The evolving challenge of regulatory compliance in Model Risk Management

Redefining model documentation with end-to-end-automation

Contents

About the Research

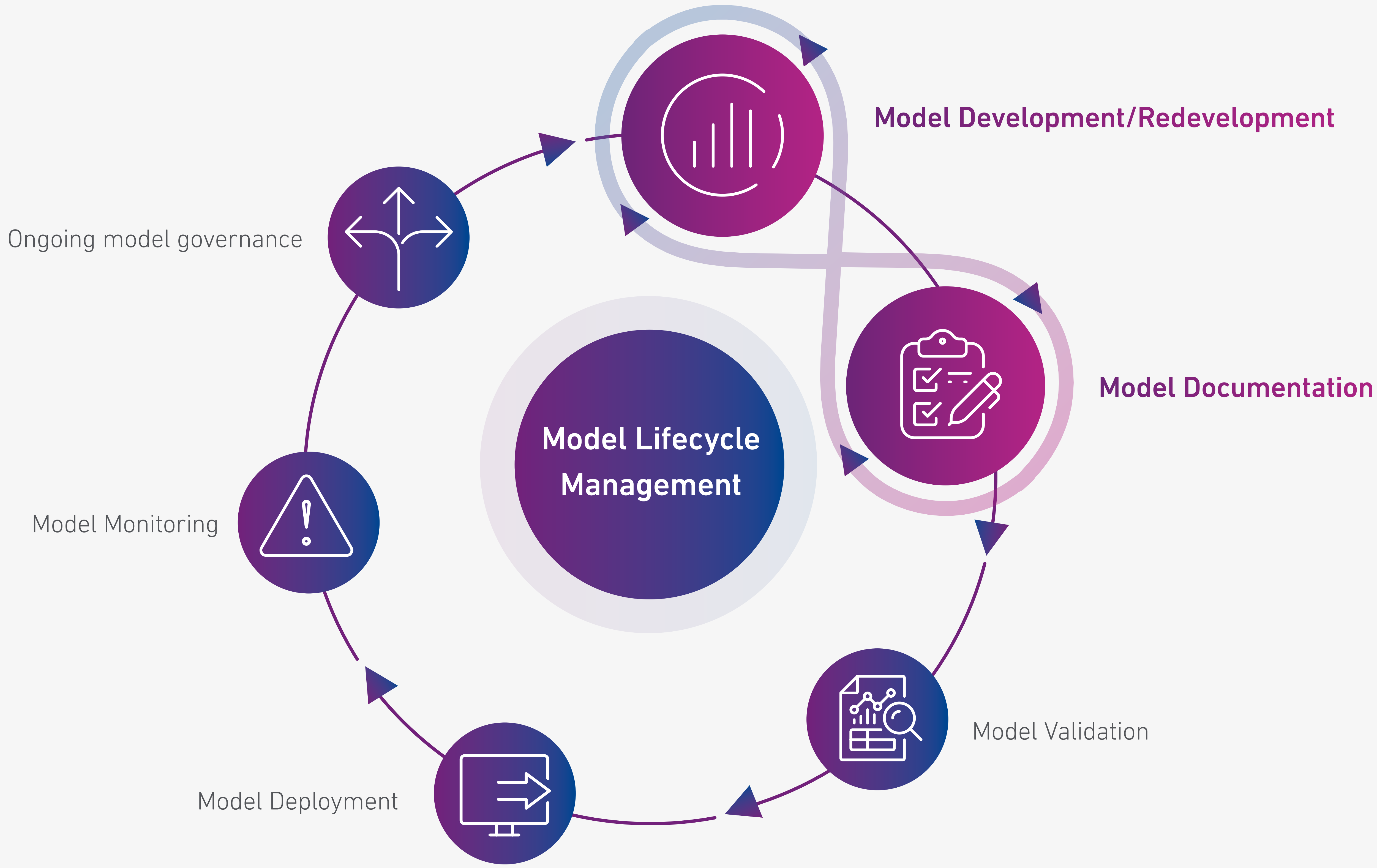
Survey conducted in August 2024 with 511 respondents from financial institutions (FIs) across the United States, United Kingdom, and Brazil.

Definitions

Regulatory Technology (RegTech):
- Using technology to improve regulatory compliance

Model documentation compliance:
- Documenting risk models to comply with regulatory requirements
- **First line of defense:** What the model does (from the developer)
- **Second line of defense:** Audit what the model does - model validation (from the risk team)
- **MRA: Matter Requiring Attention:** Regulator flags an issue with the model and gives a deadline
- **MRIA:** Matter Requiring Immediate Attention: Regulator flags an issue requiring an immediate response

Why model documentation is central to Model Risk Management (MRM) compliance



Up-to-date and comprehensive documentation helps regulatory bodies understand the decision-making process during model development. It also makes it easier to streamline model validation and maintenance.

Executive Summary

Financial institutions (FIs) face increasing regulatory demands for model risk compliance. The evolving landscape, driven by artificial intelligence (AI) advancements and the rising volume of regulations, has made compliance resource-intensive. Frequent updates to models and documentation are essential to maintain transparency and accuracy, yet, according to our research, **67% of FIs find it challenging to meet these requirements.**

"A robust and scalable RegTech solution needs to allow for seamless integration, ensuring consistency that is customizable and streamlines model governance. By enhancing transparency and explainability, FIs can navigate increasing regulatory scrutiny with confidence, driving both compliance and efficiency."

Vijay Mehta, General Manager, Global Solutions and Analytics, Experian Software Solutions

Key findings:

Regulatory pressure is growing

95% of FIs report an increase in the number of regulations

86% expect regulatory changes to rise over the next two years

79% say regulators communicate supervisory concerns more frequently than a year ago

Reputational and compliance risks are high

52% believe non-compliance can lead to significant reputational damage

49% struggle to keep up with evolving regulatory changes

45% cite geographic variations in compliance as a key challenge

Manual processes are unsustainable

60% of FIs rely entirely on manual processes for compliance

29 individuals, on average, are involved in model documentation compliance

Respondents spend **25-33%** of their time on documentation rather than innovation

Hybrid solutions are inadequate

70% of FIs use a combination of manual processes and automation tools but still face inefficiencies

68% say current technology fails to meet their regulatory compliance needs

High costs and lack of internal skills hinder the effectiveness of internal automation tools

FIs plan to implement more automation

87% of FIs plan to implement automated model documentation within two years

Brazil leads in prioritizing automation, followed by the **UK** and the **US**

The future is RegTech

FIs recognize the need for end-to-end model documentation automation to enhance compliance and efficiency. Key priorities include:

- **Strengthening** model governance and transparency
- **Enhancing** explainability and responsible AI integration
- **Reducing** compliance burden through seamless automation
- **Ensuring** consistency across model validation and approval processes

Navigating regulatory demands in an AI-powered world

Regulatory compliance continues to be a top priority for financial institutions (FIs) worldwide. However, a rapidly changing regulatory environment – partly due to technological advancements like artificial intelligence (AI), and the volume of new types of models – is creating significant challenges for FIs in meeting model risk compliance requirements. To add to these pressures, models often require frequent updates, especially in response to shifting consumer behavior, which necessitates redevelopment and redocumentation to ensure accuracy and compliance.

IDC forecasts that the worldwide artificial intelligence (AI) life-cycle software market will grow from **$8.8 billion** in 2023 to **$35.7 billion** in 2028 at a compound annual growth rate (CAGR) of 32.2%

IDC, Worldwide AI Life-Cycle Software Forecast, 2024–2028, doc #US52382024, July 2024

The documentation of model risk management (MRM) is a significant pressure point for FIs due to its critical role in communicating transparency and compliance to regulators. Experian's research among FIs in the United States, the United Kingdom, and Brazil highlights that the evolving regulatory landscape leads to resource-intensive documentation processes.

Although FIs state that their current documentation approach meets regulatory standards, more than two-thirds find it challenging to meet these requirements and anticipate that this pressure will only increase.

95%
say the number of regulations for models they need to comply with has increased in the last few years

67%
of FIs say they find it challenging to meet compliance requirements around model documentation

AI and explainability

With a surge in AI solutions available, FIs must be positioned to explain decisions transparently and consistently. Businesses need to prioritize the integration of responsible AI (RAI) frameworks. 58% of FIs said more focus on explainable AI would encourage them to invest in model documentation automation.

> Consistent model documentation is crucial, and if it has gaps, it creates a weakness. If a matter requiring attention (MRA) comes up, it can be because of a big issue with the model itself or just the lack of consistency in model documentation.
>
> Interview, bank (North America)

Traditional statistical modelling techniques are often more intuitive and explainable. To achieve fair lending goals, FIs need to find ways to add transparency and explainability to machine learning (ML) models.

Model documentation must be executed consistently to reduce risk and the potential for rework. Without defined minimum standards, FIs cannot recognize whether an identified weakness is in the model documentation or the model itself.

The growing volume of regulatory requirements intensifies compliance challenges

Like most regulatory systems, model risk management (MRM) governance varies by location. Countries and regions follow distinct regulatory frameworks that guide FIs in ensuring their models' transparency, accuracy, and accountability.

The increasing number of supervisory concerns and MRAs from regulators that require escalation is creating longer resolution timescales for FIs, and businesses don't anticipate this will change. When considering future regulations, 85% of respondents report that regulators are becoming more stringent in their requirements for model documentation. Additionally, 86% believe that the frequency of regulatory changes and updates related to model documentation compliance will increase over the next two years.

Key regulations

SR 11-7 has been the core regulation in the United States since it was introduced in 2011 by the Office of the Comptroller of the Currency (OCC) and the Federal Reserve (Fed). This regulatory guideline laid the foundation for model risk management (MRM), covering the entire model lifecycle, from model development and documentation to implementation, governance, and controls.

The **United Kingdom** introduced its model risk management (MRM) principles more recently with **SS 1/23**[1], in which the Prudential Regulatory Authority (PRA) drew heavily on the principles laid out in the US's SR 11-7.

"The desired outcome of the PRA's supervisory statement (SS) is that banks take a strategic approach to model risk management (MRM) as a risk discipline in its own right." *Bank of England*

Brazil also has regulatory frameworks in place. Resolution CMN 4557, introduced in 2017, provides a structure for risk management.

86%

of respondents say the frequency of regulatory change and updates around model documentation will increase in the next two years

79%

of respondents report that regulators communicate supervisory concerns - issues and matters requiring attention (MRAs) - more frequently now than a year ago

> PRA will have teams overseeing the banks (particularly the big banks), and model risk will be one of the topics they assess. For example, how are your models performing, what is the remediation plan? In 2025 they will really expect that banks do this well and they will be on the lookout for banks that are falling short.
>
> Interview, bank (United Kingdom)

[1] https://www.bankofengland.co.uk/prudential-regulation/publication/2023/may/model-risk-management-principles-for-banks-ss

The financial and reputational consequences of non-compliance

With frequent regulatory updates and feedback from examinations and MRAs/ MRIAs, FIs report that keeping up with regulatory changes is a constant struggle. This challenge is exacerbated for businesses operating across multiple regions worldwide due to variations in governance at the country level. An FI operating in multiple regions must navigate a patchwork of regulatory demands, adding significant complexity to the model documentation process. These issues heighten the risk of non-compliance and the potential for significant reputational damage, which businesses recognize as a problem.

52% of respondents believe non-compliance can lead to significant reputational damage

49% of respondents say keeping up with regulatory changes is a constant struggle, especially in global organizations where different geographies have different requirements

45% of respondents cite that compliance requirements vary significantly based on geography

FIs report that keeping up with regulatory changes is a constant struggle

As regulatory requirements continue to increase, FIs must find ways to stay compliant without sacrificing efficiency. 67% of respondents agreed that meeting model documentation compliance requirements is more complex when different countries have different requirements.

The cost of non-compliance isn't just reputational—it can mean millions of dollars in fines, damaged shareholder value, and weakened performance. With a lack of clarity on regulations and varying interpretations of compliance requirements, the risk is real, and partnering with an experienced vendor in this space is essential.

Respondents in Brazil are less concerned about reputational risk (**42%**) compared to FIs in the UK (**55%**) and the US (**54%**). The concern around reputational risk increases with business size. Larger businesses report high reputational risk as a significant pain point (**59%**), whereas smaller businesses report this concern at a lower rate (**48%**).

Additionally, credit card companies perceive reputational risk as a more significant issue (**53%**) compared to retail banks (**38%**).

Industry View

How to mitigate regulatory risk that could lead to financial loss or reputational damage:

- Consistent and clear model documentation
- Effective model testing
- Transparent model governance that triggers appropriate action when needed
- Ability to identify and address problems with models before they impact the business and customers

Manual documentation processes are resource-intensive and inefficient

Many FIs still rely heavily on manual processes for model documentation. According to respondents, 60% rely entirely on manual processes for compliance, while only 15% of organizations report using automation alone.

60%

of FIs rely entirely on manual processes for compliance

An average of **29** individuals are involved in model documentation compliance

FIs report that 29 individuals, on average, are involved in model documentation compliance. About one-third of companies indicate that 50 or more people participate in this process. Additionally, over 70% of larger companies report involving over 50 people. The need for collaboration across various departments makes model documentation particularly difficult for larger, more complex organizations.

Respondents spend up to 33% of their time on model documentation, which could otherwise be spent on innovation and improving or creating new models

Responding to regulators' supervisory concerns is one of the areas FIs report spending the most time and resources

Key compliance challenges for FIs

- **78%** Lack of clarity on compliance requirements
- **73%** Constant changes in model documentation compliance and keeping up with those changes across geographies
- **68%** Current technology fails to meet regulatory compliance needs
- **63%** Frequent changes in current processes that require documentation
- **60%** Total reliance on manual processes for compliance

Percentage of respondents that cite very or quite challenging

Brazil experiences the greatest challenge with lack of clarity around compliance requirements (**84%**), slightly higher than institutions in the UK (**79%**) and the US (**73%**), with Automotive Finance (**82%**) notably more affected than other sectors. Frequent regulatory changes across regions also complicate compliance, with Brazil again reporting the highest challenge (**81%**), followed by the UK (**73%**) and the US (**69%**). Fintech Lenders (**82%**) are the most impacted by these geographic inconsistencies, while Credit Card Companies (**72%**) show slightly lower concern levels.

Additionally, existing technologies and processes exacerbate compliance difficulties. Current automation technology fails to fully meet regulatory needs, especially among larger institutions (**71%**) and those in Automotive Finance (**76%**), while manual processes present more challenges (**71%**) compared to automated ones (**62%**). Frequent changes in documentation processes further heighten concerns, particularly in Brazil (**68%**) and the UK (**66%**), and among companies actively seeking greater automation (**64%**). Total reliance on manual processes remains burdensome for larger institutions (**63%**) and those within Automotive Finance (**71%**), demonstrating a clear need for more effective and adaptable automated solutions.

Industry View

MRM governance in practice

Supervisory concerns differ by region. In the US, the regulator will issue Matters Requiring Attention (MRAs) or Matters Requiring Immediate Attention (MRIAs). MRIAs are usually the result of an examination, where institutions regulated by the Fed or the OCC may need to provide a remediation plan and resolve the issue by a deadline in response.

In the UK, the Prudential Regulation Authority (PRA) runs supervisory reviews quarterly for large banks alongside thematic reviews to examine specific topics in more detail. When the PRA flags specific issues, banks need to present remediation plans. The PRA also mandates banks to perform independent reviews of their models which can be run by internal independent validation teams or external consultants. FIs must also assign an individual to take on Senior Management Function (SMF) model risk accountability. This person is required to supply extensive evidence that MRM is being effectively managed.

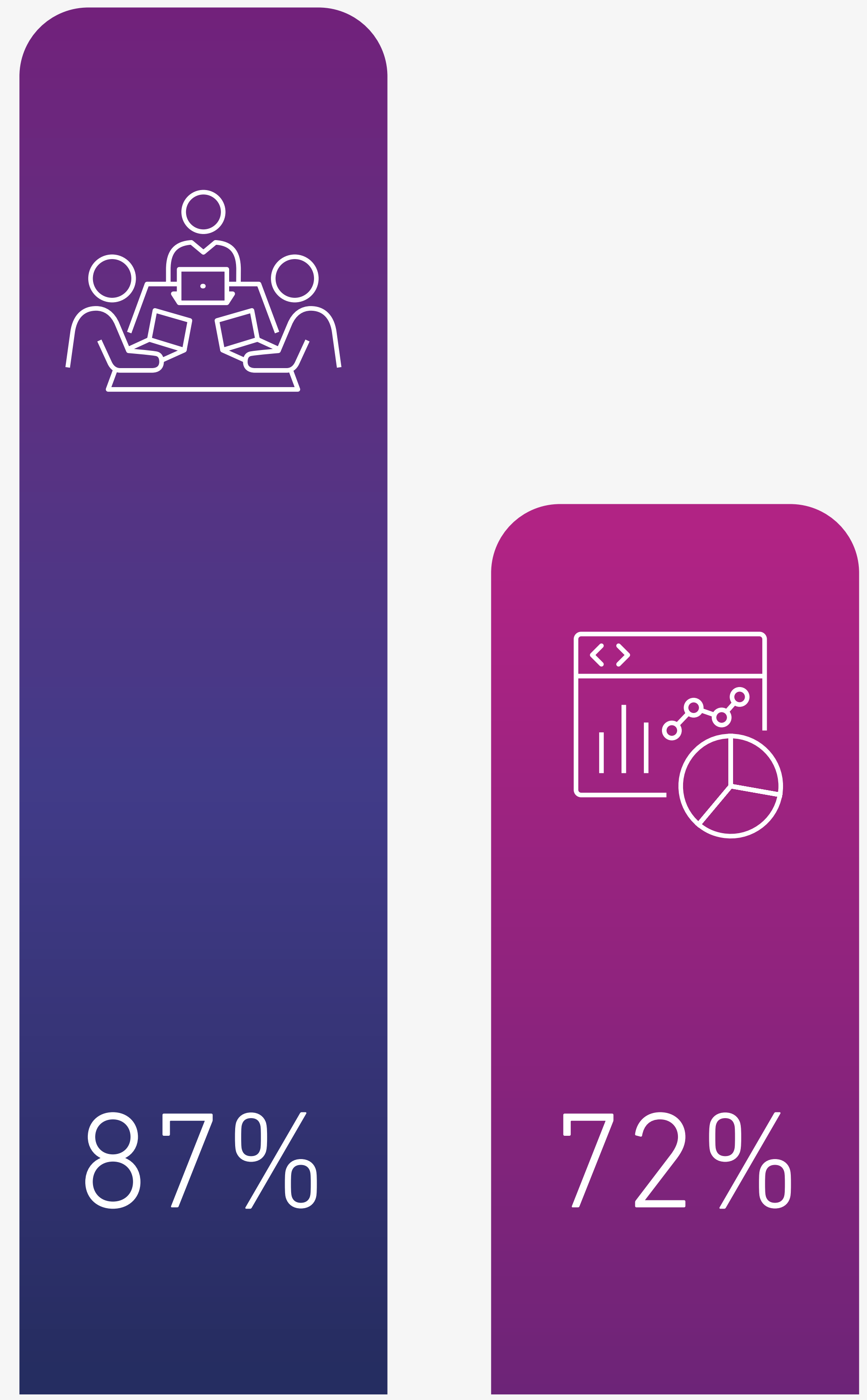
Most FIs (79% of respondents) are concerned that the regulators are raising supervisory concerns more frequently than a year ago. Additionally, 71% agree that supervisory concerns have increased in materiality, requiring more resources and time to solve them. In parallel, two-thirds of respondents report needing to perform more escalations to address supervisory concerns.

FIs in Brazil show the highest level of concern (**76%**) about the increased materiality of supervisory issues compared to last year, followed by the US (**71%**) and the UK (**68%**). Within this group, there is a notable difference in concern levels between companies that document their models manually (**73%**) and those that have implemented some degree of automation (**68%**).

In terms of escalations needed, companies that document models manually report significantly higher levels of concern compared to those that have automated parts of the process (**73%** vs **61%**).

Industry View

Automation reduces volume of supervisory concerns



Most (**87%**) companies that document models manually report that the regulator has communicated supervisory concern more frequently than a year ago, compared to those companies that use some automation (**72%**).

The limitations of partial automation in model documentation

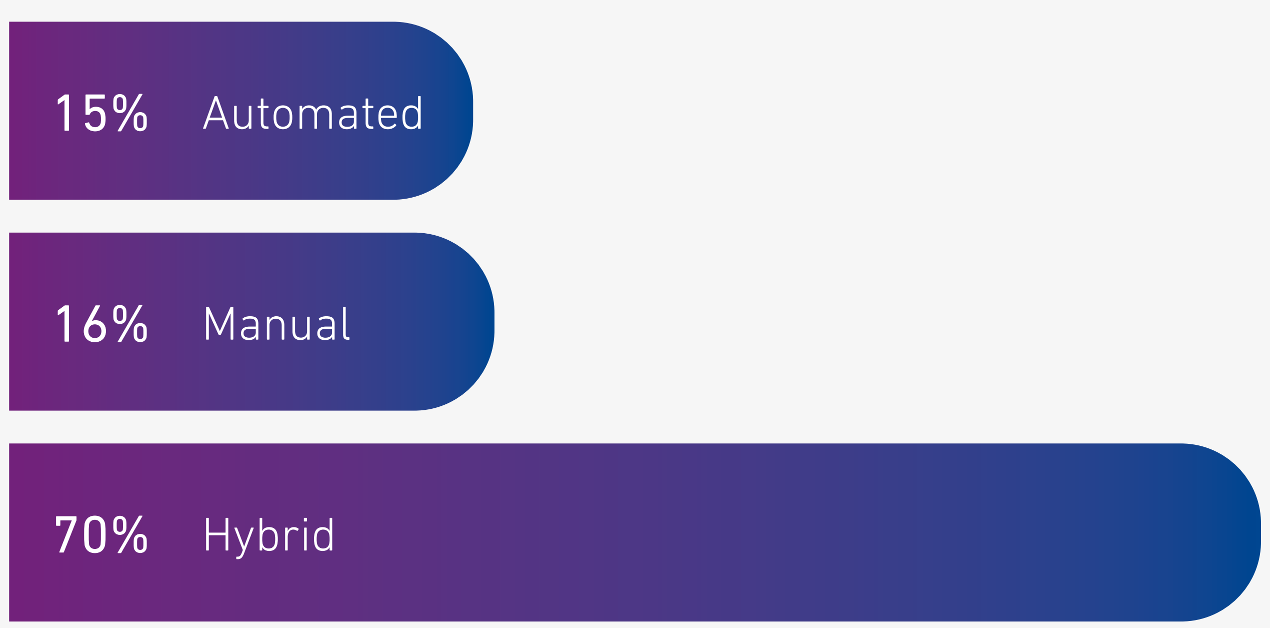
In response to the resource-heavy nature of manual model documentation, many FIs have attempted to streamline the process by adopting a hybrid approach.

70%

of respondents handle compliance with manual processes and automation tools

However, hybrid methods remain inadequate for meeting the needs of FIs, who continue to face numerous challenges. The primary issues reported include constant changes in model documentation compliance, difficulties keeping up with these changes across different regions, and a lack of clarity on compliance requirements.

How model documentation compliance requirements are handled

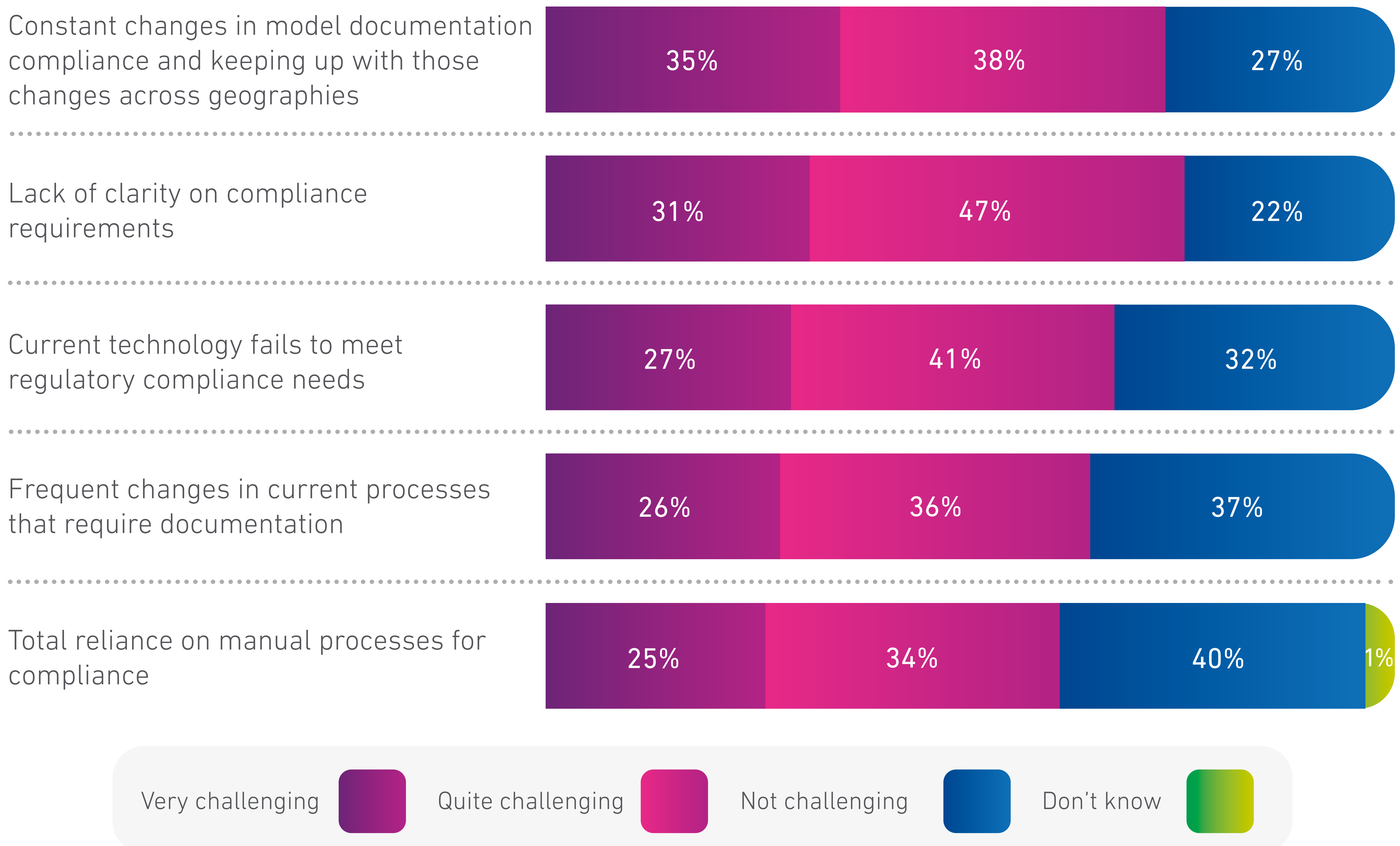


Hybrid approach definition: FIs using a combination of manual processes, vendor automation tools and internal automation tools for model documentation

68%

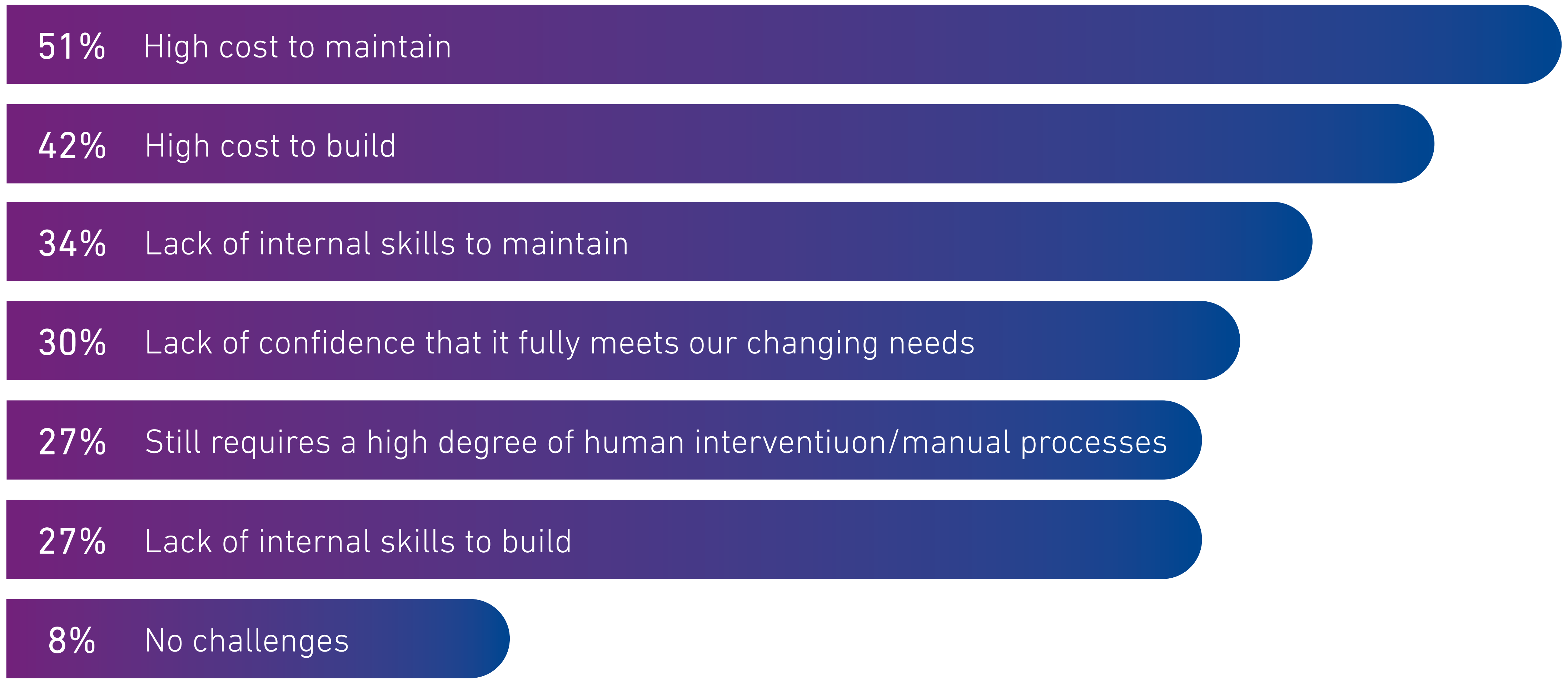
of institutions find it very or quite challenging that current technology fails to meet regulatory compliance needs

Challenges with model documentation compliance



FIs also report challenges with using internal tools for model automation, with high costs for building and maintaining these tools being the primary concern.

Challenges with using an internal tool for model documentation



In addition, FIs are experiencing problems correctly resourcing internal automation tools, with 34% of respondents lacking the internal skills to maintain them and 27% lacking the skills to build them.

FIs face significant cost-related challenges when maintaining and building internal automation tools for model documentation. High maintenance costs are a critical concern, especially in the US (**54%**) and the UK (**53%**), with the credit card sector particularly impacted (**60%**) alongside fintech (**46%**). The high initial cost of building internal automation tools is similarly challenging, notably for fintech (**56%**) and automotive finance (**43%**), with substantial concerns also highlighted in the US (**44%**) and the UK (**40%**).

Additionally, a lack of internal skills further complicates the effectiveness of automation efforts. Institutions in the US (**37%**), Brazil (**32%**), and the UK (**32%**) report insufficient internal expertise for tool maintenance. Confidence in the adaptability of these tools is also low, particularly in hybrid-system environments (**42%**) and within the fintech sector (**40%**), indicating ongoing challenges in meeting evolving compliance needs through internally managed automation tools.

Industry View

Building and maintaining internal automation tools is costly. These tools require regular updates to comply with new regulations, typically involving specialized IT teams. Each time the regulatory landscape shifts or a new issue or MRA is identified, the tools must be adjusted, increasing the demand on institutions.

"Even with growing investment in GenAI, most tools fall short when it comes to the regulatory rigor, transparency, and auditability required for compliance. FIs face ongoing ambiguity around how GenAI can be used to support functions like model documentation without introducing risk. While many are already investing in internal solutions, the size, complexity, and high stakes of the compliance landscape make this a costly and uncertain path. A purpose-built, automated approach designed with evolving regulatory standards in mind offers a more reliable and scalable alternative, helping FIs reduce operational burden and avoid the guesswork of GenAI solutions not yet mature enough to be dependable."

Michael Gross, VP, Applied Fraud Research & Analytics, Experian Software Solutions

Overcoming fragmentation to enable end-to-end automation

Respondents identified 28 different third-party automation tools currently in use, either alone or in conjunction with internal tools. However, qualitative insights from the study revealed that these tools fall short of fully addressing compliance challenges. While many tools effectively handle certain phases of the modelling lifecycle—such as data cleaning or providing basic model descriptions—none produce comprehensive, regulator-ready documentation. As a result, FIs must still undertake substantial manual effort to complete the required documentation, reducing the intended benefits of automation.

> Model documentation needs to tell the whole story, and each version needs to be as robust as the earlier version.
>
> Interview, bank (North America)

77%

of respondents say they are actively looking to spend on new technology that can drive efficiency in their department

Industry analyst perspective

Although the automation of model documentation is still maturing, it presents an opportunity to improve the completeness and consistency of governance practices while enabling better use of human expertise for tasks that require nuanced judgment.

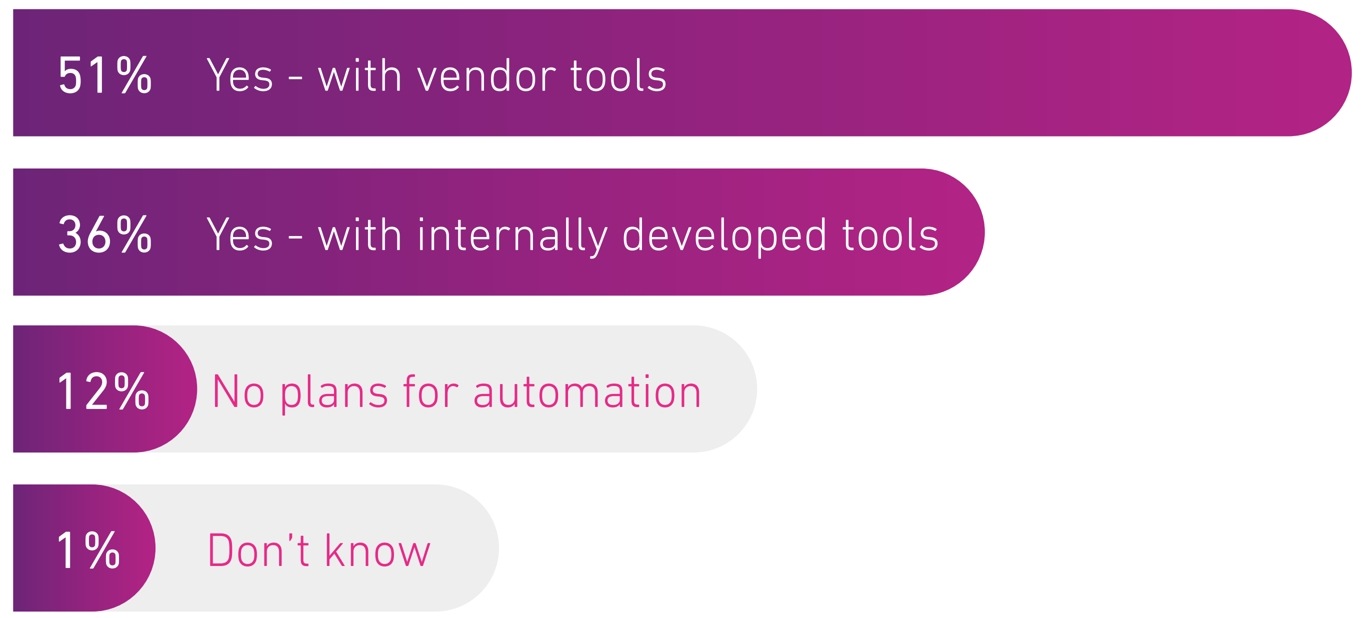
Changing guidelines from regulatory agencies worldwide means FIs must be nimble enough to react and adjust quickly and consistently. Businesses must be able to **customize** automation based on regulatory changes and drive **consistency** to speed up processes. By establishing clear workflows with assigned roles and responsibilities, modelers and validators can work independently to reinforce the validator's requirements to independently challenge the model.

Third-party automation tools that simply focus on model document automation don't represent the complexities of the model lifecycle and therefore cannot offer a robust solution.

The growing demand for comprehensive automation

Our research shows that most financial institutions plan to adopt greater automation in the near future. Within the next two years, 87% intend to implement more automated model documentation solutions—36% favor internally developed tools, while 51% prefer third-party solutions.

Over 8 in 10 FIs plan to introduce more automation for model documentation in the next two years



With banks less inclined to change vendors, it is important to have a comprehensive, customizable solution that can adapt to regulatory and other changes.

> The issue with new tools is that an FI is sticky to their current tools, so even if a tool was amazing, then changing to a new tool might be very hard. Also, they have committed with the Fed to use a tool, so the next time, using a new tool might require explanations from the regulator, which the FIs might be reluctant to do.
>
> Interview, bank (North America)

Financial institutions across the US (**88%**), UK (**86%**), and Brazil (**88%**) demonstrate strong intent to expand automation initiatives. Vendor solutions are the preferred choice in all three regions (US: **54%**, Brazil: **50%**, UK: **49%**), though Brazil notably leads in the preference for internally developed tools at **38%**. Larger organizations show a slightly greater inclination toward vendor solutions (**55%**) compared to smaller institutions (**48%**), while both groups have comparable interest in internal tools (larger: **38%**, smaller: **36%**). Organizations currently relying on fully manual processes indicate no immediate plans to adopt further automation, whereas institutions already using automated (**100%**) or hybrid systems (**92%**) show strong intentions to expand automation use.

Among sectors, retail banks show the strongest commitment to automation, evenly divided between vendor and internally developed solutions. Credit card companies exhibit more cautious intent, with **31%** indicating no immediate plans for further automation, although a majority (**57%**) lean toward vendor tools. In contrast, automotive finance (**87%**) and fintech lenders (**86%**) sectors report significant engagement with automation, actively planning to implement either vendor-provided or internally developed solutions.

Industry View

The interdependence of data, automation and agility

Although automation is a key focus for FIs, establishing robust data infrastructure is essential for achieving seamless end-to-end automation in the model documentation process. In parallel, FIs have highlighted agility and reduced time-to-market for models as further priority areas.

Across all regions, enhancing data infrastructure is the top priority, particularly in the US (**51%**), Brazil (**46%**), and the UK (**45%**). This focus underscores the need for strong data foundations to support increased automation and AI adoption.

Automation itself is most emphasized in Brazil (**55%**), compared to the UK (**47%**) and the US (**43%**). Smaller institutions, in particular, view automation as essential for effectively scaling model-driven processes. Meanwhile, larger organizations prioritize agility and faster model deployment (**45%**), with the US (**47%**) and Brazil (**45%**) leading this initiative. Credit card companies notably emphasize agility (**54%**), aligning with their need for rapid, real-time decision-making.

Industry View

Biggest priorities around models over the next 6-12 months

Improving our data infrastructure to support models	48%
Automating model documentation	47%
Improving agility and timeline to bring models to market	46%
Building knowledge about models and machine learning within my organization	44%
Hiring additional talent to support model development and deployment	42%
Performing feasability or ROI analyses for using models in our organization	38%
Sourcing more tooling/tech for staff	36%
Proving explainability of the models work	31%
Completely overhauling existing models	30%
Sourcing new data sets	27%

A robust data infrastructure is essential for achieving seamless end-to-end automation, with the ultimate goal of reduced time-to-market

Industry analyst perspective

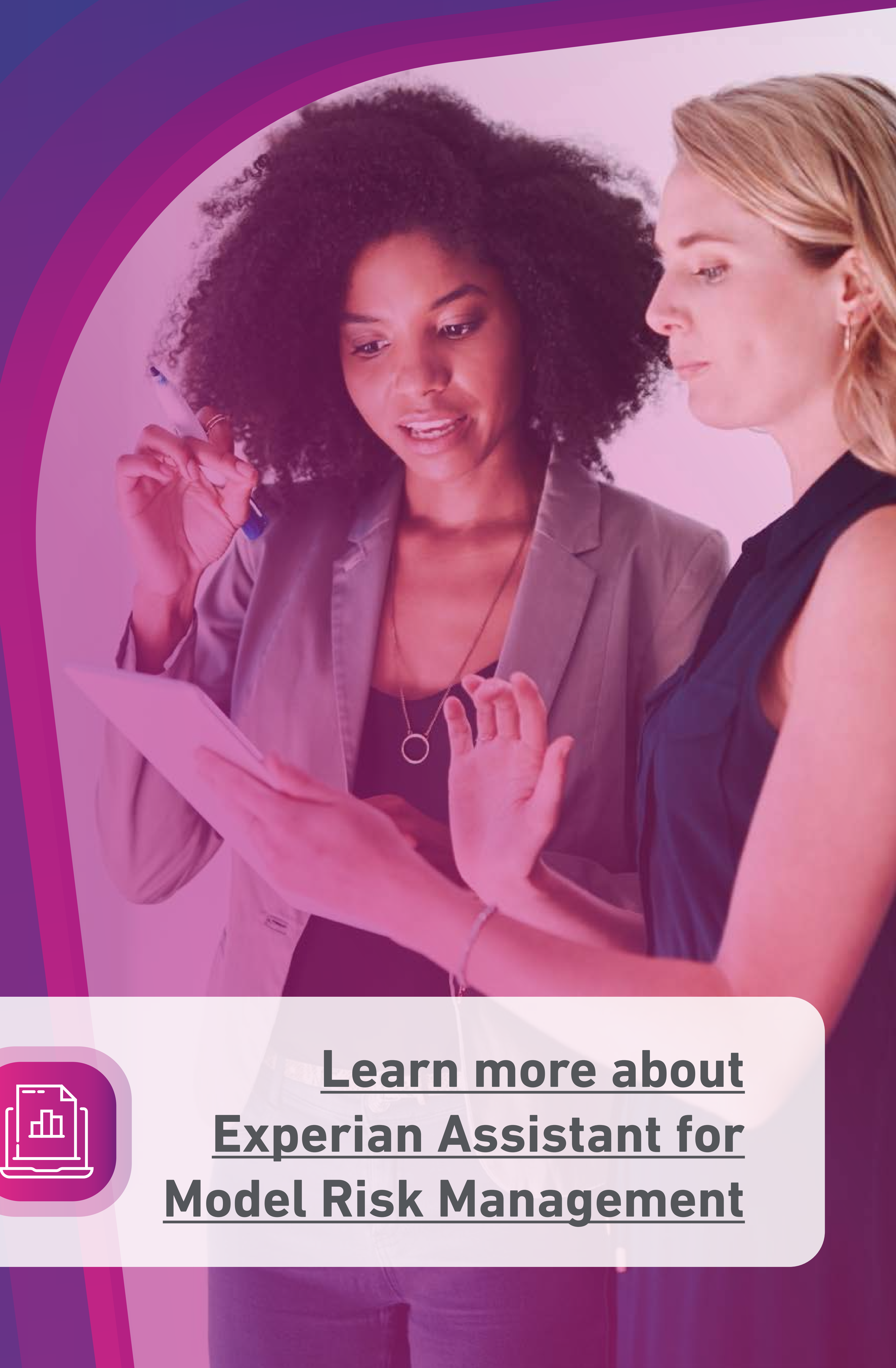
When organizations have confidence in the governance of their models, they are more likely to bring new products to market swiftly and with lower risk exposure. This capability can provide a competitive advantage, especially in highly regulated industries.

Laying the foundations for end-to-end model documentation automation

As regulations continue to change, FIs must establish robust risk management practices and adopt technology that matches the scale and speed of compliance requirements.

Whether employing AI or traditional predictive models for credit risk decisions, businesses recognize the growing importance of monitoring, transparency, and automation. These elements are crucial for effectively utilizing advanced models, and start with these key actions:

- Ensure consistency that is customizable for model types and frameworks within the institution.
- Integrate responsible AI frameworks to align with ethical and regulatory standards.
- Enhance transparency and explainability of models.
- Effectively integrate independent validation and approval processes for transparent and timely approval, enabling a faster time to market.
- Modernize operations for resilience to enhance adaptability and mitigate risks.
- Enable the ability to identify and address model issues quickly.
- Strengthen model governance to streamline compliance and improve operational efficiency.



Learn more about Experian Assistant for Model Risk Management

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