As an example, the WVDE can configure certain groups of users with "read-only" access so that they can only view content created by other users. These read-only users are further limited to seeing only the data they are permitted to access so they might not be able to see data for certain school districts, they might not

be able to see salary data or they might not be able to view content related to special projects.

Other users might be allowed to create reports but not be able to modify specific reports or save reports to specific shared folders. The scenarios available to the WVDE for managing who can do what and who can see what are extensive. Administrators by default are granted the permission to see all content and have access to most functions.

4.4.3.1.f. how the product is scalable.

As described in 4.4.3.1.c, the SAS solution is highly scalable and can adapt to virtually any usage requirements the WVDE might have. Some SAS customers have relatively small configurations to support smaller user communities working with smaller data volumes while other private sector customers have thousands of users who are working with billions of data records concurrently.

Deployment configurations provide the ability to scale from a single-server environment for department and work groups initiatives up to a massive blade infrastructure with hundreds of nodes for a high-performance, big data solution. The ability to use dedicated appliances, commodity hardware or cloud deployments provides cost-effective growth opportunities for performance and scalability. The WVDE will select the deployment option that makes the most sense for the agency.

The platform for the SAS Solution can be expanded by adding more nodes. Whether you have four nodes or hundreds, each node provides an immense amount of computing power. Today, there are at least 16-cores on each node, providing 32 threads of computing power. With hundreds, if not thousands, of threads breaking your data down into bite-sized pieces, the work required by one thread is very manageable and quick.

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

The SAS solution provides the ability to establish application and report themes to enable the WVDE to comply with design elements standards. These are enabled through application preferences and report design choices. SAS does not provide signature sign-off procedures for electronic and print-on-demand reports.

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.

The SAS solution provides the capability to create reports using a Web browser (thin client). No thick client is provided for report development. A tablet app is available for either Apple iPads or Android tablets but these apps are used for interactive information consumption only.

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:

The SAS solution's graphic user interface provides the ability to easily and dynamically create hierarchies to drill up, down and into various data element relationships. The hierarchies can be created on-the-fly by authorized users to enable OLAP-like functionality without requiring the administrative burden typically associated with the creation of and maintenance for OLAP cubes.

Drill-through is supported by enabling links from reports to detailed transaction tables or other relevant content. Content can be exported from the SAS solution by executing a right-click on the report object and choosing "export" from the menu.

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 ;

Users can drill through (expand) hierarchies by clicking on a "plus" sign which appears adjacent to drillable content. The user can drill up (collapse) hierarchies by clicking on a "minus" sign which appears adjacent to drillable content which has been expanded. Similarly a user can click on a curved arrow adjacent to drillable content to drill into the hierarchy level to focus just on that specific area. Subsequently, the user may click on a reverse arrow to return back to the previous level of the hierarchy.

As in all areas of the SAS solution, user access roles and data security configurations are honored during this navigation.

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

The SAS solution provides an extensive library of configurable report objects. Each object which can be placed on a report has configurable elements which are appropriate for that object. This includes the capacity for changes to data elements, filters, ranges, data formats, fonts, labels and a variety of display

options. Authorized users can make changes to these configuration options through the web client using an intuitive point-and-click, drag-and-drop interface.

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.

Content can be exported from the SAS solution by executing a right-click on the report object and choosing "export" from the menu. The SAS solution provides the ability to export reports to Microsoft Excel or to a PDF format file.

As described in 4.4.3.1.e, the SAS Solution has extensive capabilities to limit user access to system functionality and to data. This security is honored by the data that the user is able to export. SAS metadata-bound libraries can enforce metadata-layers permissions to the physical storage.

4.4.4 Goal IV: Professional Development Services

As part of the WVDE's PK-12 SLDS initiative, the WVDE seeks to have effective professional development services provided by the successful vendor, which will be delivered through a variety of relevant, ongoing, and continuous models. This professional development is meant to help equip developers and end-users with the skills and knowledge needed to effectively manage and use the DWRS. End-users should be equipped to make data-driven decisions (e.g. policy development, administrative operations, instructional practice, and strategic planning) that impact the education of students through enhanced data access and effective reporting at multiple levels (e.g., grade, school, LEA, regional, state).

The project objectives associated with Goal 4 are listed below:

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.

SAS has an extensive training arsenal to cover the WVDE's professional development needs. SAS can provide face-to-face training for the WVDE's various user roles to ensure their success in the implementation, training and usage of the SAS Solution. Our methods include classroom, live web classes, on-site workshops, video libraries, and customized web modules.

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.

SAS resources can conduct specific training sessions, workshops and modules both initially and in follow-up based on the needs of the WVDE users. As part of these face-to-face training sessions, the users will be provided with supporting documentation as well as a myriad of resources to support the train-the-trainer users. Those resources include access to video libraries, access to live web classes, and customized web recordings specific to the WVDE. SAS resources can help strategize the best methods for disseminating training information to the WVDE constituents.

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.

SAS will provide resources that will be on-site at the WVDE to install and implement the DWRS in a test environment. We encourage the WVDE technical resources to work with our resources as the installation and configuration are being completed so that there is direct knowledge transfer. Those resources will learn how the system is configured and will be given best practices for the maintenance of the system. To augment this knowledge transfer, we encourage those resources to attend our live web courses on SAS Administration essentials and security.

Through a serious of on-site workshops, SAS resources will provide a hands-on workshop to train 5-10 functional experts on the use of our reporting solutions. This includes building, modifying and running reports. This workshop will last 5 days and will cover all aspects of reporting in the SAS Solution. SAS resources will also a workshop to 2-5 technical resources on the use of the data management tool for ETL. This workshop is also 5 days.

4.4.5 Goal V: Project Management

As part of the WVDE's PK-12 SLDS initiative, the fifth goal of the project is to have a comprehensive and responsive management plan that supports the development and execution of the DWRS and all associated goals stated in this RFP. The WVDE believes that strong project management is paramount to an initiative's success and it should include an efficient and complete communication strategy to support WVDE with the goals and objectives within this RFP.

In addition , holistic project management should allow the state to understand the scope and sequence of the project through access to clearly articulated project schedules, staffing allocation s, proposed timelines and deliverables, success metrics, phasing, issue and risk management, tracking, and resolution.

SAS will partner with Pinnacle Solutions to provide comprehensive project management for this project. Pinnacle Solutions is a SAS Alliance Consulting Partner. As an Alliance Member, they have been certified as providers of the same high standards of market knowledge, vision, integrity, and customer satisfaction that SAS Institute sets for ourselves. The experience of Pinnacle Solutions, combined with SAS software and consulting services, provides for all the necessary project management components to drive the success of this endeavor. Pinnacle Solutions and SAS will administer this project utilizing the SAS Project Management Methodology.

The project objectives associated with Goal V are listed below:

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.

SAS' Comprehensive Project Plan Overview

The SAS Project Management Methodology (PMM) is based on best industry standards, including the Project Management Institute's Body of Knowledge (PMBOK), PRINCE2, and Keane's methodology. The SAS PMM has been developed to incorporate project management best practices related to all business intelligence and analytic projects.

The SAS PMM:

- Contains a collection of common project management processes
- Contains a set of embedded rules and guidelines for running projects of any size
- Is based on SAS' collective experience in the field

While the methodologies employed by SAS include some of the core principles that SAS believes must be incorporated, it is considered that the customer and SAS work closely together during the planning phase of the project, as much as during the execution phases, in order to apply the principles in a way that fits the project circumstances.

Methodology Goals

The main goals of this methodology are to:

- Provide a set of global processes and a common language for all technical and non-technical team members
- Help the project staff deliver on time, within budget, and within agreed scope
- Encourage and promote a spirit of teamwork among sales and services, consultants, developers, business partners, management, and other members of the extended team
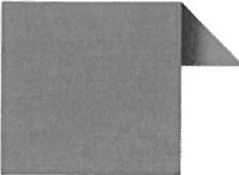
PMM supplies the basis on which all SAS projects are executed. Based on industry standard project management principles, it takes into consideration the specific requirements of a SAS project. The phases of PMM are aligned to and integrated with the phases of with the SAS Intelligence Platform Implementation (IPI) methodology, which specifies the technical details. In short, PMM:

- Supports the delivery of the project within the time frame, budget, and required features (project scope)
- Helps set and maintain the right expectations with all stakeholders
- Provides the necessary techniques and tools to monitor and control the project

Project Life Cycle

The project life cycle refers to a logical sequence of activities to accomplish a project's goals or objectives. SAS' project life cycle consists of phases that map to the sales life cycle as well as to specific SAS methodologies for development and deployment of software.

As defined in SAS' Project Management Methodology (PMM), information leveraged from sales' early efforts in the Project Qualification and Project

Definition phases are incorporated into the Project Planning phase. During this phase, the project team, together with the customer, refine the project requirements and objectives and plan the project management details and environment. In many instances, SAS recommends doing an assessment service project to focus on producing requirements and in developing a detailed proposal for a subsequent project. This is beneficial if the requirements are unclear or the customer's funds are limited.

Once requirements and the project management structure are clearly defined, the Project Execution phase establishes and manages every aspect of project delivery to assure the project is successful. The final phase of the project life cycle is the Project Summation phase, where final acceptance and project closeout take place.

Meeting Customer's Needs

The PMM methodology is flexible and can be tailored to fit the specific requirements of the customer. It can also be blended with standard customer project management practices to ensure that the project will match the specific requirements of the proposed project.

The central elements of the PMM approach are outlined below. The description includes some of the core principles that SAS believes must be incorporated into a project. For example, it is key that the customer and SAS work together as much during the planning phase of the project as during the execution phase. Working together during the planning phase ensures that the teams apply the principles in a way that fits the project circumstances.

Phases of the Methodology

The PMM consists of five phases. The first two are linked to the sales cycle and focus on gathering a high-level definition of the project's objectives and background so that an initial estimate and a proposal can be developed. The remaining three phases take place once a contract is in place.

The following diagram provides an overview of how the five phases fit into a full project lifecycle. It shows how they fit together with standard project management activities.
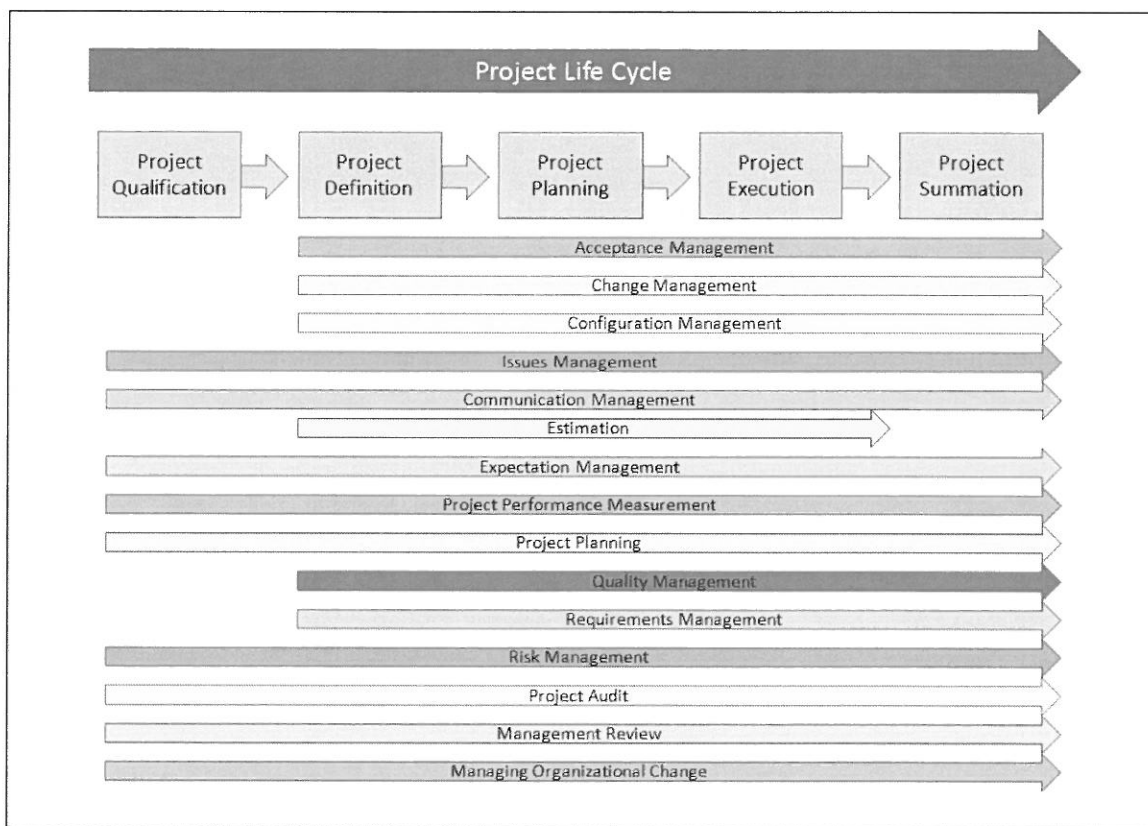
Qualification

The purpose of the Project Qualification phase is for SAS Professional Services to develop an understanding of the opportunity to make an informed decision on whether the opportunity should be pursued. This phase is typically triggered by a request from Sales but also by the receipt of a Request for Proposal (RFP) from a current or prospective customer.

Definition

The purpose of the Project Definition phase is to gain a thorough understanding about the project scope, the project's objectives, and background. During this phase, SAS will try to fill information holes both through validating existing information against needed information as well as gathering information not yet available. Based on this information, the project effort can be estimated and the services proposal developed.

Planning

The Project Planning phase refines project objectives and establishes the proper project management and quality environment for the project at its onset. The foundation of every successful project is a detailed definition of the project that is understood and agreed to by all stakeholders. In this phase, the project charter document is developed. The project charter document consists of the defined work products, the project risk profile, and the detailed project plan for the initial phases. It also includes an outline plan for the remaining phases and the project management rules of engagement.

Execution

The Project Execution phase establishes and manages every aspect of project delivery to assure the project is successful. At this point, the resources are in place and the project management and quality environments are established. In this phase, the execution of the project is managed and its progress tracked according to the plans established during the Planning phase.

Summation

The Summation phase properly manages the closure of a project. Closing the project is an important step for today's learning organization. Consultants and customer team members conduct a thorough review of the project. The review is the first step towards developing best practices for both organizations. Team members record and discuss lessons learned, analyze metrics, and archive all relevant project information so feedback can be used to improve methodologies, tools, techniques, and general service offerings.

SAS has a reputation for listening to its customers and forming strong partnerships with them. By participating in reviews, gathering feedback and recording lessons learned, those relationships become even stronger and future engagements even more successful.

Project Management Tools

SAS will use Microsoft Project to capture and manage the daily activities, milestones/deliverables, overall project phase/goals, staffing allocations, project timelines for the SDLS. SAS will distribute project files to WVDE project stakeholders as part of the routine communication process. The response to question 4.4.6.1.2 includes an example of project file that embodies the style and type of report that SAS plans to generate.

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

As part of SAS' communication management strategy, SAS plans to use Microsoft SharePoint as a collaborative electronic repository for sharing and engaging fellow project stakeholders. Once WVDE authorized stakeholders have approved the camera-ready electronic content for posting, that content may be posted on WVDE's SLDS website per WVDE approved electronic posting standards.

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.

As part of SAS' communication management strategy, SAS will work with WVDE project stakeholders to understand, collect, and then document the approved list of project stakeholders within project level tiers. Once SAS and WVDE distributes those project stakeholders within project level tiers, SAS and WVDE will create an agreed upon list of actions and activities that correlates to proper communication standards that align with each project level tier.

4.4.6 Goal VI: Transition Strategy

As part of the WVDE's PK-12 SLDS initiative, the state seeks to be in a contract with a Vendor that will directly and fully participate in the transfer of the program to the state at the conclusion of the project (either through the successful completion of the contract period or through termination). Successful transition should include, but not be limited to, a transition plan, meetings, identification of a core transition team, associated team members, documentation, and any resources to promote successful sustainability of the DWRS. As stated in Section 4.5, Mandatory Requirement s, all materials and products regard less of the forms developed for and used in conjunction with this project shall remain the property of WVDE regardless of the phase of transition. All deliverables become property of the WVDE in an electronic, editable form (e.g., stamped CD with all documentation, videos, manuals, business rules, etc.). The solution is not proprietary.

Transition Strategy

SAS will fully participate in all transition planning mutually agreed to by WVDE and SAS as described in any resulting contract. The proposed solution is a SAS proprietary solution. Therefore, as stated in the Letter of Transmittal beginning on page iii, title to resulting Work Product will remain with SAS. WVDE will be granted a license to use the Work Product on mutually agreeable terms as described in the resulting contract.

Transition Team and Special Skill Sets

The transition team should comprise the following members:

- SAS Team Leader
- SAS Development Team
- WVDE Transition Leader - Coordinate activities between SAS and WVDE throughout transition; provide workspace for all transition staff; facilitate transition meetings as required
- WVDE Project Leader - Responsible for overseeing all contract actions and deliverables; responsible for ensuring accountability on all funding and budget items pertaining to the contract
- WVDE IT Transition Leader - Ensure all IT activities are completed during transition; document all IT processes, tasks, and activities for transition to WVDE
- WVDE Additional IT team members
    - DBA
    - Systems and Networking
    - Application Developers
- Production Support
- WVDE Configuration Manager - Ensure all training documentation is complete; ensure completion of user and technical manuals; ensure all documentation is in accordance with WVDE standards; ensure proprietary materials are not part of transition
- WVDE Other Support Staff members
- Desktop Support
- Help Desk

The special skill sets required for the administration, maintenance and support of the application include experience in relational databases, SAS infrastructure, SAS metadata administration, and SAS programming.

Accounts and Authorizations

Part of the transition includes creating and enabling various user account accesses and authorizations. The SAS personnel listed in the chart below will possess the user accounts and access necessary for the contract deliverables. The appropriate WVDE employees will be granted access on the first day of the contract transition phase. Once the transition is complete and approved, all SAS user accounts will be disabled.

User Account
SAS Administrator
Database Administrator
SAS Developers

Knowledge Transfer

The knowledge transfer for this initiative will be determined once all business requirements have been established and approved between SAS and WVDE. SAS recommends holding ongoing 2 to 4 hour workshops with WVDE staff via web conferencing with the appropriate transition teams. These workshops will focus on specific IT concerns related to database, data quality and integration, web portal, and report development tasks associated with the sustainability of the DWRS. They will also cover documentation requirements and associated application tools and processes. SAS feels that this is the best way to teach our customers how to perform the necessary tasks to support their end-users because it provides a hands-on training session with one or two of our senior developers. SAS has been very successful in knowledge transfer during these workshop sessions for several clients across multiple industries.

Handover and Acceptance

Formal acceptance by WVDE will determine when the transition is completed. The WVDE Transition Leader will utilize the established transition checklist in order to determine that all activities associated with the transition have been completed and that all concerns and issues have been met and addressed appropriately.

The objectives for this goal include:

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 ;

Special consideration and planning will go into the transition plan based on the results of the design phase of the software to meet WVDE needs. As certain details and timelines may not be known until after the design phase, SAS at a minimum will identify key WVDE stakeholders that will be part of the transition team, conduct transition meetings, and identify the activities and deliverables required to ensure a smooth transition of software and processes. A sample schedule is provided as part of the response to question 4.4.6.1.2.

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

Schedule

This section provides an example Gantt chart schedule of the transition period. Because the design requirements of the software are not known at this time, this schedule is intended to identify only major milestones as well as estimated transition durations.

#	Task Name	Duration	Start	Finish	Predecessors	Resource
1	Data Warehouse Reporting System Transition	60 days	Mon 1/13/14	Fri 4/4/14		
2	Transition Start	1 day	Mon 1/13/14	Mon 1/13/14		
3	Teams identified	5 days	Tue 1/14/14	Mon 1/20/14	2	
4	Kick-off Meeting	1 day	Tue 1/28/14	Tue 1/28/14	3FS+5 days	
5	Knowledge Transfer	37 days	Wed 2/5/14	Thu 3/27/14	3	
6	IT Staff	35 days	Wed 2/5/14	Tue 3/25/14		
7	Data Warehouse Workshops	8 days	Wed 2/5/14	Fri 2/14/14		
8	Administration	2 days	Wed 2/5/14	Thu 2/6/14	4FS+5 days	
9	Schema Review	1 day	Mon 2/10/14	Mon 2/10/14	8FS+1 day	
10	Data Quality Processes	1 day	Wed 2/12/14	Wed 2/12/14	9FS+1 day	
11	Data Integration Processes	1 day	Fri 2/14/14	Fri 2/14/14	10FS+1 day	
12	Metadata Configuration Worksho	8 days	Thu 2/20/14	Mon 3/3/14		
13	Administration	2 days	Thu 2/20/14	Fri 2/21/14	7FS+3 days	
14	Users, Roles, and Group Permissions	2 days	Tue 2/25/14	Wed 2/26/14	13FS+1 day	
15	Data Libraries	0.5 days	Fri 2/28/14	Fri 2/28/14	14FS+1 day	
16	Application Folders	0.5 days	Mon 3/3/14	Mon 3/3/14	15FS+1 day	
17	Web Portal Workshops	13 days	Fri 3/7/14	Tue 3/25/14		
18	Administration	4 days	Fri 3/7/14	Wed 3/12/14		
19	Data Transfer procedures	0.5 days	Fri 3/7/14	Fri 3/7/14	12FS+3 days	
20	Data Preparation procedure	0.5 days	Mon 3/10/14	Mon 3/10/14	19FS+1 day	
21	Portal Pages	1 day	Wed 3/12/14	Wed 3/12/14	20FS+1 day	
22	Report Generation	6 days	Tue 3/18/14	Tue 3/25/14		
22	Report Generation	6 days	Tue 3/18/14	Tue 3/25/14		
23	Tables and Graphs	2 days	Tue 3/18/14	Wed 3/19/14	18FS+3 days	
24	Predictive Analytics	3 days	Fri 3/21/14	Tue 3/25/14	23FS+1 day	
25	Support Staff	2 days	Wed 3/26/14	Thu 3/27/14		
26	Desktop Support	0.5 days	Wed 3/26/14	Wed 3/26/14	6	
27	Help Desk	0.5 days	Thu 3/27/14	Thu 3/27/14	26FS+1 day	
28	User Accounts and Authorizations	40 days	Mon 2/3/14	Fri 3/28/14		
29	Appropriate WVDE Accounts set-up and activated	1 day	Mon 2/3/14	Mon 2/3/14	4FS+3 days	
30	SAS Accounts disabled	1 day	Fri 3/28/14	Fri 3/28/14	5	
31	Customer Acceptance and Approval	5 days	Mon 3/31/14	Fri 4/4/14	5,28	
32	Transition End	0 days	Fri 4/4/14	Fri 4/4/14	31	

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

Software Technical Support and Maintenance

SAS maintains outstanding levels of support and customer satisfaction through self-help and assisted-help resources. You can watch a short video to learn more about how to help yourself by using our Web resources as well as how and when to contact SAS Technical Support.

Self Help

While we pride ourselves on fast and accurate responses to customer questions and problems, SAS provides an array of resources to enable you to find answers and resolve problems on your own, without having to contact Technical Support.

♦ **Go to Our Knowledge Base** (http://support.sas.com/resources)

♦ **Engage Your On-site SAS Support Personnel** (http://support.sas.com/techsup/onsite.html)

♦ **Download Files and Hot Fixes** (http://support.sas.com/techsup/dwnload/)

♦ **Manage Your Accounts** (http://support.sas.com/adminservices/)

♦ **Get Assistance with License Issues** (http://support.sas.com/techsup/license/)

- ◆ **Visit the SAS Support Communities to Converse with SAS Users** (https://communities.sas.com/community/support-communities)
- ◆ Subscribe to:
  - – **TSNEWS-L for hot fix announcements and important news** from Technical Support (http://support.sas.com/techsup/news/tsnews.html)
  - – **e-Newsletters** (http://support.sas.com/community/newsletters)
  - – **RSS feeds, blogs, and listservs** (http://support.sas.com/community/rss/)

Assisted Help

SAS provides real-time support when you are unable to address a problem successfully on your own or have a question that is not answered through Self-Help resources.

- ◆ **SAS Technical Support** (http://support.sas.com/techsup/contact/)
- ◆ **SAS Contracts Support** (http://support.sas.com/adminservices/contact.html)
- ◆ **SAS Customer Loyalty Team** (customerloyalty@sas.com?Subject=Contact%20for%20Support%20from%20Customer%20Loyalty%20Team)

Ongoing Maintenance and Support

SAS collaborates with Pinnacle Solutions to offer "Pinnacle First Aid Kit™" (www.psiconsultants.com/index.php?option=com_content&task=view&id=111&Itemid=55&limit=1&limitstart=5)

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

> **Vendor Response:** The Solution will consist of Vendor's proprietary software that will be licensed by WVDE.

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:** Vendor will grant WVDE a nonexclusive, nontransferable, non-assignable, royalty free license to use any deliverables that are delivered by Vendor in connection with the services (collectively "Work Product") only with the software with which the Work Product operates and only for as long as WVDE maintains a license for such software.

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

> **Vendor Response:** The Agency will own the Data Warehouse and Reporting System (DWRS) upon project completion. Vendor will maintain ownership in the deliverables and Work Product as stated above.

Please also refer to the signed checklist on page vi.

Please refer to the responses submitted in a separate sealed envelope, as specified.

Please also refer to the following related collateral materials:

- ◆ SAS® Visual Analytics
- ◆ SAS® Office Analytics
- ◆ SAS® Data Management Advanced

SAS® Visual Analytics

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SAS® Visual Analytics

Visually explore your data for better, faster insights, create reports and share results to the Web and mobile devices

What does SAS® Visual Analytics do?

SAS Visual Analytics provides a robust set of BI capabilities and approachable analytics, enabling different types of users to gain insights from any size of data through data visualization and exploratory analysis. You can quickly and easily explore all of your data using a drag-and-drop interface, analyze data and share results easily via Web reports and mobile devices. The solution helps you identify patterns, trends and relationships in data that were not evident before.

Why is SAS® Visual Analytics important?

The software enables users of all skill levels to explore their data while tapping into SAS' powerful analytics capabilities. It provides an unprecedented way to derive value from all of your data, empowering you to uncover unexpected insights, find answers to complex problems, and quickly identify new and better courses of action.

For whom is SAS® Visual Analytics designed?

SAS Visual Analytics supports data discovery and exploration for users across your organization, from decision makers and analysts to statisticians and data scientists. Designed for users of all skill levels, the solution provides an easy way for IT to protect and manage the integrity and security of data, while enabling business users to explore their data and communicate results via dashboards and KPIs.

Regardless of their size or sector, organizations today collect all kinds and amounts of data. Unfortunately, traditional architectures and existing infrastructures often have difficulty performing the fast analytical processing needed to deliver instantaneous insights.

IT also is burdened with ever-growing requests for data, ad hoc analyses and one-off reports. Decision makers become frustrated because it takes too long – or is even impossible – to get the reports they need to answer questions quickly. And increasingly, they want to be able to access information from mobile devices such as iPad® or Android tablets.

SAS Visual Analytics combines an easy-to-use, dynamic interface with powerful in-memory technology to enable all types of users to visually explore data, execute analytic correlations on any size of data within minutes or seconds, understand what the data means, and deliver the results quickly wherever needed via Web reports and mobile devices.

Key Benefits

- **Broaden access to analytics and empower all users.** SAS Visual Analytics enables users of all skill levels to conduct fast, thorough explorations on all available data – revealing more options and prompting more precise decisions. Easy-to-use, interactive Web interfaces help everyone glean new insights for greater success faster than ever before.

- **Answer complex questions faster and enhance the productivity of your analytical talent.** SAS Visual Analytics augments the data discovery and exploration process by providing extremely fast results to enable better, more focused analysis. The solution dramatically improves the productivity of your analytically savvy users by helping them quickly identify areas of opportunity or concern.

- **Improve information sharing and collaboration.** A variety of users, including those with limited analytical skills, can quickly view and interact with reports and charts via the Web, Adobe PDF files and mobile devices, while IT maintains control of the underlying data and security. The solution provides the right information to the right person at the right time to improve productivity and organizational knowledge.

- **Liberate IT by giving users a new way to access the information they need.** Free IT from the constant barrage of demands from users requesting access to different amounts of data, data views, ad hoc reports and one-off requests. With SAS Visual Analytics, IT can load and prepare data for multiple users in one instance. Users can then dynamically explore data, create reports and share information, all without constantly requiring IT support.

- **Right-size your analytics discovery environment.** Whether you prefer to deploy SAS Visual Analytics on-site using your hardware, in your own private cloud, in a public cloud such as Amazon or in the SAS Cloud environment, we offer options that are sure to fit your organizational needs.

Product Overview

SAS Visual Analytics combines powerful in-memory analytics with an extremely visual, easy-to-use exploration interface so that organizations can derive value from their data faster than ever before.

Deployment options

Deployment configurations provide the ability to scale from a single-server environment for department and work groups initiatives up to a massive blade infrastructure with hundreds of nodes for a high-performance, big data solution. The ability to use dedicated appliances, commodity hardware or cloud deployments provides cost-effective growth opportunities for performance and scalability. You can select the deployment option that makes the most sense for your organization.

High-performance in-memory SAS® LASR™ Analytic Server

The SAS LASR Analytic Server provides the foundation for this solution and greatly accelerates analytic computations. Its in-memory capabilities provide extremely fast processing of data, right out of the box, regardless of the amount of data to be explored and analyzed.

Easy set-up and data administration for IT

SAS Visual Analytics empowers many types of users. With easy-to-use administration tools, IT can set up a single working environment that allows business users, analysts and information consumers to perform their individual functions from within the same application environment. IT can easily load and prepare data for multiple users, translate data structures into terms that everyone can understand, as well as define and apply business rules in a

consistent manner. With the ability to control how much and which types of data can be accessed and retrieved, IT maintains data security and integrity without infringing on users' productivity and flexibility to explore and query data as needed. No longer forced to respond to the incessant demand for new views of data or one-off reports, your limited IT resources can now focus on more strategic tasks.

Visual data exploration

Once IT has loaded data from any source into the SAS LASR Analytic Server, users can visually and interactively explore data to gain insights and discover patterns and trends for further analysis. Through Web-based exploratory analysis, even users without analytical expertise can extend their use of analytics to gain more precise insights. Nontechnical users can easily create and change queries by select-
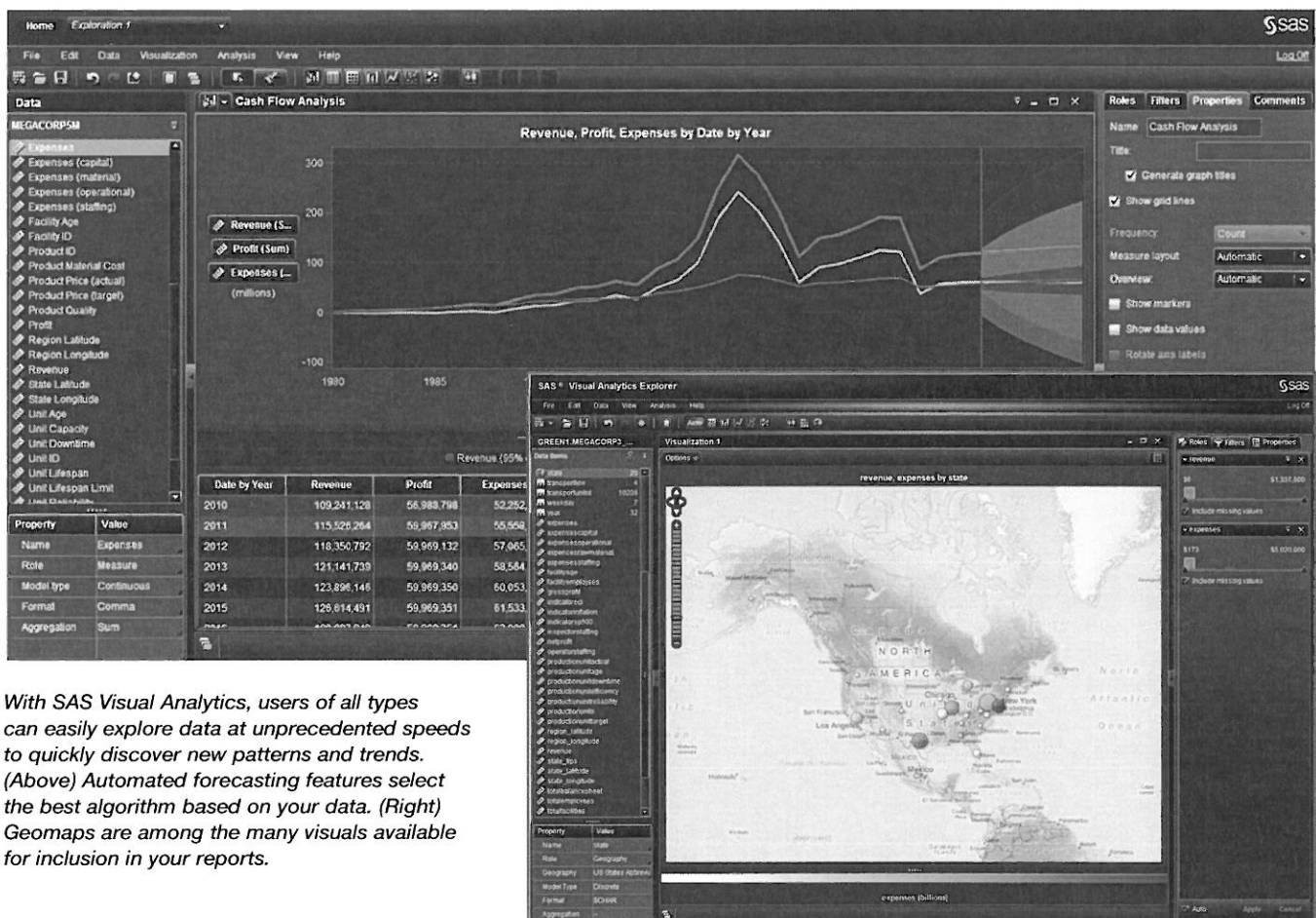
With SAS Visual Analytics, users of all types can easily explore data at unprecedented speeds to quickly discover new patterns and trends. (Above) Automated forecasting features select the best algorithm based on your data. (Right) Geomaps are among the many visuals available for inclusion in your reports.

ing items displayed from a sidebar or dynamically filtering and grouping data items. Drag-and-drop and autocharting automatically selects the visualization that best suits the type of data chosen. Additionally, users themselves can choose from a wide variety of compelling visuals to display results. The "what does it mean" pop-up boxes provide easy explanations of complex analytic functions and data correlations, helping everyone better understand the data and what the analysis is showing. In addition, analytically savvy users can spot trends and derive intelligence quickly and easily. This eliminates much of the everyday trial-and-error process currently used to identify areas that need additional analysis.

Self-service approachable analytics

Analytic features are tailored for different skill levels so that a wide variety of users can explore data autonomously without learning new skills or engaging IT. The solution makes it easy to explore and seek correlations between variables. Automated forecasting capabilities generate forecasts dynamically by selecting the most appropriate forecasting method for the data chosen, enabling even novice users to forecast reliably.

With new scenario analysis capabilities, you can visibly see how your forecast would be affected by changing different variables. And you can interactively generate decision trees to graphically depict the most likely outcomes. An expert level allows modification of certain influencing parameters for the tree generation.

Build-it-yourself hierarchies eliminate the need for data analysts to constantly seek help from IT. Users can drill up and down through the hierarchies and slice and dice data on any level. This enables advanced analysts to explore more data more quickly, while help-

Key Features

High-performance in-memory SAS® LASR™ Analytic Server
- Uses in-memory analytics to quickly conduct exploration and analysis.
- Designed to run in a single-server mode for smaller organizations and departments.
- Optimized for distributed environments to use the parallel processing capabilities of many nodes to scale as your organization and data grow.
- Integrates with Hadoop for performance optimization and scalability.
- Can be used on commodity hardware or on database appliances.

Easy set-up and data administration for IT
- User authentication and information authorization is persisted across all solution components to support data governance and IT policy implementation.
- Data is provisioned to in-memory servers based on volume, frequency of required updates and scalability requirements.
- Data can interactively be prepared for analysis, including joining tables, defining custom calculated columns and creating custom expressions.
- A single Web-based interface is provided to manage SAS information assets, including users, servers and data.

Visual data exploration
- Web-based, interactive data exploration mode for all types of users.
- Autocharting capability helps determine the chart best suited to display data based on items selected for analysis (e.g., one measure yields a frequency chart, two measures yield a scatter plot, three measures yield a bubble chart, etc.).
- Geographical map views provide a quick understanding of geospatial data.
- "What does it mean" capabilities identify and explain the relationships between variables.
- Exploration capabilities are provided for in-memory server data sources.
- Graphical skins can be applied for 3-D appearance and light effects on visuals.
- Compelling visuals include box plots, heat maps, bubble charts and more.
- The toggle feature displays grid lines and lets you adjust axes to optimize viewing.
- Queries can be changed by selecting items to be displayed from a sidebar or by dynamically filtering and grouping.
- A resizable overview bar lets you visually subset a portion of data sets with many records (high cardinality).
- Viewable descriptive statistics, such as min, max and mean, enable you to gain an overall sense of a particular measure.

Self-service approachable analytics
- Explore and seek correlations on data using in-memory server sources for any size analysis.
- Query data from a seamless set of viewing modes.
- Slice and dice multidimensional data by applying filters on any level of a hierarchy.
- Drill up and down through hierarchies, or expand and collapse entire levels.
- View descriptive statistics, such as min, max and mean, to gain an overall sense of a particular measure.
- Calculate new measures and add them to any view.
- Generate forecasts on the fly with forecasting confidence intervals included.
- Know that the most appropriate forecasting algorithm for specific data will be automatically selected.
- Use new scenarios analysis capabilities to test the impact of using different variables in your forecasts.
- Use decision trees to find out what is happening and visually depict the most likely outcome for the future.
- Save views as report packages to share with other advanced data exploration users in Web reports, images or SAS mobile apps.
- Remove complexity of data structures for nontechnical users.

ing nontechnical users easily navigate through the different levels of data by removing the complexity of different data structures.

Robust report design, creation and distribution

SAS Visual Analytics provides a Web-based interface that makes report design, creation and distribution easy for users of all skill levels. Specialized groups or business users can build reports within boundaries established by IT. Extensive presentation layouts speed report creation. With a comprehensive suite of graphical data presentation options, users can create and easily incorporate charts and plots in reports. It is easy to design and produce business graphics, apply corporate design standards and then publish the reports to a Web-based viewer, iPad or Android tablet. And reports only have to be designed once, regardless of where they will be displayed.

Report viewing and mobile BI

SAS Visual Analytics enables users to view reports in a self-service manner while respecting the need for IT to maintain control of the underlying data and security. All types of users can quickly open, view and interact with reports from the Web, an Adobe PDF file, or an iPad or Android tablet. (The mobile BI app can be downloaded free from Apple's iTunes® store and Google Play.) Advanced analysts can quickly view data from multiple angles and interact with the data in many ways. Easy-to-use collaboration capabilities promote idea sharing while saving valuable time. You can annotate screen captures of reports and email report links to others, who can then add their thoughts as well. Or capture your comments via video and audio to share.

Key Features (continued)

Robust report design, creation and distribution

- Web-based, interactive report-building interface is provided for report authors.
- Data acquisition wizard is available for previewing, filtering or sampling data prior to creating visualizations or reports.
- Precision layout capabilities provide flexibility in report layout and design. Stack or group items, use send-to-back or bring-to-the-front capabilities, and more.
- On-the-fly hierarchy creation lets you add drill-down capabilities to visualizations and reports.
- Ability to select predefined filters, set groupings and sorting, and override default formatting; or create custom calculations and filters.
- New customizable graph templates are available.
- A variety of charts are included: bar/3-D bar with multiple lines, pie/3-D pie, line, scatter, heat map, bubble, and tile – all of which allow annotated reference lines to be added.
- Easy-to-integrate common action elements such as radio buttons, drop-down/combination boxes, check boxes and sliders add filtering and selection capabilities to your reports.

Report viewing

- A Web-based, interactive report viewing interface is provided for all information consumers.
- Interactive report viewing is available on iPad and Android devices.
- Reports can be previewed as they will display on mobile devices before they are published.
- Drag-and-drop functionality enables objects to be resized on the screen.
- Reports can be printed as PDFs or PNGs.

Mobile BI

- Native iPad and Android support uses popular gestures and capabilities (zoom, swipe, etc.).
- Flexible layouts let you create content tailored to different needs.
- Link indicators enable data brushing as defined while creating reports. A selection in one indicator is applied as a filter or selection in the related indicator(s).
- Reports can be viewed securely on mobile devices either online or offline.
- Comments can be added to reports for better collaboration. Report links with comments can be emailed to others.
- Screenshots can be captured and comments shared with others.
- Alerts are provided to mobile devices when reports are updated.
- SAS Visual Analytics iOS and Android apps integrate with Mobile Device Management solutions from Good Technologies or Mocana.

Centralized user hub

- Thumbnails of recent and favorite items can be viewed and selected to open them.
- Items can be opened directly from the SAS Visual Analytics Hub, whether they are reports, visualizations or data sources for exploration.

Centralized user hub

The SAS Visual Analytics Hub is the home page and launching pad for all of the solution's applications. It provides a central log-on facility so users can view and open recent content, add their favorites and use Google-like search capabilities to find any content that they are authorized to see.

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More analytic power. Easy integration with data visualization and high-performance capabilities. All from a familiar Microsoft Office environment.

What does SAS® Office Analytics do?

SAS Office Analytics enables businesses of all sizes to access powerful SAS Analytics and high-performance tools using familiar, Windows-based software. As a result, analysts can share findings and information easily and seamlessly. Executives can track performance from within their mail client or SharePoint portal. Credentialed users can embed analytic results directly into Excel spreadsheets, Word documents, or PowerPoint presentations, and update charts and views directly from their Office applications.

Why is SAS® Office Analytics important?

Powerful business intelligence capabilities are now within the reach of any business user, with minimal IT support. Users can access and share more accurate, fact-based information for greater collaboration and better-informed decision making.

For whom is SAS® Office Analytics designed?

SAS Office Analytics is designed for business and data analysts, statisticians, programmers conducting self-service analysis and business users who need to access the analytical results of SAS output created by others.

Overview

Businesses accumulate huge volumes of data at amazing speeds. But pulling together all that data and transforming it into valuable information can be challenging.

From a business perspective, gaining access to data is only part of the issue. Even when information is accessible, it's often scattered among different sources and databases, and the potential for reporting errors is high. And IT departments struggle to manage it all in the face of shrinking budgets and limited resources.

Your business needs useful information in a meaningful format – e.g., a visual, multidimensional assessment of customers instead of a flat, two-dimensional spreadsheet. And information must be shared across the enterprise so that everyone can work toward common goals, and decision makers – wherever they are – can act quickly and decisively.

The good news is that timely access to trustworthy data that can be analyzed and shared across your business is within your reach.

SAS Office Analytics puts the power of SAS Analytics in the hands of business users via the familiar environment of Microsoft Office products. From intuitive point-and-click interfaces to its easy-to-follow metadata capabilities, SAS Office Analytics reduces the learning curve, enabling business users to get valuable insights from the solution quickly.

Key Benefits

• **Access powerful SAS Analytics via Microsoft Office applications.** An intuitive point-and-click interface lets business users access and analyze large amounts of data and view results directly in familiar Microsoft Office applications – e.g., Word, Excel, PowerPoint and SharePoint. Guided analysis via built-in tasks and visual process flows means even SAS novices can quickly perform sophisticated analyses, schedule projects, share results and easily embed outputs for repeated use.

• **Create and share reports with anyone, anywhere.** Create and distribute custom wizards as needed, and deliver information through an established publishing framework. You can also publish dynamic, interactive content – including data visualizations created in SAS Visual Analytics – to Microsoft Office and Web users.

• **Liberate IT by centralizing data access and control.** Centralized access to corporate data enables IT to ensure that users have appropriate access privileges, while empowering them to react quickly to evolving business demands. Performance and audit reports enable proactive compliance with data governance rules. And because the software enables users to be more self-sufficient, IT is free to focus on more strategic initiatives.

• **Achieve greater productivity through high-performance computing.** Integration with high-performance tools from SAS enables greater productivity. Jobs can be optimized for your environment, and auto-detection of the grid environment saves time and enables you to get results sooner.
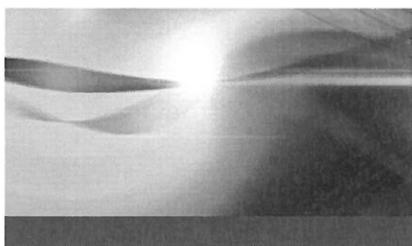
Solution Overview

SAS Office Analytics is an easy-to-use, project-oriented solution that provides access to the analytic power of SAS via the familiarity of a Windows environment. Business analysts, statisticians, and SAS programmers can gather and manage data to quickly perform meaningful analyses and seamlessly share results using applications with which they are already familiar, including Microsoft Office applications, Outlook clients and SharePoint portals.

A tiered licensing model accommodates organizations of all sizes. You can buy just what you need, and expand as your business needs grow.

Data Access and Management

Microsoft Excel users can access and view a variety of data sources, and analyze the data with SAS Analytics. An intuitive query interface returns results directly to Excel spreadsheets so you can preview and query data sources larger than those permitted by Microsoft Excel. Several thousand rows of data can be browsed at the same time. This ensures more accurate analyses based on a complete set of records, while eliminating problems associated with summarized data formats, which are often subsets or aggregations of detail data. Because data processing is performed on the SAS server, the data limitations of Microsoft Office are bypassed.

Filter and Sort dialog boxes make it easy to reduce and organize results to acceptable sizes, as well as to identify the data to be inserted into Microsoft Excel. Results from various data sources can be delivered as raw data into Excel for further manipulation with native Excel functionality.

SAS Office Analytics lets you refresh data automatically, as well as rerun any queries and apply relevant filters to ensure that the most up-to-date information is available. You can switch dynamically between multiple data sources, which enables you to run multiple tasks with different data sources from within one worksheet
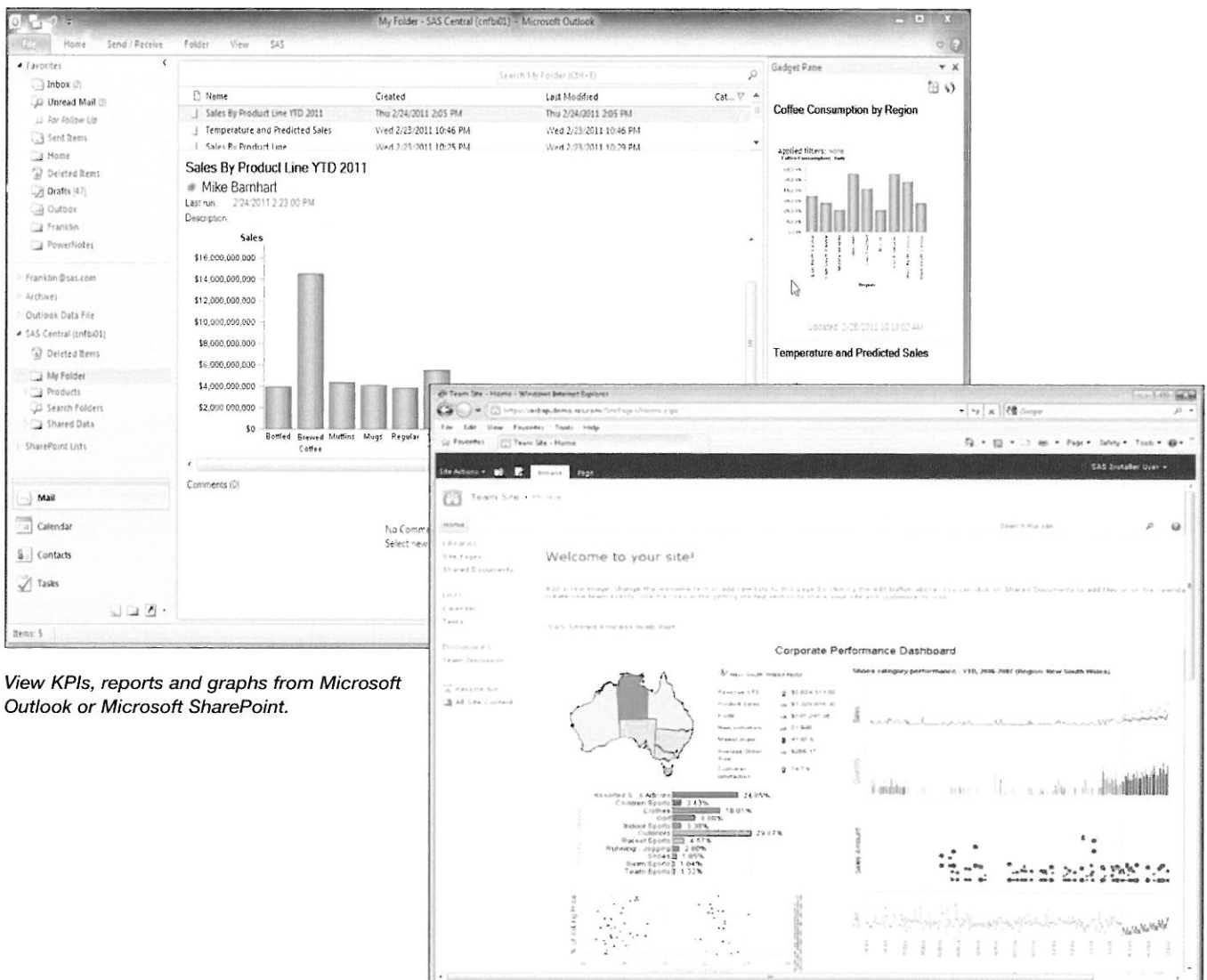
View KPIs, reports and graphs from Microsoft Outlook or Microsoft SharePoint.

or document. You receive a warning whenever the result set will be over the size limit you have set.

Streamlined, centralized security gives decision makers access to the data they need, without overburdening IT. The result is fewer backlogs, companywide access to accurate information and faster, more-informed decision making.

Powerful SAS® Analytics

SAS offers the most extensive set of predictive analytics available. SAS Office Analytics provides a wide range of statistical methods – from traditional analysis of variance to exact methods and dynamic visualization techniques. Using statistical software can help you uncover new information for improving processes, driving development and revenues, and retaining valued and satisfied customers.

Graphics and Reporting

Because almost everyone has some familiarity with Microsoft Office, businesses often use it as a standard for management reports. SAS Office Analytics lets you easily create reports and share findings. You can publish and distribute Microsoft Office documents – with embedded SAS Analytics – to relevant decision makers using native Microsoft functionality. Recipients can update the embedded results from the Microsoft Office documents on demand, as needed.

Guided Analysis and High-Performance Tools

The solution includes SAS® Enterprise Guide®, which gives advanced users access to more sophisticated types of analyses, data manipulation and visualization. You can incorporate these custom analyses and results into Web-based reports or Microsoft Office documents seamlessly.

Key Features

Data Access and Management

- Map physical data structures to business terms in an easy-to-use interface.
- Access data from virtually any data source, including multiple sources at once.
- Define consistent business views of the data for relational tables and OLAP cubes.
- Create one business view over disparate database management systems for a combined set of query attributes.
- Combine data from multiple sources.
- Control the size of result sets that can be returned to avoid long-running queries.
- Capture consistent business rules and specify allowable options and prompts for users.
- Centrally manage metadata.
- Create and manage repositories and prompts (including cascading prompts that use dynamically generated value lists), control the SAS Metadata Server, define access controls, and register and manage users and groups through a single interface.

Guided Analysis and High-Performance Tools

- Enable power users, programmers and analysts to perform more advanced types of analyses using .NET-based native Windows applications.
- An enhanced user interface includes context-sensitive menus, toolbars and role-based user definitions.
- Includes a large number of prebuilt tasks and task templates covering a variety of topics.
- Create complex conditional processing faster with Wizard-driven conditional flow logic capabilities.
- Enhance programmer productivity with program editor features, such as autocomplete and integrated syntax.
- Improve the efficiency of query-building processes with computed columns creation, filtering options and the ability to preview results.
- View OLAP cubes from SAS or other vendors that support OLE DB for OLAP and the MDX standard.
- Use slices of OLAP cubes for further analysis.
- Easily incorporate geospatial data into analyses.
- Query and subset data graphically from any accessible source or write SQL/MDX.
- Package results into SAS Stored Processes for use in all SAS Business Intelligence interfaces and Microsoft Office to gain access to anything SAS can do, allowing work to be distributed without IT involvement while maintaining security.
- Integrate with high-performance tools from SAS with the addition of the High-Performance Logistic and High-Performance Linear Regression tasks.
- View all errors, warnings and notes generated, as well as related line numbers and a sample of the affected code, in a log summary window.
- Identify potential internationalization issues in SAS programs and get substitution suggestions.
- Add notes to a process flow or to specific objects in the process flow.
- Includes the new .msi installer and application streaming support.

Microsoft Office Integration

- Access SAS capabilities for data access, reporting and analytics directly from Microsoft Office tools, including Word, Excel, PowerPoint and Outlook.
- Create wizard-driven reports within Microsoft Office tools.
- View previously created results offline.
- Use Microsoft Excel as an application instead of an ad hoc data store.
- Access data from any centrally IT-defined enterprise data source and perform a "writeback" to source data using Microsoft Excel.
- Refresh data at the click of a button from any central, IT-defined enterprise data source.
- Cycle through data that exceeds Microsoft Excel's row limitations. Server-side optimization ensures large data sources are never transferred as one to the client.

Integration with high-performance tools, as well as several administration and productivity enhancements, enable faster, more efficient results, and less margin for error.

Microsoft SharePoint Integration

By adding a SAS Stored Process Web part to a SharePoint site, you can enable report consumers to view and refresh reports, as well as apply filters and parameters for custom views, while maintaining user authorizations and reusing the underlying SAS asset.

Business Metadata Management for IT

IT users and data architects can define business rules consistently and translate data structures into terms that business users can understand and use. These data structures enable IT to control which data – and what volume of data – users can retrieve. This ensures that IT maintains control of the data without infringing on users' flexibility and productivity.

SAS® Office Analytics System Requirements

To learn more about SAS Office Analytics system requirements, download white papers, view screenshots and see other related material, please visit sas.com/ officeanalytics.

Key Features (continued)

- Use all Microsoft Excel capabilities on the data displayed, while always having access to the latest view of information.
- Embed intelligence and information derived from SAS into Microsoft Word and Excel.
- Deliver results as a PDF, RTF, or HTML with Microsoft Word, raw data (CSV) or HTML into Excel for further manipulation with native Microsoft Office functionality.
- Manipulate pivot tables to illustrate multidimensional data from various sources.
- Deliver graphics results directly into Microsoft Word, Excel, PowerPoint and Outlook in any of these formats: ActiveX, PDF, GIF, JPEG or PNG.
- Refresh tables and charts automatically to get the latest view of information, pulling from current data that is centrally maintained.
- Enable distribution of embedded results on demand using native Microsoft Office functionality.
- Utilize the latest Microsoft Office ribbon-bar technology to logically group like items.
- View visualizations and explorations created by SAS Visual Analytics in Microsoft Word, Excel and PowerPoint.
- Render reports created with SAS Enterprise Guide in Microsoft Office.

Microsoft SharePoint Integration

- Add reports from SAS Stored Processes to SharePoint so users can monitor organizational performance.
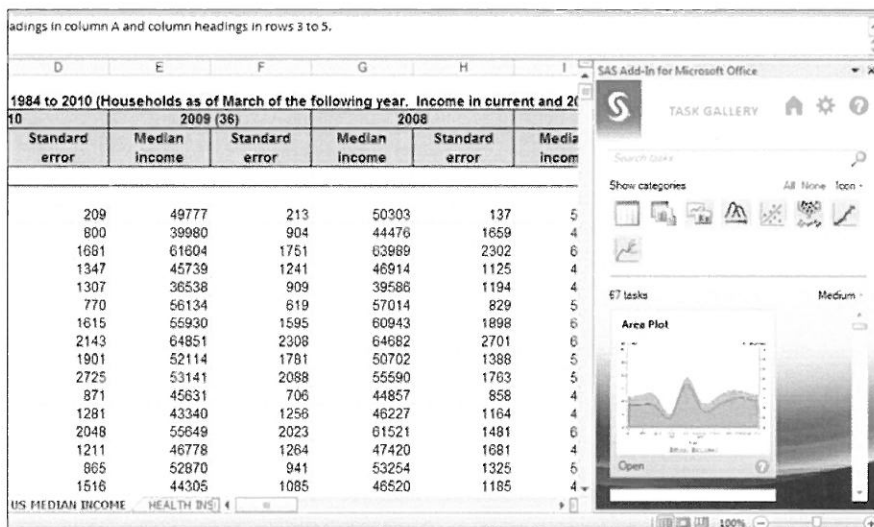
Seamless integration with Microsoft Office for easy access to SAS tasks, charts and statistics.

SAS® Data Management Advanced

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A complete solution designed to meet the full spectrum
of enterprise data integration needs

Organizations struggle daily with the challenges of large distributed data volumes, inconsistently defined data across disparate systems and high expectations from data consumers who depend on information to be correct, complete and available when they need it. SAS Data Management Advanced provides a comprehensive solution that enables organizations to solve these challenges in a timely, cost-effective manner. It enables the efficient management of data integration projects on an enterprise scale, increasing overall productivity and reducing the total cost of ownership.

Key Benefits

- **Always access the data you need.** From legacy systems to ERP applications to data stored in Hadoop, data from virtually any hardware platform or operating system can be accessed, cleansed and processed. New source systems can easily be added and security is managed centrally. This saves time, shortens learning curves and gives decision makers the complete information they need.

- **Reuse work by others.** A common repository enables the centralized storage, management and reuse of work based on user authorizations, reducing both development and maintenance time.

- **Improve productivity.** A GUI environment that is easy to use provides a standard interface for building and documenting work. Collaboration is encouraged and manual coding is available when needed. New team members can get up to speed quickly on work done by others, which is important when documentation is inadequate or missing.

- **Manage security and administration at all levels.** Reusable templates make it quick and easy to provide role-based authorizations and administrative privileges at the user, department or enterprise level.

- **Meet time constraints even within decreasing windows of availability.** SAS processes data fast! Organizations can take advantage of a grid-enabled, load-balanced, multithreaded parallel processing architecture that can quickly transform and move data between different platforms and systems. SAS also supports zero data movement by using SQL pass-through into popular database appliances, including Oracle, DB2, Teradata, Netezza, SQL Server, Aster and Hadoop.

- **Deliver consistent, trusted and verifiable information.** Consistently getting correct data when and where it is needed provides increased confidence in the accuracy and timeliness of operational and business information. Data quality auditing tools monitor the quality of data in processes and source systems. Users can see where data originated and how it was transformed. Optional enrichment components can add value and ensure everyone receives the best possible data.

- **Eliminate overlapping, redundant tools and systems with one solution.** SAS offers the only comprehensive enterprise data integration solution that is built from the ground up to meet the full spectrum of data integration needs. It eliminates the piecemeal approach of linking and managing technologies from different vendors and provides lower overall cost, reduced risk and faster results.

Product Overview

SAS offers the only comprehensive enterprise data integration environment that is built from the ground up to meet enterprise data integration needs. Instead of linking and managing technologies from different vendors, SAS Data Management Advanced offers a collaborative design environment promoting object reuse and sharing, administrative controls, wizard-driven design process workflow, and ease of use and maintenance. This flexible, reliable solution can access data from virtually any system in any form, transform and cleanse data in real time, and handle data migration, synchronization and federation projects all through a versatile services environment that is easy to deploy and maintain.

Interactive Data Integration Development Environment

A graphical user interface (GUI) simplifies and speeds projects with wizards, extensive built-in transformations and powerful productivity enhancements, all while providing a single point of control for managing complex enterprise data integration processes. SAS Data Integration Studio is easy to learn and use. Its collaborative environment lets you build reusable processes to speed data integration development. It automatically captures and manages standardized metadata from any source, and enables you to display, visualize and understand enterprise metadata and your data integration processes.

Connectivity and Data Access

Most organizations struggle with accessing the plethora of data sources (legacy, relational, flat files, XML, cloud data, text, etc.) that are needed to support analytical systems. SAS Data Management Advanced lets you connect to virtually all types of data sources and types, operating systems and hardware environments using both native access and open standards. It also supports the reading and writing of data from message queues and the sending and receiving of data to and from Web services.

Metadata Management

SAS provides a shared metadata environment that is both independent (for data integration) and part of SAS' comprehensive platform. Technical, business, process and administrative metadata is stored and managed in a way that facilitates reuse of existing table definitions, business rules and more. Navigational tools help users understand how the data was derived and where it is stored and used. Shared metadata provides a consistent definition across data sources to speed integration projects, simplify design and reduce maintenance costs.

Data Cleansing and Enrichment

There is an increased awareness, driven by compliance mandates and data breaches, of how data quality and data governance can directly affect the bottom line. This puts increasing pressure on IT to address potential data quality issues. With SAS Data Management Advanced, you get a single environment that seamlessly integrates data quality within the data integration process, taking users from profiling and rules creation through execution and monitoring of results. From data deduplication (e.g., within database marketing applications) to cleaning up data (e.g., before storing in a data warehouse), SAS provides an enterprise approach that lets you develop and share a library of data rules and processes between projects and across the entire data integration solution. Organizations can transform and combine disparate data, remove inaccuracies, standardize on common values, parse values and cleanse dirty data to create consistent, reliable information.

Extraction, Transformation and Load (ETL) and Extraction, Load and Transformation (ELT)

Loading data warehouses and data marts within allotted time windows, quickly building analytical marts for special projects, and creating extract files for reporting and analysis applications are tasks IT organizations face each day. SAS Data Management Advanced includes an intuitive point-and-click Design Editor window that allows developers to easily build logical process workflows, quickly identify the input and output data stores, and create business rules in metadata. This enables the rapid generation of data warehouses, data marts and data streams. Users can also choose to have many transformations and processes take place inside a connected database, data warehouse or storage system. This is referred to as ELT, push-down or in-database processing, and can substantially speed up overall processing times by reducing unnecessary data movement. SAS Data Management Advanced uses visual SQL push-down to select the optimal processing approach.

Migration and Synchronization

Moving data from system to system is a constant activity in most organizations. Mergers and acquisitions result in multiple, overlapping systems containing information that often needs to be synchronized and ultimately migrated. Moving legacy data during upgrades and conversions is an ongoing process, as is the movement of data into and out of enterprise applica-

tion systems. SAS Data Management Advanced enables you to migrate, synchronize and replicate data across different operational systems and data sources. The point-and-click process design editor makes it easy to document migration and synchronization processes in workflows that can be reused and modified for other projects. Powerful data transformations are available for altering, reformatting and consolidating information during these processes. You also can build a library of reusable business rules ensuring that bad data is never spread from system to system. In this way, information delivered across all applications, systems, environments and geographies is up-to-date, consistent and accurate.

Data Federation

Organizations have data stored and scattered in and across numerous data sources. Often what's needed is fast access to the most current operational data to support real-time analytics and reporting needs. With SAS Data Management Advanced, you can query and use data across multiple systems without the physical reconciliation or movement of source data. The logical semantic layer shields business users from the complexities of the underlying physical data. By avoiding unnecessary data replication and movement, it is possible to quickly and cost-effectively deliver up-to-date data that is consistent and accurate.

Master Data Management Support

SAS Data Management Advanced includes data-mastering capabilities that provide a basis for implementing master data management projects so you can identify, standardize and correct common master data such as customer and product data. Unsurpassed data access, profiling, enrichment, clustering and consolidation to clean, standardize and enhance data, and an intuitive development environment that is adaptable to each organization's technologies and standards, increase productivity and produce more rapid results.

Data Governance

All organizations need an effective governance strategy to manage their different types of data. SAS Data Management Advanced has Web-based interfaces to help you maintain a single, consistent set of policies and processes for monitoring and managing data across your enterprise. Business users and the IT staff can easily collaborate on the creation and management of business terms. Users can easily store and manage different types of data hierarchies. Hierarchy information creates a complete view of relationships among business terms and links relationships across data elements. Definitions and relationships can be clearly defined for each entity and entity values, and you can identify, profile and validate reference data from any source system.

SOA and Message Queue Integration

Organizations want to improve operational efficiency, streamline processes and be more agile. Using a service-oriented architecture (SOA) approach helps IT ensure that various applications can communicate with each other to meet changing business requirements. SAS Data Management Advanced enables developers to build sophisticated data services once and deploy them across the enterprise for reuse. Message queue integration is another way to reduce maintenance and integration costs and bridge new technologies. You can access message queues in batch or real time without the need for custom programming. Integration developers simply treat message queues as any other source and target.
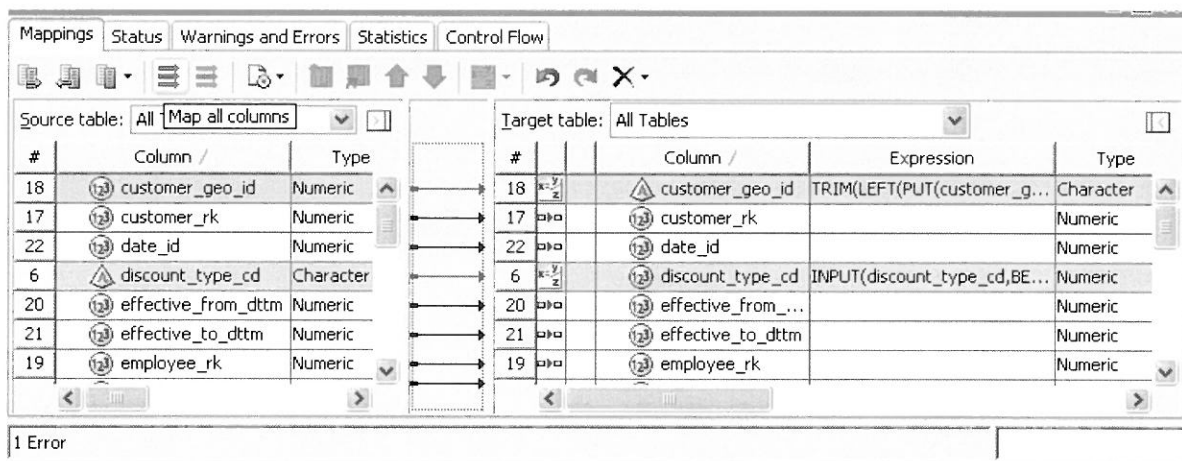
With SAS Data Management Advanced, you can define the propagation of information from table to table in your transformations. Here, default mapping rules are applied when mapping numeric to character columns, and character to numeric columns. It also shows the use of color to indicate the presence of a transformational expression between source and target.

Key Features

Interactive data integration development environment

- An easy-to-use, point-and-click GUI uses an intuitive set of configurable windows for managing data integration development processes.
- A visual, end-to-end process designer lets developers quickly build and edit processes.
- Drag-and-drop functionality eliminates programming.
- Wizards make it easy to access source systems, create target structures, import and export metadata, and build and execute ETL process flows.
- The multiple-user, multiple-level design environment supports collaboration on large, enterprise projects.
- Role-based permissions show users only what they are authorized to see.
- Customizable metadata tree views let users display, visualize and understand metadata.
- Dedicated GUI for profiling data to identify and repair source system issues while retaining the business rules for use in other ETL processes.
- Interactive debugging and testing of jobs during development and full access to logs.
- Check-in/check-out of jobs, related tables and objects; and job status viewing.
- Audit history lets designers see which jobs or tables were changed, when and by whom.
- Ability to distribute data integration tasks to nearly any platform and to connect virtually any source or target data store.
- Integration with third-party vendors Subversion and CVS provides enhanced version and source control features such as archiving, differencing and rollback.
- Job status and performance reports provide the ability to track metrics such as CPU use, memory, I/O, etc.
- Automated job deployment allows the use of common scripting languages to deploy SAS Data Integration Studio batch jobs in an automated manner.
- Enhanced SAS code import capabilities give current SAS users an easy way to import their SAS jobs and SAS code into SAS Data Integration Studio. Includes logging and error checking.
- Command-line job deployment for deploying single and multiple jobs.
- Enhanced data integration job orchestration (process flow).
- The ability to surface in-database scoring models within SAS Data Integration Studio.
- Enhanced connectivity to Aster, EMC Greenplum, Hadoop and Sybase IQ databases with the ability to push down more processing to the databases.
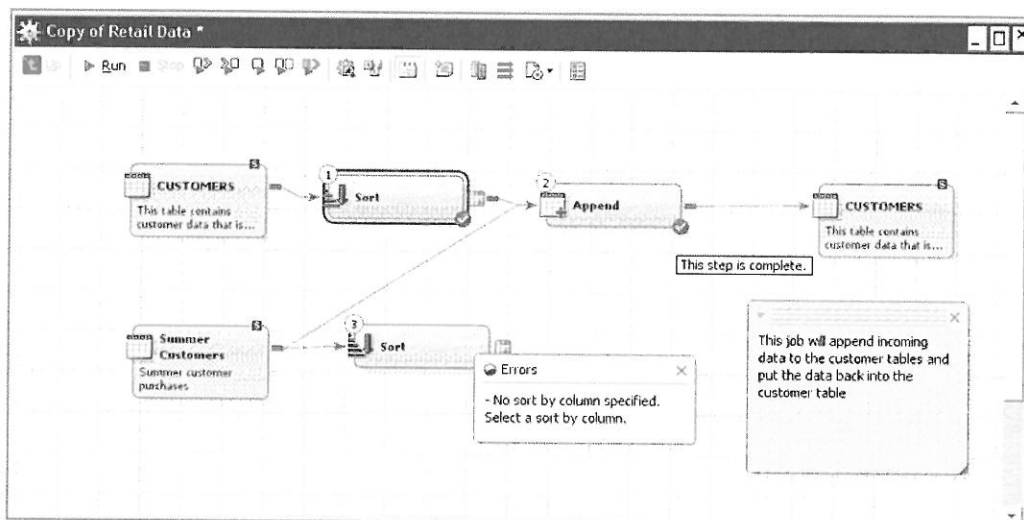
SAS Data Management Advanced includes an easy-to-use and informative GUI. You build jobs by dragging and dropping data objects into the diagram area. You can add transformations such as sorts, joins and loads from a library and draw arrows to connect the objects together. Self-documentation is provided using annotated data, and yellow notes containing further information can be added by users.

Connectivity and data access

- Provides connectivity in batch or through message queues in real time to more data sources on more platforms than any other solution.
- Data access engines are available for enterprise applications, nonrelational databases, RDBMSs, data warehouse appliances, PC file formats and more.
- Specialized table loaders provide optimized bulk loading of Oracle, Teradata and DB2.
- File reader/writer available for Hadoop file system (HDFS).
- Support for Hadoop's MapReduce, Pig and Hive within flows.
- Data movement capabilities to and from Hadoop.
- A complete and shared metadata environment provides consistent data definition across all data sources.
- Native access methods deliver the best performance and reduce the need for custom coding.
- Support for message-oriented middleware, including WebSphere MQ from IBM, MSMQ from Microsoft, Java Message Service (JMS) and Tibco Rendezvous.
- Support for unstructured and semi-structured data to parse and process files.
- Access to static and streaming data for sending and receiving via Web services.
- Expanded support for MPP databases: Aster, EMC Greenplum and Sybase IQ, enabling more ELT pushdown and support for bulk-load utilities.
- Native support for SQL-based processing.

Metadata management

- Metadata is captured and documented throughout transformations and data integration processes, and is available for immediate reuse.
- Sophisticated metadata mapping technologies for quickly propagating column definitions from sources to targets, and for creating automated, intelligent table joins.
- Metadata search tool.
- Impact analysis for assessing the scope and impact of making changes to existing objects such as columns, tables and process jobs before they occur.
- Ability to determine the path, processes and transformations taken to produce the resulting information.
- Data lineage (reverse impact analysis), which is critical for both validating processes and building user confidence in data.
- Change analysis for metadata change discovery, comparison, analysis and selective propagation.
- Multiple-user collaboration support includes object check-in and check-out.
- Promotion and replication of metadata across development, test and production environments.
- Wizard-driven metadata import and export.
- Wizard for metadata column standardization.
- Metadata-driven deployment flexibility so that process jobs can be deployed for batch execution, as reusable stored processes or as Web services.
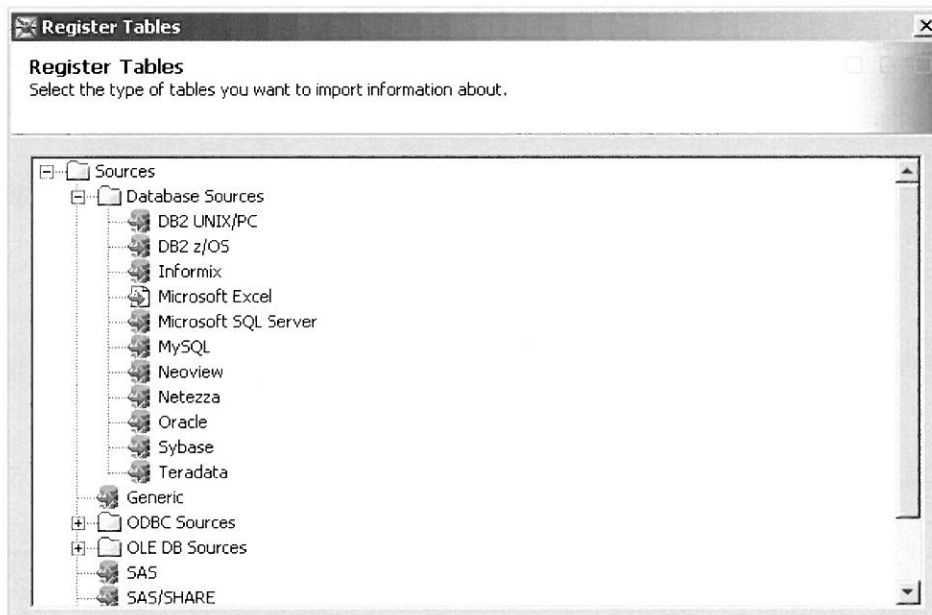
The Register Tables wizard makes it easy to access data from many different systems, as well as read and manage metadata from external sources.

Data cleansing and enrichment

- Data quality is embedded into batch, near-real-time and real-time processes.
- Data quality rules are callable through message queues, Web services and custom exits.
- Data cleansing is provided in native languages with specific language awareness and localizations for more than 20 regions worldwide.
- Data quality functions are available in both operational and reporting (transaction and batch) environments.
- Out-of-the-box standardization rules conform data to corporate standards, or you can build customized rules for special situations.
- Metadata built and shared across the entire process provides an accurate trail of actions applied to the cleansed data.
- Add value to existing data by generating and appending postal addresses, geo-coding, demographic data or facts from other sources of information.
- Data stewards can profile operational data and monitor ongoing data activities with an interactive GUI designed specifically for their needs.
- Simple process for institutionalizing data quality business rules. Apply basic or complex rules to validate data according to the specific business requirements of a particular process, project or organization. Rules may be applied in batch mode or as a real-time transaction cleansing process.
- Data quality monitoring enables you to continuously examine data in real time and over time to discover when quality falls below acceptable limits. Alerts can be issued when there is a need for corrective action.
- An interactive GUI enables you to profile operational data to identify incomplete, inaccurate or ambiguous data.
- Customizable and reusable data quality business rules that can be accessed directly within process job flows.
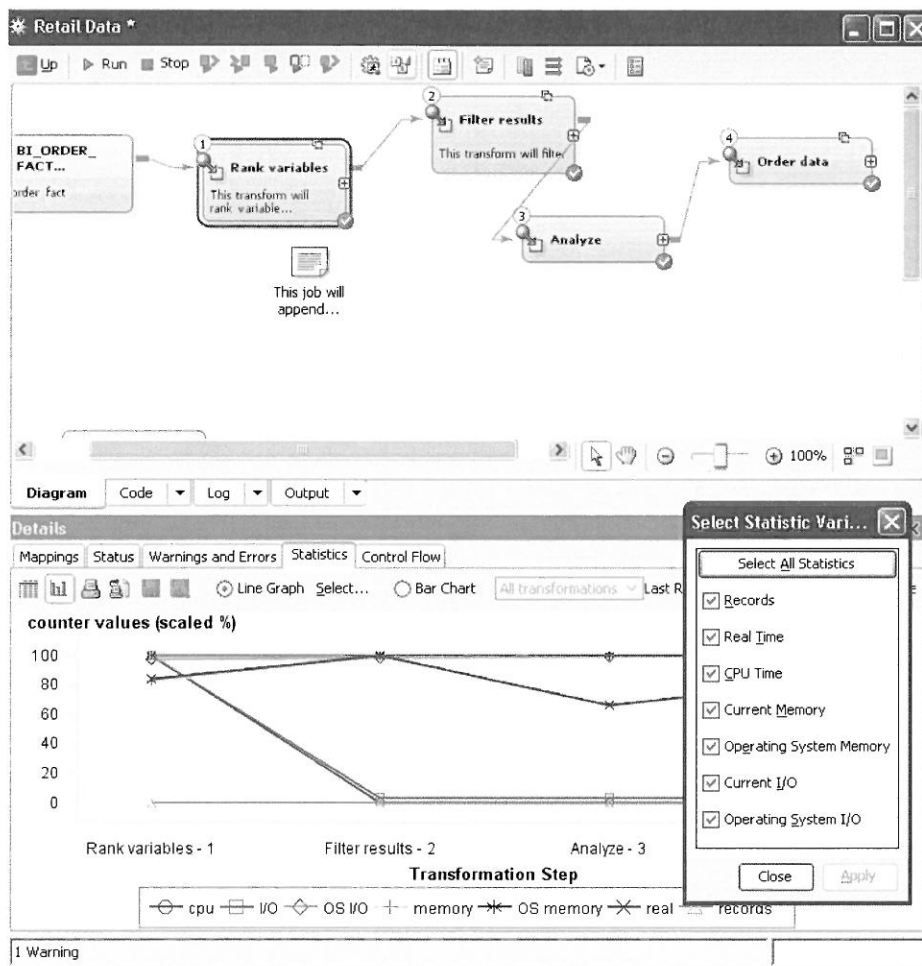
Often it is not enough to ensure that a job completes successfully as indicated by the green checkmarks in the lower right corner of each transformation step (top).

When working with large data flows, it is important to make sure that the job performs well. Saved metadata statistics are collected for each transformation step and can be viewed either graphically or in a tabular report (shown at bottom) to help tune performance.

Extraction, transformation and load (ETL) and extraction, load and transform (ELT)

- A powerful, yet easy-to-use transformation user interface that supports collaboration, reuse of processes and common metadata.
- Out-of-the-box SQL-based transforms deliver ELT capabilities, including create tables, join, insert rows, delete rows, update rows, merge, SQL set, extract and SQL execute.
- Single or multiple-source data acquisition, transformation, cleansing and loading enable the easy creation of data warehouses, data marts, or BI and analytic data stores.
- Metadata is captured and documented throughout the data integration and transformation processes and is available for immediate reuse.
- Transformations can run on any platform with any data source.
- More than 300 predefined table and column-level transformations.
- Ready-to-use analytical transformations, including correlations and frequencies, distribution analysis and summary statistics.
- Transformation Generator wizard or Java plug-in design templates let you easily create reusable and repeatable transformations that are tracked and registered in metadata.
- Transformation processes, callable through custom exits, message queues and Web services, are reusable in different projects and environments.
- Transformations can be executed interactively and scheduled to run in batch at set times or based on events that trigger execution.
- Framework for publishing information to archives, a publishing channel, email or various message-queuing middleware.
- Easily refresh, append and update during loading.
- Optimize loading techniques with user-selectable options.
- Database-aware loading techniques include bulk-load facilities, index and key creation, and dropping and truncating of tables.
- Ability to easily design, create and load OLAP cubes.
- Transformations generate high-performance SAS code that is very efficient.
- Transformations include Type 1 SCD support for merge and hash techniques, table differencing and enhancements for Type 2 SCD loaders.
- The Compare Tables transformation compares two data sources and detects changes in data.

Migration and synchronization

- Ability to migrate or synchronize data between database structures, enterprise applications, mainframe legacy files, text, XML, message queues and a host of other sources.
- Metadata-driven access to sources and targets.
- Extensive library of predefined transformations can be extended and shared with other integration processes.
- Embedded, reusable data quality business rules clean data as it is moved, synchronized or replicated.
- Recognizes changes to key fields and replicates/synchronizes changes across multiple databases.
- Optional, integrated scheduler allows changes made in one or more systems to be propagated to other systems on a scheduled basis.
- Delivers real-time data services for synchronization and migration projects.
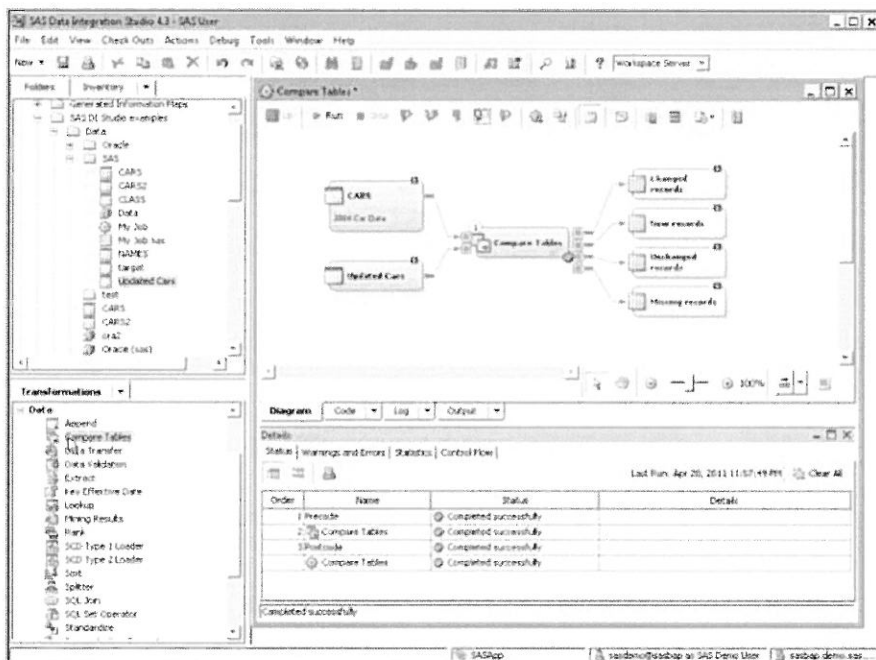
The Compare Table transformation feature compares two data sources and detects changes in data.

Data federation

- Virtual access to database structures, enterprise applications, mainframe legacy files, text, XML, message queues and a host of other sources.
- Ability to join data across data sources for real-time access and analysis.
- Instant access to a real-time view of the data using the built-in data viewer.
- Query optimization is provided both automatically as part of DBMS requests, and manually within the advanced SQL editor, and can be used for both homogenous and heterogeneous data sources.

Master data management

- Enhanced metadata search features enable you to search by type, name, date or other keywords, subset by folders or other options, and save searches for future use.
- Support for semantic data descriptions of input and output data sources uniquely identifies each instance of a business element (customer, product, account, etc.).
- Powerful transformation tools and embedded data quality processes ensure that master data is correct.
- Sophisticated fuzzy matching technology and innovative clustering methodologies enable you to validate and consolidate master records into identifiable data groups.
- Real-time data monitoring, dashboards and scorecards let you check and control data integrity over time.
- Can be used as a basis for transitioning to a full-fledged master data management offering.
- Data feeds can arrive in a single transaction or in hundreds of transactions at the same time.
- Data sets can be processed in a single pass of the source data.

Data governance

- Includes an enhanced Web-based reference data management component.
- Provides a Web-based integrated business data network environment to create a semantic layer for business users.
- Delivers integrated monitoring capabilities across the entire governance environment.

Service-oriented architecture (SOA) Web services

- Open communication protocols for Windows and Java clients give developers access to SAS data integration and analytics from other programming languages, including Java, C++, VisualBasic.Net and more.
- SAS jobs and run streams can be called and executed remotely by developers without SAS programming knowledge.
- Access to static and streaming data for sending and receiving via Web services.
- Ability to leverage SAS data management capabilities from other business applications and systems via industry-standard Web services interface.
- Ability to expose standardized data quality and data mastering capabilities for real-time access in both internal and external business applications.

Message queuing

- Provides integration of asynchronous business processes via message-based connectivity.
- Interfaces to the leading message-queuing products, including Microsoft MSMQ, IBM WebSphere, Tibco Rendezvous and Java Message Service (JMS).
- Guaranteed message/transaction delivery reduces the cost of disruptions.
- Optimized access for each message-queue manager that is designed for minimal administrative effort.
- Event-based application integration so activities in one application automatically trigger actions in other applications.
- Dynamic, event-driven run streams and alerts.
- Ability to send and receive messages between distributed and disparate systems.

For More Information

To learn more about SAS Data Management Advanced, download white papers, view screenshots and see other related material, please visit sas.com/dmadvanced.

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SAS Institute Inc.	**Fax to:**	connie. s. oswald
World Headquarters		
+1 919 677 8000	**Fax number:**	13045583970
	From:	Alan O'Neal
	Contact number:	
	Date:	10/15/2013 12:07 PM
	Number of Pages:	22

FOR SEALED BID DELIVERED 10/08/13
BUYER: Connie Oswald
SOLICITATION NO.: EDD398772 (ADDENDA 3)
BID OPENING DATE: October 15, 2013
BID OPENING TIME: 1:30pm
FAX NUMBER: 919-677-4444

As discussed, our signed acknowledgement is attached for Addenda 3 to RFP EDD398772: Design, Development, and Implementation of a Statewide Longitudinal Data System.

I would appreciate a note indicating this was successfully received.

Thanks,

Alan O'Neal
Sr. Proposal Manager ? U.S. Commercial Proposal Center
Tel: 919-531-5428 ? Mobile: 919-607-1952 ? alan.oneal@sas.com
World Headquarters ? 820 SAS Campus Drive / C2174 ? Cary, NC 27513
www.sas.com

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10/15/13 12:18:05 PM
West Virginia Purchasing Division

To contact your local SAS office, please visit: **www.sas.com/offices**

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

Solicitation

NUMBER	PAGE
EDD398772	1

ADDRESS CORRESPONDENCE TO ATTENTION OF

CONNIE OSWALD
304-558-2157

VENDOR

RFQ COPY
TYPE NAME/ADDRESS HERE

SHIP TO

DEPARTMENT OF EDUCATION

BUILDING 6
1900 KANAWHA BOULEVARD, EAST
CHARLESTON, WV
   25305-0330

DATE PRINTED
10/07/2013

BID OPENING DATE: 10/15/2013   BID OPENING TIME   1:30PM

LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT

ADDENDUM NO. 3

1.   TO PROVIDE THE ANSWER TO A QUESTION RECEIVED FOR
THIS SOLICITATION REGARDING THE PERFORMANCE BOND.
NO FURTHER QUESTIONS WILL BE ACCEPTED.
2.   TO PROVIDE REVISED TERMS & CONDITIONS TO REFLECT
THE REVISED PERFORMANCE BOND AMOUNT OF $300,000.00
3.   TO MOVE THE BID OPENING FROM: 10/9/2013
                                 TO: 10/15/2013
SAME TIME AND LOCATION.
4.   TO PROVIDE THE ADDENDUM ACKNOWLEDGMENT.

         END OF ADDENDUM NO. 3

10/15/13 12:18:11 PM
West Virginia Purchasing Division

SIGNATURE		TELEPHONE	DATE
TITLE	FEIN		ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

0002

SOLICITATION NUMBER: EDD398772
Addendum Number: 03

The purpose of this addendum is to modify the solicitation identified as
("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

| ✓ | Modify bid opening date and time

[   ]   Modify specifications of product or service being sought

| ✓ | Attachment of vendor questions and responses

[   ]   Attachment of pre-bid sign-in sheet

[   ]   Correction of error

[   ]   Other

Description of Modification to Solicitation:

1. To provide the answer to a question received for this solicitation regarding the Performance Bond.
2. To provide revised terms & conditions to include a Performance Bond of $300,000.00
3. To move the bid opening date from 10/9/13 to 10/15/13 at 1:30 pm; same location.
4. To provide the addendum acknowledgment.

Additional Documentation: Documentation related to this Addendum (if any) has been
included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in
   full force and effect.

2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by
   completing an Addendum Acknowledgment, a copy of which is included herewith.
   Failure to acknowledge addenda may result in bid disqualification. The addendum
   acknowledgement should be submitted with the bid to expedite document processing.

Revised 6/8/2012

ATTACHMENT A

EDD398772

Question and Response

1. We are unclear as to why a Performance Bond was inserted into this RFP. The reason for our uncertainty is that there is no matrix, list, or schedule as to how WV DOE will judge the chosen vendor on their performance. There is also no stated information as to how a bond may be credited back to our company, and how that process will come to fruition. Without justification on why this was inserted, the associated parameters & measures for judging any particular vendor's response, and how your organization plans to refund these fees, it's nearly impossible for anyone to fully commit to this project.

Response:

The apparent successful Vendor shall provide a performance bond in the amount of $300,000. The six (VI) goals of the Request for Proposal shall be the benchmark to determine completion of the awarded contract. The Performance Bond shall permit a reduction of $50,000 per the completion of each RFP goal. Upon the stated completion of each goal, both contractual parties must agree in writing that the specified goal has been completed, thus granting permission of a $50,000 one time reduction per each goal.

REQUIRED DELIVERABLIES to qualify for Performance Bond Reduction of $50,000:

GOAL I: Architecture, Infrastructure, and Development

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 proposed DWRS must support encryption for data in transit and for data at rest.

The proposed DWRS must be compatible with Internet Explorer 5.0 or later, FireFox, Safari, and Chrome browsers.

Operating systems, databases, and additional software must include tools with documentation, current support plans, and evidence of an existing user base.

Operating systems for all proposed servers must have the capability to receive automated upgrades, based on the patch management recommendations of the manufacturers of those operating systems, without negatively impacting the functionality of the DWRS.

The proposed solution must be able to function within the West Virginia educational system network environment.

All software components must have a maintenance plan including regular, automatic update releases.

GOAL II: Technical Support

The successful Vendor must train WVDE staff in the following areas, which are directly related to the Vendor's proposed solution: hardware, software, networking, and platform integration.

The successful Vendor must document processes and transfer knowledge of those processes to the Agency. (e.g., business rules, system documentation, etc.)

The successful Vendor must provide a solution that allows for cross-platform data exchange and secure data transformation.

GOAL III: Analysis and Reporting

The proposed reporting solution must integrate with the data warehouse as part of a larger DWRS solution.

The Vendor's solution must include a dynamic reporting engine that includes report-building capabilities, which allows for data to be displayed

in tables and graphs/graphical representations with flexible, professional-looking output for both electronic and print-optimized consumption.

The Vendor's solution must have the capacity for users to develop and run ad hoc and a priori queries and reports.

The Vendor's solution must have the capacity to export database files in multiple formats.

The Vendor's proposed reporting tool must handle at least 15 concurrent users for developing static reports to be deployed through the DWRS.

The Vendor's solution must allow for the deployment of publicly available reports with static, "canned" reports, suppression rules, and the ability to select parameters to run reports through standard web browser technology.

Must support role-specific access tied to Single-Sign-On (SSO) authentication.

Must be able to suppress/unsuppress what is displayed in reports depending on user access; must always be able to suppress student counts that are less than ten on public-facing sites.

GOAL IV: Professional Development Services

The Vendor responding to this RFP must provide professional development services for the following target audiences:

- WVDE developers and programmers responsible for system design, development, and implementation.

- Trainers who will be responsible for knowledge transfer to end-users at the SEA, LEA, school-buildings, and for the general public.

- End-users who will be accessing the DWRS to engage in data-driven decision making to improve educational outcomes for students.

The Vendor must provide face-to-face trainings for at least the WVDE developers, programmers, and train-the-trainer recipients.

The Vendor must provide face-to-face trainings for a select groups of end-users through User Acceptance Training to test system functionality.

GOAL V: Project Management

The Vendor must document all records of decision making, including, but not limited to:

> •Agendas,
>
> •The content of all meetings, and
>
> •The substance of all decisions made during contract activities (e.g., meetings, reviews, conference calls).

The Vendor must present records of all content in 4.4.III. (Goal III) in a timely manner (i.e.. within 5 business days) for review and confirmation of content. The Vendor will maintain version control (e.g., time/date stamps) of documents processed. All documents created and administered during the contract period will be cataloged and updated for WVDE use following conclusion of the contract.

The Vendor must use project management tools that track issues, provide notifications, and are accessible without the requirement to purchase software.

GOAL VI: Transition Strategy

THE SOLUTION SHALL NOT BE PROPRIETARY

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

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

0008

GENERAL TERMS AND CONDITIONS:

1. **CONTRACTUAL AGREEMENT:** Issuance of a Purchase Order signed by the Purchasing Division Director, or his designee, and approved as to form by the Attorney General's office constitutes acceptance of this Contract made by and between the State of West Virginia and the Vendor. Vendor's signature on its bid signifies Vendor's agreement to be bound by and accept the terms and conditions contained in this Contract.

2. **DEFINITIONS:** As used in this Solicitation / Contract, the following terms shall have the meanings attributed to them below. Additional definitions may be found in the specifications included with this Solicitation / Contract.

   2.1 **"Agency"** or **"Agencies"** means the agency, board, commission, or other entity of the State of West Virginia that is identified on the first page of the Solicitation or any other public entity seeking to procure goods or services under this Contract.

   2.2 **"Contract"** means the binding agreement that is entered into between the State and the Vendor to provide the goods and services requested in the Solicitation.

   2.3 **"Director"** means the Director of the West Virginia Department of Administration, Purchasing Division.

   2.4 **"Purchasing Division"** means the West Virginia Department of Administration, Purchasing Division.

   2.5 **"Purchase Order"** means the document signed by the Agency and the Purchasing Division, and approved as to form by the Attorney General, that identifies the Vendor as the successful bidder and Contract holder.

   2.6 **"Solicitation"** means the official solicitation published by the Purchasing Division and identified by number on the first page thereof.

   2.7 **"State"** means the State of West Virginia and/or any of its agencies, commissions, boards, etc. as context requires.

   2.8 **"Vendor"** or **"Vendors"** means any entity submitting a bid in response to the Solicitation, the entity that has been selected as the lowest responsible bidder, or the entity that has been awarded the Contract as context requires.

Revised 07/25/2013

3. **CONTRACT TERM; RENEWAL; EXTENSION:** The term of this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below:

☑   **Term Contract**

Initial Contract Term: This Contract becomes effective on
Upon Award
and extends for a period of   One (1)   year(s).

Renewal Term: This Contract may be renewed upon the mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any request for renewal must be submitted to the Purchasing Division Director thirty (30) days prior to the expiration date of the initial contract term or appropriate renewal term. A Contract renewal shall be in accordance with the terms and conditions of the original contract. Renewal of this Contract is limited to   Two (2)   successive one (1) year periods. Automatic renewal of this Contract is prohibited. Notwithstanding the foregoing, Purchasing Division approval is not required on agency delegated or exempt purchases. Attorney General approval may be required for vendor terms and conditions.

Reasonable Time Extension: At the sole discretion of the Purchasing Division Director, and with approval from the Attorney General's office (Attorney General approval is as to form only), this Contract may be extended for a reasonable time after the initial Contract term or after any renewal term as may be necessary to obtain a new contract or renew this Contract. Any reasonable time extension shall not exceed twelve (12) months. Vendor may avoid a reasonable time extension by providing the Purchasing Division Director with written notice of Vendor's desire to terminate this Contract 30 days prior to the expiration of the then current term. During any reasonable time extension period, the Vendor may terminate this Contract for any reason upon giving the Purchasing Division Director 30 days written notice. Automatic extension of this Contract is prohibited. Notwithstanding the foregoing, Purchasing Division approval is not required on agency delegated or exempt purchases, but Attorney General approval may be required.

Release Order Limitations: In the event that this contract permits release orders, a release order may only be issued during the time this Contract is in effect. Any release order issued within one year of the expiration of this Contract shall be effective for one year from the date the release order is issued. No release order may be extended beyond one year after this Contract has expired.

☐   **Fixed Period Contract:** This Contract becomes effective upon Vendor's receipt of the notice to proceed and must be completed within   days.

☐ **One Time Purchase:** The term of this Contract shall run from the issuance of the Purchase Order until all of the goods contracted for have been delivered, but in no event shall this Contract extend for more than one fiscal year.

☐ **Other:** See attached.

4. **NOTICE TO PROCEED:** Vendor shall begin performance of this Contract immediately upon receiving notice to proceed unless otherwise instructed by the Agency. Unless otherwise specified, the fully executed Purchase Order will be considered notice to proceed

5. **QUANTITIES:** The quantities required under this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below.

☑ **Open End Contract:** Quantities listed in this Solicitation are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually ordered for delivery during the term of the Contract, whether more or less than the quantities shown.

☐ **Service:** The scope of the service to be provided will be more clearly defined in the specifications included herewith.

☑ **Combined Service and Goods:** The scope of the service and deliverable goods to be provided will be more clearly defined in the specifications included herewith.

☐ **One Time Purchase:** This Contract is for the purchase of a set quantity of goods that are identified in the specifications included herewith. Once those items have been delivered, no additional goods may be procured under this Contract without an appropriate change order approved by the Vendor, Agency, Purchasing Division, and Attorney General's office.

6. **PRICING:** The pricing set forth herein is firm for the life of the Contract, unless specified elsewhere within this Solicitation/Contract by the State. A Vendor's inclusion of price adjustment provisions in its bid, without an express authorization from the State in the Solicitation to do so, may result in bid disqualification.

7. **EMERGENCY PURCHASES:** The Purchasing Division Director may authorize the Agency to purchase goods or services in the open market that Vendor would otherwise provide under this Contract if those goods or services are for immediate or expedited delivery in an emergency. Emergencies shall include, but are not limited to, delays in transportation or an unanticipated increase in the volume of work. An emergency purchase in the open market, approved by the Purchasing Division Director, shall not constitute of breach of this Contract and shall not entitle the Vendor to any form of compensation or damages. This provision does not excuse the State from fulfilling its obligations under a One Time Purchase contract.

8. **REQUIRED DOCUMENTS:** All of the items checked below must be provided to the Purchasing Division by the Vendor as specified below.

Revised 07/25/2013

☐ **BID BOND:** All Vendors shall furnish a bid bond in the amount of five percent (5%) of the total amount of the bid protecting the State of West Virginia. The bid bond must be submitted with the bid.

☑ **PERFORMANCE BOND:** The apparent successful Vendor shall provide a performance bond in the amount of $300,000.00   . The performance bond must be issued and received by the Purchasing Division prior to Contract award. On construction contracts, the performance bond must be 100% of the Contract value.

☐ **LABOR/MATERIAL PAYMENT BOND:** The apparent successful Vendor shall provide a labor/material payment bond in the amount of 100% of the Contract value. The labor/material payment bond must be issued and delivered to the Purchasing Division prior to Contract award.

In lieu of the Bid Bond, Performance Bond, and Labor/Material Payment Bond, the Vendor may provide certified checks, cashier's checks, or irrevocable letters of credit. Any certified check, cashier's check, or irrevocable letter of credit provided in lieu of a bond must be of the same amount and delivered on the same schedule as the bond it replaces. A letter of credit submitted in lieu of a performance and labor/material payment bond will only be allowed for projects under $100,000. Personal or business checks are not acceptable.

☐ **MAINTENANCE BOND:** The apparent successful Vendor shall provide a two (2) year maintenance bond covering the roofing system. The maintenance bond must be issued and delivered to the Purchasing Division prior to Contract award.

☑ **WORKERS' COMPENSATION INSURANCE:** The apparent successful Vendor shall have appropriate workers' compensation insurance and shall provide proof thereof upon request.

☑ **INSURANCE:** The apparent successful Vendor shall furnish proof of the following insurance prior to Contract award and shall list the state as a certificate holder:

     ☑ **Commercial General Liability Insurance:** $1,000,000.00 minimum   or more.

     ☐ **Builders Risk Insurance:** builders risk – all risk insurance in an amount equal to 100% of the amount of the Contract.

     ☑ Professional Liability - $1,000,000.00 minimum

     ☐

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The apparent successful Vendor shall also furnish proof of any additional insurance requirements contained in the specifications prior to Contract award regardless of whether or not that insurance requirement is listed above.

☐ **LICENSE(S) / CERTIFICATIONS / PERMITS:** In addition to anything required under the Section entitled Licensing, of the General Terms and Conditions, the apparent successful Vendor shall furnish proof of the following licenses, certifications, and/or permits prior to Contract award, in a form acceptable to the Purchasing Division.

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The apparent successful Vendor shall also furnish proof of any additional licenses or certifications contained in the specifications prior to Contract award regardless of whether or not that requirement is listed above.

9. **LITIGATION BOND:** The Director reserves the right to require any Vendor that files a protest of an award to submit a litigation bond in the amount equal to one percent of the lowest bid submitted or $5,000, whichever is greater. The entire amount of the bond shall be forfeited if the hearing officer determines that the protest was filed for frivolous or improper purpose, including but not limited to, the purpose of harassing, causing unnecessary delay, or needless expense for the Agency. All litigation bonds shall be made payable to the Purchasing Division. In lieu of a bond, the protester may submit a cashier's check or certified check payable to the Purchasing Division. Cashier's or certified checks will be deposited with and held by the State Treasurer's office. If it is determined that the protest has not been filed for frivolous or improper purpose, the bond or deposit shall be returned in its entirety.

10. **ALTERNATES:** Any model, brand, or specification listed herein establishes the acceptable level of quality only and is not intended to reflect a preference for, or in any way favor, a particular brand or vendor. Vendors may bid alternates to a listed model or brand provided that the alternate is at least equal to the model or brand and complies with the required specifications. The equality of any alternate being bid shall be determined by the State at its sole discretion. Any Vendor bidding an alternate model or brand should clearly identify the alternate items in its bid and should include manufacturer's specifications, industry literature, and/or any other relevant documentation demonstrating the equality of the alternate items. Failure to provide information for alternate items may be grounds for rejection of a Vendor's bid.

11. **EXCEPTIONS AND CLARIFICATIONS:** The Solicitation contains the specifications that shall form the basis of a contractual agreement. Vendor shall clearly mark any exceptions, clarifications, or

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other proposed modifications in its bid. Exceptions to, clarifications of, or modifications of a requirement or term and condition of the Solicitation may result in bid disqualification.

12. **LIQUIDATED DAMAGES:** Vendor shall pay liquidated damages in the amount

for

This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other available remedy.

13. **ACCEPTANCE/REJECTION:** The State may accept or reject any bid in whole, or in part. Vendor's signature on its bid signifies acceptance of the terms and conditions contained in the Solicitation and Vendor agrees to be bound by the terms of the Contract, as reflected in the Purchase Order, upon receipt.

14. **REGISTRATION:** Prior to Contract award, the apparent successful Vendor must be properly registered with the West Virginia Purchasing Division and must have paid the $125 fee if applicable.

15. **COMMUNICATION LIMITATIONS:** In accordance with West Virginia Code of State Rules §148-1-6.6, communication with the State of West Virginia or any of its employees regarding this Solicitation during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited without prior Purchasing Division approval. Purchasing Division approval for such communication is implied for all agency delegated and exempt purchases.

16. **FUNDING:** This Contract shall continue for the term stated herein, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise made available, this Contract becomes void and of no effect beginning on July 1 of the fiscal year for which funding has not been appropriated or otherwise made available.

17. **PAYMENT:** Payment in advance is prohibited under this Contract. Payment may only be made after the delivery and acceptance of goods or services. The Vendor shall submit invoices, in arrears, to the Agency at the address on the face of the purchase order labeled "Invoice To."

18. **UNIT PRICE:** Unit prices shall prevail in cases of a discrepancy in the Vendor's bid.

19. **DELIVERY:** All quotations are considered freight on board destination ("F.O.B. destination") unless alternate shipping terms are clearly identified in the bid. Vendor's listing of shipping terms that contradict the shipping terms expressly required by this Solicitation may result in bid disqualification.

20. **INTEREST:** Interest attributable to late payment will only be permitted if authorized by the West Virginia Code. Presently, there is no provision in the law for interest on late payments.

21. **PREFERENCE:** Vendor Preference may only be granted upon written request and only in accordance with the West Virginia Code § 5A-3-37 and the West Virginia Code of State Rules. A Resident Vendor Certification form has been attached hereto to allow Vendor to apply for the preference. Vendor's

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failure to submit the Resident Vendor Certification form with its bid will result in denial of Vendor Preference. Vendor Preference does not apply to construction projects.

22. **SMALL, WOMEN-OWNED, OR MINORITY-OWNED BUSINESSES:** For any solicitations publicly advertised for bid on or after July 1, 2012, in accordance with West Virginia Code §5A-3-37(a)(7) and W. Va. CSR § 148-22-9, any non-resident vendor certified as a small, women-owned, or minority-owned business under W. Va. CSR § 148-22-9 shall be provided the same preference made available to any resident vendor. Any non-resident small, women-owned, or minority-owned business must identify itself as such in writing, must submit that writing to the Purchasing Division with its bid, and must be properly certified under W. Va. CSR § 148-22-9 prior to submission of its bid to receive the preferences made available to resident vendors. Preference for a non-resident small, women-owned, or minority owned business shall be applied in accordance with W. Va. CSR § 148-22-9.

23. **TAXES:** The Vendor shall pay any applicable sales, use, personal property or any other taxes arising out of this Contract and the transactions contemplated thereby. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

24. **CANCELLATION:** The Purchasing Division Director reserves the right to cancel this Contract immediately upon written notice to the vendor if the materials or workmanship supplied do not conform to the specifications contained in the Contract. The Purchasing Division Director may cancel any purchase or Contract upon 30 days written notice to the Vendor in accordance with West Virginia Code of State Rules § 148-1-7.16.2.

25. **WAIVER OF MINOR IRREGULARITIES:** The Director reserves the right to waive minor irregularities in bids or specifications in accordance with West Virginia Code of State Rules § 148-1-4.6.

26. **TIME:** Time is of the essence with regard to all matters of time and performance in this Contract.

27. **APPLICABLE LAW:** This Contract is governed by and interpreted under West Virginia law without giving effect to its choice of law principles. Any information provided in specification manuals, or any other source, verbal or written, which contradicts or violates the West Virginia Constitution, West Virginia Code or West Virginia Code of State Rules is void and of no effect.

28. **COMPLIANCE:** Vendor shall comply with all applicable federal, state, and local laws, regulations and ordinances. By submitting a bid, Vendors acknowledge that they have reviewed, understand, and will comply with all applicable law.

29. **PREVAILING WAGE:** On any contract for the construction of a public improvement, Vendor and any subcontractors utilized by Vendor shall pay a rate or rates of wages which shall not be less than the fair minimum rate or rates of wages (prevailing wage), as established by the West Virginia Division of Labor under West Virginia Code §§ 21-5A-1 et seq. and available at http://www.sos.wv.gov/administrative-law/wagerates/Pages/default.aspx. Vendor shall be responsible for ensuring compliance with prevailing wage requirements and determining when prevailing wage

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requirements are applicable. The required contract provisions contained in West Virginia Code of State Rules § 42-7-3 are specifically incorporated herein by reference.

30. **ARBITRATION:** Any references made to arbitration contained in this Contract, Vendor's bid, or in any American Institute of Architects documents pertaining to this Contract are hereby deleted, void, and of no effect.

31. **MODIFICATIONS:** This writing is the parties' final expression of intent. Notwithstanding anything contained in this Contract to the contrary, no modification of this Contract shall be binding without mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). **No Change shall be implemented by the Vendor until such time as the Vendor receives an approved written change order from the Purchasing Division.**

32. **WAIVER:** The failure of either party to insist upon a strict performance of any of the terms or provision of this Contract, or to exercise any option, right, or remedy herein contained, shall not be construed as a waiver or a relinquishment for the future of such term, provision, option, right, or remedy, but the same shall continue in full force and effect. Any waiver must be expressly stated in writing and signed by the waiving party.

33. **SUBSEQUENT FORMS:** The terms and conditions contained in this Contract shall supersede any and all subsequent terms and conditions which may appear on any form documents submitted by Vendor to the Agency or Purchasing Division such as price lists, order forms, invoices, sales agreements, or maintenance agreements, and includes internet websites or other electronic documents. Acceptance or use of Vendor's forms does not constitute acceptance of the terms and conditions contained thereon.

34. **ASSIGNMENT:** Neither this Contract nor any monies due, or to become due hereunder, may be assigned by the Vendor without the express written consent of the Agency, the Purchasing Division, the Attorney General's office (as to form only), and any other government agency or office that may be required to approve such assignments. Notwithstanding the foregoing, Purchasing Division approval may or may not be required on certain agency delegated or exempt purchases.

35. **WARRANTY:** The Vendor expressly warrants that the goods and/or services covered by this Contract will: (a) conform to the specifications, drawings, samples, or other description furnished or specified by the Agency; (b) be merchantable and fit for the purpose intended; and (c) be free from defect in material and workmanship.

36. **STATE EMPLOYEES:** State employees are not permitted to utilize this Contract for personal use and the Vendor is prohibited from permitting or facilitating the same.

37. **BANKRUPTCY:** In the event the Vendor files for bankruptcy protection, the State of West Virginia may deem this Contract null and void, and terminate this Contract without notice.

38. [RESERVED]

39. CONFIDENTIALITY: The Vendor agrees that it will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the Agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the Agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in http://www.state.wv.us/admin/purchase/privacy/default.html.

40. DISCLOSURE: Vendor's response to the Solicitation and the resulting Contract are considered public documents and will be disclosed to the public in accordance with the laws, rules, and policies governing the West Virginia Purchasing Division. Those laws include, but are not limited to, the Freedom of Information Act found in West Virginia Code § 29B-1-1 et seq.

If a Vendor considers any part of its bid to be exempt from public disclosure, Vendor must so indicate by specifically identifying the exempt information, identifying the exemption that applies, providing a detailed justification for the exemption, segregating the exempt information from the general bid information, and submitting the exempt information as part of its bid but in a segregated and clearly identifiable format. Failure to comply with the foregoing requirements will result in public disclosure of the Vendor's bid without further notice. A Vendor's act of marking all or nearly all of its bid as exempt is not sufficient to avoid disclosure and WILL NOT BE HONORED. Vendor's act of marking a bid or any part thereof as "confidential" or "proprietary" is not sufficient to avoid disclosure and WILL NOT BE HONORED. In addition, a legend or other statement indicating that all or substantially all of the bid is exempt from disclosure is not sufficient to avoid disclosure and WILL NOT BE HONORED. Vendor will be required to defend any claimed exemption for nondiclosure in the event of an administrative or judicial challenge to the State's nondisclosure. Vendor must indemnify the State for any costs incurred related to any exemptions claimed by Vendor. Any questions regarding the applicability of the various public records laws should be addressed to your own legal counsel prior to bid submission.

41. LICENSING: In accordance with West Virginia Code of State Rules §148-1-6.1.7, Vendor must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agency or political subdivision. Upon request, the Vendor must provide all necessary releases to obtain information to enable the Purchasing Division Director or the Agency to verify that the Vendor is licensed and in good standing with the above entities.

42. ANTITRUST: In submitting a bid to, signing a contract with, or accepting a Purchase Order from any agency of the State of West Virginia, the Vendor agrees to convey, sell, assign, or transfer to the State of West Virginia all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the

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purchasing agency tenders the initial payment to Vendor.

43. **VENDOR CERTIFICATIONS:** By signing its bid or entering into this Contract, Vendor certifies (1) that its bid was made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, person or entity submitting a bid for the same material, supplies, equipment or services; (2) that its bid is in all respects fair and without collusion or fraud; (3) that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; and (4) that it has reviewed this RFQ in its entirety; understands the requirements, terms and conditions, and other information contained herein. Vendor's signature on its bid also affirms that neither it nor its representatives have any interest, nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency.

The individual signing this bid on behalf of Vendor certifies that he or she is authorized by the Vendor to execute this bid or any documents related thereto on Vendor's behalf; that he or she is authorized to bind the Vendor in a contractual relationship; and that, to the best of his or her knowledge, the Vendor has properly registered with any State agency that may require registration.

44. **PURCHASING CARD ACCEPTANCE:** The State of West Virginia currently utilizes a Purchasing Card program, administered under contract by a banking institution, to process payment for goods and services. The Vendor must accept the State of West Virginia's Purchasing Card for payment of all orders under this Contract unless the box below is checked.

☑   Vendor is not required to accept the State of West Virginia's Purchasing Card as payment for all goods and services.

45. **VENDOR RELATIONSHIP:** The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this Contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents. Vendor shall be responsible for selecting,

supervising, and compensating any and all individuals employed pursuant to the terms of this Solicitation and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever. Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, *etc.* and the filing of all necessary documents, forms and returns pertinent to all of the foregoing. Vendor shall hold harmless the State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

46. **INDEMNIFICATION:** The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered

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by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the Contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the Contract in a manner not authorized by the Contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage and hour laws.

47. **PURCHASING AFFIDAVIT:** In accordance with West Virginia Code § 5A-3-10a, all Vendors are required to sign, notarize, and submit the Purchasing Affidavit stating that neither the Vendor nor a related party owe a debt to the State in excess of $1,000. The affidavit must be submitted prior to award, but should be submitted with the Vendor's bid. A copy of the Purchasing Affidavit is included herewith.

48. **ADDITIONAL AGENCY AND LOCAL GOVERNMENT USE:** This Contract may be utilized by and extends to other agencies, spending units, and political subdivisions of the State of West Virginia; county, municipal, and other local government bodies; and school districts ("Other Government Entities"). This Contract shall be extended to the aforementioned Other Government Entities on the same prices, terms, and conditions as those offered and agreed to in this Contract. If the Vendor does not wish to extend the prices, terms, and conditions of its bid and subsequent contract to the Other Government Entities, the Vendor must clearly indicate such refusal in its bid. A refusal to extend this Contract to the Other Government Entities shall not impact or influence the award of this Contract in any manner.

49. **CONFLICT OF INTEREST:** Vendor, its officers or members or employees, shall not presently have or acquire any interest, direct or indirect, which would conflict with or compromise the performance of its obligations hereunder. Vendor shall periodically inquire of its officers, members and employees to ensure that a conflict of interest does not arise. Any conflict of interest discovered shall be promptly presented in detail to the Agency.

50. **REPORTS:** Vendor shall provide the Agency and/or the Purchasing Division with the following reports identified by a checked box below:

   ☑ Such reports as the Agency and/or the Purchasing Division may request. Requested reports may include, but are not limited to, quantities purchased, agencies utilizing the contract, total contract expenditures by agency, etc.

   ☐ Quarterly reports detailing the total quantity of purchases in units and dollars, along with a listing of purchases by agency. Quarterly reports should be delivered to the Purchasing Division via email at purchasing.requisitions@wv.gov.

51. **BACKGROUND CHECK:** In accordance with W. Va. Code § 15-2D-3, the Director of the Division of Protective Services shall require any service provider whose employees are regularly employed on the grounds or in the buildings of the Capitol complex or who have access to sensitive or critical information to submit to a fingerprint-based state and federal background inquiry through the state

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repository. The service provider is responsible for any costs associated with the fingerprint-based state and federal background inquiry.

After the contract for such services has been approved, but before any such employees are permitted to be on the grounds or in the buildings of the Capitol complex or have access to sensitive or critical information, the service provider shall submit a list of all persons who will be physically present and working at the Capitol complex to the Director of the Division of Protective Services for purposes of verifying compliance with this provision.

The State reserves the right to prohibit a service provider's employees from accessing sensitive or critical information or to be present at the Capitol complex based upon results addressed from a criminal background check.

Service providers should contact the West Virginia Division of Protective Services by phone at (304) 558-9911 for more information.

52. **PREFERENCE FOR USE OF DOMESTIC STEEL PRODUCTS:** Except when authorized by the Director of the Purchasing Division pursuant to W. Va. Code § 5A-3-56, no contractor may use or supply steel products for a State Contract Project other than those steel products made in the United States. A contractor who uses steel products in violation of this section may be subject to civil penalties pursuant to W. Va. Code § 5A-3-56. As used in this section:

   a. "State Contract Project" means any erection or construction of, or any addition to, alteration of or other improvement to any building or structure, including, but not limited to, roads or highways, or the installation of any heating or cooling or ventilating plants or other equipment, or the supply of and materials for such projects, pursuant to a contract with the State of West Virginia for which bids were solicited on or after June 6, 2001.

   b. "Steel Products" means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed, or processed by a combination of two or more or

   such operations, from steel made by the open heath, basic oxygen, electric furnace, Bessemer or other steel making process.

The Purchasing Division Director may, in writing, authorize the use of foreign steel products if:

   a. The cost for each contract item used does not exceed one tenth of one percent (.1%) of the total contract cost or two thousand five hundred dollars ($2,500.00), whichever is greater. For the purposes of this section, the cost is the value of the steel product as delivered to the project; or

   b. The Director of the Purchasing Division determines that specified steel materials are not produced in the United States in sufficient quantity or otherwise are not reasonably available to meet contract requirements.

53. **PREFERENCE FOR USE OF DOMESTIC ALUMINUM, GLASS, AND STEEL:** In Accordance

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with W. Va. Code § 5-19-1 et seq., and W. Va. CSR § 148-10-1 et seq., for every contract or subcontract, subject to the limitations contained herein, for the construction, reconstruction, alteration, repair, improvement or maintenance of public works or for the purchase of any item of machinery or equipment to be used at sites of public works, only domestic aluminum, glass or steel products shall be supplied unless the spending officer determines, in writing, after the receipt of offers or bids, (1) that the cost of domestic aluminum, glass or steel products is unreasonable or inconsistent with the public interest of the State of West Virginia, (2) that domestic aluminum, glass or steel products are not produced in sufficient quantities to meet the contract requirements, or (3) the available domestic aluminum, glass, or steel do not meet the contract specifications. This provision only applies to public works contracts awarded in an amount more than fifty thousand dollars ($50,000) or public works contracts that require more than ten thousand pounds of steel products.

The cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than twenty percent (20%) of the bid or offered price for foreign made aluminum, glass, or steel products. If the domestic aluminum, glass or steel products to be supplied or produced in a "substantial labor surplus area", as defined by the United States Department of Labor, the cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than thirty percent (30%) of the bid or offered price for foreign made aluminum, glass, or steel products.

This preference shall be applied to an item of machinery or equipment, as indicated above, when the item is a single unit of equipment or machinery manufactured primarily of aluminum, glass or steel, is part of a public works contract and has the sole purpose or of being a permanent part of a single public works project. This provision does not apply to equipment or machinery purchased by a spending unit for use by that spending unit and not as part of a single public works project.

All bids and offers including domestic aluminum, glass or steel products that exceed bid or offer prices including foreign aluminum, glass or steel products after application of the preferences provided in this provision may be reduced to a price equal to or lower than the lowest bid or offer price for foreign aluminum, glass or steel products plus the applicable preference. If the reduced bid or offer prices are made in writing and supersede the prior bid or offer prices, all bids or offers, including the reduced bid or offer prices, will be reevaluated in accordance with this rule.

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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
[X] 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.

SAS Institute Inc.
_____
Company

Ke Hennett
_____
Authorized Signature

October 15, 2013
_____
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.
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