

Creating a Comprehensive Risk-aware Business Culture Using SAS® Risk Management Products

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ABSTRACT

The Thompson Reuters Cost of Compliance 2018 study surveyed global systemically important financial institutions on their expectations for costs associated with regulatory compliance over the next year. Seventy six percent of participants expected an increase in focus on managing regulatory risk in the upcoming year. These institutions expected that they would prioritize General Data Protection Regulation (GDPR) readiness, policy management, risk identification and control effectiveness, and the assessment of the impact that regulatory changes have on business.

Since the financial crisis of 2008, this shift in focus on regulatory obligations within financial institutions has become a driving force for the creation of software that can be customized, enhanced, and easily updated by the user. These changes are often necessary to keep pace with the ever-changing regulatory efforts of governments around the world.

SAS® has developed software with these needs in mind, including SAS Model Risk Management and SAS Solution Content for Stress Testing. These solutions are built on a common framework, SAS Risk Governance Framework, so that financial institutions can implement the software to fit their current needs and then customize the software at any time as those needs evolve. Allowing risk and regulatory compliance software to work in together as one system enables financial institutions to quickly solve increasing governmental demands and fosters a risk-aware business culture.

INTRODUCTION

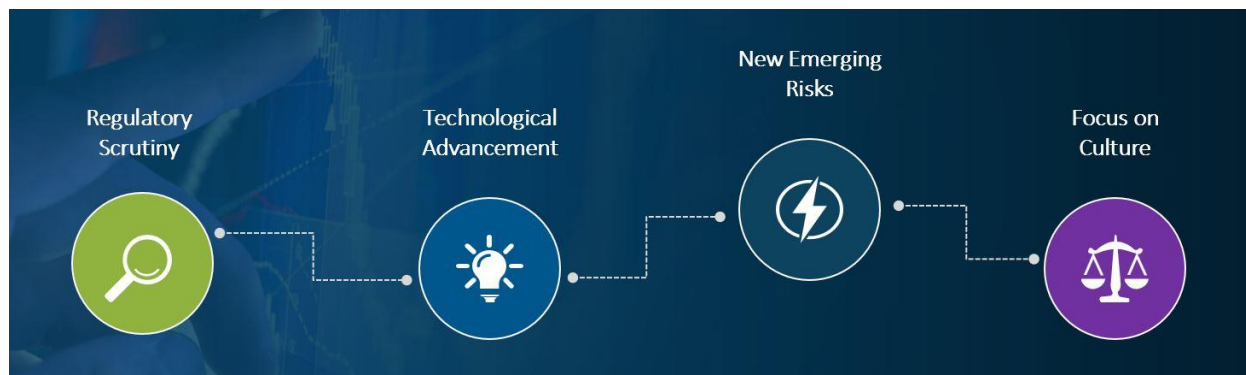
Financial institutions have faced an increasingly fast-paced regulatory climate since the mid-2000's. While several factors pushed regulators around the world to begin efforts to prevent future financial crises, changing geopolitical climates and ever-evolving technology make risk management increasingly difficult. More than ever, senior managers are forced to assume dual responsibilities of keeping updated on all the regulatory changes that occur around the world and translating what those changes mean to their own institutions.

As the regulatory pressure increases, institutions have begun to increase spending on risk management to keep up with the demands. The following pages explore the main factors that have influenced this trend and how software developers can best meet customer needs and make risk management efforts less complicated.

THE FORCES BEHIND CHANGE IN RISK MANAGEMENT

The Thompson Reuters Cost of Compliance 2018¹ study explained why risk managers are increasing their efforts and how they are meeting their risk management and regulatory

compliance needs. The main reasons included increased exposure to regulators, the impact of new technology on compliance efforts, and the effect of corporate culture on those efforts. More than 60 percent of the institutions that were surveyed responded that they expected to increase their compliance teams' budgets in 2018. Where these funds are allocated will be just as important as the increase in spending.



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Regulatory Scrutiny

Regulators around the world have different priorities, and multi-national companies are burdened with navigating the regulations of multiple countries. The Thomson Reuters study¹ found that quickly implementing firm-wide changes to become compliant with new regulations was one of the main concerns of risk managers.

A recent example of a new regulation that requires firm-wide changes is the General Data Protection Regulation (GDPR). GDPR was introduced by the European Union as a proposal in 2012. Once ratified, financial institutions were given two years to establish business frameworks that were compliant with GDPR before the May 2018 deadline. While it may seem like ample time, most institutions coming under the purview of GDPR had to completely reorganize the ways that they managed personal data.

Although GDPR was initially limited to the management of personal data for individuals who reside in the European Union, its principles will likely filter to the United States. Further regulatory pressure comes from the stress testing regulations implemented by the United States. The earliest and most significant of these regulations were enacted around 2013. Soon after

As more and more regulations come into effect, financial institutions are struggling to keep up with changing regulatory climates. With limited resources, risk managers have had to prioritize their efforts, which is also a risk. With increased regulation comes a liability that is much greater than in previous years. The chances of regulatory penalties having a real effect on an institution's bottom line have increased exponentially, and a company has to account for the chance of penalties when planning its regulatory efforts.

Technological Advancements

Unfortunately, people who would harm companies and consumers can easily take advantage of weaknesses in security systems. With technology changing at such a rapid pace, it can be difficult for companies to keep up with ever changing types of attacks³. The issue is no longer just the problem of a few IT security employees in a firm. Financial institutions face

possible regulatory actions, lawsuits by any consumers affected by the attack, and damage to the image of the firm, if an attack occurs.

In addition to the possibility of losses due to increasing security risks, the incorporation of new technology can often be a painful process for any firm. There are inherent risks of doing so too early. This trend is particularly prevalent with the advances in artificial intelligence (AI) and the increasing number of ways AI is used in many different areas of finance. More and more institutions are incorporating AI into their business practices, but there are hiccups along the way.

The primary obstacle these institutions encounter is regulators. Regulators dislike the black-box nature of AI models, many want to treat these models differently than traditional models. However, companies are figuring out how to use AI in ways that circumvent regulators. One such example is to use AI to narrow down the process of variable selection. Currently the variable selection process can be a very involved process and it can take a very long time. What AI can do is pour through the data and create a set of possible models to use. At this point all the normal statistical tools can be used on these models to further refine and select the final model. This way the final model is backed up by all the statistics regulators like. Another thing to consider is that even though AI models can be extremely reliable they open the door for unexpected behavior, this is another source of risk that needs to be taken into consideration. There are two big driving factors for incorporating AI. First, AI is remarkably good at spotting relationships among huge amounts of data. This is particularly important now a days that we are collecting so much data. Second, it the speed gained by using AI models. Being able to obtain quick usable information from data is of paramount importance. That's precisely what AI can provide. Another thing AI has going for it is that it can perform certain task at human level, allowing humans to concentrate on other things and it also reduces the operational risk. Lastly, as it is customary in every regulated field, new technological advances are usually slower than in unregulated field.

Focus on Culture

When a regulator begins an investigation into the actions of any institution, the entire institution, along with the culture that keeps it alive, are under scrutiny. No person involved in the day-to-day actions of an institution is free from this scrutiny, from the board members to the data analysts. The "business as usual" methods used by all firms will face a new kind of exposure. The culture of any workplace leaves it vulnerable in a few different ways.

The first cultural focus of any institution should be the responsibility it has to operate with a clear vision and specific goals. In an audit or investigation, an institution is asked who is responsible for each step in any process. Many companies have become so large (through fast growth, mergers and acquisitions, or simply years of doing things a certain way) that describing specific roles and responsibilities can be difficult. What seems like an easy answer is sometimes complex. Responsibilities for one process are split among groups, different roles often handle different parts of each step, and different levels of management oversee each process. Having clear and consistent roles and management oversight for each step in any regulatory process will help a firm avoid penalties for missing information and incorrect oversight procedures.

Reputational risk is a unique area of risk that comes out of internal issues of an institution's culture. Reputational risk is especially critical in the age of immediate news stories, twitter feeds, and easy access to stock market trading. A viral news story can cause stock prices to fall drastically, which could trigger class-action lawsuits, regulatory investigations, and internal shakeups. It often does not matter if anything happened at all within a company,

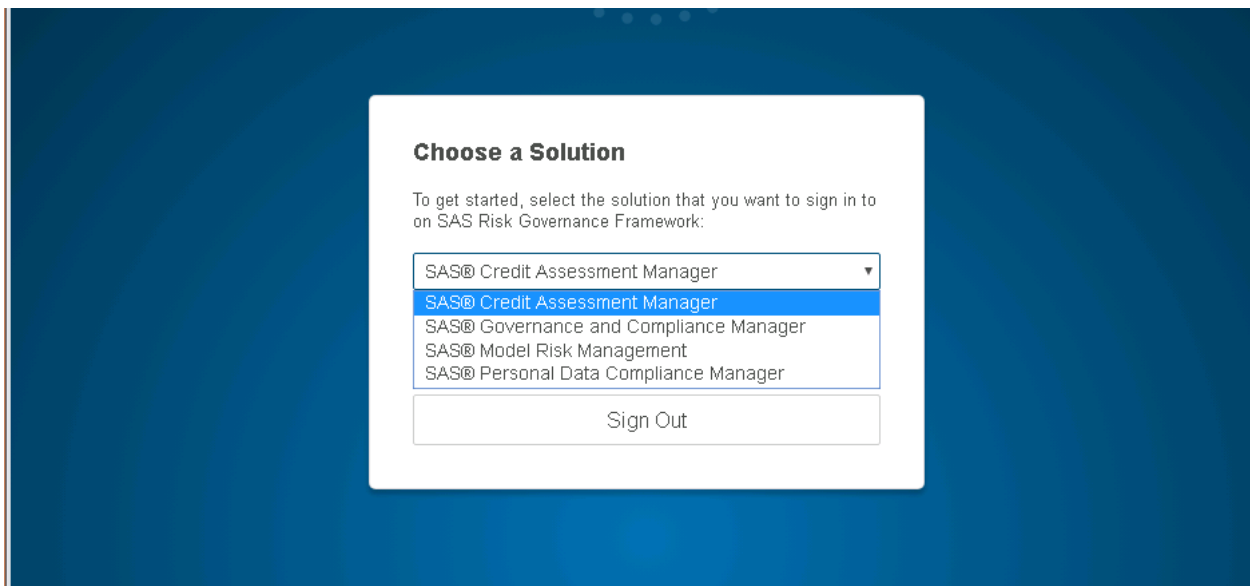
public perception can cause a company a major loss. What might have been a small loss to a firm in the past can easily become far more problematic in today's

Risk management should be a priority of the entire institution. As such, an institution must develop and implement a firm-wide risk-aware culture to prevent potential damages and maintain regulatory compliance.

PUTTING IT ALL TOGETHER

A Framework for the Future

SAS knows that the above issues weigh on the minds of risk managers across the globe. The intention of R&D developers, solution leads, and product managers, is to keep those needs in the forefront of our minds when developing new products. Even after solutions are released, SAS continuously take the feedback we get from customers to keep up with the vision of how these solutions will be used in the future. Within the Risk Research and Quantitative Solutions division of R&D, the focus is to provide institutions with enterprise software that can be used for quantitative purposes, but also meet the increasing need for internal governance standards.



One such example of these efforts it's the creation of risk solutions that can exist together on a common governance framework. Regulatory pressures mean that institutions often must continuously increase the time and money spend on these activities. To make it easier to comply with these regulations, we give clients to ability to complete governance activities on the same framework as their other risk management processes. There are several advantages to this:

Clear Risk Management Roles

Across several different solutions, the framework allows administrators to assign roles, and capabilities to each role. Going one step further than that however, each person assigned to a role can belong to that role within a specific organization within the institution. In many cases, one role can exist in many different organizations. The role is the same, but the organization is not. Someone building models in the corporate services division does not need to see the same information as someone in the same role inside the retail card services division. Being able to designate certain information as being part of a certain organization allows greater control of what internal staff have access to. Issues of who does what role in which organization are not going to arise in a system using the same framework.

The screenshot displays the SAS Model Risk Management interface. At the top, there is a navigation bar with the text "SAS Model Risk Management". Below this, the role details for "Role: MRM: Model User" are shown. The details include: Role ID: 10014, Source System: MRM, and Name: MRM: Model User. There are three tabs: "Global Capabilities", "Object Capabilities", and "Positions", with "Positions" being the active tab. Below the tabs is a search bar with the text "Search" and a magnifying glass icon, followed by the text "User". Below the search bar is a table with two columns: "User" and "Location". The table contains seven rows of data. At the bottom of the table, it says "Showing 1 to 7 of 7 results".

User	Location
Carrie Hunter	Business unit: Sunshine Financial
Satish Venkatesan	Business unit: Sunshine Financial
Ann Kellog	Business unit: Sunshine Financial
Doris Chan	Business unit: Quantum Bancorp
Carrie Hunter	Everywhere
Satish Venkatesan	Everywhere
Ann Kellog	Everywhere

Using New Technology Responsibly

New technology is often one of the most discussed and requested items at any user driven SAS event. Inside R&D and within the governance frameworks we develop on, we use subject matter experts to guide our steps into the future of these technologies. For example, those using the Model Risk Management solution have often asked product management and solution leads for a way to track and govern models created by and used with artificial intelligence (AI). As referenced above, AI can be tricky to any institution working with regulators. Knowing this, SAS developers were careful in their inclusion of AI modules for upcoming releases of the product. There has to be a balance of giving customers what is necessary to continue their business practices, while also keeping regulatory requirements in mind.

▼ Machine Learning Usage: *

Does the model use ML techniques?: Yes No

Level of ML usage:

Reason for choosing ML technique:

- Large volume of data
- Fast data accumulation
- Involves unstructured data
- Better predictability
- Best fit for the problem
- Low materiality model
- Other

▼ ML Selection Rationale:

Search

Actions	Name	Type	File Size	Revision	Locked By	Modified By
<input type="checkbox"/>	Lift.html	HTML	51 B	Draft		Frank Gifford

Showing 1 to 1 of 1 results

▼ Data:

Model Data Source

Actions	Model data source name ^	Data usage	Data refresh fr
<input type="checkbox"/>	Credit behavior data		Monthly

Showing 1 to 1 of 1 results

▼ Model: *

Type of machine learning method:

ML Algorithms used:

Does the model use open source tools?: Yes No

Is there a recalibration policy?: Yes No

Link to Recalibration policy: *

Fast Paced Regulations = Efficient Content Updates

The regulatory climate is such that R&D needs to anticipate what the coming regulatory climate may be to have offerings in place that customers will need. There is no magic eight ball for these decisions, so every other part of the processes needed to be made more efficient to properly meet the needs of customers. When constructing a regulatory framework, R&D developers worked tirelessly to extract what the essential content was from the framework itself. Traditionally, new releases of software were lengthy, because releasing new versions, or even hot fixes, were costly. By extracting the content, R&D enabled customers to receive updates more often of the things they really need, while continuing to maintain a lengthier schedule for framework related items.

This initiative allowed developers to add on new regulatory requirements as they were released by regulators. For example, in 2017, the European Central Bank introduced new model requirements called targeted review of internal models (TRIM)⁴. Immediately after its announcement, customers will begin asking for a solution to show regulators that they are complying. Being able to release content several times a year makes it possible for these customers to maintain compliance without worry.

TRIM: *Create

Status: Create

Workflow Activity: Create TRIM

Create → Approve

Classification: <Custom> Manage...

Business unit: Quantum Bancorp

Details* Topic 0 Topic 1 Topic 2 Topic 3 Topic 4 Topic 5 Topic 6 Topic 7 Topic 8 Topic 9 Topic 10 Topic 1 - Annex Related Objects Other Attachments and Comments Workflow

General:

TRIM ID: 10000

Title: *

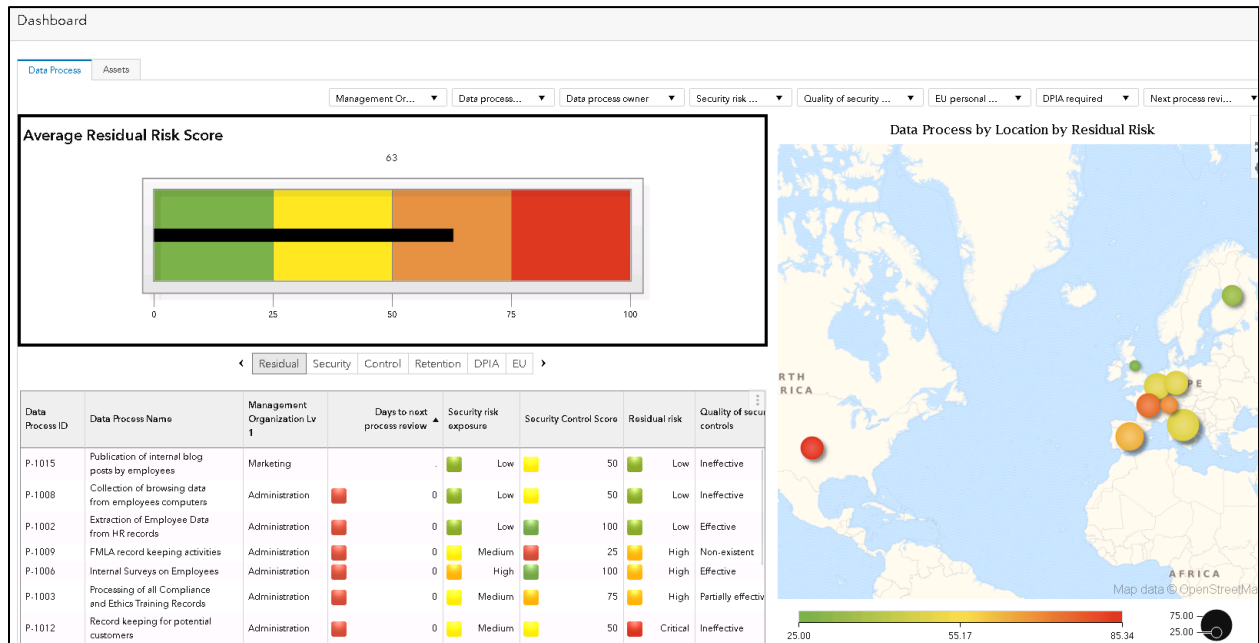
Description:

Assessment period: (none selected)

TRIM references:

- What is the targeted review of internal models (TRIM?)
- Guide for TRIM

On a larger scale you can see this content development with regulators and business needs aligned in SAS Personal Data Compliance Manager. Traditionally, the SAS Governance Compliance Manager included everything most firms need to fulfill their compliance needs. When GDPR was announced and the regulation was inspected from every angle, it was determined that the regulation was large enough to warrant a separate content package. Once officially released, it is now an offered add on to SAS Governance Compliance Managers. Having a flexible system of tools that can allow users who have access to multiple solutions the ability to go back and forth between them easily is one of the key focus points for future development in the division.



CONCLUSION

The needs of any R&D organization should remain focused on the anticipation of what customers need now and will need in the future. Keeping an eye on the newest regulations, technology, and political climates around the world only better allow the organization to develop products that are meaningful. Having a risk management system in place that covers every base is the first step to creating a risk-aware business culture.

CONTACT INFORMATION

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REFERENCES

¹ English, S. & Hammond, S, 2018. “Cost of Compliance 2018.” *Thomson Reuters*, 1–38.

² Garside, Thomas & Mitchell, Johnathan, 2017. “The Future of Risk Management: Ten Years After the Crisis.” Oliver Wyman, 1-13. Available at <https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2017/sep/OW-Future-of-Risk-2017.pdf>.

³ Schneier, Bruce, 2014. “How Changing Technology Affects Security.” Available at <https://www.wired.com/insights/2014/02/changing-technology-affects-security>.

⁴ European Banking Association, 2017. “What is the targeted review of internal models? What is its main goal?” Available at <https://www.bankingsupervision.europa.eu/about/ssmexplained/html/trim.en.html>.