



## CHAPTER

## 1

# Value of the SAS Intelligence Platform

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## What is the SAS Intelligence Platform?

The SAS Intelligence Platform is a comprehensive, end-to-end infrastructure for creating, managing, and distributing enterprise intelligence. The platform includes tools and interfaces that enable you to do the following:

- extract data from a variety of operational data sources on multiple platforms, and build a data warehouse and data marts that integrate the extracted data
- store large volumes of data efficiently and in a variety of formats
- give business users at all levels the ability to explore data from the warehouse in a Web browser, perform simple query and reporting functions, and view up-to-date results of complex analyses
- use high-end analytic techniques to provide capabilities such as predictive and descriptive modeling, forecasting, optimization, simulation, and experimental design
- centrally control the accuracy and consistency of enterprise data

It would be possible to build an enterprise intelligence infrastructure using applications from different vendors that specialize in specific areas. However, the implementation process would be extremely complex and time consuming. With the SAS Intelligence Platform, you can implement a fully integrated, end-to-end intelligence infrastructure by using software that is delivered, tested, and integrated by SAS. The platform draws from your existing enterprise data, and it is designed to work in even the most complex and heterogeneous information technology environments.

Using the tools provided in the SAS Intelligence Platform, you can create applications that reflect your unique business requirements and domain knowledge. The platform also serves as the foundation for SAS business solutions in areas such as customer intelligence, financial intelligence, and supply chain intelligence, as well as for SAS solutions for vertical markets such as financial services, life sciences, health care, retail, and manufacturing.

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## Components of the SAS Intelligence Platform

The SAS Intelligence Platform includes components in the following categories:

<i>Data Integration and ETL</i>	The data integration and extract, transform, and load (ETL) components enable you to consolidate and manage enterprise data from a variety of source systems, applications, and technologies. Components are provided to help you cleanse, migrate, synchronize, replicate, and promote your data. Metadata for all of your intelligence resources is stored centrally and controlled through a single management interface.
<i>Business Intelligence</i>	The business intelligence components enable users with various needs and skill levels to create, produce, and share their own reports and analyses. Through easy-to-use interfaces, users can obtain their own answers to business questions. Meanwhile, Information Technology retains control over the quality and consistency of the data.
<i>Analytics</i>	SAS offers the richest and widest portfolio of analytic products in the software industry. The portfolio includes products for statistical data analysis, data and text mining, forecasting, econometrics, quality improvement, and operations research. You can use any combination of these tools with the SAS Intelligence Platform to add extraordinary precision and insight to your reports and analyses.
<i>Intelligence Storage</i>	The intelligence storage options are optimized for analytical processing, enabling you to quickly retrieve and report on large volumes of data. The options include simple relational databases, a threaded multidimensional database that supports online analytical processing (OLAP), and relational storage with a threaded multiple input/output (I/O) subsystem for intensive use by focused applications.

The following sections describe the data integration and ETL, business intelligence, analytics, and intelligence storage components in more detail.

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## Data Integration and ETL

The software tools in the data integration and ETL category enable you to consolidate and manage enterprise data from a variety of source systems, applications, and technologies. The data sources can include SAS data sets, database management system (DBMS) tables, and data from enterprise resource planning (ERP) systems. Metadata for all of your intelligence resources is stored centrally in the SAS Metadata Repository.

Each of the data integration and ETL tools is described briefly in the following sections.

### SAS Data Integration Studio

SAS Data Integration Studio is a visual design tool that enables information architects to consolidate and manage enterprise data. The software enables you to create jobs and process flows that extract, transform, and load (ETL) data for use in data warehouses and data marts. You can also create processes that cleanse, migrate, synchronize, replicate, and promote your data.

For more information, see Chapter 6, “Clients in the SAS Intelligence Platform,” on page 33.

### SAS/ACCESS

SAS/ACCESS provides interfaces to a wide range of relational databases. With this product, SAS Data Integration Studio and other SAS applications can read, write, and update data regardless of which database and platform the data is stored on. SAS/ACCESS interfaces provide fast, efficient data loading and enable SAS applications to work directly from your data sources without making a copy.

### SAS Data Surveyor

The SAS Data Surveyor applications enable you to build SAS Data Integration Studio jobs to help you read data in the ERP systems of vendors such as SAP and Oracle.

### SAS Data Quality Server

SAS Data Quality Server analyzes, cleanses, and standardizes your data. The software uses parsing, standardization, and matching algorithms to analyze your data and help you identify and reduce inconsistencies, inaccuracies, and redundancies.

This product is often used in conjunction with products such as DataFlux Corporation’s dfPower Studio, which enables you to customize the Quality Knowledge Base that the SAS Data Quality Server uses to store its data-cleansing guidelines.

### Platform Process Manager

Platform Process Manager provides scheduling capabilities, including scheduling the execution of jobs, managing dependencies between jobs, and submitting jobs to Platform LSF (Load Sharing Facility). Platform LSF manages resource requirements and provides for load balancing. The Platform Grid Management Service includes a monitoring daemon that enables administrators to monitor the load on machines running Platform LSF.

### SAS Metadata Repository

All of your information assets are managed in a common metadata layer called the SAS Metadata Repository.

This repository stores logical data representations of items such as libraries, information maps, and cubes, thus ensuring central control over the quality and consistency of data definitions and business rules. The repository also stores information about system resources such as servers, the users who access data and metadata, and the rules that govern who can access what.

All of the data integration, ETL, and business intelligence tools read and use metadata from the repository and create new metadata as needed.

## SAS Management Console

SAS Management Console provides an single interface through which system administrators can explore and manage metadata repositories. With this interface, administrators can efficiently set up system resources, manage user and group accounts, and administer security.

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## Business Intelligence

The software tools in the business intelligence category address two main functional areas: information design, and self-service reporting and analysis.

The information design tools enable business analysts and information architects to organize data in ways that are meaningful to business users, while shielding the end users from the complexities of underlying data structures. These tools include the following products:

- *SAS Information Map Studio* enables analysts and information architects to create and manage information maps that contain business metadata about your physical data.
- *SAS OLAP Cube Studio* enables information architects to create cube definitions that organize summary data along multiple business dimensions.

The self-service reporting and analysis tools enable business users to query, view, and explore centrally stored information. Users can create their own reports, graphs, and analyses in the desired format and level of detail. In addition, they can find, view, and share previously created reports and analyses. The tools feature intuitive interfaces that enable business users to perform these tasks with minimal training and without the involvement of information technology staff.

The self-service reporting and analysis tools include the following products:

- *SAS Web Report Studio* is a Web-based query and reporting tool that enables users at any skill level to create, view, and organize reports.
- *SAS Information Delivery Portal* provides a Web-based, personalized workplace to help decision makers easily find the information they need.
- *SAS Web OLAP Viewer* is a stand-alone Web-based application that uses SAS Information Maps to provide interactive and powerful navigation of OLAP data.
- *SAS Add-In for Microsoft Office* enables users to access SAS functionality from within Microsoft Office products.
- *SAS Enterprise Guide* is a project-oriented Windows application that enables users to create processes that include complex computations, business logic, and algorithms.

As users create information maps, cubes, report definitions, portal content definitions, and stored processes, information about them is stored in the SAS Metadata Repository. Client applications and users can access these information assets on a need-to-know basis. Access is controlled through multilayered security that is enforced through the metadata.

For a description of each of the business intelligence tools, see Chapter 6, “Clients in the SAS Intelligence Platform,” on page 33.

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## Intelligence Storage

The data storage options that are available with the SAS Intelligence Platform include SAS data tables, parallel storage, multidimensional databases, and third-party hierarchical and relational databases such as DB2 and Oracle. These storage options can be used alone or in any combination.

All metadata for your data sources is stored centrally in the SAS Metadata Repository for use by other components of the intelligence platform.

Each of the options is described briefly below.

### Relational Storage: SAS Data Sets

You can use SAS data sets, the default SAS storage format, to store data of any granularity. The data values in a SAS data set are organized as a table of observations (rows) and variables (columns). A SAS data set also contains descriptor information such as the data types and lengths of the columns, as well as which SAS engine was used to create the data.

### Multidimensional Storage: SAS OLAP Server

SAS OLAP Server provides dedicated storage for data that has been summarized along multiple business dimensions. The server uses a threaded, scalable, and open technology and is especially designed for fast-turnaround processing and reporting.

A simplified ETL process enables you to build consistent OLAP cubes from disparate systems. A threaded query engine and parallel storage enable data to be spread across multiple-disk systems. Support is provided for multidimensional (MOLAP) and hybrid (HOLAP) data stores, as well as for open industry standards.

### Parallel Storage: SAS Scalable Performance Data Engine and SAS Scalable Performance Data Server

SAS SPD Engine and SAS SPD Server provide a high-speed data storage alternative for processing very large SAS data sets. They read and write tables that contain millions of observations, including tables that exceed the 2-GB size limit imposed by some operating systems. In addition, they provide the rapid data access that is needed to support intensive processing by SAS analytic software and procedures.

These facilities work by organizing data into a streamlined file format and then using threads to read blocks of data very rapidly and in parallel. The software tasks are performed in conjunction with an operating system that enables threads to execute on any of the CPUs that are available on a machine.

The SAS SPD Engine, which is included with Base SAS software, is a single-user data storage solution. SAS SPD Server, which is available as a separate product or as part of the SAS Intelligence Storage bundle, is a multi-user solution that includes a comprehensive security infrastructure, backup and restore utilities, and sophisticated administrative and tuning options.

### Third-party Hierarchical and Relational Databases

The SAS Intelligence Platform can access data that is stored in third-party hierarchical and relational databases such as DB2, Oracle, SQL Server, and NCR

Teradata. SAS/ACCESS interfaces provide fast, efficient data loading and enable SAS applications to work directly from your data sources without making a copy.

Several of the SAS/ACCESS engines use an I/O subsystem that enables you to read entire blocks of data instead of reading data just one record at a time. This feature, which reduces I/O bottlenecks and enables procedures to read data as fast as they can process it, is included in the SAS/ACCESS engines for Oracle, Sybase, DB2 (UNIX and PC), ODBC, SQL Server, and Teradata.

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## Analytics

SAS offers the richest and widest portfolio of analytic products in the software industry. The portfolio includes products for statistical data analysis, data and text mining, forecasting, econometrics, quality improvement, and operations research. You can use any combination of these tools with the SAS Intelligence Platform to add precision and insight to your reports and analyses.

One such tool is SAS Enterprise Miner, which enables analysts to create and manage data mining process flows. These flows include steps to examine, transform, and process data to create models that predict complex behaviors of economic interest. The SAS Intelligence Platform enables SAS Enterprise Miner users to centrally store and share the metadata for models and projects. In addition, SAS Data Integration Studio provides the ability to schedule data mining jobs.

SAS software provides the following types of analytical capabilities:

- statistical data analysis, to drive fact-based decisions
- data and text mining, to build descriptive and predictive models and deploy the results throughout the enterprise
- forecasting, to analyze and predict outcomes based on historical patterns
- econometrics, to apply statistical methods to economic data, problems and trends
- quality improvement, to identify, monitor, and measure quality processes over time
- operations research, to apply techniques such as optimization, scheduling, and simulation to achieve the best result

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## Strategic Benefits of the SAS Business Intelligence Platform

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### Multiple Capabilities Integrated into One Platform

The SAS Intelligence Platform combines advanced SAS analytics, high-speed processing of large amounts of data, and easy-to-use query and reporting tools. The result is accurate, reliable, and fast information with which to make decisions.

You can build data warehouses, perform data mining, enable users to query data and produce reports from a Web browser, and give users easy access to SAS processes that perform robust analytics.

The SAS Intelligence Platform provides all of this functionality in one centrally managed suite of products that are designed to work together seamlessly. This integration reduces the administration, management, and deployment costs that would be associated with providing multiple technologies to meet the needs of different users.

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## Consistency of Data and Business Rules

The SAS Intelligence Platform makes use of your organization's existing data assets, enabling you to integrate data from multiple database platforms and ERPs. Tools are provided to help ensure the reliability, consistency, and standardization of this data.

Users can choose from multiple tools with which to perform queries and produce reports. Since all of the tools access data through the same metadata representations, users throughout your enterprise receive consistent data. As a result, they can make decisions based on a common version of the truth.

Similarly, business logic, complex computations, and analytic algorithms can be developed once and stored centrally in SAS processes for all users to access. These processes, as well as the information in the SAS Metadata Repository, are controlled through multi-level security.

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## Fast and Easy Reporting and Analysis

The SAS Intelligence Platform's self-service reporting and analysis tools enable users across the enterprise to access and query data from virtually any data source. Any number of users can use wizards to create reports in the needed time frames, without waiting for support from information technology professionals. Through Web-based interfaces, users can explore large volumes of multidimensional data quickly and interactively, from multiple perspectives and at multiple levels of detail.

The reporting and analysis tools hide complex data structures, so that average business users can perform queries without having to learn new skills. The intelligence storage options are optimized for analytical processing, enabling the reporting tools to quickly retrieve large volumes of data.

As a result of these reporting and analysis capabilities, everyone spends less time looking for answers and more time driving strategic decisions.

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## Analytics Available to All Users

SAS is the market leader in analytics. With the SAS Intelligence Platform, you can make the full breadth of SAS analytics available to users throughout the enterprise.

SAS analytics include algorithms for functions such as predictive and descriptive modeling, forecasting, optimization, simulation, and experimental design. You can now incorporate these capabilities into self-service reports and analyses, so that decision makers throughout your enterprise can benefit from the accuracy and precision of high-end analytics.

