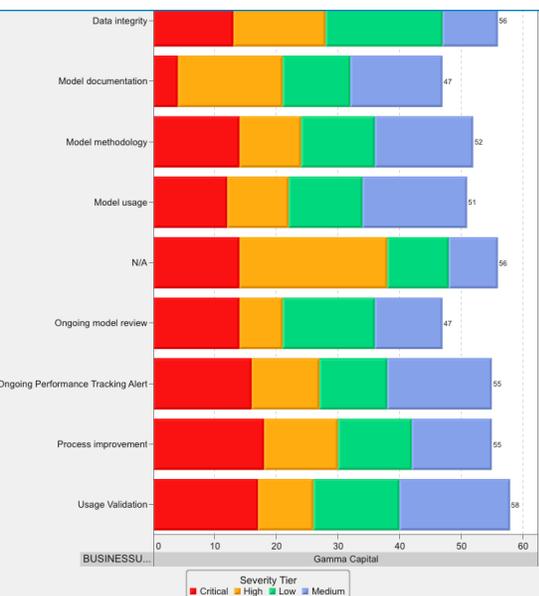# SAS® Model Risk Management

Control model risk and increase business value

What does SAS® Model Risk Management do?

SAS Model Risk Management provides a powerful solution to understand and control model risk throughout a fully integrated model management life cycle. You can organize enterprise-wide model inventory, validate inventories to support supervisory guidance and business objectives, set policy and documentation protocols, and easily share auditable information.

Why is SAS® Model Risk Management important?

As model risk grows, business complexity and regulatory scrutiny require that all risk categories be identified, monitored, controlled and documented. To rapidly and accurately report risk exposure to executive management and regulators, you need clear oversight throughout your organization's model risk life cycle, including well-controlled model development, implementation, appropriate use and validation policies.

For whom is SAS® Model Risk Management designed?

SAS Model Risk Management is designed for organizations seeking to establish a fully integrated model governance framework to ensure all risk categories related to models are monitored and controlled.

The regulatory scrutiny being applied to model risk management is intensifying globally. In the US, the Federal Reserve and the Office of the Controller of the Currency (OCC) set the standard with the publishing of SR 11-7. Those US requirements have since been reinforced by the Dodd-Frank Stress Testing requirements. The Basel Committee and European Central Bank (ECB) have also published strict guidelines, including the Targeted Review of Internal Models (TRIM), for banks in the European Union.

As a result, banks need to efficiently maintain an inventory of models along with the resources required to be confident that their models are well managed throughout the entire model life cycle and their risk exposures are quantifiable.

SAS Model Risk Management reduces the manual effort required to appropriately inventory, manage, document, communicate, monitor changes and audit firmwide models. This solution provides critical support for decision making as well as for the efficient adoption and implementation of new policies to meet changing regulations.

Benefits

- **Centralize model information management.** SAS Model Risk Management provides an enterprisewide model inventory and validation process to keep risk models fresh and improve their performance. Controls, guidelines and workflows measure and address model risk at each stage of the model life cycle to generate consistent, reliable and timely insights. A robust infrastructure includes permissions, version control and data mining capabilities. And you can import attributes and metadata from any type of model developed with any technology.

- **Document and track models throughout the model life cycle.** Effectively track model issues, concerns, challenges and remediations with a rigorous model review and validation process. A single source of model documentation consistently records the review and validation process, which can be examined at various levels, including model lineage, version, business line, model owner and more. This makes it easier to identify models for review and possible upgrading or decommissioning.

- **Easily adjust to changing model risk policies.** Regulations demand rigorous design, implementation and validation techniques. Quickly tune your model review and validation practices to stay on top of ever-changing risk policies and regulatory requirements. Improve your ability to facilitate internal and external model audits, and reduce preparation time for regulatory reporting. Governance tools help enforce appropriate signoffs, legal reviews and testing within a consolidated framework.

- **Gain greater insight into your model risk concentration.** Analyze thousands of data points – using both quantitative and qualitative data – to gain greater insight into your organization's model risk concentrations. Then transform model risk data into usable information with state-of-the-art visualization capabilities. Interactive visualizations tell your model risk story clearly and accurately to broaden institutional awareness. And users can easily drill down through reports to learn more.

Overview

SAS Model Risk Management provides a comprehensive solution that includes a centralized model inventory, model assessment and risk reporting capabilities. With it, you can:

- **Easily organize models.** It is recommended that banks maintain an inventory of all models used to produce the required estimates on revenue or loss projections. With SAS, you can inventory your entire model library, including related documentation, supported by a feature-rich platform that enforces your model risk management policies.

- **Validate models.** Independently review, attest and validate all models to support existing supervisory guidance and business objectives in a framework that tracks and records the entire conversation.

- **Set policy and documentation protocols.** Carry out model-related issue tracking and enable thorough documentation and policy management for effective challenge and remediation plans.

- **Continuously monitor models.** Set model performance thresholds that appropriately alert you when models are not performing as expected.

- **Easily share information.** Construct and disseminate reports for effective top-down model risk reporting. You can even ease the burden of regulatory reporting with SAS tools that prepopulate regulatory documentation from a single source data repository.

Capabilities

Model inventory and management

As banks strengthen their model governance programs, documentation becomes increasingly critical to provide a foundation for well-controlled model development, inventory management, testing, implementation, use and validation.

But despite its widely recognized importance and emphasis from regulators, firms tend to underinvest in maintaining complete, accurate, well-organized and up-to-date model documentation.

SAS Model Risk Management provides a repeatable, reliable and auditable process for classifying models and non-models. You can organize a centrally controlled model inventory complete with:

- Model candidate assessment.
- Supporting theoretical and assumption documentation.
- Model limitation scoring.
- Validation results.
- Criticality model risk and control assessments ratings.
- Model interdependence relationships.
- Model attestation.

A single source of model documentation, including model lineage, version, business line, model owner or customized factors, may be reviewed by multiple stakeholders. You can easily import attributes and metadata from models developed using industry standard technology – whether developed by SAS, third parties or in-house. A comprehensive and flexible workflow management system streamlines user engagement with model inventory and validation processes.

SAS Model Risk Management provides easy-to-use software that supports, standardizes and orchestrates all of your model risk management activities, including development, testing, implementation, use and validation.

Model review and validation

As models proliferate, grow in complexity and affect more investment capital, it's critical to have an effective review and validation framework to adequately manage your model risk. Corporate boards and regulators recognize this growing risk and are demanding a reliable model management framework with transparent model risk reporting.

SAS Model Risk Management allows you to customize an end-to-end framework consistent with regulatory requirements and internal policies and procedures. Bottom-up risk reporting allows you to identify model risk from the individual model level up through comprehensive enterprise risk reporting.

Using the SAS solution, your risk management staff can demonstrate a rigorous model review and validation process that's consistent with guiding principles and expectations – including meeting regulatory challenges, remediation, and effective defense of model quality and usage.

As risk policy and regulatory requirements become increasingly dynamic, SAS enables business users to quickly tune model review and validation practices by applying a set of integrated governance tools that enforce appropriate signoffs, legal reviews and testing within a comprehensive framework that maintains an audit trail of relevant communication and workflows.

Model risk reporting challenges

Do your model risk managers, analysts and lines of business struggle to understand how decommissioning a model would affect downstream processes? And do they know how many models are being used within your exception validation policy? What about a comprehensive report that aggregates model risk at the corporate level? Can you review a specific business unit's model risk?

SAS Model Risk Management lets you review thousands of data points in interactive visualizations that tell your model risk story. Business users can drill down into

Key Features

Model inventory and documentation
- Assess whether a candidate meets the qualifying criteria for a model.
- Import attributes and metadata from any type of model developed in any technology.
- Confirm and attest the accuracy of a model inventory.
- Securely store model attributes and assumptions across model types, sources (in-house and third party) and technologies for enterprisewide reporting.
- Attach documents to models, track versions and manage documents in a secure fashion.
- Assign and document model reviews and track model performance.
- Develop working documents for the model validation team.
- Expedite the management and deployment of best-practice models into production.
- Facilitate effective challenges, fact-based conversations and defense among internal and external model quality stakeholders.
- Integrate advanced model monitoring with management reporting and alerts.
- Enable auditability and compliance to meet regulatory requirements, including OCC and TRIM.
- Gain transparency and apply model review and validation procedures that are consistent with your policies and standards.

Model risk reporting
- Aggregate model risk across an organization.
- Easily disseminate model performance and validation reports.
- Provide executive insight into an accurate view of model risk concentrations.
- Understand the impacts of altering/decommissioning models.
- Interactively identify model risk from the bottom up.
- Use SAS Add-In for Microsoft Office to easily export data into Excel, PowerPoint and Word.
- Use text sentiment analysis that identifies and escalates "hot topics."

Model performance monitoring
- Systematically track model performance measures, thresholds and alerts.
- Intergrade any model monitoring metric, at any level, from any source, directly into your model risk management framework.
- Use the model monitoring calculation engine with a library of performance metrics.
- Easily monitor models with a library of detailed and interactive dashboards.
- Continuously monitor models, automatically generate findings and maintain a record of changes.

Address ECB Targeted Review of Internal Models (TRIM) framework
- Meet internal model validation, governance and supervision standards.
- Take advantage of robust internal models documentation and data quality standards.
- Define and enforce roles and responsibilities per your organization's policy.

model relationships and details, including various business units, model owners and parent/child relationships to investigate troubled areas requiring additional attention. Models that are candidates for review, and possible decommission, can be identified – and impacts understood – with just a few clicks.

Built-in scheduling eliminates the need for manual reporting, and you can set continuous monitoring rules that alert appropriate stakeholders when defined thresholds are breached.

Model risk governance hosted by SAS

SAS offers global hosting services for its industry-leading model risk management solution. Delivered through SAS Cloud so there is zero hardware footprint or capital expenditure (Capex) for you to manage, we provide hosting expertise to build and support your environment, coupled with analytics expertise to answer your most difficult questions.

SAS provides the expertise, infrastructure and ongoing support to ensure rapid deployment and a robust, fully available solutions environment. All SAS data centers are certified and meet vendor risk compliance requirements set by the OCC, EBA and other regulatory bodies, including Service Organization Controls SOC 2 and SOC 3.

It's easy to generate management dashboards to provide a quick snapshot of all your modeling activities.
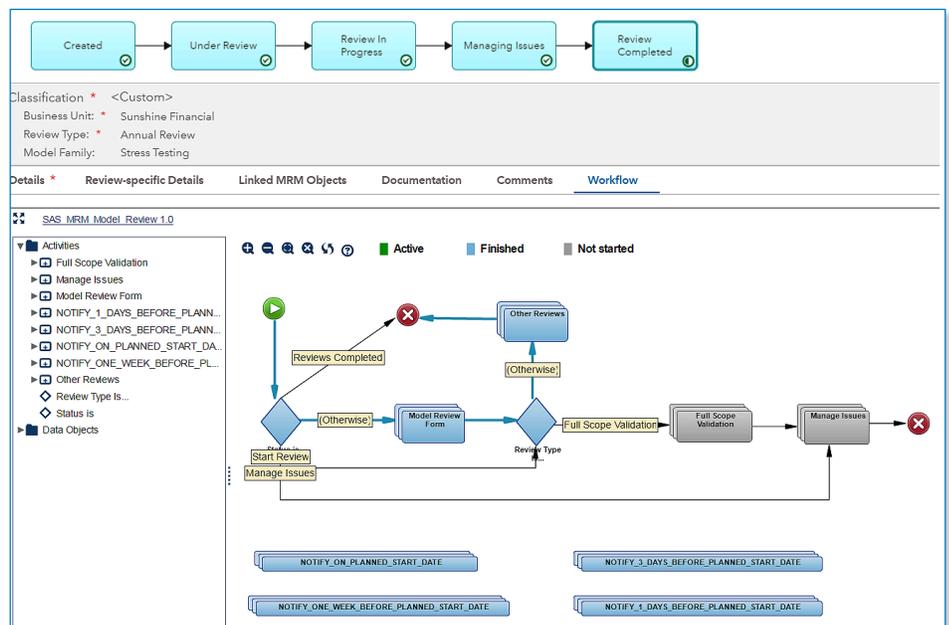
Intuitive workflow tools streamline and enforce your model policy, coordinate and record relevant communications, and report historical model life cycles.

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