

Vendor Analysis: SAS

Model Risk Management Solutions, 2024



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Vendor Analysis

1. Report context

This Vendor Analysis is based on the Chartis quadrant report **Model Risk Management Solutions, 2024: Quadrant Update** (published in December 2024). This section summarizes the key theses in that report; subsequent sections take a detailed look at SAS's quadrant positioning and scoring, and Chartis' underlying opinion and analysis.

Key thesis

Chartis' quadrant analysis in this iteration of our model risk management (MRM) research highlights increased complexity in the space. As the lines between products, services, governance and validation have become less distinct, vendors have expanded across these areas and entered and matured in different quadrants. The key differentiation between firms continues to be that some are model providers (shown as orange dots in the validation quadrants), with validation and governance as an integral part of their offerings, and others provide stand-alone validation and governance capabilities (shown as purple dots in the validation quadrants).

Across the three primary quadrants analyzed in the report, we observe the following:

- **Model validation solutions and services (derivatives).** In this quadrant, success often depends on offering advanced quantitative modeling and explicable frameworks to manage complex processes. The line between model providers and validation specialists is becoming blurred as model providers enhance their offerings.
- **Model validation solutions and services (credit).** As more firms have matured in this space, the distinction between point solution providers and platform vendors has narrowed, with machine learning (ML) and automation driving innovation.
- **Model governance solutions.** The model governance space demands increasing specialization. Vendors that survive and thrive differentiate themselves with integrated solutions and automation capabilities. Artificial intelligence (AI)-driven tools for documentation, regulatory reporting and metadata management are becoming essential differentiators.

Demand-side takeaways

MRM continues to evolve as regulators and institutions face growing challenges posed by increasing model complexity, particularly with the rise of AI and ML models.

Regulators are refining their guidelines to address these complexities, emphasizing robust validation frameworks, explainability standards and enhanced governance to ensure accountability and fairness. For institutions, this shift demands greater investment in technology, expertise and processes to manage the full model lifecycle, from development to deployment and monitoring. As a result, MRM practices are becoming more integrated.

Supply-side takeaways

Quadrant complexity grows. As the lines between products, services, governance and validation have become less distinct, firms have also expanded across these areas, entering and maturing in different quadrants. The key differentiation between firms continues to be that some are model providers, with validation and governance as integral parts of their offerings, while others provide standalone validation and governance capabilities.

Across the three primary quadrants analyzed in the report the trends were as follows:

- **Derivatives validation.** Within this quadrant, success often depends on advanced quantitative modeling and explicable frameworks to manage complex processes. The line between model providers and validation specialists is becoming less distinguishable as model providers enhance their offerings.
- **Credit validation.** Maturity in this space has narrowed the distinctions between point solution providers and platform vendors, with ML and automation driving innovation.
- **Governance quadrant.** The model governance space demands increasing specialization. Vendors that survive and thrive differentiate themselves with integrated solutions and automation capabilities. AI-driven tools for documentation, regulatory reporting and metadata management are becoming essential differentiators.

2. Quadrant context

Introducing the Chartis RiskTech Quadrant®

This section of the report contains:

- Chartis RiskTech Quadrants® for model validation solutions and services (credit) and model governance solutions, 2024.
- An examination of SAS's positioning and scores as part of Chartis' analysis.
- A consideration of how the quadrant reflects the broader vendor landscape.

Summary information

What does the Chartis quadrant show?

Chartis' RiskTech Quadrant® uses a comprehensive methodology that involves in-depth independent research and a clear scoring system to explain which technology solutions meet an organization's needs. The RiskTech Quadrant® does not simply describe one technology option as the best model risk management solution; rather it has a sophisticated ranking methodology to explain which solutions are best for specific buyers, depending on their implementation strategies.

The RiskTech Quadrant® is a proprietary methodology developed specifically for the risk technology marketplace. It considers vendors' product, technology and organizational capabilities. Section 4 of this report sets out the generic methodology and criteria used for the RiskTech Quadrant®.

How are quadrants used by technology buyers?

Chartis' RiskTech Quadrant® and FinTech Quadrant provide a view of the vendor landscape in a specific area of risk, financial and/or regulatory technology. We monitor the market to identify the strengths and weaknesses of different solutions and track the post-sales performance of companies selling and implementing these systems. Users and buyers can consult the quadrants as part of their wider research when considering the most appropriate solution for their needs.

Note, however, that Chartis does not endorse any vendor, product or service depicted in its research publications and does not advise technology users to select only those vendors with the highest ratings or other designation. Chartis' publications consist of the opinions of its research analysts and should not be construed as statements of fact.

How are quadrants used by technology vendors?

Technology vendors can use Chartis' quadrants to achieve several goals:

- Gain an independent analysis and view of the provider landscape in a specific area of risk, financial and/or regulatory technology.
- Assess their capabilities and market positioning against their competitors and other players in the space.
- Enhance their positioning with actual and potential clients and develop their go-to-market strategies.

In addition, Chartis' Vendor Analysis reports, like this one, offer detailed insight into specific vendors and their capabilities, with further analysis of their quadrant positioning and scoring.

Vendor Analysis

Chartis Research RiskTech Quadrant® for MRM solutions, 2024

Figures 1 and 2 illustrate Chartis' view of the vendor landscapes for model governance solutions and model validation solutions and services (credit), highlighting SAS's position.

Figure 1: RiskTech Quadrant® for model governance solutions, 2024



Source: Chartis Research

Vendor Analysis

Figure 2: RiskTech Quadrant® for model validation solutions and services (credit), 2024



*Acquired by LSEG

Note:

- Orange dots indicate model providers.
- Purple dots indicate model validation providers.

Source: Chartis Research

Quadrant dynamics

General quadrant takeaways

Model governance solutions

Category leader vendors typically have strong foundations in governance, risk and compliance (GRC) frameworks but may not fully cover the entire spectrum of governance needs. These vendors are well-equipped to handle key aspects of risk management but might lack the breadth required to address the full governance landscape. They focus on providing solutions that address certain regulatory and operational challenges, yet do not extend their offerings to cover every aspect of model risk. This is particularly evident in such specialized areas as advanced AI validation or more comprehensive integration with cutting-edge technologies. As such, while they provide solid, process-oriented capabilities, they may not have the same level of specialization or breadth as vendors positioned farther along the spectrum of full governance capabilities.

Vendor Analysis

Model validation solutions and services (credit)

Vendors positioned on the far right of the quadrant stand out for their strong service capabilities, large teams with deep domain expertise in credit, and advanced tools that streamline and automate the validation process. These vendors provide a comprehensive suite of solutions, including document generation, management and acceleration tools, complemented by robust human resources and domain knowledge.

Moving left within the category leader section, vendors maintain strong human resources and domain expertise but may lack the breadth or specialization of tools seen in vendors on the far right. Farther left, vendors often focus more on process and their own product validation, with a lighter emphasis on domain expertise, while point solution providers are niche-focused, with limited validation services and fewer resources.

Vendor positioning in context – completeness of offering

Model governance solutions

SAS earned the category leader rating in the RiskTech Quadrant® for model governance by demonstrating a forward-thinking approach to managing models across traditional and emerging domains. It addresses the classical aspects of governance, such as model analysis, controls and documentation – areas that rely heavily on domain knowledge – as well as the rapidly evolving demands of AI and generative AI (GenAI) governance, including advanced capabilities in ModelOps, SecurityOps, DevOps, orchestration and Big Data management.

The company’s frameworks for handling traditionally oriented models, such as those used in corporate banking credit and governance cycles, are proven and well-established. These frameworks have been implemented across numerous institutions, contributing to their depth, reliability and scalability. This breadth of deployment also demonstrated SAS’s capacity to provide governance solutions for diverse operational and regulatory needs. This was further underscored by the company’s ability to integrate external data sources, as well as its wide array of tools specifically designed to support AI governance.

By bridging traditional governance practices with modern technologies and offering solutions that are both adaptable and rooted in industry expertise, SAS has established itself as a leader in model governance, earning its recognition as a category leader.

Table 1 shows Chartis’ rankings for SAS’s coverage against each of the completeness of offering criteria.

Model validation solutions and services (credit)

SAS secured a category leader position in the RiskTech Quadrant® for model risk validation solutions and services (credit) due to its expertise and depth of capabilities in credit modeling and analytics. With a long-standing reputation for building credit models, SAS has demonstrated adaptability and reliability across several sectors, including retail and wholesale banking, underscoring its versatility and effectiveness.

SAS demonstrated strong analytical support in the complex credit risk environment. Analytical accelerators were considered differentiators, due to their strong integration with existing software infrastructures. SAS also demonstrated a broad approach to the credit model lifecycle, encompassing

Table 1: Completeness of offering – SAS (model governance solutions, 2024)

Completeness of offering criterion	Coverage
Model coverage	High
Governance	High
Data management	High
Model inventory	High
Dashboarding	High
Visualization	High

Source: Chartis Research

Vendor Analysis

development and regulatory compliance. Notably, its solutions address such accounting standards as International Financial Reporting Standard (IFRS) 9 on the accounting side of credit, as well as risk.

Over time SAS has broadened its support for more complex and non-traditional credit modeling approaches. This has strengthened its ability to address the needs of a wider array of clients.

Another key differentiator was the company's well-defined data infrastructure, developed via its long tenure in credit default analytics. By combining innovation, expertise and alignment with both regulatory and operational requirements, SAS has solidified its position in model risk validation for credit.

Table 2 shows Chartis' rankings for SAS's coverage against each of the completeness of offering criteria.

Table 2: Completeness of offering – SAS (model validation solutions and services [credit], 2024)

Completeness of offering criterion	Coverage
Organizational depth and personnel	High
Supporting tools	High
Methodological frameworks and structure	High
Data handling/approach	High
Dashboarding	High
Visualization	High

Source: Chartis Research

Vendor positioning in context – market potential

Model governance solutions

SAS's market potential rating in the Chartis RiskTech Quadrant® for model governance is bolstered by its deep expertise in retail credit and anti-fraud, which provides a solid foundation for its governance solutions. These areas demand robust frameworks, and SAS's proven tools address both traditional governance needs and emerging challenges such as AI governance and ModelOps.

This depth of experience gives SAS a clear advantage, particularly as regulatory demands increase and governance frameworks become more complex. SAS's established presence in these critical sectors ensures that it is well-positioned to remain a key player in the model governance space.

Table 3 shows Chartis' rankings for SAS's coverage against each of the market potential criteria.

Table 3: Market potential – SAS (model governance solutions, 2024)

Market potential criterion	Coverage
Customer satisfaction	High
Market penetration	High
Growth strategy	High
Business model	High
Financials	High

Source: Chartis Research

Model validation solutions and services (credit)

SAS's strong market potential rating in the Chartis RiskTech Quadrant® for model validation solutions and services (credit) is due to its established leadership and central role in credit model development and validation across the banking sector. Its position as a dominant player in this space ensures it is well-placed to benefit from sector growth, particularly as regulatory scrutiny and the demand for advanced credit risk models continue to increase.

As a supplier of credit models and tools, SAS occupies a pivotal role in both risk and accounting functions within banking institutions. This deep integration into the credit business ensures that SAS remains a strong provider for institutions aiming to enhance their model validation capabilities.

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SAS's market potential is further amplified by its ability to offer end-to-end solutions. These cover the lifecycle, from initial development to ongoing validation, and align with existing infrastructures.

The widespread use of SAS's solutions in the industry not only validates the robustness of its offerings but also ensures that SAS remains a key beneficiary of evolving market trends. This combination of proven expertise, deep market penetration and alignment with growth opportunities cemented SAS's market potential rating.

Table 4 shows Chartis' rankings for SAS's coverage against each of the market potential criteria.

**Table 4: Market potential – SAS
(model validation solutions and services [credit], 2024)**

Market potential criterion	Coverage
Customer satisfaction	Medium
Market penetration	Medium
Growth strategy	Medium
Business model	Medium
Financials	High

Source: Chartis Research

3. Vendor context

Overview of relevant solutions/capabilities

Table 5 gives an overview of SAS and its MRM solutions.

Table 5: SAS – company information

Company	SAS
Headquarters	Cary, NC, US
Other offices	For a complete list of SAS global offices, please see: https://www.sas.com/en_us/contact.html#m-global-offices
Description	SAS’s continued development of next-generation risk solutions will emphasize a cloud- and application programming interface (API)-first architecture based on SAS Viya 4, an AI, analytics and data management platform. With more than 15 years of experience in building enterprise governance solutions, SAS aims to use its expertise and services-based framework to meet clients’ needs across a range of ever-changing risk and compliance requirements.
Solution	<p>SAS has spent a decade simplifying MRM via feedback from its large client base, and now delivers the following capabilities:</p> <ul style="list-style-type: none"> • AI literacy cards. • Best-in-class APIs, simplifying integration with open-source, data governance and risk systems. • Automated documentation and performance monitoring. • Enterprise system of record that supports regional variations and regulatory jurisdictions. • One-click model attestation. • Business-user configuration. • Out-of-the-box (OOTB) reporting for areas and functions, including board, business unit and model owner. • AI governance toolset, including OOTB EU AI Act risk assessments. • Governs models, AI systems and use cases. • Visualizes and tracks contagion risk, including the risk associated with tuning AI with personally identifiable information (PII) data. • Cloud-tuned offering with monthly cadence, providing client requests and regulation updates. • Best-in-class model and MLOps.

Source: SAS

Vendor Analysis

SAS MRM and AI governance

For more than a decade, SAS has been a recognized leader in MRM, providing organizations with tools to better manage their models and AI systems. Its platform focuses on improving transparency, reducing risk and supporting compliance with evolving regulations. SAS demonstrates a strong commitment to customer collaboration, hosting annual Customer Connection events where industry professionals share insights, challenges and best practices. This focus on both technology and community enables SAS to assist organizations effectively in strengthening their model governance practices.

As regulators expand their oversight of both traditional MRM and AI systems, institutions must enhance their governance practices across the entire model lifecycle. This includes building, validating, deploying and managing models and AI systems at scale, while ensuring compliance with evolving regulatory frameworks and company policy.

Key questions for institutions to address include:

- Can we demonstrate that our model and AI inventory is complete, accurate and up-to-date?
- How do we ensure that models and AI systems are being employed only for their intended purposes?
- Are all models and AI systems validated, verified and monitored for compliance and ethical integrity?
- Can we provide consistent execution, traceability and documentation across the entire lifecycle?
- Is our governance framework adaptable to evolving AI regulations and company standards?

Forward-thinking institutions are standardizing and simplifying model lifecycle management to ensure transparency, accountability and regulatory alignment. By eliminating complexity and improving traceability, banks can scale AI-driven decision-making responsibly while staying compliant with both model risk and AI governance frameworks (see Figure 3).

SAS enables complete lifecycle management with end-to-end traceability, allowing data science teams to continue using their preferred languages, frameworks and tools while standardizing such downstream processes as validation, approval, deployment, execution and monitoring. By increasing automation and focusing on critical models, institutions can improve operational efficiency and respond to regulatory inquiries with agility. This streamlined approach not only reduces time-to-market for new models and AI systems, it also ensures they are developed and deployed responsibly.

Figure 3: Mitigating model risk



Source: SAS

Vendor Analysis

A decade of helping G-SIBs with global regulations

SAS is a long-standing partner of leading banks, including global systemically important banks (G-SIBs). Its cloud-based solution for model lifecycle management and MRM can scale to thousands of models and provide the robust governance and agility a bank's modeling communities need to meet regulatory requirements while accelerating model deployment (see Table 6).

Table 6: SAS MRM – an overview

Model and AI governance	<ul style="list-style-type: none"> • What's measured is managed. Provides board level-reporting and real-time model cards across an entire organization. • OOTB reporting for all levels of an organization. • Agnostic reporting marts that work with BI tools of choice, including VA, Power BI, etc. • MRM Viya model card that can be called by external applications. This configurable card will contain information that communicates model risk and AI literacy across an organization. • SAS MRM includes powerful AI governance capabilities that help organizations manage their AI systems responsibly. It provides centralized visibility into models, workflows and policies, making it easier to monitor, document and control AI use cases across the enterprise. With tools for risk assessment, performance monitoring, auditing and regulatory compliance, SAS MRM enables organizations to identify and mitigate risks, ensure responsible AI practices and align AI systems with business goals.
Model identification and model risk classification	<ul style="list-style-type: none"> • SAS MRM offers a one-click model inventory attestation. • Assesses the accuracy and completeness of the model inventory. • Includes a 'one-button' feature to kick off a project to attest an organization's entire model inventory. • Identifies and corrects gaps. • Repeatable and systematic assessments for regional regulations. • Defines a model, a model inventory and a risk-based tiering approach to categorize models.
Model development, implementation and use	<ul style="list-style-type: none"> • ModelOps and MLOps integrate with open-source platforms while enforcing MRM policy.
Independent model validation	<ul style="list-style-type: none"> • Orchestrates three lines of defense. Numerous continuous monitoring and automated documentation features.
Model risk mitigants	<ul style="list-style-type: none"> • Reduces time to establish and measure via continuous monitoring and automation.

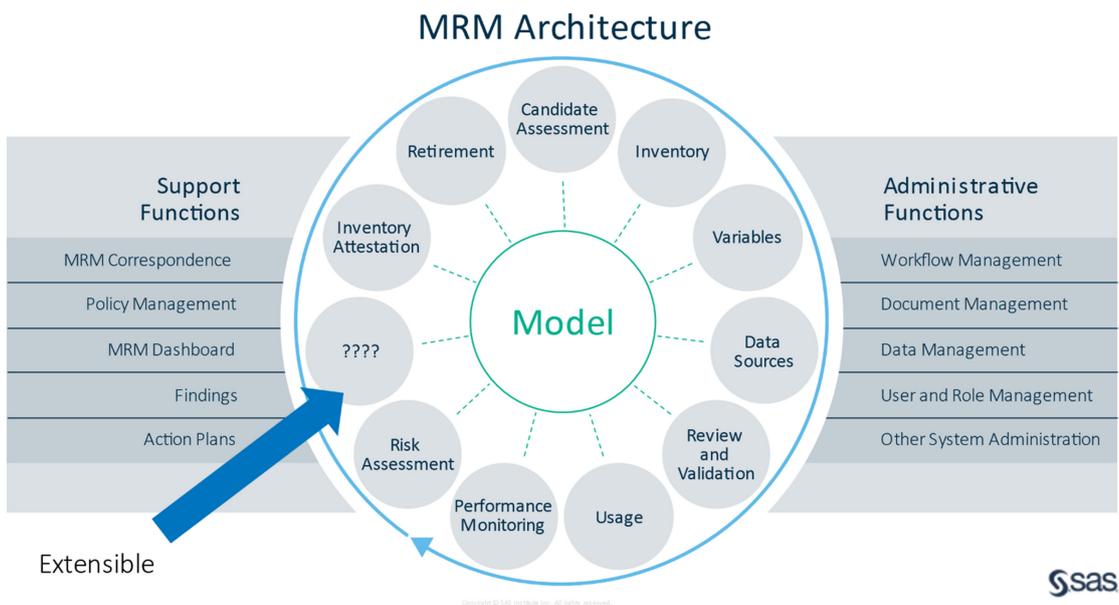
Source: SAS

Vendor Analysis

Vendor leading practices

SAS's MRM solution enables institutions to create a centralized inventory for unified governance across models, AI systems, data and use cases. The platform provides advanced tools for comprehensive oversight, including model candidate assessments, theoretical and assumption documentation, model limitation scoring, validation results, and model and data maps (see Figure 4).

Figure 4: SAS MRM architecture



Source: SAS

Its AI governance capabilities support the management of foundational models and complex AI systems fine-tuned with proprietary data, all within a unified catalog that ensures full traceability and transparency. To further strengthen oversight, SAS's solution can classify and report on AI models by lineage, data sources, use cases and customizable governance factors – helping organizations stay compliant with evolving AI regulations and internal policies.

This holistic approach enables institutions to govern the entire AI lifecycle with confidence, ensuring accountability, effective risk management and the responsible use of data and AI technologies.

Configurable, capable and comprehensive

SAS MRM is an OOTB configurable solution. It includes a browser interface, application and data logic, workflow automation, model risk card (providing real-time model risk data) and a database structure with comprehensive reporting capabilities.

MRM offers the option of a 'quick start' implementation methodology that enables customers to achieve pilots in 8–12 weeks.

SAS MRM is built around three core design principles:

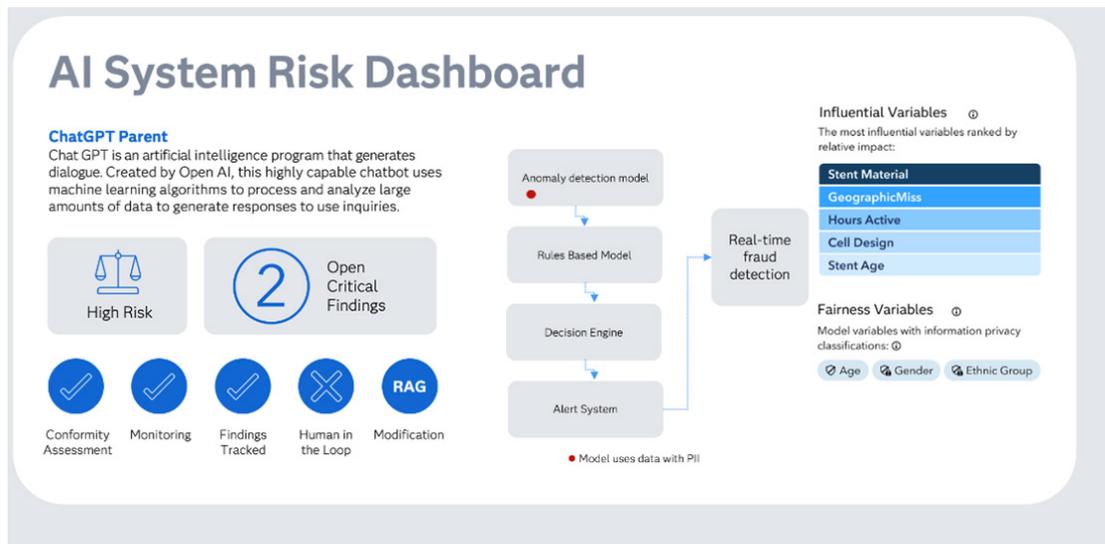
- A configurable, capable and comprehensive offering.
- The 360-degree linking of models, documentation and all relevant attributes.
- Auditable workflow-controlled processes and interaction between operational, control and business-managed change processes.

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MRM solution – features and capabilities

- A model and AI catalog that enables users to register and maintain a single model library covering global and regional regimes, all model types and classes, and all business units.
- Flexible workflows to enforce policy and support collaboration.
- An understanding of the interconnected risk inherent in AI systems with model maps, including an API-first architecture for simple integration with model execution and data governance platforms.
- Automated continuous monitoring that supports and integrates with existing systems to automate explainability, bias, fairness and performance monitoring, including model/data drift.
- Executive-level risk reporting.
- Facilitation of literacy, collaboration and transparency with model cards. Model risk cards operate at a business level and can be called by external applications. The configurable card will contain information that communicates the model risk status across an organization (see Figure 5). Externalizing MRM data is possible via API-callable cards that are relatively straightforward to interpret. SAS is creating a common language that can communicate model and AI literacy to model users, owners, executives, auditors and interns.

Figure 5: Distributing MRM data



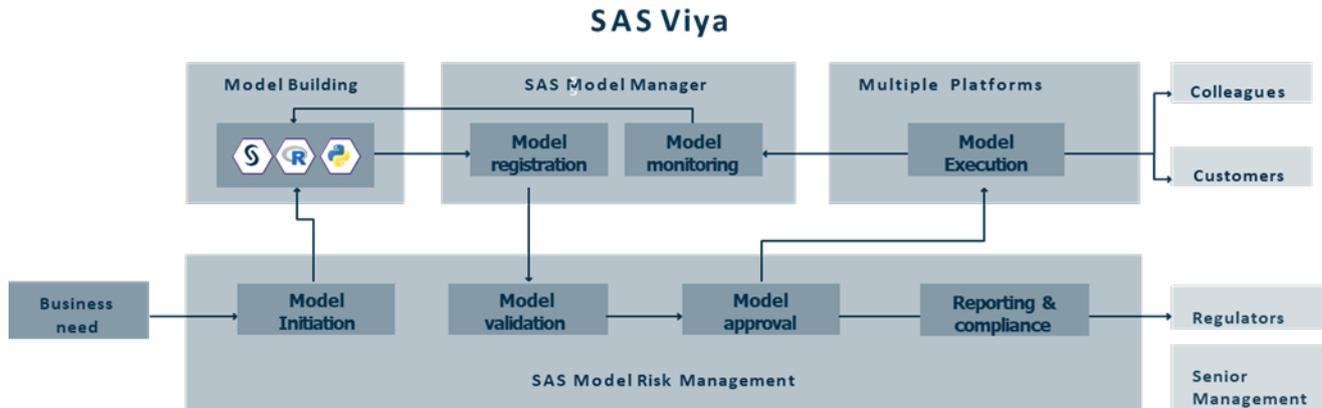
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Source: SAS

Vendor Analysis

Figure 6: Integrated ModelOps environment



Source: SAS

Model lifecycle: a unified approach

When a bank's modeling communities identify the need for a new model, a unified approach allows the process to flow seamlessly through an integrated ModelOps environment (see Figure 6). By taking a unified approach, a bank can radically simplify and streamline the way it works with models to:

- Ensure control, transparency and responsible decisioning with comprehensive governance.
- Empower data scientists to build models in any language and execute them anywhere.
- Reduce time-to-value by getting models validated, approved and into production faster.
- Simplify model management, eliminate manual hand-offs and reduce the risk of errors.

With a unified approach, when a modelling community identifies a need for a new model, the process will flow seamlessly through an integrated ModelOps environment. Details on each element in the process are as follows:

- **Model initiation.** SAS's solution helps the community determine and automatically document the key characteristics for the new model – identifying the data, techniques and methodologies, use cases, materiality and risk tiering.
- **Model building.** The community builds the model using the modeling languages, frameworks and tools it prefers – SAS or open source, in the cloud or on-premise. Once built, models created in SAS, R, Python and other languages can be executed directly without recoding, saving time and rework for technical teams.
- **Model registration.** The model is registered in the model catalog, together with automatically generated metadata and documentation. This ensures full traceability and robust governance throughout the lifecycle of the model.
- **Model validation.** The model is automatically tested and validated to ensure accuracy and freedom from bias. Champion/challenger tests, for example, can be used to confirm whether the model outperforms existing ones.
- **Model approval.** MRM acts as a gatekeeper, ensuring that the new model has passed all necessary approval checkpoints before it moves into execution, and capturing a full audit trail.

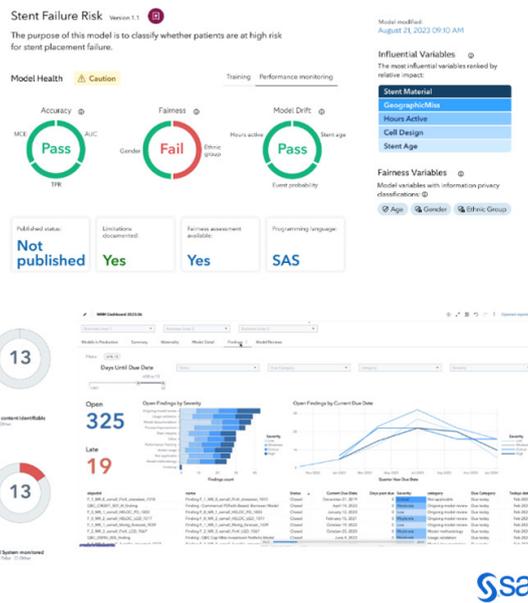
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- **Model execution.** SAS Viya provides a cloud-based execution environment for models and integrates with such external data processing engines as Apache Spark. The results of running the model can then be integrated into business processes to support colleagues and customers.
- **Model monitoring.** Model performance is automatically monitored in production with real-time dashboards, and alerts are raised whenever results fall outside the limits defined and signed off by the governance team. This then prompts data science teams to rebuild or replace models when necessary.
- **Reporting and compliance.** SAS MRM provides comprehensive, out-of-the-box reporting capabilities for all levels of an organization, including board, line of business and MRM team. Regional data can then be aggregated, giving a global view of the model risk an organization faces. Since all data and metadata throughout each model's lifecycle are fully captured by SAS MRM, the solution makes it easy to explain and audit models, and it automatically generates comprehensive reports for management and regulators (see Figure 7).

Figure 7: Explaining and auditing models

Board Level Reporting

- Board level accountability & responsibilities including AI Catalog attestation.
 - Understanding
 - Reporting & aggregation
 - Monitoring
 - Risk mitigates in place
- Customized reporting for dashboards, risk-tiering, materiality, findings etc. to meet specific needs such as regulatory reporting



Source: SAS

Deploying SAS MRM provides:

- A complete model governance and MRM solution as required by the business and regulators.
- A central model inventory and model assessment capabilities.
- Comprehensive AI governance across jurisdictions.
- Streamlined model validation activities.
- The communication of model risk 'wellness' across the organization.
- Documentation and tracking of models throughout the model lifecycle and across model types and technologies.
- Greater insight into model risk concentrations and contagions.
- A model governance and MRM solution that can keep pace with changing risk policies and regulations.

4. Methodology

Overview

Chartis is a research and advisory firm that provides technology and business advice to the global financial services industry. Chartis provides independent market intelligence regarding market dynamics, regulatory trends, technology trends, best practices, competitive landscapes, market sizes, expenditure priorities, and mergers and acquisitions. Chartis' RiskTech Quadrant® and FinTech Quadrant™ reports are written by experienced analysts with hands-on experience of selecting, developing and implementing financial technology solutions for a variety of international companies in a range of industries, including banking, insurance and capital markets. The findings and analyses in our quadrant reports reflect our analysts' considered opinions, along with research into market trends, participants, expenditure patterns and best practices.

Chartis seeks to include RiskTech and FinTech vendors that have a significant presence in a target market. The significance may be due to market penetration (e.g., a large client base) or innovative solutions. Chartis uses detailed vendor evaluation forms and briefing sessions to collect information about each vendor. If a vendor chooses not to respond to a request for information, Chartis may still include the vendor in the report. Should this happen, Chartis will base its opinion on direct data collated from technology buyers and users, and from publicly available sources.

Chartis' research clients include leading financial services firms and Fortune 500 companies, leading consulting firms and financial technology vendors. The vendors evaluated in our quadrant reports can be Chartis clients or firms with whom Chartis has no relationship.

Chartis evaluates all vendors using consistent and objective criteria, regardless of whether they are Chartis clients. Chartis does not give preference to its own clients and does not request compensation for inclusion in a quadrant report, nor can vendors influence Chartis' opinion.

Briefing process

We conduct face-to-face and/or web-based briefings with each vendor.¹ During these sessions, Chartis experts ask in-depth, challenging questions to establish the real strengths and weaknesses of each vendor. Vendors provide Chartis with:

- A business update – an overview of solution sales and client satisfaction.
- A product update – an overview of relevant solutions and R&D roadmaps.
- A product demonstration – key differentiators of their solutions relative to those of their competitors.

In addition to briefings, Chartis uses other third-party sources of data, such as conferences, academic and regulatory studies, and publicly available information.

Evaluation criteria

We develop specific evaluation criteria for each piece of quadrant research from a broad range of overarching criteria, outlined below. By using domain-specific criteria relevant to each individual risk, we can ensure transparency in our methodology and allow readers to fully appreciate the rationale for our analysis. The specific criteria used for the Model Risk Management Solutions, 2024 report are shown in Table 7.

¹ Note that vendors do not always respond to requests for briefings; they may also choose not to participate in the briefings for a particular report.

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Table 7: Evaluation criteria for Chartis' Model Risk Management Solutions, 2024 report

Completeness of offering	Market potential
<p>Model validation solutions and services (credit)</p> <ul style="list-style-type: none"> • Organizational depth and personnel • Supporting tools • Methodological frameworks and structure • Data handling/approach • Dashboarding • Visualization <p>Model governance solutions</p> <ul style="list-style-type: none"> • Model coverage • Governance • Data management • Model inventory • Dashboarding • Visualization 	<ul style="list-style-type: none"> • Customer satisfaction • Market penetration • Growth strategy • Business model • Financials

Source: Chartis Research

Completeness of offering

- **Depth of functionality.** The level of sophistication and number of detailed features in the software product (e.g., advanced risk models, detailed and flexible workflow, domain-specific content). Aspects assessed include innovative functionality, practical relevance of features, user-friendliness, flexibility and embedded intellectual property. High scores are given to firms that achieve an appropriate balance between sophistication and user-friendliness. In addition, functionality linking risk to performance is given a positive score.
- **Breadth of functionality.** The spectrum of requirements covered as part of an enterprise risk management system. This can vary for each subject area, but special attention is given to functionality covering regulatory requirements, multiple risk classes, multiple asset classes, multiple business lines and multiple user types (e.g., risk analyst, business manager, CRO, CFO, compliance officer). Functionality within risk management systems and integration between front-office (customer-facing) and middle/back office (compliance, supervisory and governance) risk management systems are also considered.
- **Data management and technology infrastructure.** The ability of risk management systems to interact with other systems and handle large volumes of data is considered very important. Data quality is often cited as a critical success factor and ease of data access, data integration, data storage and data movement capabilities are all important factors. Particular attention is given to the use of modern data management technologies, architectures and delivery methods relevant to risk management (e.g., in-memory databases, complex event processing, component-based architectures, cloud technology and software as a service). Performance, scalability, security and data governance are also important factors.

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- **Risk analytics.** The computational power of the core system, the ability to analyze large volumes of complex data in a timely manner (where relevant in real time), and the ability to improve analytical performance are all important factors. Particular attention is given to the difference between 'risk' analytics and standard 'business' analytics. Risk analysis requires such capabilities as non-linear calculations, predictive modeling, simulations, scenario analysis, etc.
- **Reporting and presentation layer.** The ability to present information in a timely manner, the quality and flexibility of reporting tools, and ease of use, are important for all risk management systems. Particular attention is given to the ability to do ad hoc 'on the fly' queries (e.g., 'what if' analyses), as well as the range of 'out of the box' risk reports and dashboards.

Market potential

- **Business model.** Includes implementation and support and innovation (product, business model and organizational). Important factors include size and quality of implementation team, approach to software implementation, and post-sales support and training. Particular attention is given to 'rapid' implementation methodologies and 'packaged' services offerings. Also evaluated are new ideas, functionality and technologies to solve specific risk management problems. Speed to market, positioning and translation into incremental revenues are also important success factors in launching new products.
- **Market penetration.** Volume (i.e., number of customers) and value (i.e., average deal size) are considered important. Rates of growth relative to sector growth rates are also evaluated. Also covers brand awareness, reputation and the ability to leverage current market position to expand horizontally (with new offerings) or vertically (into new sectors).
- **Financials.** Revenue growth, profitability, sustainability and financial backing (e.g., the ratio of license to consulting revenues) are considered key to scalability of the business model for risk technology vendors.
- **Customer satisfaction.** Feedback from customers is evaluated, regarding after-sales support and service (e.g., training and ease of implementation), value for money (e.g., price to functionality ratio) and product updates (e.g., speed and process for keeping up-to-date with regulatory changes).
- **Growth strategy.** Recent performance is evaluated, including financial performance, new product releases, quantity and quality of contract wins, and market expansion moves. Also considered are the size and quality of the sales force, sales distribution channels, global presence, focus on risk management, messaging and positioning. Finally, business insight and understanding, new thinking, formulation and execution of best practices, and intellectual rigor are considered important.

Quadrant construction process

Chartis constructs its quadrants after assigning scores to vendors for each component of the completeness of offering and market potential criteria. By aggregating these values, we produce total scores for each vendor on both axes, which are used to place the vendor on the quadrant.

Definition of quadrant boxes

Chartis' quadrant reports do not simply describe one technology option as the best solution in a particular area. Our ranking methodology is designed to highlight which solutions are best for specific buyers, depending on the technology they need and the implementation strategy they plan to adopt. Vendors that appear in each quadrant have characteristics and strengths that make them especially suited to that category and, by extension, to particular users' needs.

Vendor Analysis

Point solutions

- Point solutions providers focus on a small number of component technology capabilities, meeting a critical need in the risk technology market by solving specific risk management problems with domain-specific software applications and technologies.
- They are often strong engines for innovation, as their deep focus on a relatively narrow area generates thought leadership and intellectual capital.
- By growing their enterprise functionality and utilizing integrated data management, analytics and business intelligence (BI) capabilities, vendors in the point solutions category can expand their completeness of offering, market potential and market share.

Best-of-breed

- Best-of-breed providers have best-in-class point solutions and the ability to capture significant market share in their chosen markets.
- They are often distinguished by a growing client base, superior sales and marketing execution, and a clear strategy for sustainable, profitable growth. High performers also have a demonstrable track record of R&D investment, together with specific product or 'go-to-market' capabilities needed to deliver a competitive advantage.
- Because of their focused functionality, best-of-breed solutions will often be packaged together as part of a comprehensive enterprise risk technology architecture, co-existing with other solutions.

Enterprise solutions

- Enterprise solution providers typically offer risk management technology platforms, combining functionally rich risk applications with comprehensive data management, analytics and BI.
- A key differentiator in this category is the openness and flexibility of the technology architecture and a 'toolkit' approach to risk analytics and reporting, which attracts larger clients.
- Enterprise solutions are typically supported with comprehensive infrastructure and service capabilities, and best-in-class technology delivery. They also combine risk management content, data and software to provide an integrated 'one stop shop' for buyers.

Category leaders

- Category leaders combine depth and breadth of functionality, technology and content with the required organizational characteristics to capture significant share in their market.
- They demonstrate a clear strategy for sustainable, profitable growth, matched with best-in-class solutions and the range and diversity of offerings, sector coverage and financial strength to absorb demand volatility in specific industry sectors or geographic regions.
- They will typically benefit from strong brand awareness, a global reach and strong alliance strategies with leading consulting firms and systems integrators.