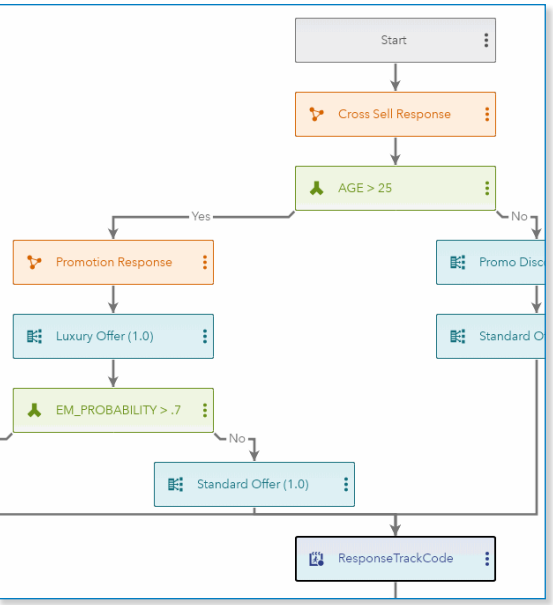
SAS® Decision Manager on SAS® Viya®

Streamline analytical model deployment and automate operational business decisions



What does SAS® Decision Manager do?

SAS Decision Manager delivers business rules management and streamlines analytical model deployment. It integrates data, business rules and models and creates validated, managed assets – providing assurance and integrity for automated operational decisions. All from a single interface.

Why is SAS® Decision Manager important?

By automating thousands of decisions daily, SAS Decision Manager makes organizations more efficient and consistent. It prevents duplicate efforts and eases the burden of manually redefining models for production. As a common decision authoring and deployment environment for business and IT, it preserves version control, testing traceability and continuity of all analytically driven operational decisions.

For whom is SAS® Decision Manager designed?

It's designed for business analysts who must assess alternate decision scenarios for optimal outcomes, and for IT staff and database administrators who put analytical decision models into production environments. It also makes it easier for compliance personnel to trace operational decisions.

A typical day brings countless business decisions that affect everything from profitability to customer satisfaction. What is a reasonable price point? When is a discount too excessive – and unprofitable? Which clients qualify for special programs? How can services and logistics be more efficient? Day-to-day decisions like these can alter the trajectory of a business. And while one bad move may not be too detrimental, hundreds or thousands of such operational decisions are made each day. So it's important that each decision is made with the best, most accurate information – and is consistent with organizational policy.

SAS Decision Manager automates analytics-based decision making so organizations can function more efficiently while improving interactions with customers, suppliers, partners and employees. Likewise, organizations that are highly regulated – such as financial services, health care and insurance – can more easily achieve compliance as a result of documented, traceable decisions.

Benefits

- **Instill confidence by automating operational decisions.** Based on operational data – informed by analytical models and governed by business rules – IT and business can jointly engineer operational decisions to automatically define the best action to take.
- **Streamline business rule management.** Speed business rule development and testing, including dynamic term management. You get a common and consistent method for accessing and managing information, selecting analytical models and defining the business rules that create the context for production use.
- **Standardize model deployment with one shared environment.** A common decision authoring and deployment environment used by different specialists dramatically reduces IT time spent validating and deploying analytical models. Shared, flexible processing control logic lets analysts select data and models from existing repositories. Defining business rules in context ensures continuity and shared terminology.
- **Simplifies IT testing and extended analytical model use.** Skip the manual work and recoding. SAS Decision Manager generates the entire code path, including necessary business rules, within the context of analytical models. There's no need for IT to reassemble decision flows for batch or real-time deployment, or piece together code for deployment testing. Consistent decision logic is defined once, and can be deployed many times for batch or real-time decisions, all from a single deployment interface.
- **Control operational decisions and reduce compliance headaches.** Managed, automated decisions defined for operational activities deliver analytically sound, consistent actions across the organization. A fully integrated

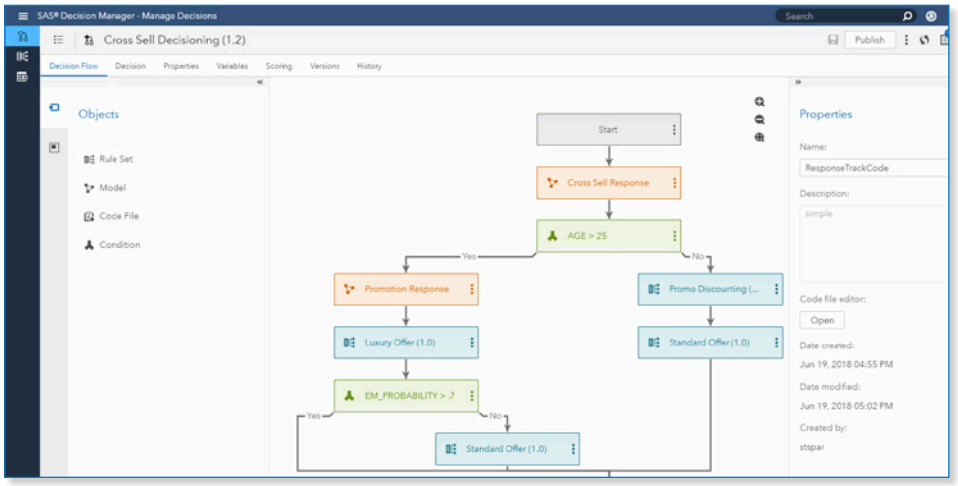
application on a single framework means users' activities are fully traceable and open to detailed investigation, helping ensure governance and policy compliance.

- **Extend operational decisions with custom code and open source.** Business rules and analytical models can be integrated with custom code to deliver customer-specific decision logic that goes beyond analytical models and rules. Custom code provides the ability to integrate with your business applications using open REST APIs, integrate Python code and enrich decisions with external data.

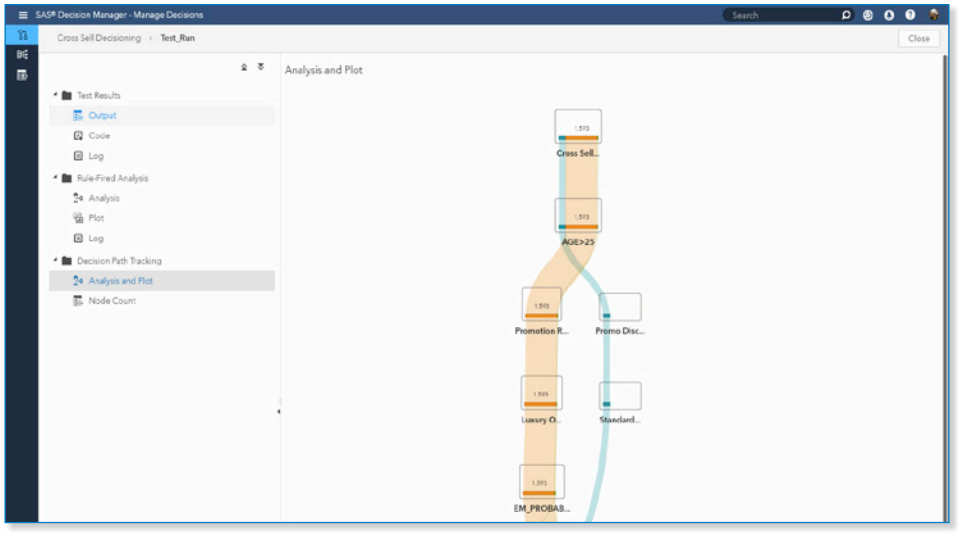
Overview

Responding to dynamic environments and changing business requirements, SAS Decision Manager consolidates and streamlines the deployment of analytical models, automating repeated operational decisions and making them both data-driven and analytically sound. This ensures rapid deployment and consistent decisions in dependent applications and by front-line workers or other systems.

Written once, these defined, systematic operational decisions can be quickly and easily adjusted to handle policy changes, new market conditions and the dynamics of your business environment – before models become obsolete or the opportunity passes. With the common user interface, analytical model deployment is explicit, fully documented and traceable – providing proof of adherence to compliance and regulatory requirements, as well as organizational policy governance.



The decision builder interface helps you assemble models and rules.



Easily evaluate test results with decision path tracking.

Streamlined analytical model deployment

Business and IT users face the cumbersome task of logging in to different tools to access and manage information, select analytical models and define the business rules that create the context for production use. SAS Decision Manager provides a common and consistent method for each of these tasks, so you can put analytical models into production quickly for batch as well as real-time processing without manual recoding for each execution target.

It alleviates duplicate effort across departments and provides clear, centralized instruction for how analytical models are defined and how they are meant to be used. From a single interface, analytical models and business rules are natively integrated, managed and published, with identical logic for both batch and real-time web service execution. The result is faster deployment and model integrity within analytically driven operational decisions.

A common decision authoring and deployment environment

Many analytically savvy organizations don't have standardized or efficient processes to apply advanced analytical models in their businesses. Often, IT has to recode models for deployment – and seldom do they have the business context, analytical rationale or even shared terminology to work with. As a result, not only does the relevance of the models deteriorate due to delays associated with these manual tasks, but operational controls necessary to trace full lineage, authorized approvals and more are lost or require tedious, additional work.

SAS Decision Manager provides a common decision authoring and deployment environment for both IT and the business side that preserves documentation, testing traceability and continuity in a shared environment. One environment used by different specialists to orchestrate decision flows simplifies validation of the entire decision, and provides complete version control.

Comprehensive impact analysis for the entire operational decision flow is visible, and includes models, rules and data – making it easier to assess the effect and dependencies associated with changing elements and conditions. You can import models from various code bases and use them in a decision flow, including models from SAS Visual Data Mining and Machine Learning, SAS® Enterprise Miner™, PMML and SAS Factory Miner models/projects.

Simplified IT testing and extended model use

With extended Hadoop environment support, in-database execution and full decision support – for both batch and web services – consistent decision logic is defined once, and can be deployed many times. The micro analytics web service (MAS) creates a real-time analytical scoring service in just a few clicks, automatically generating deployment code from the interface. These small, self-contained scripts run in memory and don't require in-state software or other servers to run, which streamlines IT tasks and easily extends analytical model use.

Simplified IT testing of applications that call operational analytics also includes usage reporting and any documentation or attachments detailed in the process, such as comprehensive user logs, notes, and testing and audit history. Enhanced security to lock down rule flows provides better control and governance for publication. Decision and model testing supports execution on execution targets where decisions are published. This provides an added layer of test validation and governance.

Key Features

Decision flow builder

- A centralized, graphical drag-and-drop interface lets you assemble business rules, custom code and models into complete decision flows, minimizing the need to write deployment code that joins these pieces together.
- To define decisions, you can browse existing repositories of data, models and business rules and select from existing assets.
- Create custom code within a decision flow to integrate with business application REST APIs, databases, web service calls and open source Python.
- To control decision orchestration, add condition logic (i.e., IF-THEN-ELSE) and use outputs from any preceding rule or model.
- From a decision flow, you can easily navigate to the business rule editor to simplify editing and rule-logic updates using deep linking.
- Ability to drill through from decision flow to model repository simplifies model selection and model inspection.
- Property panels for each node let you quickly modify parameters of models, custom code files, business rules and conditional logic.
- The enhanced rule list view provides compressed, easy-to-read rules for readily identifiable logic definitions.
- Full version control for entire decision flows simplifies testing and validation.

Business rules management

- An integrated business rule management platform enables fast rule construction, testing, governance and integration within decision flows.
- Manage rule versions for improved tracking and governance during deployment, including deep linking to business rules from decision flows.
- Quickly create complex business logic within decision flows, including on-the-fly term development.
- Provides free-form rule-logic creation with full access to sophisticated functions.
- Lookup table integration to execute lookup for rule-logic checks and rule actions.
- Lookup table management for table import and updates gives you the ability to create lookups from SAS Visual Analytics tables.
- Lookup tables can be activated and locked at user discretion to support proper usage of most current lookup tables within business rules.

Testing and governance

- Business rules:
  - Rule versions can be locked down or augmented.
  - Explicit and detailed rule-fire analysis can be used for testing, refinement and rule auditing documentation prior to operational deployment.
  - Rule tests, test suites and log details can be saved for documentation and reuse.
- Deployment:
  - Disciplined testing, change management, auditing and validation are available from a common environment.
  - Complete decision flows can be created from within the interface for both batch and real-time environments, simplifying IT integration and acceptance testing, as well as operational deployment.
  - Simplified IT testing for applications that call operational analytics as web services includes reporting and user logs for audit history.
  - Multiple input tables can be registered for use within SAS Decision Manager, including testing, publish target validation and simulation.

Improved content and access security

- Integration with SAS Drive provides a common location from which advanced analytical models, business rules, decisions and supporting analytical content can be accessed, modified and managed. Access to lineage is also supported, providing simplified access to examine relationships between different decision components.

Integrated with SAS® machine learning capabilities

Prior to deploying an analytical model, it's important to define the logical elements of a decision and how the elements combine rigorously tested business scenarios. All of these activities take time. Sometimes so much time passes that analytical models become obsolete before they're put into production. Bringing science to the art of operational decisions, SAS Decision Manager helps expedite this process. It integrates with the Model Studio interface in SAS Visual Mining and Machine Learning for faster model development. Common tasks, like defining business rules and deployment, take much less time.

Easy compliance validation

Most vendor technologies only give you the ability to integrate data or develop business rules, or they only allow you to develop analytical models creating scoring code for deployment. But SAS Decision Manager combines all those required capabilities into a single solution – from data definitions through the model deployment process. Your operational decisions are defined, tested and traceable – all from one application. And they are validated by the specialists who understand your organization's operations, goals and compliance requirements. There's no need for IT to recode, validate and deploy decision flows in other programming languages or systems.

TO LEARN MORE »

To learn more about SAS Decision Manager, download white papers, view screenshots and see other related material, please visit sas.com/decision-manager.

Key Features (continued)

- Role-based security is available for creation, deletion, updates and publishing actions.
- Decisions and rule versions can be automatically locked down by authorized personnel for better control and governance when it's time to publish.

Enhanced term management

- Automated rule-to-term mapping includes type and domains from existing data dictionaries and tables.
- You can rename terms, and choose what to include/exclude from the input and output the definition of a decision flow.
- Dynamically add new terms as needed to simplify term definition, data type, input/output designation and lengths

Model inventory management

- Model Studio projects and models are directly accessible from SAS Decision Manager when registered within SAS Model Manager. [1]
- The designated champion model is easily recognizable to business analysts.
- Published or republished Model Studio projects are automatically versioned.
- With model inventory management, you can import models to SAS Model Manager from many code bases, including SAS/STAT®, SAS Enterprise Miner, SAS Visual Statistics, SAS Visual Data Mining and Machine Learning, R and PMML , as well as generic models (e.g., C, C++, Java, Python, etc.). Zip file and SPK file import also supported.
- Model registration is supported from Model Studio, SAS Visual Statistics, SAS Visual Analytics and SAS Visual Text Analytics.

Simplified deployment

- Real-time deployment (via web services):
  - Micro analytic web service (MAS) provides fast, scalable web service deployment.
  - Easily move complete decision flows into IT web service testing environments and production deployment.
  - Supporting analytical scoring as a service, MAS execution operates in a self-contained and portable standalone architecture (with a minimal footprint). It uses in-memory threaded kernel processing for simplified integration with transactional systems, as well as IoT edge or in-stream computing.
- SAS Environment Manager plug-in provides simplified execution target definition and management for CAS, MAS, in database and Hadoop targets.
- In-database batch deployment:
  - Execute business rules and analytical model scoring without moving the data.
  - Deployment of business rules, decisions and related analytical models in Hadoop distributions is supported (SAS/ACCESS® Interface to Hadoop), which transforms data lakes into functional IT testing and implementation environments.[2]
  - Extended support is included for the following Hadoop environments: Cloudera, Hortonworks, MapR, Pivotal and BigInsights.
  - In-database rule execution for models, rules and decisions is supported for Hadoop, Teradata and CAS.

1 SAS Model Manager is the model management capability sold separately from SAS Decision Manager.
2 SAS/ACCESS Interface to Hadoop is required, which includes the SAS Scoring Accelerator needed to support Hadoop distributions. This is an add-on for in-database execution of analytical models only.