Enhanced Data Entry Solution

RFI EDD393080

State of West Virginia

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Enhanced Data Entry Solution
RFI EDD39308

State of West Virginia

May 30, 2013

Submitted by:

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May 29, 2013

Connie Oswald
WV Purchasing Division
WVDE
2019 Washington Street, East
Charleston, WV 25305

Dear Connie:

Thank you for inviting SAS Institute Inc. (SAS) to respond to the request for information number EDD393080; for software products to facilitate seamless integration of student information.

SAS looks forward to partnering with West Virginia Department of Education (WVDE). The attached response provides information on how SAS can deliver a comprehensive solution to integrate data from WVEIS and provide a data entry solution to support all of the fifty seven districts information.

In our third decade of service to the education field, SAS has the specific knowledge and experience that will provide expertise and direction to enable the enhanced data entry system WVDE requires and that is described within the requirements of the RFI. As the leader in data management solutions, our proven methodology, technology, and the ability to quickly respond to customers' needs 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 provides solutions to over 30 state education agencies in the US.

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 6-12) is now a free resource from SAS to our nation's children. Shrinking budgets and pricing structures should not stand in the way of America's students receiving education technology that will engage them and better prepare them for today's work force." This multi-million dollar commitment is just the most visible example of SAS' on-going commitment to education.

Thank you again for the opportunity to participate in this RFI 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)

CERTIFICATION AND SIGNATURE PAGE

~> SAS Institute Inc.

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

_____
(Company)

_____
(Authorized Signature)

S.SAS. Kevin Farrell
Manager
Contracts Administration
SAS INSTITUTE INC.

_____
(Representative Name, Title)

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

May 29, 2013
_____
(Date)

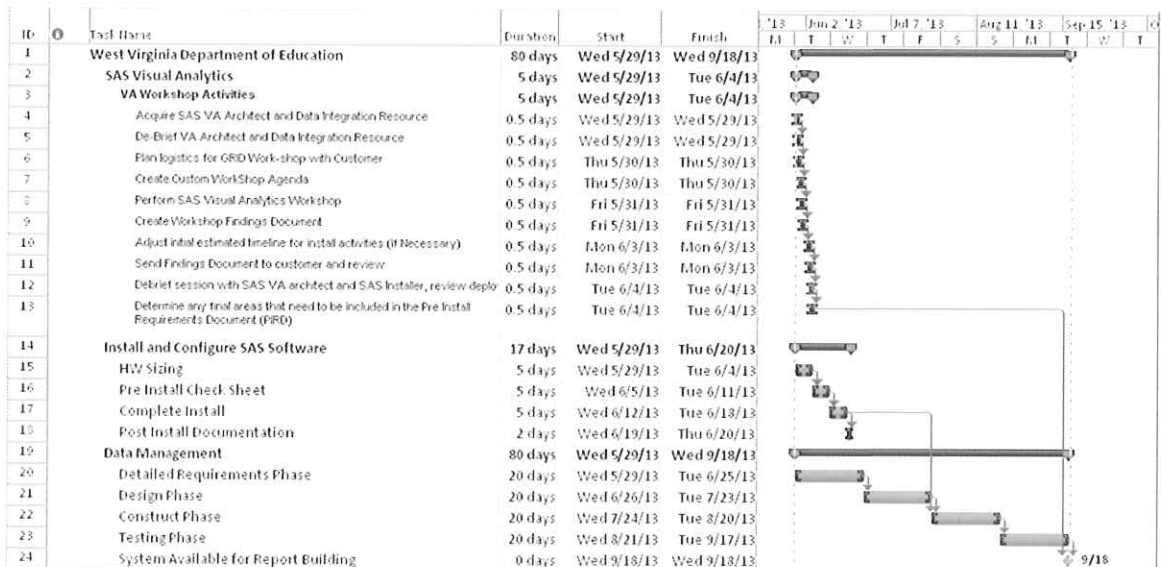VK
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Responses to Request for Information

WVDE Specifications	Complies	SAS Response
1. Provide a data entry platform online and mobile ready	✓	SAS can offer this capability through COTS with customizations to provide a web-enabled data collection system. The specific requirements for the data entry functionality will determine the approach to be used.
2. Support, pull, and transform data from/across multiple sources to be presented in a unified interface	✓	SAS enables seamless access to more than 60 data sources, including relational and non-relational databases, PC files, data warehouse appliances and distributed file systems. SAS also provides complete data management capabilities, including extensive data transformation functionality, to enable integration of source data into a single interface.
3. Have a platform that can integrate existing and new tools (e.g., attendance, grades, messaging, user-level customized reports, assessment results, etc.)	✓	SAS provides the ability to integrate data from multiple sources, in multiple formats, via an easy to use graphic interface that provides a single point of control for managing data integration processes.
4. Can integrate with existing single-sign-on structures	✓	SAS' support for Integrated Windows Authentication facilitates silent launch of desktop applications. SAS' support for Web authentication facilitates silent launch of Web applications. SAS' support for Pluggable Authentication Modules (PAM) helps unify cross-platform authentication. SAS' support for Kerberos also facilitates single sign-on functionality.
5. Have interfaces/dashboards that are intuitive, well designed, easy to use across multiple role-based access levels	✓	SAS enables users to easily conduct ad-hoc data analysis, visually explore data, develop reports, dashboards and KPIs, and share insights through the Web and via mobile tablets. Control is applied via roles that are assigned to users or groups. These roles control the availability of application features.

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WVDE Specifications	Complies	SAS Response
6. Allow for customized reports that provide instructional recommendations (e.g., strategies, tools, resources, or supports) based on data-driven and standards-based results	✓	SAS enables sophisticated and easily-customizable reports, dashboards, and explorations that readily integrate data from multiple source systems. The output can be data driven and standards-based.
7. Have the capability of creating student profiles that provide information about students' full educational careers	✓	SAS is able to access data from multiple source systems and then integrate that data in a way that makes sense for how the data need to be analyzed. Data can be maintained in the source system, in SAS data sets, or in a common data warehouse that SAS can exploit to provide educational career reporting.
8. Can be seamlessly integrated with existing data sets/systems	✓	SAS enables seamless and transparent access to more than 60 data sources and SAS provides the ability to integrate data from multiple sources, in multiple formats, via a graphic user interface.
9. Provide custom and on-the-fly reporting capabilities and analytics	✓	SAS enables users to dynamically explore data, create reports, and share information. SAS provides sophisticated, approachable (anyone can do it) analytics, such as correlations and forecasts.
10. Comply with industry standards for data exchange	✓	SAS complies with common data exchange standards, including XML, JSON, and REST APIs.
11. Support standard structured query language (SQL)	✓	SAS supports standard structured query language and the SQL procedure implements SQL for SAS.
12. Provide adequate data privacy and security	✓	SAS offers encryption features that help protect information on disk and in transit. SAS also provides a metadata-based authorization layer that supplements protections from the host environment and other systems. You can use this layer to manage access to almost any metadata object. Across authorization layers, protections are cumulative.

WVDE Specifications	Complies	SAS Response
13. Are supported with training and end-user support	✓	SAS provides training and services that empower users to realize the full potential of SAS software. The mission of the SAS Technical Support Division is to: "Help our customers make the best use of our software products through effective and responsive support, active advocacy, and a broad and flexible range of self-help resources."
14. Align and report on all content including integrated third party content as a cross-sectional analysis of daily instruction and student performance by standard	✓	SAS enables seamless access to, and integration with, multiple data sources and formats. The data can be readily queried and analyzed as a cross section of daily instruction and/or by performance compared to standard. This can be done as ad-hoc data analysis, visual data explorations, reports, dashboards and KPIs. Insights can be shared through the Web and via mobile tablets.
15. Have the ability to support batch and event-based data integrations	✓	SAS data integration processes can be executed manually, in batch, deployed for scheduling or triggered based on specific events.
16. Integrate existing Early Warning System or provide a student-focused early warning system and corresponding reporting	✓	SAS enables seamless access to, and integration with, more than 60 types of data sources. SAS is able to leverage the existing Early Warning System and surface that information for reporting, exploration, and advanced analytic analyses.
17. Provide lesson planning capabilities for teachers that could include third-party content	✓	SAS offers lesson planning resources in support of our online curriculum product, SAS® Curriculum Pathways®. The Integration Support section of our website includes sample lesson plans, demonstrating how SAS Curriculum Pathways resources can be integrated into existing curriculum. We also provide support for lesson planning through the Best Practices section of our website. Finally, the resources within SAS Curriculum Pathways can serve as a model for lesson development.

WVDE Specifications	Complies	SAS Response
18. Allow for system components to be tagged with flags/identifiers that are state-defined (e.g., Common Core State Standards, WV State Standards, etc.)	✓	For reporting purposes, SAS can manage the definitions of standards adherence for non-SAS curriculum elements. All SAS® Curriculum Pathways® resources are aligned to both individual state standards and Common Core State Standards. An educator can launch an individual resource and view the associated standards. Educators can also navigate by state standard or common core state standard to find the applicable associated resources. Additional information is available on the SAS Curriculum Pathways Common Core State Standards webpage.

Representative Timeline for Typical Product Implementation and Example of Representative Project Plan

ID	0	Task Name	Duration	Start	Finish
1		West Virginia Department of Education	80 days	Wed 5/29/13	Wed 9/18/13
2		SAS Visual Analytics	5 days	Wed 5/29/13	Tue 6/4/13
3		VA Workshop Activities	5 days	Wed 5/29/13	Tue 6/4/13
4		Acquire SAS VA Architect and Data Integration Resource	0.5 days	Wed 5/29/13	Wed 5/29/13
5		De-Brief VA Architect and Data Integration Resource	0.5 days	Wed 5/29/13	Wed 5/29/13
6		Plan logistics for GRID Work-shop with Customer	0.5 days	Thu 5/30/13	Thu 5/30/13
7		Create Custom Workshop Agenda	0.5 days	Thu 5/30/13	Thu 5/30/13
8		Perform SAS Visual Analytics Workshop	0.5 days	Fri 5/31/13	Fri 5/31/13
9		Create Workshop Findings Document	0.5 days	Fri 5/31/13	Fri 5/31/13
10		Adjust initial estimated timeline for install activities (if Necessary)	0.5 days	Mon 6/3/13	Mon 6/3/13
11		Send Findings Document to customer and review	0.5 days	Mon 6/3/13	Mon 6/3/13
12		Debrief session with SAS VA architect and SAS Installer, review deplo	0.5 days	Tue 6/4/13	Tue 6/4/13
13		Determine any final areas that need to be included in the Pre Install Requirements Document (PIRD)	0.5 days	Tue 6/4/13	Tue 6/4/13
14		Install and Configure SAS Software	17 days	Wed 5/29/13	Thu 6/20/13
15		HW Sizing	5 days	Wed 5/29/13	Tue 6/4/13
16		Pre Install Check Sheet	5 days	Wed 6/5/13	Tue 6/11/13
17		Complete Install	5 days	Wed 6/12/13	Tue 6/18/13
18		Post Install Documentation	2 days	Wed 6/19/13	Thu 6/20/13
19		Data Management	80 days	Wed 5/29/13	Wed 9/18/13
20		Detailed Requirements Phase	20 days	Wed 5/29/13	Tue 6/25/13
21		Design Phase	20 days	Wed 6/26/13	Tue 7/23/13
22		Construct Phase	20 days	Wed 7/24/13	Tue 8/20/13
23		Testing Phase	20 days	Wed 8/21/13	Tue 9/17/13
24		System Available for Report Building	0 days	Wed 9/18/13	Wed 9/18/13

Representative staffing for typical implementation

Key Roles & Responsibilities

SAS® implementations are typically very lean. Our consultants are skilled in a number of areas and draw from their skill sets to execute in many capacities. This enables us to minimize the consulting fees associated with the project. Outlined below are various SAS roles that are necessary to ensure project success.

SAS Role	Responsibilities
Project Sponsor	• Provide internal strategic perspective and priorities regarding the project for the organization implementing the project • Facilitate cross-departmental activities, as needed • Facilitate resolution of cross-departmental issues, as needed • Facilitate strategic decision-making regarding pricing, billing, cost management, or contractual matters, as needed • Manage expectations of service provider stakeholders • Represent executive management with the client, as needed
Project Manager	• Ensure adequate project planning takes place • Facilitate and manage cross-organizational activities • Monitor progress of project • Ensure team members have adequate resources • Manage project risks • Coordinate with client's project manager • Manage end-user expectations • Maintain project timeline • Act as liaison between team and end-users • Keep both service provider management and client project sponsors informed as project progresses • Establish software configuration management practices for project documents and set up project folders
Functional Lead	• Advise the project team on the key industry business objectives and the definition of the business process • Advise the project team on specific subject matter, including industry trends, and business systems requirements • Provide functional leadership to the business team • Coordinate and participate in day-to-day activities of functional development • Communicate high-level business requirements to team • Develop test plans • Write Unit and Integration Test Plans • Execute Unit and Integration Test Plans
Technical Lead	• Translate business requirements to technical requirements • Develop System requirements • Analyze requirements and perform architectural design of the system • Set up development and test environments and establish software configuration management practices for software modules • Provide technical leadership to developers

SAS Role	Responsibilities
	◆ Coordinate day-to-day activities of the development team ◆ Develop or oversee development of Software Unit Specifications and software units themselves ◆ Develop integration test plans ◆ Integrate software units and perform integration tests ◆ Develop system test plans ◆ Write technical Unit and Integration Test Plans ◆ Execute technical Unit and Integration Test Plans
Technology Architect	◆ Help team to select an appropriate set of technologies during Solution Definition ◆ Help team during architectural and detailed design tasks to ensure specialized technologies are being correctly utilized ◆ Help team with implementation issues during the Build Phase
Documentation Specialist	◆ Write user and system documentation and online help ◆ Ensure all project documents meet service provider's documentation standards, and they are appropriately trademarked

Our consulting style and approach is very collaborative and customer participation is a key to the success of our projects. We prefer to engage with our customers from the very beginning and maintain involvement throughout the course of the project. This approach leads to better solution design and user acceptance at project completion. Outlined below are customer roles that may be needed during a SAS implementation.

Customer Role	Responsibilities
Executive Sponsor	◆ Provide overall direction for team ◆ Promote cross-departmental activities ◆ Facilitate resolution of cross-departmental issues ◆ Create environment conducive to teamwork ◆ Ensure adequate funding is available ◆ Manage expectations of executives ◆ Identify the key members of the project's management team ◆ Establish key priorities ◆ May authorize and/or finance the project

Customer Role	Responsibilities
Project Manager/Project Facilitator	◆ Coordinate with service provider's project manager ◆ Monitor progress of project ◆ Ensure team members have adequate resources ◆ Manage project risks ◆ Manage end-user expectations ◆ Maintain project timeline, and ensure timely resolution of issues, such as providing timely information and feedback to the service provider team, sending Sample data ◆ Act as liaison between team and end-users ◆ Keep sponsor informed as project progresses ◆ Advise management team on various aspects of establishing the project, including applying a project methodology, identifying project resources, and identifying and evaluating the business value of the project ◆ Coordinate and oversee the execution of Acceptance Testing
Business Analyst	◆ Advise the project team on the key industry business objectives and the definition of the business process ◆ Advise the project team on specific subject matter, including industry trends, and business systems requirements ◆ Help identify and evaluate the business value of the project. This may involve establishing and measuring ROI ◆ Communicate high-level business requirements to team ◆ Assist system analyst with design issues
IT Manager	◆ Advise project team on the organization's overall IT strategy, processes, and policies ◆ Coordinate the IT staff to support the project team
IT Specialist and/or System Administrator	◆ Provide team with background on operational systems ◆ Set up and maintain servers, including SAS/SHARE and Web servers ◆ Install supporting software products ◆ Maintain networks ◆ Install and configure peripheral devices ◆ Assist programmers with software performance tuning ◆ Promote system to "production" environment ◆ Provide continuing support and maintenance to system after it is delivered

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Customer Role	Responsibilities
Database Administrator	♦ Develop detailed design of database tables ♦ Create database tables and indexes ♦ Develop database backup and recovery routines ♦ Monitor database performance and utilization ♦ Establish database security
Data Modeler	♦ Perform logical database design
Data Manager	♦ Responsible for the management of the corporate data model, providing data standards and naming conventions. ♦ Provide information on the design of the operational data sources and responsible for reviewing and approving the subject data models, dimensional data models, and physical data models
End-Users or Business Users	♦ Advise project team on business requirements, GUI requirements/preferences, and desired software attributes ♦ Actively provide feedback on intermediate deliveries, if any ♦ Assume responsibility for the quality of the system, and perform Acceptance Testing ♦ The end-users can include: ♦ Business users ♦ Business unit analyst ♦ User representatives ♦ Test users ♦ Business unit managers

Skillsets Required

Some key roles will be required to be filled by in house LAUSD employees in order to fully leverage the power of SAS.

♦ **SAS Administrator** – deployment maintenance, backups/restores, system availability, security management

♦ **SAS Data Architect(s)** – data source expertise, data extraction (DI Studio, DS4SAP functionality), OLAP design and construction (OCS, PROC OLAP), OLAP security constraints (MDX)

♦ **SAS Reporting Analyst(s)** – IMS, WRS, BI Dashboard, SAS Portal

♦ **SAS Developer/Business Analyst(s)** – Enterprise Guide, SAS Analytics Capabilities

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Typical Job Roles/User types:

- ♦ **Platform Administrators** – Responsible for installing, configuring, administering, and maintaining the platform for SAS Business Analytics.
- ♦ **Data Integration Developers** – Collect, store, and cleanse data in preparation for reporting and analysis. Data integration developers use applications such as SAS Data Integration Studio and the SAS Data Quality solution, they may also use SAS Information Map Studio, write SAS code and build cubes for Online Analytical Processing.
- ♦ **Programmers/Analysts** – Responsible for accessing and managing data and for performing complex queries and analyses by writing SAS programs or using SAS Enterprise Guide.
- ♦ **Business Analysts** – Understand their organization's data and the applications and how to use them to create reports and analyses for themselves and others in their organization. Business analysts typically use SAS Enterprise Guide, SAS Information Map Studio, and SAS BI Dashboard. They create stored processes and may use SAS OLAP Cube Studio to build cubes for Online Analytical Processing.
- ♦ **Business Users** – Access existing information as well as create their own reports and analyses using point-and-click applications by using the SAS Add-In for Microsoft Office, SAS Web Report Studio, and the SAS Information Delivery Portal.

Enhanced Data Entry
Solution

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SAS® Enterprise Intelligence Suite for Education

Enabling informed, proactive decision making

What does the SAS® Enterprise Intelligence Suite for Education do?

The SAS Enterprise Intelligence Suite for Education is a bundle of solutions for profiling, managing and analyzing data, and then deploying information across your organization. The solution gives you the information you need when you need it and in the format you need via self-service reporting and analysis.

Why is the SAS® Enterprise Intelligence Suite for Education important?

SAS addresses the entire process of translating raw data into useful, trusted and timely information for fact-based proactive decisions. Using SAS as the integrated single-source solution for data access, reporting and analysis, organizations only have to learn and maintain one software system, thus reducing cost, resources and time. They no longer have to access multiple disparate systems to access information and reports. SAS gives them the accurate, reliable information they need at their fingertips.

For whom is the SAS® Enterprise Intelligence Suite for Education designed?

The solution is designed specifically for those organizations that require self-service reporting and analysis at their fingertips, so they spend less time looking for answers and more time driving strategic decisions.

Overview

Education leaders are under increasing pressure to take a holistic view of their organizations. At the same time, a silo-based and often redundant infrastructure prevents them from seeing the big picture. The volume of available information, coupled with data irregularities, is simply overwhelming. With budget shortfalls and calls for greater accountability, there is a need for greater insight to move forward while reducing costs, implementing efficient and effective academic programs and maintaining trust. Education leaders need to access a single version of the truth to ensure that they're moving confidently, collectively and successfully into the future.

A superior solution for a single, strategic view of your organization

The SAS Enterprise Intelligence Suite for Education brings together data on students, finances, human resources, facilities, etc. to provide a holistic view of your organization so you can make informed, proactive decisions. The result is an information flow that transcends disparate silos, diverse computing platforms and niche tools. SAS is able to consolidate, cleanse and analyze vast amounts of raw data, turning it into usable insight. This takes you beyond just reporting historical data; it gives you the power of predictive analytics, enabling you to determine probable future outcomes.

The SAS Enterprise Intelligence Suite for Education includes two main core components: SAS Data Management (Standard) and SAS Enterprise BI Server.

SAS® Data Management (Standard)

SAS Data Management (Standard) provides a comprehensive solution to handle the challenges of distributed and rapidly increasing data volumes, inconsistently defined data across disparate IT systems, and the high expectations of education leaders across the organization who depend on data to be correct, complete and available when they need it.

By extending traditional data integration with data quality and profiling capabilities, you can integrate and analyze data from databases spread across education organizations. SAS Data Management does this in a timely, cost effective manner, ensures credibility and consistency, and gives organizations the ability to efficiently manage data integration and data quality projects, increasing overall productivity and reducing the total cost of ownership.

SAS® Enterprise BI Server

SAS Enterprise BI Server is a comprehensive, easy-to-use business intelligence software solution that integrates the power of SAS Analytics and SAS Data Management to provide insights to power better decisions. It includes role-based, self-service interfaces for all types of
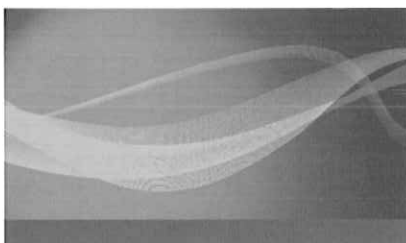
users within a well-defined IT governance framework and a centralized point of administration. This helps organizations simplify and speed business intelligence deployment.

Within SAS Enterprise BI Server, there are different interfaces and add-ins available:

SAS® Enterprise Guide® provides a guided mechanism to exploit the power of SAS and publish dynamic results throughout your institution. The solution is the preferred SAS interface for business analysts, programmers and statisticians and a key application in SAS Business Intelligence offerings.

SAS® Web Report Studio provides intuitive and efficient access to query and reporting capabilities on the Web. With SAS Web Report Studio, decision makers across the enterprise gain self-sufficient access to high-quality data and the predictive power of SAS Analytics, while minimizing administrative overhead, maximizing resources and freeing IT and IR staff to focus on strategic projects.

SAS® Add-In for Microsoft Office gives users seamless access to SAS Analytics and business intelligence from within their Microsoft Office applications, so it is easy for them to access data, perform queries and analysis and create reports. They can also use familiar Microsoft Office functionality to distribute results to others.

The SAS® Advantage

No matter where your organization is on the path toward evolving information capabilities, SAS can adapt to your situation and drive your intelligence evolution to the next level, while leveraging and extending the value of your existing IT investments. Through our proven track record of customer successes and best practices, we help you deliver the right information to the right people at the right time to help you make a difference in students' lives.

Commitment to Education

Since our beginning more than 35 years ago as a research project at North Carolina State University, SAS has remained committed to partnering with education to deliver software and services for both academics and administration. Each year, SAS donates millions of dollars as a means of improving the educational process. SAS solutions help education improve learning, services and management and are licensed and implemented at more than 3,000 educational institutions worldwide. Learn more about SAS solutions at: sas.com/education.

About SAS

SAS is the leader in business analytics software and services, and the largest independent vendor in the business intelligence market. Through innovative solutions delivered within an integrated framework, SAS helps customers at more than 60,000 sites improve performance and deliver value by making better decisions faster. Since 1976 SAS has been giving customers around the world THE POWER TO KNOW.®

■ Additional Suite Components

SAS/ACCESS® software is an interface that enables your SAS solutions to read, write and update data regardless of native databases or platforms.

SAS/STAT® software provides a complete, comprehensive set of tools that can meet the data analysis needs of the entire organization – both specialized and enterprisewide.

SAS/IML® Studio provides a powerful and flexible matrix programming language in a dynamic environment for programmers, statisticians, researchers and high-end analysts.

SAS/ETS® offers a broad array of econometric, time series and forecasting techniques that enable modeling, forecasting and simulation of business processes.

SAS/INSIGHT® makes all graphs and analyses dynamic so you can spin a three-dimensional plot to explore your data and click on points to identify them.

SAS® AppDev Studio™ supports the creation of Java applications, tapping into the back-end business analytics power of SAS.

SAS® Scalable Performance Data Server® is a data storage system that is optimized for fast loading and fast retrieval of data subsets from large stores of data.

SAS® OLAP Server is a multidimensional data store for quick access to pre-summarized data.

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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
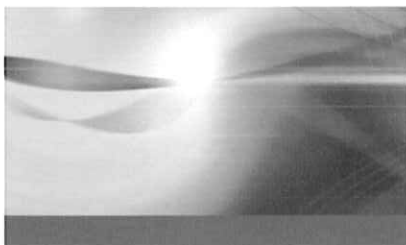
What does SAS® Visual Analytics do?

SAS Visual Analytics enables organizations of all sizes to gain analytical insights from large amounts of data through engaging exploratory analysis. You can visually explore all of your data with an easy-to-use, drag-and-drop interface without the need to subset or sample data. The solution helps you identify new patterns, trends and relationships in data that were not evident before.

Why is SAS® Visual Analytics important?

The software allows 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. With SAS Visual Analytics, you can now share information gleaned from data discovery via the Web and mobile devices.

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 communicate results via dashboards and KPIs.

Regardless of their size or sector, organizations today collect all kinds and amounts of data. Unfortunately, however, 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 produce 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 iPad 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.

- **Grow at a self-determined pace.** SAS Visual Analytics provides the option of using commodity hardware or database appliances from EMC Greenplum and Teradata. Designed from the ground up for performance optimization and scalability, the solution meets the needs of all organizations, regardless of their size.

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. Armed with reliable information, organizations can solve difficult problems, improve business performance and mitigate risk – rapidly and confidently.

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

The SAS LASR Analytic Server provides the foundation for this solution and greatly accelerates analytic computations. Because of its in-memory capabilities, SAS Visual Analytics provides extremely fast processing of data, right out of the box. Whether running in a small business, work group, department or the data center of a large enterprise, SAS Visual Analytics provides fast processing 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, SAS Visual Analytics empowers users to visually and interactively explore data to gain insights and discover patterns and trends for further analysis. Through interactive, 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 selecting items displayed from a sidebar or dynamically filtering and grouping data items.

Drag-and-drop and autocharting further broadens the audience, allowing more users of all skill levels to understand
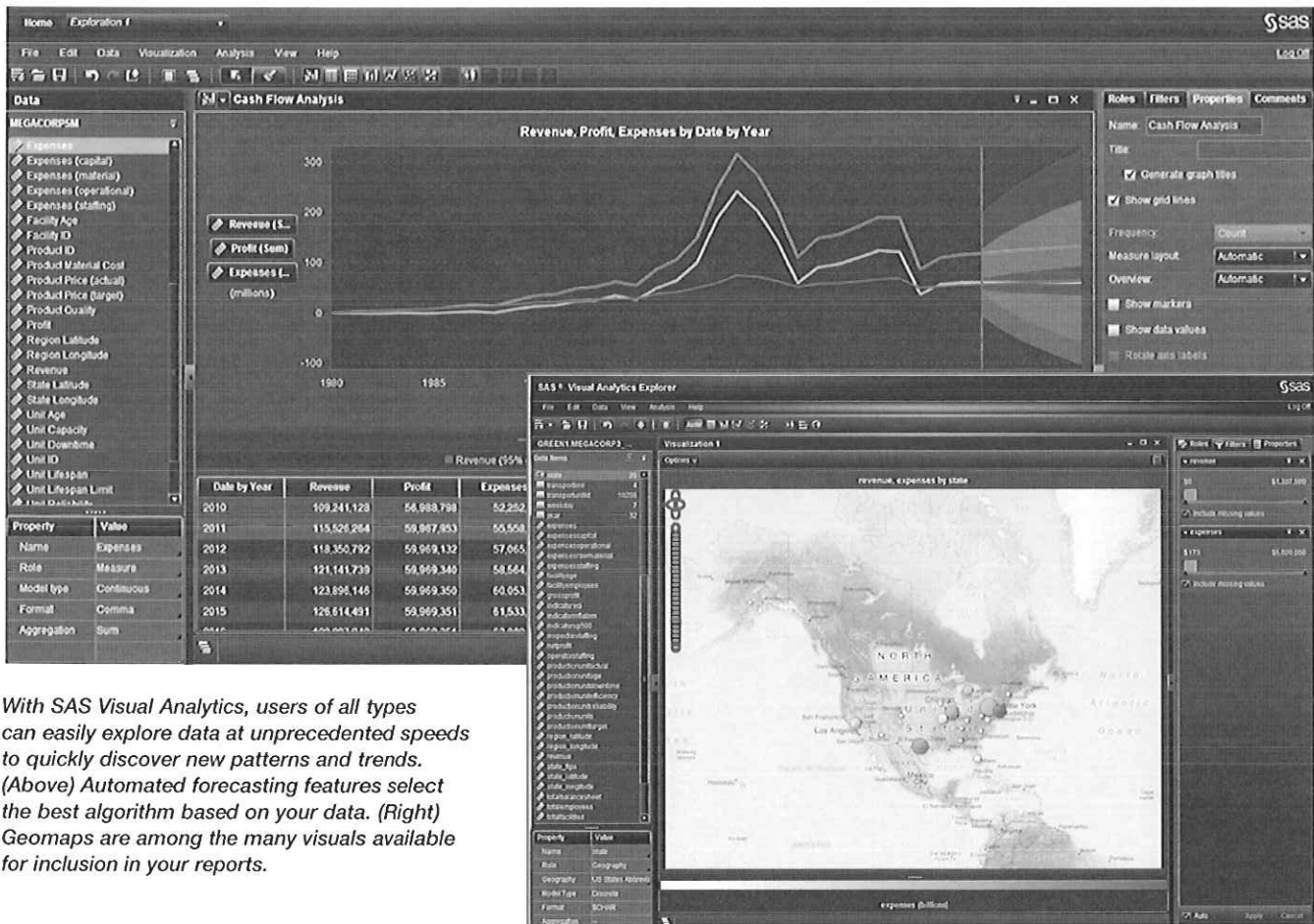
With SAS Visual Analytics, users of all types can easily explore data at unprecedented speeds to quickly discover new patterns and trends. (Above) Automated forecasting features select the best algorithm based on your data. (Right) Geomaps are among the many visuals available for inclusion in your reports.

their data. 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, including animated bubble charts. 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

Data of any size is easily conquered and analyzed with the in-memory SAS LASR Analytic Server. 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. New automated forecasting capabilities generate forecasts dynamically by automatically selecting the most appropriate forecasting method for the data chosen, enabling even novice users to forecast reliably.

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

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 from our partners EMC Greenplum and Teradata.

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 within the solution 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 automatically 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.
- Predict what might happen in the future with new forecasting capabilities.
- Generate forecasts on the fly with forecasting confidence intervals included.
- Know that the the most appropriate forecasting algorithm for specific data has been automatically selected.
- 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.

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.

Report viewing and mobile BI

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 mobile app can be downloaded from Apple's iTunes® store and Google Play. Advanced analysts can quickly view data quickly 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 them to others, who can then add their thoughts as well. Or capture your comments via video and audio to share.

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.

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.
- 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 targeted mobile devices before they are published.
- Rich desktop-like experience with 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 the most popular gestures and capabilities, including zoom, swipe, etc., to optimize ease of use and user engagement.
- 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 eamiled to others.
- Screenshots can be captured and comments shared with others.
- Alerts are provided to mobile devices when reports are updated.

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.

For More Information

To learn more about SAS Visual Analytics, download white papers, view screenshots and see other related material, please visit sas.com/visualanalytics. Or, try SAS Visual Analytics for yourself at sas.com/vademos.

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THE POWER TO KNOW.

SAS® Curriculum Pathways®

Improve and expand educational opportunity

"SAS Curriculum Pathways has really made an impact on the learning environment in my classroom. Thanks for helping to equip teachers with a comprehensive resource as we help all children achieve success."

George Ward
Math Teacher and Lead Teacher Administrator, Wake County Public School System, NC

Overview

With budgetary constraints and weakening competitiveness, US education is in dire need of accessible technology that will engage students and address the core disciplines and higher-order thinking skills essential in today's global, knowledge-based economy. SAS is fully committed, both in funding and development, to delivering online curriculum resources with a proven impact on increasing student learning and teacher effectiveness – at no cost to US middle and high schools, virtual schools, home schools, and other teaching and learning environments.

SAS Curriculum Pathways provides Web-based learning environments by integrating proven instructional strategies and techniques. The product encourages active, collaborative and cooperative learning that challenges students to become critical thinkers. SAS provides an innovative approach where doing and seeing provide information and encourage insights in ways that textbooks cannot for grades six through 12.

Built in accordance with the way students learn, SAS Curriculum Pathways is your online partner for teaching the core curriculum and is the result of more than a decade of unprecedented collaboration between teachers and technology experts. Consistent with our long-standing commitment to education, SAS will continue to develop and support US education through this and other programs.

■ Challenges

- **Lack of engagement.** Developing high-quality online courseware is expensive and takes far longer than traditional materials. With school districts' limited technical resources, educators lack access to or resist online curriculum resources.

- **Poor college preparation.** Educators are not provided compelling or remedial and support materials, and students alike have inadequate access to comprehensive course materials for individualized learning.

- **Declining achievement.** As educators and administrators find themselves unprepared or resistant to use technology in the classroom, students lack the opportunities to develop their higher-order thinking and problem-solving skills necessary for life.

- **Budgetary constraints.** Funding for education across most schools and districts is inadequate, placing nonconventional teaching methods, such as education technology, as low funding priorities. A lack of public support also prevents innovative action.

Increase student engagement

The SAS® Solution

SAS® Curriculum Pathways® can enhance student achievement and teacher effectiveness by providing Web-based curriculum resources in all the core disciplines: English language arts, mathematics, science, social studies and Spanish. Fully funded by SAS and offered at no cost to educators and students in the US, it is developed for grades six through 12 and used by educators and students in middle and high schools, virtual schools, home schools, and other teaching and learning environments. Support and advocacy for the product may come from curriculum specialists, IT professionals, the public, legislators and other government leaders, educators and administrators.

SAS Curriculum Pathways can enhance student achievement and teacher effectiveness at significantly lower costs than traditional methods. To prepare students for an increasingly competitive, knowledge-based global economy, educators need online curriculum resources that instill fundamental skills in the core disciplines. Competence in those skills is the foundation for success in academics, scientific research, business innovation and other endeavors.

Benefits

Targets higher-order thinking skills

SAS Curriculum Pathways offers tools, simulations, models and examples for student manipulation and interaction. Students can manipulate information, variables and graphs as they explore, experiment and learn. The environment encourages active and collaborative learning that challenges students to become critical thinkers and to make connections among ideas.

Integrates content and technology into the classroom at no cost to educators

SAS Curriculum Pathways provides Web-based learning environments by using proven instructional strategies and techniques, such as integrating primary-source materials and providing a broad (holistic) context for specific learning concepts and skills. Students learn by using various resources, such as visual models, images, virtual labs, diagrams, graphic organizers, audio recordings of literary excerpts, poetry, dialogues, historical documents and narrated and captioned videos.

Employs a learner-centered approach

Using the structured and guided processes of SAS Curriculum Pathways, students of varying abilities can better understand concepts and develop skills. Students become motivated as they use hyperlinked explanations, animations, glossaries and rollover definitions to better understand ideas and apply and evaluate what they learn.

Integrates various instructional strategies

SAS Curriculum Pathways provides simulations and learning activities that incorporate real data so that students can experience and understand real-world applications. The product lets students test a hypothesis and validate conclusions, construct their understanding using interactive websites, apply learning in other contexts and bring external learning into the classroom.

Incorporates formative as well as summative assessments

All lessons have measurable outcomes – requiring students to apply, evaluate or synthesize information. Interactive Tools provide several means of final assessment; formative assessment is built into the learning process, or the teacher can tailor outcomes to meet student needs. Online activities and resources can be accessed repeatedly in preparation for summative assessments, such as end-of-course tests.

Provides eco-friendly delivery and content

Minimize the impact on the environment by accessing the product and support electronically, without any CDs, DVDs, paper or packaging. Science students can learn about environmental impacts and the diversity of life with Interactive Tools on stream ecology and modern taxonomy. Virtual labs enable students to perform and repeat experiments that would otherwise be too dangerous, toxic, expensive or time-consuming.

Capabilities

Students Interact with Information to Build Skills

Interactive Tools provide online instruction and encourage insights by showing topic depth and relationships in ways a textbook cannot. They enable students to clarify concepts and build skills through active learning.

Inquiries

An Inquiry is a guided, self-paced investigation, organized around a focus question. Students answer the question in a three-step process: read, research and respond.

Comprehensive Learning Opportunities

Web Lessons are complete learning activities on a broad range of concepts and skills, designed for classroom use or independent study. Lessons may include student handouts, discussion and writing opportunities, and links to Internet sites or SAS Interactive Tools.

Audio and Visual Tutoring

An Audio Tutorial is a short lesson addressing core content. Audio and visuals help to solidify student understanding, which is assessed using an online quiz.

Core Discipline Engagement

SAS focuses on material difficult to convey through conventional methods – topics where doing, seeing and listening provide information and encourage insights in ways that textbooks cannot:

- **English Language Arts** – Our audio and video materials enhance reading comprehension and writing proficiency – in everything from essay organization to sentence structure and punctuation. Our award-winning Writing Reviser helps students ask the kind of questions experienced writers ask automatically. In the process, students develop the judgment that is essential to effective writing.

- **Mathematics** – Interactive features, animations and immediate feedback can mean the difference between comprehension and despair. Students visualize key concepts while practicing fundamental skills. Our transition modules provide lessons designed to prepare students for Algebra I (as defined by the Common Core State Standards.)

- **Science** – Virtual labs clarify abstract concepts in novel ways that provide a practical means of instruction. Dangerous, difficult, expensive or time-consuming experiments are no longer off-limits.

- **Social Studies** – A unique case study approach encourages critical thinking about complex issues. Audio and video stimulate interest and encourage rigorous scholarship, and an interactive tool helps students analyze documents.

- **Spanish** – Students enhance reading, listening and writing skills by immersing themselves in practical situations. Assessment materials let students monitor their progress.

■ The SAS® Difference

- **Rooted in education with an ongoing commitment.** Beginning more than 35 years ago as a research project at North Carolina State University, SAS continues to be committed to serving education by delivering software and academic programs that spark innovation and expand educational opportunities. To date, SAS has invested 12 years and $75 million in R&D to the development and implementation of SAS Curriculum Pathways. To further its commitment, SAS will continue to fully fund product development and offer the software at no cost to US educators.

- **Our focus on content.** With SAS, teachers, developers, artists and specialists clarify the content. For content difficult to convey with conventional methods, SAS provides an innovative approach where doing and seeing provides information and encourages insights in ways that textbooks cannot.

- **Our approach to technology.** SAS products make learning more profound and efficient, not simply more entertaining. Audio, visual and interactive components all reinforce the teachers' educational objectives.

- **Awards and support.** Year after year, SAS Curriculum Pathways earns awards for educational technologies and, more importantly, SAS earns the support of students, teachers and parents.

Why SAS®?

SAS customers represent many innovative and successful educational organizations. Read below to learn how SAS is helping both students and institutions enhance teaching and learning using SAS Curriculum Pathways.

"I didn't understand mitosis when it was introduced in class. But when we went in the lab and worked with Cell Division [in SAS Curriculum Pathways] I did. I also used [the product] to review for the test. I didn't have to ask the teacher to go over it again. I could go back on my own."

Science student

"Writing Reviser has been such a valuable tool for our students. They love the fact that they can analyze their own writing at their own pace and were able to get a great revision before turning in their paper for a formal grade. As a teacher I trust the program to give sound instruction and suggestions to my students. Thank you for creating such an amazing instruction tool!"

Bonnie McMurray
English teacher, Marshville, NC

"[This approach] helps you learn because you can control how the information is given to you. Some teachers rush to give you all the information. But when you're on the Internet learning it yourself, you can spend as much time as you need … reading through it and figuring it out."

History student

"SAS Curriculum Pathways is a perfect complement to the online instructional resources that a virtual school uses. It provides our teachers with engaging lessons, [Interactive Tools], online tools and simulations in all core disciplines and Spanish. It promotes critical thinking skills while making our online courses relevant and fun, and allows students to learn when and where it is most convenient for them."

Julie E. Young
President and CEO, Florida Virtual School

"SAS … is developing the kind of resources I'd develop if I had more time, more funding and unlimited access to current technologies."

Karen Burden
High School Literacy Coach, Wake County Public School System, NC

"My child is part of the Internet generation. SAS Curriculum Pathways not only assumes her technological expertise – it embraces it. The [Interactive Tools] blend a variety of multimedia techniques to engage her unique learning style. I can have my child diagram sentences, balance chemical reactions or analyze the impact of the New Deal – all from the same website."

Beth Langston
Home-school parent of a high school junior

"Seventy-seven percent of students are not adequately prepared academically for first-year college courses in English Composition, College Algebra, social sciences, and Biology."

The Condition of College Readiness 2009, ACT
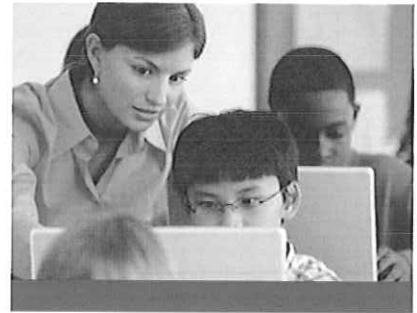
"For every academic standard, we find and license the best content available. Free access to SAS materials lets us provide students with first-class digital content, engaging lessons, and interactive high-quality instruction."

Caterina Trimm
Director of E-Learning/Head of Online School, Catholic Schools K12 Virtual

About SAS

SAS is the leader in business analytics software and services, and the largest independent vendor in the business intelligence market. Through innovative solutions delivered within an integrated framework, SAS helps customers at more than 50,000 sites improve performance and deliver value by making better decisions faster. Since 1976 SAS has been giving customers around the world THE POWER TO KNOW.®

www.sas.com

Academic Benchmarks