

Data Management in Action: Solving Real-World Challenges



Contents

Data Management at a Glance	2
The Benefits of Definitive Data Management	3
Get Data On Demand	3
Make Data Decisions You Can Trust	3
Build a Data-Driven Business	4
See Data Management in Action	5
Case in Point: Florida Department of Education.....	6
Results With SAS® Solutions.....	6
Benefits	6
How SAS Helps You Get More Out of Your Data	7
Where to Begin?	
SAS® Data Management Methodology.....	7
Plan	8
Act.....	9
Monitor.....	9
Learn More	10

Let's say you're working to improve the customer experience through a Know Your Customer initiative. Maybe you're meeting regulatory requirements like BCBS 239 or GDPR in Europe to avoid fines. Or you might be cutting costs by removing duplicates from your monthly catalog mailer.

No matter what your initiative, accurate data is where to start if you want to make the best possible decisions. There's certainly no lack of data. But simply having lots of data won't necessarily help you answer big questions, understand problems or make faster, better decisions. To achieve competitive advantage, maintain profitability or satisfy customers, you must be able to act on what the data tells you.

Unfortunately, many of us are overwhelmed by our data despite recent advances in data management technology and tools. Massive volumes of it are often spread across departments, teams and locations in different formats and systems, hindering reporting and analysis. And if there are disparities among different systems or reports, you probably spend too much time finding and cleansing data – time that could be better spent analyzing, communicating or responding. Even after the data is fixed during a monthly fire drill, you haven't necessarily changed the systemic issues or root causes of your data quality challenges.

How do you capture the lessons you've learned and automatically apply them to the data – so next month you won't have to waste time blending and cleansing data the same way all over again?

Consider a simple example where several systems contain different versions (and names) for the same person.

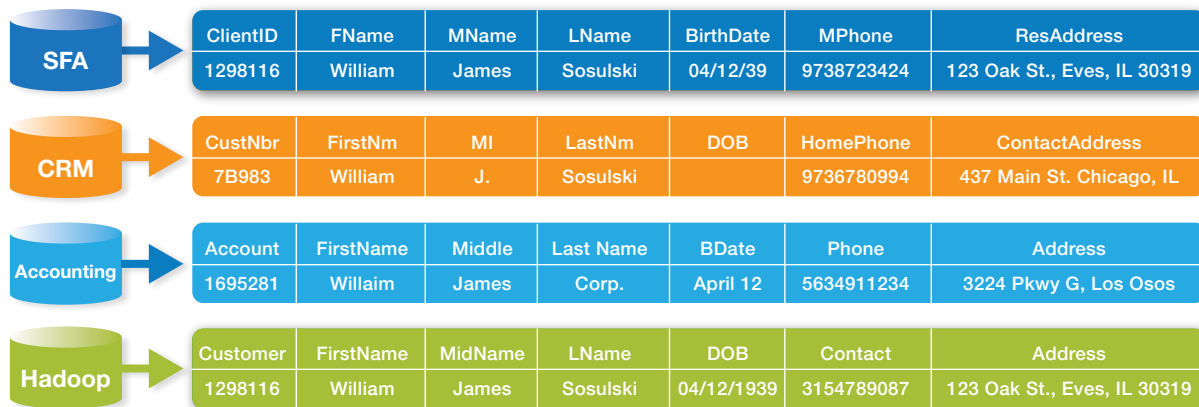


Figure 1: Customer details stored and referenced differently in each operational application.

Any system can store this information and provide it to a user. But how would you know that these records are all related to the same customer? You could reconcile them manually. Imagine the challenges of fixing hundreds or thousands of records like this. Do you have the time and resources to do it?

Effective data management enables you to integrate, clean and maintain your data. But what exactly does that entail? Why should you prioritize investment in data management solutions, and what do they support?

This paper answers these questions and explores how SAS® Data Management solutions can help you overcome common barriers to seize the value in the wealth of data available to you.

Data Management at a Glance

Beyond the many data enthusiasts and professionals who love data, organizations don't do data management because they enjoy it. They do it because it helps them make a buck, save a buck or stay out of jail.

Organizations use data management to improve customer experience, increase revenue, reduce costs through operational efficiency, or meet compliance or regulatory mandates. These regulatory directives include federal or state mandated reporting, or adhering to risk, fraud or privacy regulations like the General Data Protection Regulation (GDPR).

To obtain the clean, complete and current data required for accurate reporting and analytics or other operational use cases, you must have a comprehensive data management foundation. All the activities your organization engages in to understand, cleanse, integrate, govern, master and monitor data as a strategic asset are essential to your data management platform.

As shown in Figure 2, data management involves numerous capabilities. Specifically:

- **Data access** refers to your ability to locate and retrieve information wherever it's stored. Certain technologies can make this step as easy and efficient as possible so you can spend more time using the data – not just trying to find it.
- **Data quality** is the practice of making sure data is accurate and usable for its intended purpose. This starts from the moment data is accessed and continues through various integration points with other data – and even includes the point before it's published or reported.
- **Data preparation**, often in a self-service capacity, gives business users access to manipulate the data they need with minimal training and without burdening IT to provision and transform the data.
- **Data integration** allows you to combine different types of data, usually run overnight in what are called extract, transform and load (ETL) jobs. Data virtualization is a subset of data integration that provides more agility than traditional ETL batch routines. It allows you to generate a dynamic view of the data (which is sometimes masked) – without moving it and without needing an intermediary data mart to store it.
- **Data governance** is an ongoing set of rules and decisions for managing data to ensure that your organization's data strategy and business strategy are aligned. It helps prevent you from violating business rules and stay in compliance with state and federal mandates.
- **Master data management** defines, unifies and manages the data that is common and essential to all areas of your organization. It makes use of data integration and data quality capabilities to create a consistent view of customers, citizens, students, products and other types of important data (called master data).

The goal of data management is to ensure that organizations have clean, consistent, complete and current data. This supports reporting and analytics as well as operational use cases, data migration or modernization efforts and – ultimately – guides better decisions and actions.

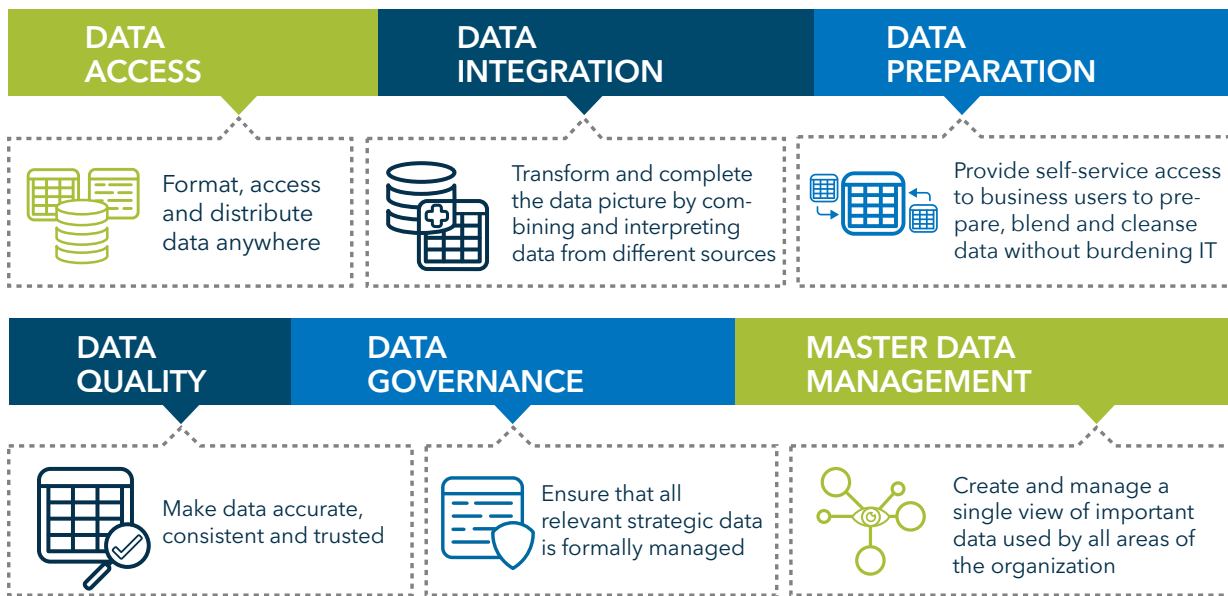


Figure 2. The six aspects of definitive data management.

The Benefits of Definitive Data Management

Modern data management solutions incorporate the six capabilities shown above as part of an end-to-end solution. With a comprehensive foundation like SAS Data Management in place, you can:

Get Data On Demand

- Provide simple, straightforward and automated access to the data you need, when you need it.
- Integrate all required data and correct inconsistencies and duplications.
- Manage analytical data marts and data lakes to provide streamlined data access.
- Make abstracted views of your data available to applications while you change the source of that data during a modernization effort.
- Run data processes in your environment of choice.

Make Data Decisions You Can Trust

- Profile and validate data to better understand it.
- Establish business rules governing the content, quality and structure of data.
- Perform sophisticated identity resolution to establish a single view of any domain and to reduce duplicate customer entries (helping to improve customer experience).
- Enable departments to monitor data quality on an ongoing basis and call out exceptions before issues arise.
- Provide real-time data services to stop data quality issues before they enter the system.

Build a Data-Driven Business

- Ensure compliance and minimize risk by assuring that data is timely, accurate and stored in the appropriate formats for reporting and audit trails.
- Improve the way key data streams are organized to provide better visualization and decision-making from your data.
- Empower business professionals through the use of self-service data preparation tools that require less training.
- Create a common vocabulary to bridge the gap between business and IT.
- Align data management tasks with corporate goals so you can compete more effectively with data.



Understanding *Action Starts With Data*

Without action, decisions are meaningless. Action is what changes behavior and fixes broken business processes. And action starts with data. With SAS Data Management, you get data on demand, helping you make decisions you can trust – so you can run a data-driven business. Let's take a look at what this means.

Get data on demand. This relates to delivering the right data to the right people at the right time. Different users and situations require different levels of data latency. For example, to determine the risk associated with offering a new loan to a high-value customer, you would want real-time data within a few seconds. But you can run overnight batch updates to determine the loyalty points a credit card has accrued. It's important to offer multiple avenues of access via differing latencies and related costs for a variety of situations.

Make data decisions you can trust. Now you've got access to the data you need in the time frame in which you need it. Is the data consistent and accurate? If it's not, the decisions you make might be the wrong ones. To get to a decision you can trust, you need a consistent view of data across disparate silos or departments, which can be achieved by applying data quality processes like standardization or deduplication. You also need consistent naming and alignment between business and IT groups. And data quality processes must be applied at the original source of the issues to ensure you don't go through this process every time you need to create a report.

Build a data-driven business. Using a variety of processes and technologies, you can begin to prioritize IT projects according to the business value they generate. Business and IT start speaking the same language. Risk is reduced, and you're in compliance with privacy and other policies. You make decisions and take action based on data instead of guesses. You're running a data-driven business, and studies have shown that you're likely to be more profitable because of it.

See Data Management in Action

The value of effective data management is increasingly understood across industries, so it's no surprise to see so many organizations investing in data management solutions. Examples include:

World Wildlife Fund (WWF) used SAS Analytics and SAS Data Management to maximize its marketing efforts. As a result, the US office of WWF has significantly increased revenue from donations while reducing acquisition costs. That means more funding to protect the planet.

Umstead Hotel and Spa turned to SAS Master Data Management (SAS MDM) and its embedded data quality capabilities to create a "golden record" for guest data. SAS MDM pulls data from existing systems, cleanses it and integrates it into a single view of customer interactions. Then it can display the data in a single interface that all customer-facing personnel can access.

Des Moines Community College employed a SAS data warehouse to ensure its data was properly managed and accurate. The warehouse feeds the self-service reporting and analytics solutions deployed across the college. Users can securely view data and reports without assistance.

The Orlando Magic - a professional sports team - used SAS Analytics and SAS Data Management to become among the top revenue earners in the NBA.

San Bernardino County Department of Behavioral Health used data management and advanced analytics to improve care and dispel misconceptions about mental health.

Ecclesiastical Insurance used SAS Data Management to improve its data quality as part of a data governance initiative. This helps strengthen decision making for underwriting, reinsurance and risk selection - and helps with regulatory compliance.

Western Kentucky University used SAS to collect and analyze massive amounts of data to provide information to staff members about the school's students, faculty, programs and courses.

The North Carolina Office of Information Technology Services worked with SAS to develop the Criminal Justice Law Enforcement Automated Data Services (CJLEADS) application. This solution uses data integration technology from SAS to quickly blend data from many sources and help prevent crime - at a cost savings of \$12 million annually.

Enerjisa used the data quality and data integration capabilities of SAS Data Management to reduce duplicates, cutting the number of total customer records by 25 percent and obtaining a single view across multiple sources. This consistent, reliable view of customers significantly increased the rate of successful customer contacts.

Case in Point: Florida Department of Education

To better understand how SAS can help, consider how the Florida Department of Education (FLDOE) – which gathers data from universities, colleges and K-12 schools for legislative reporting, educational effectiveness reporting and research – is using SAS solutions.

FLDOE needed to deploy an enterprise-level data collection, processing and data governance process to facilitate and provide access to statewide longitudinal education data to stakeholders, as well as:

- Create a persistent unique identifier that tracks a student from K-12 to college and beyond.
- Establish enterprise governance policies and processes.
- Deliver a single view of students and personnel to internal users.
- Facilitate and provide statewide education data to stakeholders.
- Enable accurate reporting and integration across more than 67 sources.

At the same time, the solution had to meet statewide business requirements, improve data quality, support increasing reporting frequencies and employ shared metadata to boost efficiency. Equally important, it needed to integrate with and use FLDOE's existing system investments.

Results With SAS® Solutions

To meet these needs, FLDOE deployed SAS Data Quality, SAS Master Data Management and SAS Data Governance. Now FLDOE is able to:

- Uniquely identify each individual (students and staff) within the Florida educational system using a primary unique identifier (FLEID).
- Properly identify individuals, which is a critical component of determining funding across districts.
- Create a secondary anonymous identifier for each individual with no recognizable correlation to the FLEID outside of the FLEID application. The secondary identifier is intended to protect an individual's personally identifiable information when individual information is provided to organizations for purposes such as research.
- Create an independent data repository to store both the latest and all historical identifying records on individuals.
- Submit various survey files with information regarding students, staff and faculty on an established schedule running through a data quality system.
- Support – and enable easy editing of – more than 1,600 business rules used to validate the contents and format of the data.

Benefits

The benefits of this solution have been significant. "SAS is helping us create a persistent statewide unique identifier and longitudinal view of students and staff across colleges, K-12, and other sources and systems," says Andre Smith, Assistant Deputy Commissioner of Data Systems at FLDOE. "They uniquely provided the integrated suite of MDM, data quality and governance capabilities and consulting skills required to modernize our systems, increase reporting accuracy and improve stakeholder experience."

"SAS is helping us create a persistent statewide unique identifier and longitudinal view of students and staff across colleges, K-12, and other sources and systems," says Andre Smith, Assistant Deputy Commissioner of Data Systems at FLDOE.

"They uniquely provided the integrated suite of MDM, data quality and governance capabilities and consulting skills required to modernize our systems, increase reporting accuracy and improve stakeholder experience."

For more details, check out Florida's PK-20 Education Information Portal at edstats.fldoe.org.

How SAS Helps You Get More Out of Your Data

These organizations turned to SAS to become data-driven, the foundation of which is access to trusted, consistent and integrated data.

To achieve this, SAS offers comprehensive, fully integrated solutions for data management, data visualization, reporting and analytics that you can deploy as your needs or users evolve. For example, users may need to move to advanced, exploratory analytics, or may need to deploy data quality in real time to applications or source systems. SAS solutions are unique because they support data processing at the source, include common metadata that spans data management and analytics, and provide data management for business users. And SAS software's data management foundation is powered by built-in analytics.

With SAS Data Management – an industry-leading solution built on a data quality platform – you can fully exploit, integrate and govern your data. SAS provides a unified environment of solutions, tools, methodologies and workflows for managing data as a core asset. You can access your data regardless of where it's stored – including traditional systems and emerging big data environments like Apache Hadoop. And because the software's underlying technology is fully integrated, you're not forced to integrate a solution that's been cobbled together. All the functionality – from data preparation to data quality to master data management – is part of the same architecture. So you can prepare your data for visualization, analytics or operational use while simultaneously ensuring quality, transparency and accountability.

Where to Begin? SAS® Data Management Methodology

When you're ready to put your data management strategy into action, get started by following the SAS Data Management methodology. This step-by-step process guides you in performing data management tasks, such as data quality, data integration, data migration and master data management.

The methodology guides you through building a foundation that can help optimize revenue, control costs and mitigate risks. All the stages interact. So, for example, you can (and should) revisit your initial plans and operational designs when evaluating your progress in the monitoring stage. The methodology includes three stages:

- **Plan.** Where you discover data and define processes and rules for managing it.
- **Act.** Where you design and execute those defined processes.
- **Monitor.** Where you evaluate the data and control it as it flows into and through your organization.

SAS is a recognized leader in data integration, data quality and analytics. And 94 of the top 100 companies on the 2016 Fortune Global 500® are SAS customers.

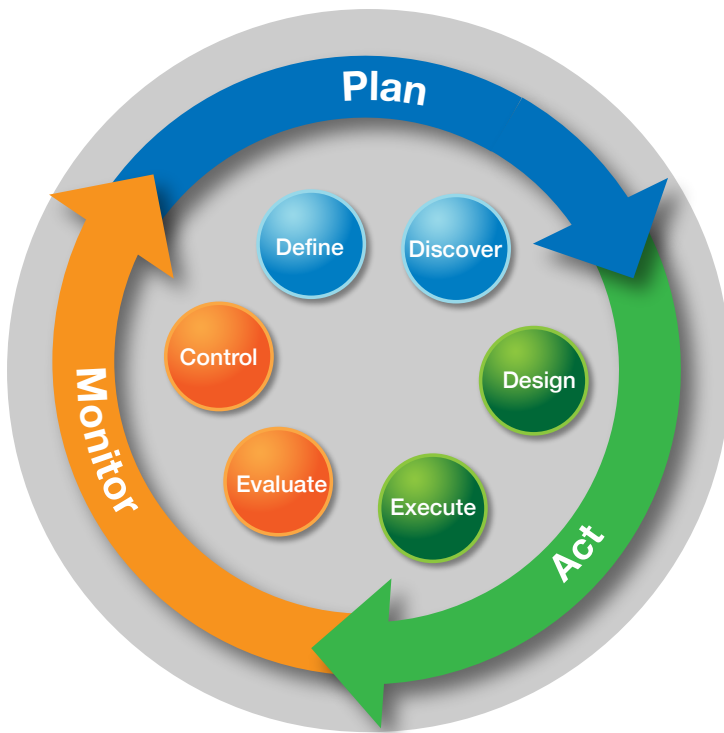


Figure 3. The three stages of the SAS Data Management methodology are plan, act and monitor.

Plan

During the plan phase, you define the people, processes and technologies that are part of your data management project. This phase gives you time to discover and categorize all of your data assets. To get started, ask questions like these:

- **People.** Who is involved, and for what purpose? Who owns which data, applications or processes?
- **Road map.** Where are we now, and where do we want to go? What obstacles do we face? What are our organizational goals?
- **Source systems.** What data do we need, and where does it come from? What's the quality of our data?
- **Security.** Who should have access to what data? What audit requirements do we have to meet?
- **Business processes.** Which business processes are affected? How can better data enhance how our organization operates?
- **Business terms, rules and data definitions.** How do we define "customer"? How can we optimize procurement and spending? Do we have a centralized business glossary to store commonly used business terms, their owners and related technical metadata?

Act

During the act phase, your team should design a system than can accommodate all of your data needs and execute your business processes. Take stock of all the different data structures, formats, sources and feeds you use. Then consolidate and coordinate data management activities by concentrating on:

- **Consistency of rules.** Your ultimate goal is to have one set of business rules that can be stored centrally but deployed across all data sources, applications and lines of business. This is where you take the rules you designed in the plan phase and create and deploy data processes that execute on the data to enrich or cleanse it.
- **Consistency of the data model.** The data model is the single, definitive source for how your data maps to your business. A well-structured data model will enable you to identify appropriate source systems and begin to reconcile multiple views.
- **Consistency of business processes.** Here, your goal is to provide consistency across all of the business processes involved in each of your data management tasks.

Monitor

A healthy data life cycle requires a robust monitoring and reporting system that keeps pace with an evolving business – one that may often adopt new partners, new data, new initiatives and new products. All of these changes need to be reflected in your data. To gain a consistent, validated view of the business, your data must be monitored consistently. At this stage, you should:

- **Monitor.** Monitor and validate data as it enters your organization to verify that it adheres to your rules. At the same time, constantly monitor your rules to ensure they still meet the needs of your business.
- **Review.** Consolidate your rules and requirements into a single environment.
- **Optimize.** Centralize data management rules so you can immediately share changes across the organization, without duplicating efforts.
- **Visualize.** Visualize the level of data health quickly and easily with bundled reports, and create new ones when needed.

Learn More

As your organization struggles with growing volumes and sources of data, increasingly complex regulatory requirements, and pressure to do more with fewer resources, SAS Data Management can help. How? Our solution helps you make sense of your data so you can make better decisions. Then you can take the right actions to improve customer experience, boost revenue, become more efficient and remain compliant.

What's the state of data management at your organization?

- Do you trust your data, and is it easy to access, clean, integrate and monitor?
- Do you know which types of data are used by what people in your organization?
- Is there a system in place for analyzing data as it flows into and through your organization?
- Can your IT department keep up with the demands of the business?
- Do your business users have self-service access to the data they need to make better decisions and take action?
- Do you know how to use your data to help you compete?
- Do you support corporate strategies, and can you glean more value from the data locked in your organization?
- Can you bridge the gap in skills required to manage data or make better decisions from it?

Find out more about SAS solutions for data management by visiting sas.com/dmebook.

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

