Fast and Furious
How SAS® Visual Analytics Helps IT Deliver a Business Intelligence Platform for High-Speed Analytics
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What Does Your Organization Need Most?

Everyone today wants to increase and speed up their fact-based decision making. They know that decisions based on facts and insights garner better results than those based on gut feelings. And in most organizations, the burden of delivering leading-edge technologies that make better decisions a reality falls largely to IT. Most IT groups find themselves under tremendous pressure to deliver major functionality using minimal resources – with the goal of moving their organizations forward in a way that results in competitive advantage.

But it’s tough with limited resources. Business units and other departments demand more than simple reporting. They want hands-on data manipulation and exploration. They want to ask questions and get their own answers – quickly. And share answers with colleagues – without asking IT to create reports. The complexity of data usage is growing, and the user base is expanding. Everyone wants to be able to use analytics and get results from analytic processing in seconds.

If IT can empower analysts and even nontechnical users with the ability to use organizational data to answer their own questions, along with self-service analysis and visualization tools that can help them formulate new questions and gain new insights, IT leaders will be well on their way to becoming champions for innovation.

At SAS, we are happy to usher in technologies for a new era of business intelligence, including a platform that blends visualizations, analytics, dashboards and mobile reporting with heightened in-memory performance and affordable scalability. The result is a true high-performance business analytics platform that quickly provides answers to your organization’s most complex problems. These technology innovations empower your end users with self-service BI and analytics, encourage an analytic culture, and enable you to deliver a scalable, flexible infrastructure that can grow as your needs do. And you can make critical decisions, based on data and analytically derived information, with unprecedented speed.

This paper presents a high-level architectural overview of SAS Visual Analytics to help you:

- Understand the underlying solution components and the power they can deliver to different types of users.
- Become acquainted with the IT administration and management tools that will make your life easier.
- Grasp the different deployment and implementation options that are available to meet both existing and changing infrastructure needs.

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Why Business Intelligence Needs a Fast Analytics Platform

With each passing day, organizations generate and collect more data. The ability to quickly turn volumes and volumes of data into relevant information that can be used to support decision making is one of the main challenges IT departments face.

There are three things that underpin business intelligence and fact-based decision making – data, analytics and platforms. Let’s start with data. Organizations today have a lot of it. And fortunately, storage is cheaper than ever. Can you store tons and tons of data in a relational database? Yes. But can you process all of the data in those databases in a reasonable time frame? Many will agree that the increasing amounts of data and the complex computations needed to affect decisions have stretched the limits of analytic processing in relational databases. Here’s why.

SQL processing is very good at joining tables, summarizing data and extracting summarized data quickly. But advanced analytical processing, which requires multiple passes through the data, is not the type of operation that relational databases were designed for. When using SQL in a relational database system, simple statistical operations such as running a box plot can require many passes through the data. So even calculating a simple count, average, or median and standard deviation can require numerous passes and take many minutes, depending on the size of the data. With large amounts of data, some analyses would take so long on an SQL- or MDX-based database that it would be computationally unfeasible. These inefficiencies mean organizations need to look elsewhere for a platform that can process larger volumes of data.

What about analytics? It seems like most vendors now have descriptive “analytics” in their software. But it comes down to your definition of analytics. Is it simple summary statistics? Is it an operational alert? Or are we talking about powerful predictive analytics that enables you to be more proactive in your strategies and decision making – things like optimization, forecasting, predictive modeling and regressions (advanced analytics)? In the first quarter of 2013, industry analysts Forrester Research issued The Forrester Wave™: Big Data Predictive Analytics Solutions, Q1 2013. Not surprisingly, SAS was identified as the leader, with 36 percent of market share. Factors considered included strength of algorithms, how well the solutions work across different platforms, integration, how models are deployed and support for specific industry issues. SAS ranked higher for predictive analytics than any other software vendor, including IBM.
And that brings us to platforms. With today’s data variety and the need for complex computations, you need a high-performance platform that can carry out millions and billions of analytical calculations on any amount of data in a matter of seconds or minutes. But the platform also must have a manageable, scalable infrastructure that is integrated with existing enterprise architectures. Deployment diversity is required. The high-speed business analytics platform from SAS provides numerous deployment options from on-site applications and cloud deployments to mobile apps. And we work with different architectures and an array of hardware vendors to support single servers (symmetric multiprocessing or SMP) and multiple servers for massively parallel processing (MPP), enabling you to get the most value from your existing technology and infrastructure investments.

With today’s data variety and the need for complex computations, you need a high-performance platform that can carry out millions and billions of analytical calculations on any amount of data in a matter of seconds or minutes.

The Paradigm Shift: Self-Service BI and Approachable Analytics

Today’s IT departments are faced with more users, more data and more requests for self-service analytics and reporting. There is increased interest in using more sophisticated analyses to ferret out new insights. And of course there is the need for speed.

In this world where business intelligence (BI) and analytics are converging, SAS Visual Analytics combines out-of-the-box, self-service business intelligence with fast descriptive, predictive and prescriptive analytics. It is a solution that enables organizations of any size to derive insights from data by giving both data analysts and nontechnical users the ability to easily explore data on their own, create compelling data visualizations, and deliver results wherever they want to – even to mobile devices. Because it can handle all sizes of data with extreme scalability, it works for any size work group, department or enterprise.

With its ease of use, SAS Visual Analytics provides a vehicle for the democratization of analytics, meaning it extends the use of analytics to a wider variety of users who possess different degrees of analytic knowledge and experience. Approachable analytics, delivered in an easy-to-use and easy-to-consume fashion, is important for organizations trying to expand their analytic cultures. The combination of analytics and the highly visual exploration interface enables all types of users to derive value from organizational data faster than ever before.

IT staffs will value the ease of use and simplicity of supporting one solution that serves many types of users and delivers value across all levels of the organization. With SAS Visual Analytics, IT can load and prepare data for multiple users in one instance. And users can then dynamically explore data on their own, create reports and share information, all without constantly requiring further assistance from IT. This self-service BI capability frees IT staff members from the constant barrage of demands from users requesting access to different amounts of data, new data views, ad hoc reports and one-off requests, while still allowing IT to control data access and security.

In this world where business intelligence (BI) and analytics are converging, SAS Visual Analytics combines out-of-the-box, self-service business intelligence with fast descriptive, predictive and prescriptive analytics.
The Beauty of SAS® Visual Analytics

If your IT department is like most, there’s frequently a backlog of requests from users. The self-service, ad hoc data visualization environment of SAS Visual Analytics empowers both nontechnical users and analysts to explore data and perform analyses to uncover patterns, and then easily share that information via visualizations in reports on mobile devices or a Web viewer. Traditional reporting is very reactive – you know what you are looking at and what you need to convey. On the other hand, data discovery invites you to probe the data, its characteristics and relationships. And because it is all powered by the SAS In-Memory Analytics platform – the SAS® LASR™ Analytic Server – it is very fast.

SAS Visual Analytics provides many types of users with self-service data discovery and visualization capabilities. 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, and 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.

Once IT has loaded data from any source into the SAS LASR Analytic Server, everyone can explore data using interactive visualizations such as charts, histograms and tables. Then, when informative visualizations are achieved, those can be incorporated into reports. Report authors can point and click to query central sources of data, add filters and look at data in many different ways. Drag-and-drop capabilities make it easy to design reports and dashboards that include KPIs, tables and graphs, which can be designed once and shared on all devices. Users do not have to design reports with mobile in mind. They can be designed once and then published to both the Web and to mobile devices.

SAS Visual Analytics empowers users across your organization to:

- Visually explore data of any size, quickly and easily.
- Uncover new relationships buried in data that were not previously known.
- Understand analytic relationships without having to be an analytical expert.
- Determine new opportunities for further analytic exploration.
- Use forecasting and scenario analysis capabilities for the preliminary analysis of what might happen.
- Design interactive, Web-based reports.
- Design reports and dashboards once, and then publish to a variety of devices with no changes required.
- View reports from Web browsers, PDFs and mobile devices.

“With the completeness and the speed of data that SAS Visual Analytics provides, combined with its intuitive interface, our analysts can, and will, push themselves to get answers to their questions.”

Peter Wijers
Business Support Manager, Euramax Coated Products
The highly visual, drag-and-drop interface combined with high-performance analytics technologies accelerates analytic computations, empowering organizations to derive maximum value from all of their data. This creates an unprecedented ability to solve difficult problems, improve organizational performance and find new ways to advance business efficiencies, making or saving your company valuable money.

Figure 1: Business users can quickly explore and understand relationships in their data and easily create interactive reports that can be distributed to Web viewers or mobile devices.

Understanding the Components of SAS® Visual Analytics

The heart of SAS Visual Analytics lies in the SAS LASR Analytic Server – an innovative in-memory server engineered to accelerate analytic computations. The solution also includes an integrated suite of Web clients and mobile apps along with a foundation server environment and a middle-tier management component. The in-memory analytics platform provides the processing power. The clients provide ease of use. The server and middle tier tie all of the pieces together, creating a high-speed business intelligence and analytics platform.
High-Performance SAS® LASR™ Analytic Server

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 a high-performance analytics platform that can efficiently use all available processing cores.

The vision of SAS CEO Jim Goodnight was integral in the development of the SAS LASR Analytic Server. As he visited a customer site, conversations centered on some key challenges concerning processing large amounts of data quickly. Goodnight says, “I had a long flight home to spend thinking about the problem, and I knew what we needed to do. I came back and talked with my development teams. We found that with the multiprocessor chips now available, we could build a very large in-memory matrix in a matter of seconds. We could distribute our SAS statistical operations across different processors and spread the computational load out among them so they would run much faster, and in parallel.” SAS development teams took it from there, and the result was the SAS LASR Analytic Server that lets you:

- Persist data in memory within a distributed environment.
- Use large amounts of distributed memory as if it were a single platform.
- Perform extremely fast analytic operations on data.
- Reduce startup times for distributed computing.
- Enable multiple users to access the same in-memory data in a secure manner.
- Use client-side applications such as SAS Visual Analytics Explorer to operate quickly on big data.

The unmatched performance and scalability of the SAS LASR Analytic Server provide the ability to answer questions that previously were computationally impossible. It enables users to explore data and analyze a variety of big data problems, including areas such as risk management, customer intelligence, revenue optimization and merchandise planning.

With the power of the SAS LASR Analytic Server behind the scenes, SAS Visual Analytics also includes a number of components that deliver analysis and data visualization capabilities to users. These clients communicate with the SAS LASR Analytic Server for data and calculations. All of the calculations performed by the SAS LASR Analytic Server happen on data that resides in memory, which means results are delivered incredibly fast. In addition, this processing all takes place in the server memory—not in the memory of a PC client, so an exorbitant amount of fast memory is available for loading extremely large amounts of data.
SAS® Visual Analytics Hub

The hub is the central, starting point for users of SAS Visual Analytics. This “home page” delivers a personalized and secure central location for all users and serves as an entry point for their daily activities with SAS Visual Analytics. This Web-based client makes it very easy to access and view content. Users can have their own favorite collection of reports, dashboards, explorations and stored processes as a starting point. Or they can access recently viewed visualizations and reports, search for and open existing content, or create new content. The hub also provides search capabilities across the enterprise and enables collaboration and communication with other users.

SAS® Visual Data Builder

SAS Visual Data Builder excels at accessing and loading data from a variety of sources, including relational databases, Excel spreadsheets, CSV files and SAS data sets, and then performing analytic data preparation and staging the prepared data. Once the data is staged, the server can load the data to memory for exploration by users. SAS Visual Data Builder also provides a series of features that are used in SAS LASR Analytic Server deployments. An existing table can be loaded directly into memory, the results of a query can be loaded into memory, or rows can be appended to an in-memory table on a server. And all of this can be accomplished without writing one line of code through an easy-to-use GUI. However, those familiar with SQL code can access and modify the automatically generated code.

Data preparation is an important and critical step in the analytic process. SAS Visual Data Builder makes it easy for analysts and data administrators to prepare data for analysis. They can build queries to perform joins, add calculated columns, and subset and sort data. Several productivity features speed the creation of columns based on common aggregation functions. With the data in memory, users can explore the data on their own and create visualizations with SAS Visual Analytics Explorer. Likewise, they can use the impressive reporting capabilities of SAS Visual Analytics Designer.
The SAS Visual Data Builder makes it easy for IT and data administrators to stage and load data into memory, where business users and analysts can then explore data on their own.

**SAS® Visual Analytics Explorer**

The SAS Visual Analytics Explorer is an ad hoc analysis, data discovery and visualization tool that allows users to explore and analyze their data – without assistance from IT. The interface provides options for using selected graphics as well as autocharting capabilities that help novice users choose the best visualization for their data. A drag-and-drop environment makes it easy to generate visualizations, interactively filter data and create dynamic hierarchies without the need for predefined dimensional structures.

SAS Visual Analytics Explorer can be used to explore in-memory tables from the SAS LASR Analytic Server. Exploration results can be viewed directly or exported as reports, which can be further refined using the SAS Visual Analytics Designer.

**Easy data analysis with SAS® Visual Analytics Explorer**

In addition to traditional analyses enabled via common visualizations such as bar and line charts and heat maps, SAS Visual Analytics Explorer enables users to perform several other types of data analysis, including correlations, fit lines, decision trees, box plot calculations, forecasting, scenario analyses and decision trees.

The SAS Visual Analytics Explorer is an ad hoc analysis, data discovery and visualization tool that allows users to explore and analyze their data – without assistance from IT.
• **Correlation** identifies the degree of statistical relationship between measures. The strength of a correlation is described as a number between -1 and 1. Values that are close to -1 imply a strong negative correlation, values that are close to 0 imply little or no correlation and values that are close to 1 imply a strong positive correlation. Correlation is important to business users because they can quickly identify things such as which variables influence successful marketing campaigns. They can check results more often and experiment with different variables to achieve different outcomes.

• **A fit line** plots a model of the relationship between two measures. Fit lines can be applied to scatter plots and heat maps.

• **Decision trees** are a method by which a measure or a category distribution can be explained by the variations of other measures or categories. Users can find out which of the many factors are most likely to affect a given outcome (e.g., what is most likely to affect customer satisfaction), and at what point the measures or categories provide the most impact. Decision trees are a powerful method to analyze what is happening and develop a predictive model of what is likely to happen.

• **Box plot** calculations enable users to quickly see the distribution of any measure along categories, such as sales price distribution by product brand, customer satisfaction by region, etc.

• **Forecasting** predicts future values for data based on the statistical trends in the data and is available for line charts that contain date or time data items. 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. Once forecasting is performed, additional measures can be added to refine and affect the forecasting result. The results can also be used as underlying factors to produce simulations and what-if scenarios. These dynamic capabilities illustrate to users how the forecast could be affected by changing independent variable values.

**SAS® Visual Analytics Designer**

SAS Visual Analytics Designer is used to create reports and dashboards. It enables users across your organization to view, interact with and create reports, which can be saved and viewed on either a mobile device or in the SAS Visual Analytics Viewer. Report authors can easily point and click to query central sources of data that have been provided by an administrator. They can drag and drop tables, graphs and gauges to create a well-designed report that can be rendered on desktop browsers or mobile devices. Or, they can update and refine reports that were created using the SAS Visual Analytics Explorer, adding text, images, stored processes and controls as they desire. Because of the integrated infrastructure, any exploration can be shared as a component of a report in SAS Visual Analytics Designer.
**SAS® Visual Analytics Viewer**

This Web-based client makes it extremely easy for everyone to view and interact with reports. And it is an easy way to create and share dashboards online. Among its features are the ability to navigate report hierarchies, collaborate via commenting, export data to Excel and other formats, and take advantage of existing SAS security.

**SAS® Visual Analytics Administrator**

As an IT administrator, you’ll be happy to know there is an easy way to monitor performance, security and access controls for the SAS LASR Analytic Server. You can load tables from SAS metadata to the SAS LASR Analytic Server, to HDFS or to collocated data providers such as Oracle, Teradata and Pivotal (previously Greenplum) servers, and register them as LASR tables. Large tables can be unloaded and reloaded as needed extremely rapidly with the distributed parallelized loading.

After the SAS LASR Analytic Server is started, administrators can view the information about the status, host and port information for server connections that are associated with the SAS LASR Analytic Server component in the metadata. Information is also provided about rows and columns for LASR tables that are associated with libraries and the server connection. User account information displays the start time of a SAS LASR Analytic Server connection as well as the last time it was accessed by the user.

An authorization page provides quick information about the effective permissions for a table or folder, indicates any direct access controls, and makes it easy to add or remove explicit controls. Row-level permissions for a LASR table can also be set from here so that different users and groups have different levels of access to the data. For example, regional managers can have insights into their own regions through a single report.

If you use a SAS High-Performance Analytics deployment of Hadoop, information about the properties and values for files in HDFS is shown. Because SAS uses a special file format for the data that is stored in HDFS, the HDFS content explorer also provides information about the columns and row count for the prepared data.
Figure 3: Designed specifically for IT, the SAS Visual Analytics Administrator makes it easy to monitor performance, security and access controls for the SAS LASR Analytic Server.

Resource and process monitors are provided so that administrators can view real-time statistics and visualizations of resource use such as CPU utilization, memory utilization and input/output (I/O) rates. The solution provides a line plot of resource utilization against time. In addition, a real-time view creates visualizations for each blade that is used in the cluster and each CPU on a blade.

The Mobile Devices tab lets administrators easily manage access to data through SAS Visual Analytics applications by mobile devices. Information about the mobile devices, including user ID, device information and the time stamp of the last access, is available.
Figure 4: Resource and process monitors enable you to view real-time statistics and visualizations so you can easily understand CPU utilization, memory use and I/O rates.

**SAS® Mobile BI**

SAS Visual Analytics provides native mobile applications allowing users to view their reports and dashboards on their selected devices. Currently supported devices are iPad® and Android-based tablets. SAS is continuously monitoring the market trend and the demand from customers for other operating systems, such as Windows and Blackberry, and will extend support for new devices in future releases as required.

SAS Mobile BI provides adaptive presentation capabilities so that report authors do not have to create separate reports for each device type. The report author can build once for reports that can be viewed on all devices. With this offering, SAS Mobile BI provides all the required capabilities via a highly visual and interactive mobile application backed by centralized metadata security. While viewing SAS reports, the content will be downloaded to the device to support interactive offline analysis. SAS Mobile BI facilitates collaboration by allowing users to access and share annotated content.

Additionally, SAS Visual Analytics offers two approaches to mobile security:

- The out-of-box security capabilities include mobile tethering, blacklisting, whitelisting, report wipe, application passcode, row-level data security and authentication through metadata. SAS will continue to add more mobile security-related features with every release.
SAS also recognizes that many organizations depend on third-party mobile device management software to manage the different mobile applications in use. To this end, SAS plans to support different mobile device management software vendors. We look at feedback and requests from our customers in choosing the vendors we support. Currently, we are working with Good Technologies and Mocana. We are also looking into Air Watch and Citrix.

**SAS® Foundation Servers and Midtier Management**

SAS Visual Analytics provides two foundation servers (the SAS Metadata Server and the SAS Workspace Server) that provide integration and other capabilities, as well as a midtier management component that helps you reduce the complexity and overall costs of SAS deployments.

**SAS® Metadata Server provides metadata integration and management across your organization**

SAS Metadata Server delivers the power to integrate, share, centrally manage and leverage metadata across your entire organization. It is designed for IT systems administrators looking to reduce the number of metadata silos and the costs of maintaining them to support enterprise strategies. The SAS Metadata Server:

- **Simplifies systems support.** SAS Metadata Server enables organizations to use metadata easily and consistently. This “data about data” contains valuable information on the source and format of the data, the changes it has undergone and how the data should be used.
- **Ensures data integrity.** The entire end-to-end intelligence creation process can be documented on a metadata level using SAS Metadata Server. Repositories can be promoted from development to test to production, ensuring that users have access to the repository that meets accepted corporate quality standards.
- **Lowers cost of ownership.** Because multiple data sources are supported through a common metadata layer, you can easily leverage existing database infrastructures.

**SAS® Workspace Server handles integration tasks**

SAS Workspace Servers are crucial elements of the SAS platform that enable clients to perform SAS processing and to access SAS resources. SAS Workspace Servers interact with SAS by creating a server process for each client connection. Each workspace server process enables client programs to access SAS libraries, perform tasks by using the SAS language and retrieve the results.
SAS® Web Application Server improves control and visibility of your middle-tier environment

SAS Visual Analytics now provides an embedded middle-tier server that includes all required Web infrastructure components to deliver an optimized deployment. The SAS Web Application Server includes several new middle-tier capabilities, including enhanced monitoring and management, Web-based administration, load balancing and improved availability. By taking increased responsibility for the delivery and support of the midtier services, SAS is able to provide greater control and visibility into application performance and status via management and monitoring services and reduce integration points to simplify installation and maintenance. SAS Web Application Server also lowers the total cost to deliver SAS Analytics because there is no need to acquire separate, external application servers.

Deployment Options = Architectural Flexibility

IT budgets are always scrutinized and under pressure. Yet when the organization requires growth or systems expansion, IT is expected to react quickly. Easy scalability and fast, reliable performance are important to you, and we know that business agility requires architectural flexibility.

SAS Visual Analytics offers implementation options for customers with any size data and performance requirements. With the flexibility of our in-memory analytic server, deployment configurations provide the ability to scale from a single-server environment for department and work group 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. With SAS Visual Analytics, you can select the deployment option that makes most sense for your organization.

Distributed Deployment on Commodity Hardware

SAS Visual Analytics can be deployed in a distributed environment using preconfigured commodity hardware and software packaging options. Data sources are accessed using SAS/ACCESS® engines or other SAS data access capabilities, and the data is staged in the blade environment for exploration and reporting. The blade environment is composed of a set of dedicated blades (commodity hardware) that has four main functions: middle tier, server tier, compute tier and data tier.
From the server tier, SAS Workspace Server and SAS Metadata Server work together to make data available to the SAS Visual Analytics components. The data is loaded into Hadoop (an implementation of Hadoop is included), which serves as a permanent disk store. In a second stage, the data is loaded into memory and the SAS LASR Analytic Server processes clients’ requests for fast response times. With these configurations, additional racks of blades can be added at any time to increase your computing power in near-linear fashion.

Figure 5: One of several options available, SAS Visual Analytics can be deployed in a distributed environment using preconfigured hardware and software packaging.
Distributed Deployment on Appliances

SAS Visual Analytics also can be deployed in a distributed environment on Teradata and Pivotal (previously Greenplum) appliances. Data sources are accessed using SAS/ACCESS engines or other SAS data access capabilities, and the data is staged in the blade environment for exploration and reporting. Specific database features can be used to directly and more efficiently load data into SAS Visual Analytics. The Web-based components and mobile clients communicate with the SAS LASR Analytic Server via the midtier SAS Web Application Server. With these configurations, additional racks of blades can be added at any time to increase your computing power in near-linear fashion.

Figure 6: If you choose to deploy SAS Visual Analytics in a distributed environment using database appliances, you can take advantage of specific database features for increased efficiency when loading data.
Nondistributed Deployment on Commodity Hardware

SAS Visual Analytics is also available in a single-server mode on commodity hardware, which is especially appropriate for work groups, departments and small to midsize organizations. With this configuration, all server components are installed on the same machine and there is no collocated data provider. Data sources are accessed using SAS/ACCESS engines or other SAS data access capabilities, and the data is staged for exploration and reporting. The Web-based components and mobile clients communicate with SAS LASR Analytic Server via the midtier SAS Web Application Server. Data processing and analytic computations are still distributed in parallel to all available nodes on your single-server machine.

Cloud Deployment Options

As organizations move from a traditional IT infrastructure to cloud-based applications, a key element in this shift is flexibility. You need freedom to choose the right deployment option at the right time. For SAS, flexibility means providing options for deploying sophisticated analytics solutions, including private clouds, public clouds, hosted solutions and on-site implementations.

Through cloud-enabled technology, SAS allows you to deploy solutions via:

- Private clouds in your own data center.
- The SAS Cloud (available through SAS Solutions OnDemand in the US), which provides a hosted private cloud environment where users can subscribe and access SAS Cloud tools and solutions.
- Public clouds, including Amazon EC2.
If extreme scalability and growth opportunities are your concerns, cloud-based deployments can minimize the demand on IT and at the same time provide a flexible, elastic environment to foster extreme scalability and growth opportunities.

On the other hand, if quickly getting employees up and running in a SAS Visual Analytics environment is key, the flexibility of a cloud-hosted deployment allows you to expand your SAS Visual Analytics use to more users, if and when you need to, by simply granting additional users access to the cloud environment. You can enable smaller groups with the ability to test and learn SAS Visual Analytics and then easily expand (when you’re ready) to other groups. No more hassles with hardware headaches!

**Conclusion: SAS® Visual Analytics and the IT Professional**

The responsibility of delivering leading-edge technologies that make better decision making a reality falls squarely on the shoulders of IT departments. And this is no easy task. Increasingly, everyone – business users, data scientists and analysts – wants more than simple reports and predefined views of data. They want to ask their own questions, run their own queries, perform iterative analyses, get their own answers and create their own reports. And, of course, they want results – ASAP.

In a world where the need for business intelligence and analytics is converging, SAS Visual Analytics provides an out-of-the-box solution that combines descriptive and predictive analytics with a highly visual, easy-to-use data exploration interface, enabling organizations to derive value from their data faster than ever before. The solution is powered by an in-memory analytics engine that overcomes the limitations of traditional relational databases. It is specifically designed to handle intense analytical workloads and is tuned to deliver blazingly fast results. It performs analyses in memory without the need to create SQL code or deal with the constraints of SQL processing.

IT will value the ease of use and simplicity of one solution that serves many types of users and delivers value to many different levels of the organization. With SAS Visual Analytics, IT can load and prepare data for multiple users in one instance. Once the data is loaded and made available, users across your organization can dynamically explore data, create reports and share information, all without constantly requiring assistance from IT. This frees you from the constant barrage of demands from users requesting access to different amounts of data, data views, ad hoc reports and one-off requests, while still allowing you to remain in control of data access and security.

In addition, a variety of implementation options offers the utmost in cost-effective growth for performance and scalability:

- A single-server environment for departmental, work group or SMB initiatives on commodity hardware.
- A massive, distributed blade infrastructure with as few as four or potentially hundreds of nodes for a high-performance, big data solution on commodity hardware or on database appliances, including Teradata and Pivotal (previously Greenplum).

‘That Was a Very Interesting Day …’

Kimberly Holmes, Vice President of Strategic Analytics at XL Insurance Group, doesn’t want to put any limits on what analytics can accomplish. As the Head of Strategic Analytics, Holmes recently selected SAS Visual Analytics to help global insurance and reinsurance operations at XL meet their lofty goals.

**Why did you choose SAS Visual Analytics?**

Holmes: That was a very interesting day when I saw SAS Visual Analytics for the first time. I actually wished I had a tape recorder in my brain for all the ideas that went through my thought processes as I was watching the demo. SAS Visual Analytics embodies the saying, “A picture speaks a thousand words.” If we can show information visually and communicate advanced statistical concepts in a visual way, it will be much more effective than if we present charts and numbers and correlations. Just seeing the demonstration about a fake toy company made me think about a lot of questions we could ask about our business if we were using SAS Visual Analytics. This is key. Our success depends on asking more questions, finding the answers and using that insight. If you don’t ask the question, you’re not going to discover the insight. What SAS Visual Analytics will do is inspire more questions than we ever would have asked before.

Read Alison Bolen’s complete interview with Holmes.
• Cloud deployments, including options for private clouds, public clouds and the key-in-hand SAS Cloud.

Because SAS Visual Analytics provides an easy-to-use and self-service data exploration model for business users, IT and data managers have more time to focus on their own strategic initiatives, including:

• Maintaining IT control and data governance while empowering business users with easy access to necessary data.
• Providing a highly scalable solution for easy and cost-effective growth.
• Making data easily available to analysts and analytics available for everyone.
• Ensuring that the system, even mobile access, is healthy and secure.

For More Information

For more information and to test-drive SAS Visual Analytics yourself, visit sas.com/visualanalytics
About SAS

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