



Best Practices in Information Management, Reporting and Analytics for Education

10 Tips from SAS Education Customers for Making the Most of
SAS® Software and Empowering Users to Drive Action

WHITE PAPER

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Contributing SAS Customers

This paper was made possible through the contributions and insights of SAS customers working in K-12 and higher education. All have extensive experience deploying and using SAS software to turn their scattered data sources into timely, data-driven insights – and they have seen the power of these insights to improve performance, student outcomes and more. Some of these best practices were collected from prior SAS customer papers and recorded customer presentations at conferences. Others were collected through customer interviews conducted to further validate prior work and build upon it.

SAS would like to thank the following contributors for their time and expertise:

Interviews:

Rock Hill School District 3, Rock Hill, SC

- Dan Ralyea, Research Specialist, Office of Instruction and Accountability

University of Texas System

- Sandra Woodley, D.B.A., Vice Chancellor for Strategic Initiatives
- Stephanie A. Bond Huie, PhD, Director, Office of Strategic Initiatives

Kennesaw State University

- Erik Bowe, Executive Director and Chief Data Officer, Enterprise Information Management

Information from SAS papers and videos with customers:

- *Dynamic, Self-Service Institutional Reporting*: Western Kentucky University uses SAS to give faculty and administrators self-service access to data about students, faculty, programs and courses – when they want it, the way they want it.¹ The paper was adapted from two presentations – “No Do-Overs: Tips for Implementing BI”² and “Early Warning System for Enrollment, Persistence and Student Success”³ – recorded at the Association for Institutional Research (AIR) Forum in Toronto, May 2011.
 - » Tuesdi Helbig, PhD, Director of Institutional Research, Western Kentucky University
 - » Gina Huff, Senior Applications Programmer Analyst, Western Kentucky University
 - » Christopher James, Applications Programmer Analyst, Western Kentucky University

¹ “Dynamic, Self-Service Institutional Reporting.” SAS paper summarizing presentations at the Association for Institutional Research (AIR) Forum, Toronto, May 2011. Available at sas.com/reg/wp/corp/37796.

² “No Do-Overs: Tips for Implementing a Business Intelligence Solution.” Association for Institutional Research (AIR) Forum, Toronto, May 2011. Available at sas.com/reg/web/corp/1529802.

³ “Early Warning System for Enrollment, Persistence and Student Success.” Association for Institutional Research (AIR) Forum, Toronto, May 2011. Available at sas.com/reg/web/corp/1529795.

- *A New Dimension in Institutional Reporting*: Business intelligence tools enable multidimensional reporting of enrollment and degree data for the University of Central Florida.⁴ The paper was adapted from two presentations: “Data Warehouse + BI = Multidimensional Enrollment Reporting”⁵ and “Degree Data for All”⁶ recorded at the Association for Institutional Research (AIR) Forum in Toronto, May 2011.
 - » Paige Borden, EdD, Assistant Vice President of Institutional Knowledge Management, University of Central Florida
 - » Linda Sullivan, EdD, Director of Enterprise Decision Support, University of Central Florida
 - » Maureen Murray, Data Analyst/Programmer for Enterprise Decision Support, University of Central Florida
- *Best Practices in Institutional Research*: Using SAS solutions to boost productivity and deliver increased value to customers.⁷
 - » Paige Borden, EdD, Assistant Vice President of Institutional Knowledge Management, University of Central Florida
- *Data Systems That Enable School Leaders to Make a Difference*: How Winston-Salem/Forsyth County Schools provides fast access to meaningful data to make a difference.⁸ Paper adapted from a presentation⁹ recorded at the Consortium for School Networking (CoSN) Conference 2011, New Orleans, March 2011. Presenters:
 - » Betty Weycker, Assistant Superintendent for Technology, Winston-Salem/Forsyth County Schools
 - » Debbie Harman, NC WISE Coordinator, Winston-Salem/Forsyth County Schools
- *The Importance of Creating a Data-Driven Culture*: Interviews with administrators, faculty and staff of Mooresville Graded School District, NC.¹⁰
 - » Mark Edwards, Ed.L.D., Superintendent, Mooresville Graded School District, NC

⁴ *A New Dimension in Institutional Reporting*. SAS paper summarizing presentations at the Association for Institutional Research (AIR) Forum, Toronto, May 2011. Available at sas.com/reg/wp/corp/37171.

⁵ “Data Warehouse + Business Intelligence Tools = Multidimensional Enrollment Reporting.” Association for Institutional Research (AIR) Forum, Toronto, May 2011. Available at sas.com/reg/web/corp/1529799.

⁶ “Degree Data for All.” Association for Institutional Research (AIR) Forum, Toronto, May 2011. Available at sas.com/reg/web/corp/1529790.

⁷ Georgia Mariani and Paige Borden, *Best Practices in Institutional Research*. SAS white paper published June 2010. Available at sas.com/reg/wp/corp/17620.

⁸ *Data Systems That Enable School Leaders to Make a Difference*. SAS paper summarizing presentations at the Consortium for School Networking (CoSN) Conference, New Orleans, 2011. Available at sas.com/reg/wp/corp/35331.

⁹ “Data Systems That Enable School Leaders to Make a Difference.” Consortium for School Networking (CoSN) New Orleans Conference, March 2011. Available at sas.com/reg/web/corp/1500813.

¹⁰ “The Importance of Creating a Data-Driven Culture.” Videos of interviews with administrators, faculty and staff of Mooresville Graded School District. Available at sas.com/industry/education/video/edwards-smith.html.

Use of Reporting and Analytics in Education Is on the Rise

Forward-looking education administrators in both K-12 and higher education are investigating, planning to use, or actively using information technology that can turn their vast amounts of data into data-driven insight. For example, SAS currently has about 3,000 customers in higher education and K-12 using our software. Why? Because armed with the right information and reporting and analytics tools, education administrators at all levels can generate trusted knowledge that can be used to transform programs, curriculums, student outcomes and more.

- **Information management:** The first step in any reporting and analytics initiative is to integrate, cleanse, validate and manage data as a valued asset so that you can use it to drive strategic decision making. With a comprehensive management solution that supports analytics and decision management, organizations can fully exploit and govern information assets, uncover hidden insights that improve student achievement and enhance operational effectiveness.
- **Reporting:** Reporting is about using business intelligence tools that give you the information you need, when you need it and in the format you need. Using the right tools, you can integrate data from across your district or institution and deliver self-service reporting and analysis that empowers stakeholders to work independently. You can even provide interactive visualizations that let stakeholders visually explore ideas and information in detail.
- **Advanced analytics:** As use of reporting and analytics increases, users tend to ask more sophisticated questions. And this usually means doing more than just reacting to data in hindsight; it requires using analytics to empower leaders to become predictive, proactive, data-driven decision makers. For example, users can predict which students are at risk of failing or dropping out of school so they can proactively take steps to prevent this from occurring.

“To encourage people to stop hoarding data, ask them, ‘What are we doing with all this data? Is it just there for your department to produce a list report?’ Explain how they can get so much more analytical value from it if they integrate their data with information from other departments and organizations.”

Erik Bowe

*Executive Director and Chief Data Officer,
Enterprise Information Management,
Kennesaw State University*

Getting the Most from SAS® Software Investments

To help SAS education customers get the most from their SAS software investments, SAS has aggregated the following best practices provided by our customers in K-12 and higher education. These customers have started their journey and are already realizing value from SAS solutions. They speak with the voice of experience – and offer time-tested insights that can help streamline and accelerate your evolution and maximize return on investment now and in the future.

Customer-Proven Best Practices at a Glance

1. Secure Strong Executive Sponsorship

To have a successful reporting and analytics initiative, you need more than just executive approval of a budget to purchase software. You also need to have executive sponsorship at the highest level – someone who fully understands the value that reporting and analytics can bring to the district or institution and has a vision for using it to transform school, program and student outcomes for the better. This sponsor can play a vital role throughout the life cycle of a reporting and analytics solution by:

- Creating a vision around a student-centered, data-driven culture with increased accountability. For example, in one customer's K-12 school district, the superintendent's vision is embodied by the mantra, "Every child, every day." Education professionals at all levels are encouraged to use data to understand what's working and what's not – and make decisions that are right for every child, every day.
- Gaining the support of school leaders, such as principals, the central office staff and departmental chairs, so that everyone has a shared understanding of the importance of making data-driven decisions.
- Helping to eliminate "data jails" within departments by sharing his or her vision, addressing concerns about losing control of protected data, getting buy-in from colleagues to share data and navigating political issues that can quickly derail a project.
- Determining what information will be "kept in front of the curtain" (i.e., made public) and what data must be protected and secured.

Effective executive sponsors will also provide what they call "felt leadership," meaning they are fully engaged and accessible. This builds momentum for the growing use of reporting and analytics by staff members at all levels. They build momentum by:

- **Regularly attending key meetings** about data requirements and desired metrics to learn how a district, college or department plans to use reporting and analytics to improve student outcomes and enhance operational effectiveness. Attendance at these meetings communicates that these initiatives are important and are a high priority to senior management.
- **Communicating the vision and value of reporting and analytics broadly, regularly and in a positive manner.** It's vital to build awareness that the use of reporting and analytics is to accurately assess the current state – without judgment – and collaborate on how to improve the current state. The message is, "This is not about making you look bad, or finding 'gotchas'. We are about understanding reality so we can make it better."

"We've created a situation where teachers are monitoring what they are doing. They are understanding and looking at their progress of students as groups and as individuals and creating conditions in the district where everyone has an energy and excitement around the use of data. It's driven us to a higher level of performance."

Mark Edwards, Ed.L.D.,
Superintendent, Mooresville Graded School District, NC

"People get proprietary about data. But to use SAS well, we need people to reach across departments and allow their data to be part of a business intelligence solution."

Dan Ralyea
Research Specialist, Office of Instruction and Accountability, Rock Hill School District 3, Rock Hill, SC

- **Modeling the use of reporting and analytics to understand and help solve reporting problems.** Reporting and analytics empower users to go from saying, “Something’s broken and we don’t know what it is” to “Something’s broken and we know what it is – let’s discuss how to fix it.” Executive sponsors can model the power of analytical insight by bringing reports to meetings, making decisions based on hard numbers rather than educated guesses and more. The goal is to show that, “I buy into this – and I expect you to do the same.”

2. Identify and Involve Stakeholders Early and Assess Their Unique Needs

In both K-12 and higher education, you’ll have a wide variety of potential users, ranging from different internal users and the school board/board of regents to government bodies, media, parents and the general public. These stakeholders can have vastly different skill sets and requirements. So it’s vital that you identify and engage these stakeholders early in the reporting and analytics planning process, view them as customers, and analyze and segment them.

Armed with detailed insights into the stakeholders you are supporting, you can develop a very targeted and valuable reporting and analytics solution. For example, data experts need to know the metrics the different stakeholders need so they can consolidate that data from multiple disparate databases into an enterprise data warehouse that supports the required information and reports. Similarly, before business intelligence experts can create desired reports, they need to know what kind of reporting users need, the detail level they prefer, visualization, drill-down requirements, and more.

3. Identify and Integrate Authoritative, Trusted Data Sources

Once you know what metrics and reports your stakeholders need, assess the data sources available to help you meet these needs. Most likely, data will be scattered across fragmented systems in different departments, schools and agencies, and overlap or have gaps and inconsistencies. For example, if a student went to School A for three days and then went over to School B, and the records didn’t transfer efficiently, you would find overlaps of data. This would eventually lead to double-counting of the student and report inaccuracies.

So you’ll need to carefully determine the best sources to integrate within your data warehouse. Expect some heated debates, as data owners will have reasons why their data should be declared the official data. To ensure that data is interpreted the same way by all stakeholders, it’s also recommended that you develop data definitions as part of a data dictionary. For example, student names, gender, ethnicity and GPAs should be defined, understood and stored one way by all stakeholders.

“When we meet with stakeholders, we don’t come in with answers – we come in as consultants who assess needs first and then make recommendations. We listen a lot and then operationalize their feedback by aggregating the right data and creating the right reports to meet their needs.”

Sandra Woodley D.B.A.,
Vice Chancellor for Strategic Initiatives

“Governance is about more than just cleaning up data. What’s needed is a layered approach to data governance that includes things like managing metadata, establishing data managers, reassessing stakeholder needs as they become more sophisticated data users and pushing toward advanced analytics so people can work smarter and solve bigger problems. Data is just the underlying component.”

Erik Bowe
Executive Director and Chief Data Officer,
Enterprise Information Management,
Kennesaw State University

To ensure data consistency and quality over time, establish a governance process for data validation and cleansing before it's loaded into the data warehouse. Data governance encompasses the people, processes and technology required to create a consistent enterprise view of an organization's data. It formalizes the process of managing information across an organization through business processes and policies designed to ensure that data is handled in a prescribed fashion, with human intervention handled by trained data stewards. By concentrating on the health of the data, institutions can create better data to support their core strategies and initiatives. A governance process also needs to account for the fact that data is always in flux and may change unexpectedly. For example, in K-12, parents may intentionally give the address of a relative – rather than their own – so that their kids can attend school in a better school district than their local one.

4. Manage Expectations Proactively

It's not uncommon for stakeholders to view reporting and analytics software as some kind of all-powerful magic; they can ask for anything and instantly get whatever they want, however they want it. And their wish lists can get long, unwieldy and unattainable – especially if you are just starting off on your reporting and analytics journey. Effective reporting and analytics require that you invest in significant data preparation, integration and planning before anyone can have useful reporting.

So when engaging with stakeholders, listen actively to their wish lists, help them prioritize what's most important to them and say “no” when you have to. Focus on what's achievable now – and save the rest for mid- and long-range plans. By being open and honest about what you can deliver (and when), you can help people have realistic expectations (the key to having happy customers) and build their trust.

Setting clear expectations is particularly important when working with upper-level managers, such as the board of regents (higher education) and superintendents (K-12), as they will expect certain things to be shown in reports from day one. The message to convey to them is, “We hear you. We will be able to deliver core analytics first – not the kitchen sink. If we can give you everything you want from day one, we will. If we can't, we will focus on the most important metrics first and we'll add on more later.”

5. Determine the Best Way to Process and Deliver Each Report

It's all too easy to start manually building reports and dumping them out there. For some people, the tendency is to create comprehensive, kitchen-sink solutions that are overwhelming to read and use. For others, the tendency is to create hundreds of reports and directories, many of which aren't designed to serve a specific stakeholder purpose.

As a best practice, create tight, compact data jobs designed to meet specific user needs. Find out what people truly need by performing a detailed audience analysis and scope reports accordingly. As part of this process, explore the following:

The Value of Metadata Management

When pulling data from myriad educational systems and reconciling that data into a data warehouse, it is imperative to maintain and track metadata across all the data systems, applications, reports, analyses, etc. Integrated metadata (information about data sources, how it was derived, business rules and access authorizations) is crucial for producing accurate, consistent information.

If metadata from all systems, applications and reports can be stored in an open, centralized and integrated repository, data changes only need to be documented in one place, there are fewer systems to support and users can count on high-quality, accurate information. A single version of the truth will be available to all and better use of staff time will lower the total cost of ownership for IT infrastructures.

- **User types and expectations:** For example, the president of a university or the superintendent of a K-12 district might need a high-level dashboard of key performance indicators (KPIs) complete with drill-down functionality to learn more, if needed. A dean of a college or a principal of a school might need to see what is relevant to his or her area and be able to slice and dice data to understand students in more depth. And professors and teachers might need to see select information relevant to their classes and individual students via simple, online reports.
- **Formatting and reporting priorities:** When designing reports, present data using an easy-to-use, easy-to-understand format. As a general rule, include the top 10 most important items for the target audience first and subsequent data (based on priority) in categorized layers within the report.
- **Access control requirements:** Stakeholders should only be able to see what is relevant to them. So be sure to use software that supports granular, highly secure access controls.

Based on user requirements, you can determine what should be provided as a dashboard, stored process, or OLAP cube. The choice depends largely on how much reporting flexibility and visual appeal the target users of a report need. With an OLAP cube, users can actually click the numbers and drill down to the detail – for instance, down to individual faculty members, courses and students. In contrast, a stored process is best for creating print-ready reports. Users can select variables from pull-down menus or tabs, such as college, department and a certain cohort of students, then hit the “run” button and the system creates a printed report, ready to go. A stored process report doesn’t offer the same degree of investigative flexibility as an OLAP cube, but for standard information needs, such as a presentation to the media, it provides an attractive, formatted view of the data.

To minimize work, leverage software to create repeatable, automated reporting jobs. For example, using SAS software, you can define a report in detail, and users with access rights can come back to it tomorrow, next month and next year and instantly generate an up-to-date report without further assistance.

6. Design an Intuitive, User-Friendly Interface for Accessing Reports

Use a portal to publish the data and reports you create so users can have one place to access what they need, when they need it and in a secure manner – without further assistance. For example, SAS enables you to create a portal where you can store report processes and provide a self-service reporting environment where users can access what they need with the click of a button. This self-service reporting environment uses familiar, intuitive conventions for navigation, drill-down, data selection and more.

“A business intelligence system should not try to answer every ad hoc question people will have. You want to put things out there that a lot of people would get something out of. If you have a special request, a one-time need, we’ll still write a special report for you.”

Tuesdi Helbig, PhD
Director of Institutional Research,
Western Kentucky University

“As we were working with the business intelligence tools, we thought the cube would be the last thing our users would be interested in. We thought they wouldn’t be able to figure it out and they would want reports delivered to them. Our users found the cube and they loved it ... I would take that as a lesson not to underestimate your users.”

Linda Sullivan EdD,
Director of Enterprise Decision Support,
University of Central Florida

For example, the portal can have tabs across the top of the home page that take the user to information for a specific area, such as dashboards for the provost of a college to review applicants, degrees or enrollment. Users can also access popular publications – such as the fact book, quick facts or the data dictionary – with one click from the home page. They can also see aggregate information for the university or drill down to a specific college, department, degree, program or even the individual student. And thoughtfully designed screens and easy navigation and selection tools encourage users to explore the data in more ways, leading to unexpected discoveries and better data-driven decisions. And built-in security and access controls ensure users only see what they have permission to see.

7. Collect User Feedback Continuously and Act on It

Immediately after the launch of your portal, start gathering feedback from users about how they are using the system and ways to improve it. For example, you'll want to find out if you are delivering what people want, how reports and interfaces could be improved, and what's not proven useful to them.

You can collect user feedback through many channels. Some SAS education customers organize regular focus group sessions with all types of stakeholders, where they record all the comments and suggestions, prioritize recommendations and implement them, where possible. Others provide a "comments" button where users can provide feedback directly from the report portal. It's also recommended that you set up a task force that allows you to meet with stakeholders regularly to discuss data and reports in detail. For example, you may find that the reports you are providing are too high-level; users need to be able to drill down into detail, such as profiles for individual students, at the push of a button. You will find it helpful to create a prototype of reports so users can validate that any changes meet their expectations. All of these mechanisms allow you to capture valuable feedback and allow people to appreciate being heard, which in turn creates happy users.

8. Develop In-House IT Expertise

SAS reporting and analytics software is incredibly diverse and powerful. So to quickly realize its full value, SAS customers interviewed for this paper recommend that you develop in-house expertise through two channels. During development, use SAS Consulting® for expert, on-site assistance and knowledge transfer – particularly with people running your systems and creating reports and OLAP cubes for stakeholders. And then augment this knowledge transfer by taking advantage of SAS' online courses, training classes, software manuals and programming guides. SAS has resources for everyone, from beginner to advanced software users.

“In this day and age, users shouldn't have to know where to go to find the data. We have to put it out there for them to use, and it should be as simple as clicking on that report each time they go to it and for them to know that it is real-time, it is what they need and it is effortless on their part.”

Debbie Harman

*NC WISE Coordinator for Winston-Salem/
Forsyth County Schools*

“The self-service reporting environment takes some of the daily pressure off us and, more importantly, provides better service to our clients.”

Gina Huff

*Senior Applications Programmer Analyst,
Western Kentucky University*

9. Empower Users by Providing Training and Self-Help Materials

Most education professionals are not savvy about data or analytics. They need help learning how to understand data and interpret analytical reports correctly before they can make informed decisions. So invest in user training and self-help resources, which can take many forms. Some institutions use a train-the-trainer approach, identifying key stakeholders whom they can educate and turn into effective, confident data consumers. Others provide hands-on user workshops in computer labs. Regardless of the type of training provided, it's recommended that you complement it with self-help materials, such as user manuals and data dictionaries that define value hierarchies, data elements and more. These materials can be offered in hard copy or through context-sensitive online documentation.

10. Publicize the System

To build your user community, SAS customers recommend that you “take the show on the road” and set up face-to-face meetings, such as lunch-and-learns. Show people the portal and teach how to use it. Bring up reports and cubes and discuss how they can use them to gain valuable insights and answers to complex questions that were unattainable before. And share success stories about how their colleagues in other departments, schools or classrooms have used reporting and analytics to improve performance and student outcomes. The goal is to educate and generate excitement about what's possible so that their entire district or institution can become more data-driven.

How SAS® Can Help

As more people learn about the reporting and analytics capabilities of your institution – and how they can use it to gain insight, answer complex questions and make better decisions – you'll have increased demand over time. At the same time, as they become experienced data consumers, their questions will become more sophisticated. So you will need to offer more data, more detailed reports and more sophisticated analysis, such as advanced analytics, to address these demands.

So when building out your reporting and analytics solution, make sure you invest in software that can be upgraded and expanded as your needs evolve. And consider investing in a server (or servers) that can support a larger user group than your initial deployment.

For example, SAS offers a comprehensive, modular solution for information management, reporting and analytics that you can deploy gradually as your needs change. Our software can integrate data from any existing source and deliver true, end-to-end support for any kind of reporting and analysis. SAS Information Management, SAS Reporting and SAS Analytics all leverage the sharing of common metadata and a common repository. Because no one component is isolated, communication can occur wherever there is a need for metadata sharing and exchange. All components take advantage of and can utilize metadata.

Create a Center of Excellence – Even If It's Staffed by One Person

Universities and colleges typically have an office of institutional research that executes and manages all data management, reporting and analytics activities. But this isn't always the case for K-12 districts. Yet it's vital for school districts to have at least one person who is dedicated to becoming an expert in SAS software, developing and executing strategy, creating reports, educating people, answering user questions and more. Without sufficient focus and commitment, reporting and analytics initiatives will likely fail over time.

“In our district, we've set up lab classrooms where forward-thinking teachers can showcase how they are using reporting and analytics to transform instruction and improve student outcomes – can be very valuable tools for instruction. Colleagues can see firsthand how to use analytical insights within the context of a real-world classroom to improve teacher performance and student outcomes.”

Dan Ralyea
Research Specialist, Office of Instruction
and Accountability, Rock Hill School District
3, Rock Hill, SC

SAS® Information Management

SAS Information Management manages the entire information continuum that spans data, analytics and decision management, allowing organizations to fully exploit and govern their information assets – resulting in sustained success. SAS accesses the data in your existing databases and information systems, enterprise resource planning (ERP) systems, student systems, benchmark assessment systems, operational systems and more, in order to feed into a single, enterprise data warehouse. You gain a holistic view by leveraging aggregated data from across your district or institution, regardless of its location or systems used. Once data is centralized, key personnel across various levels of an institution can access, analyze and glean greater value from data for improved proactive decision making.

SAS® Reporting

Decision makers need business intelligence that allows them to understand the past, monitor the present and access timely, accurate information needed for strategic decision making. SAS Reporting gives you the information you need – in the right format and at the right time – to make fast, informed decisions. Using a secure, online, portal-based reporting system, users can quickly generate automated and drillable reports using accurate data and information. Secure access to the portal-based reporting system is based on each employee's user-specific profile. As a result, users with different needs and skill sets can view, customize and create reports to meet their unique needs.

SAS® Analytics

SAS Analytics provides an integrated environment for predictive and descriptive modeling, data mining, forecasting, optimization and more. Using advanced analytics, educational leaders can move from reactive decision making (based on an understanding of what is currently happening) to proactive decision making (based on what is likely to happen in the future). Once data is aggregated from across a school, district, college or university, decision makers can use SAS Analytics to make discoveries, determine trends and solve complex problems.

“We’ve been able to accomplish so much with SAS – and so quickly – and looking forward, I see the opportunity to do so much more. With SAS, we have endless possibilities.”

Paige Borden, EdD
Assistant Vice President of Institutional Knowledge Management, University of Central Florida

SAS and Education

SAS solutions are licensed and implemented at more than 3,000 educational institutions worldwide. SAS has more than three decades of experience working with education institutions. SAS solutions are used at more than 55,000 business, government and university sites in more than 129 countries – including 90 of the top 100 companies on the 2011 Fortune Global 500® list.

Learn More

Armed with these insights and best practices, you have a wealth of knowledge about how to make the most of your SAS software investments. To learn more, we encourage you to explore the SAS papers and videos developed for higher education and K-12 customers mentioned in the “Contributing SAS Customers” section of this paper, or visit us online at www.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, SAS helps customers at more than 55,000 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®. For more information on SAS® Business Analytics software and services, visit sas.com.



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