Financial services organisations face a dazzling array of regulations, reporting obligations and risk management workloads. As the regulatory environment continues to evolve, our banking and capital markets customers are asking how they can rise to the challenge of data and its associated encumbrances. They need to evolve towards a more robust platform that can handle their dynamic risk and regulatory compliance needs while enabling them to leverage the volumes of data they have, to identify inherent risks and new opportunities and respond quickly to stakeholder demands.

In this report you will find real-life examples of how Microsoft and its partners are developing the solutions our customers are asking for, to enable secure, efficient and agile risk and compliance processes. Key partners give their insights into the risk and compliance trends affecting financial firms today, and the ground-breaking technologies, tools and best practices that are helping companies to manage their risk and compliance obligations in a way that creates value for the business, its employees and its customers.

The examples and insights included here illustrate what is already being achieved by companies working with Microsoft and its partners, and the transformation that is made possible by cloud, data and analytics and emerging artificial intelligence technologies.

We hope you find these articles both informative and inspiring as you explore what your organisation can achieve through the transformation of your risk and compliance processes.

**FOREWORD**

Digital transformation in risk management

A wave of technology innovation, built in the cloud, is fundamentally transforming enterprise workflow across industries, and financial markets participants are being swept up into the surge. At the same time, financial institutions are spending huge sums of money on complying with a growing set of regulations while struggling to meet the corresponding data management and compute resourcing requirements.

With the largest financial institutions spending over one billion dollars a year on regulatory compliance and controls, and the ‘average’ financial institution dedicating 10-15% of its staff to this area, the financial markets are turning to cloud-focused, enterprise-wide approaches based on the latest financial technology (fintech) innovations. An agile, adaptable approach to compliance not only supports today’s regulatory requirements but positions the firm to handle change and extract more value from capital tomorrow – whether that capital is human or financial. As data volumes grow exponentially, human hypothesis-driven and exception-based analytics struggle to keep pace. We see a trend for financial institutions to look to advanced technology and data-centric solutions to meet their compliance needs and realise internal efficiencies as well as generating alpha.

Today’s compliance platforms need to be built with agility, flexibility and scalability at their core to cope with rapidly changing requirements – including the ability to leverage exponentially growing and diverse data sets. Our research confirmed that cutting-edge technology solution providers in the regulatory compliance (Regtech) space are relying on cloud-based approaches to leverage the elasticity, scalability, higher security and innovation these provide.

**A wave of transformation**

Monica Summerville, Head of the FinTech Practice and Head of European Research at Tabb Group, sees an agile, cloud-based approach to compliance
Risk and Regtech: moving towards a data-driven digital enterprise

Rupesh Khendry, head of capital markets industry solutions, worldwide financial services at Microsoft, shares Microsoft’s vision on how enterprises can harness their data to enable truly future-ready risk management and regulatory compliance.

Financial markets can have profound and lasting impacts on the global economy. The most famous was the US stock market crash of 1929, which had devastating consequences worldwide. The financial crisis of 2008 came a close second.

The Lehman Brothers collapse in 2008 triggered counterparty and regulatory failures. Firms had to rework their models and risk management and regulatory compliance hasn’t been easy. According to data from Boston Consulting Group, banks globally have paid US$29 billion in fines since the financial meltdown for an abundance of regulatory failings.

Regulation must be considered a permanent rise in sea level – not just a flowing tide that will ebb or even a cresting tsunami that will recede,” said the report.

How can financial institutions keep up? According to Rupesh Khendry, Microsoft’s head of capital markets industry solutions, this requires institutions to consider a holistic end-to-end platform with the combination of the following:

- hyperscale compute platform
- modern data management platform
- AI complementing and supporting the efforts of the various teams with a promise of reduction in the need for resource-intensive manual oversight

To meet financial institutions’ requirements for a resilient, available platform that can scale up to meet longer-term needs, and avoiding paths that would lead to future dead-ends.”

As newer regulations such as MiFID II and Fundamental Review of the Trading Book (FRTB) come into force, financial services firms are being driven to evaluate their existing capabilities and they’re turning to Microsoft for help in their digital transformation journey.

As we speak with customers globally, it is very evident that financial institutions are keen to partner with an enterprise solutions provider that offers an end-to-end seamless platform for financial services. They are increasingly looking to leverage the power of the cloud as they transform digitally towards becoming a technology company with a banking license to cater to the demands of their end-customers.

At the heart of Microsoft’s vision for the data-driven enterprise is an intelligent cloud platform that offers

SHOWCASE: EAGLE INVESTMENT SYSTEMS

Investment management in the cloud

A new solution from Eagle Investment Systems allows investment managers to maximise the value of their data

Eagle Investment Systems, a BNY Mellon company, is collaborating with Microsoft to create a new cloud-based data management platform to help investment managers capture the diverse data needed to manage assets and seek alpha. Deploying on the Microsoft Azure cloud platform provides the resiliency, availability and scale needed to quickly adapt to today’s dynamic markets.

“The cloud has already diminished many of the barriers that have traditionally impeded investment managers’ ability to adopt and benefit from breakthrough technologies,” said Mal Cullen, Eagle’s chief executive officer.

Judson Althoff, executive vice president, Worldwide Commercial Business at Microsoft, said: “The benefits of the Azure platform, coupled with Eagle’s expertise in serving global investment managers, will allow companies to more efficiently manage costs and challenges while maximising the value of their data.

“We are proud of our track record of providing solutions with a data-centric focus. Combining our knowledge with the strength of Microsoft and the Microsoft Azure cloud platform, this data management platform will also enable future opportunities for Performance and Accounting clients to benefit from enhanced analytics and reporting capabilities, and further combined with the breadth of the BNY Mellon Asset Servicing solutions will provide clients with many opportunities to leverage their data.”
Data is among a bank’s most powerful assets but realising the benefits can be a challenge. “Achieving data nirvana in the financial services industry is no simple feat,” says Matthew Skinner, COO at Xenomorph. “It would be easier if firms were starting from a clean slate. But most are dealing with complex, siloed data architectures and an organic sprawl of data-consuming systems and applications. This mess evolved quite naturally. Over the years, different teams pursued their own data procurement and architecture decisions because they felt their requirements were unique.”

As new regulations increase the focus on data quality, many banks are looking to adopt a consistent enterprise data management (EDM) framework – but ‘consistent’ must not mean ‘inflexible’. “Any EDM system seeking to bridge the gap and drive consistency across departmental functions will need to accommodate their different requirements and ways of defining data quality, along with timeframes for data preparation,” says Brian Kristensen, CTO at Xenomorph. “The key is to capture enough structure to model the relationships and interdependencies between data elements, while maintaining enough flexibility to accommodate your full range of current requirements as well as future demands. Knowing all those relationships and interdependencies not only helps support business workflows, but also makes it easier to validate and enhance data accuracy by being able to view each data element in context.”

“To store and manipulate the growing volumes of data required by the business and regulators, banks need big data systems that go beyond the capabilities of traditional relational databases,” says Suranjan Som, vice president of Financial Services at Hitachi Consulting. “They’re looking for solutions that are almost infinitely scalable, and that won’t slow down as more data is added. The cloud provides that elasticity, allowing banks to grow capacity when they need it and turn the power down when they don’t.” Ultimately, to set themselves on the path to data nirvana, banks need to take a step back and think strategically. “Banks need to treat risk and regulation as an opportunity rather than an obligation,” says Som. “Once you have clean, organised and accessible data in one central place, you are not only ticking the box for the regulator; you’re building an asset you can use to run your organisation better.”

SHOWCASE: MITSUBISHI UFJ SECURITIES

The power of the cloud

Mitsubishi UFJ Securities is leveraging the cloud for agile risk reporting

Mitsubishi UFJ Securities International plc, a member of global financial group MUFG, was one of the first large financial institutions to leverage cloud technology to drive agility in its regulatory risk reporting. Mitsubishi UFJ Securities International plc, a member of global financial group MUFG, was one of the first large financial institutions to leverage cloud technology to drive agility in its regulatory risk reporting.

“Our efficiency of use during the utilisation is about 97-98%, which is something rarely seen with on-premises resources”

ROBERT GRIFFITHS, HEAD OF HIGH PERFORMANCE COMPUTING, MUFG SECURITIES

“In the past, Mitsubishi UFJ Securities had to buy enough servers to cope with the need for 4,000 cores on a weekend – that’s roughly 350 servers and a lot of datacentre space. Now, by moving its high-performance computing (HPC) grids to Microsoft Azure, the company has dramatically increased its computing power without increasing staff, while saving millions of dollars in servers and datacentre space. This has allowed it to support its risk computations and regulatory compliance at a lower cost.”

“Most financial firms are dealing with complex, siloed data architectures and an organic sprawl of data-consuming systems and applications”

MATTHEW SKINNER, XENOMORPH

“The key is to capture enough structure to model the relationships and interdependencies between data elements, while maintaining enough flexibility”

BRIAN KRISTENSEN, XENOMORPH

“Banks need to treat risk and regulation as an opportunity rather than an obligation”

SURANJAN SOM, HITACHI CONSULTING
Hyperscale powered risk and compliance

As trading gets increasingly high-frequency, organisations are finding they need infinite scale to take advantage of opportunities and manage risk across the enterprise.

Donna Zimmerman, TIBCO Software Inc.

The need for hyperscale computing is driven by regulatory pressure, fraud prevention and technology evolution – including digital transformation trends such as burst-to-cloud, blockchain, machine learning and big data," says Donna Zimmerman, product manager at TIBCO Software Inc. "Banks need solutions that will manage critical aspects of the overall governance practice to realise greater usage of data lake environments." TIBCO is helping organisations position themselves for success in this evolving business environment. "We are seeing our customers preparing for the various regulatory mandates in FRTB," says Zimmerman. "Acquiring and implementing effective trader surveillance has now become an urgent priority for many organisations. They want to find the most effective, secure and cost-effective means to meet the challenges they face both with regulations and in shaping their increasingly competitive digital business."

The TIBCO DataSynapse GridServer® solution helps financial firms rise to the challenge, enabling real-time high-performance computing for risk analysis scenarios, trading simulations, interactive risk reporting and management, a wide variety of financial modelling algorithms and parallel distributive computing grids. "The powerful scheduler in Data Synapse GridServer dynamically allocates resources in the cloud based on urgency of calculation tasks, allowing it to manage grid overload, SLAs and many other factors," says Zimmerman. "This flexibility allows customers to tune their compute resources to match demand, avoiding the need to add on-premises resources to meet peak demand that might otherwise be under-utilised. We have also added support for GPU, accelerating some calculations by two to three orders of magnitude."}

"Acquiring and implementing effective trader surveillance has now become an urgent priority for many organisations"

DONNA ZIMMERMAN, TIBCO SOFTWARE INC.

Removing the complexity of risk management

Capital markets face uncertainty about what the future holds, as it remains unclear how much regulation will be fragmented across multiple geographies. "Data sets are still getting bigger and regulations such as FRTB are facing firms with a need to increase calculations," says Andre Nedelcoux, managing director at Excelian. "The introduction of more exotic methods such as machine learning (ML) and artificial intelligence (AI), to leverage data and create money-making opportunities from it, will likely become a major focus within the risk organisations of financial institutions. Data consolidation is a key component to simplifying regulatory change.""Data consolidation is a key component to simplifying regulatory change"

"Data consolidation is a key component to simplifying regulatory change"
A modern approach to support new challenges

Stella Clarke, chief marketing officer at Murex, explains how a single-platform approach can help capital markets participants rise to new challenges.

Regulatory changes and the convergence of trading and risk management measures are affecting all areas of the financial institutions’ business, and legacy IT systems simply can’t adapt. “It is time for institutions to clean up years of merger and acquisition and accumulated system layers, so they can position themselves to compete effectively in the new normal,” says Stella Clarke, chief marketing officer at Murex.

Murex’s single-platform approach enables it to deliver its MX.3 solutions in the way that best suits the business – whether that’s an enterprise-wide or a modular best-of-breed solution – so organisations can adapt and evolve their IT systems with the changing environment. “The modular platform approach of MX.3 acts as an agile foundation for our clients’ IT infrastructure, connecting business processes and powering operations with advanced and specialised native business solutions for trading and analytics, post-trade and risk management,” says Clarke. “Our platform enables banks to transform and rationalise their IT infrastructure to ensure the full consistency of their processes, outputs and data.”

Murex has certified Microsoft Azure for its most demanding use cases in MX.3, and it plans to integrate Microsoft SQL Server 2016 as a relational database. “Those opting to adopt cloud as part of their infrastructure will continue to benefit from the support of Murex’s expert client services teams around the world”, says Clarke. “As well as cost-effective access to immense compute power, Microsoft gives our clients the ability to deploy and manage MX.3 more efficiently for production, test, development and disaster recovery.”

The company is also enabling transparency through the Agile and DevOps delivery approaches it is piloting with clients. “We’ve employed tools to continuously test, integrate and deploy new code, so clients could see new code incrementally and provide feedback as it was tested,” says Clarke. “DevOps offers benefits to capital markets participants, ranging from the ability to improve and update software more quickly and responsively through to greater control over the costs and risks associated with software development.”

Ultimately, says Clarke, Murex’s approach enables institutions to gain greater control over operational costs and risk while supporting revenue growth and delivering immediate value to the business. “We bring innovation to our clients and help them be ready with solutions that holistically answer the regulatory burden, while enabling them to rationalise their IT infrastructure and reduce costs through a single platform that is fully cloud certified.”

Confidential computing in the cloud

Christine Avanessians, principal PM manager, and Matt Thomson, principal program manager, in Azure Big Compute at Microsoft, discuss how the company is leading the effort towards a ‘Confidential Cloud.’

With a number of regulations hitting financial institutions over the coming years, banks face increasing requirements for transaction reporting and for the capture, retention and replay of data. This presents a monumental technology challenge that requires a new approach, leading many banks to consider public cloud for part, or all, of the solution. There are many rules governing the use of data, and specifically customer data in the cloud, which can vary from country to country. Microsoft has taken the security of this data a step further by introducing Azure Confidential Computing (ACC).

What is ACC?

Azure Confidential Computing, ACC for short, is the first step of our broader Confidential Cloud efforts. It brings hardware and software capabilities to the cloud to address a defence that is missing from public cloud today: protecting data while in use.

Today, customers are familiar with techniques to protect their data at rest and in transit. Cloud services provide functionality such as Azure Storage Service Encryption for Data at Rest and SQL Server Transparent Data Encryption to encrypt data when persisted. Secure communication protocols, such as TLS and HTTPS, are commonly used in applications to encrypt data when in transit over a public or unsecure network. However, data remains in the clear and vulnerable during use.

Expanding on this protection, Microsoft’s vision is to move towards a Confidential Cloud where:

• top data breach threats (such as a malicious insider, a hacker exploiting a bug in the hypervisor or operating system, or third-party data access without consent) are mitigated
• data is fully in the control of the customer regardless of whether in rest, transit, or use and even though the infrastructure is not unsecure network. However, data remains in the clear and vulnerable during use.

Data breaches are virtually daily news events, with attackers gaining access to personally identifiable information (PI), financial data and corporate intellectual property (IP). While many breaches result from poorly-configured access control, many can be traced to data that is accessed while in use, either through administrative accounts or by leveraging compromised keys to access encrypted data. Recent studies show one of the top drivers to move to the cloud is to improve security. Despite advanced cybersecurity controls and mitigations, four out of the ‘Breaches 12 Threats to Cloud Computing’ are related to data security. Customers are still
Cloud Security and Compliance

In some instances, the business logic holds as much value as the data. Once again, regardless of the physical infrastructure on which you run the code or the administrator who has access, a company’s sensitive IP such as a financial trading algorithm, can be protected against leaks and tampering. This opens the possibility to move scenarios that once had to remain on-premise to the public cloud without compromising confidentiality.

1. Protect data confidentiality and integrity on a remote machine
Regardless of the physical infrastructure on which the application is running or the administrator who has access, any financial application that manipulates PII or business-critical data can be protected against leaks and tampering. For example, Microsoft SQL Server used ACC to enhance its Always Encrypted capability, which ensures that sensitive data can be built to protect against data leaks and tampering. Customer applications can use this feature directly to gain the benefits.

2. Protect sensitive algorithmic IP
In some instances, the business logic holds as much value as the data. Once again, regardless of the physical infrastructure on which you run the code or the administrator who has access, a company’s sensitive IP such as a financial trading algorithm, can be protected inside a Trusted Execution Environment (TEE or ‘enclave’) such as Intel SGX or Virtualization Based Security. TEEs ensure that data or operations cannot be viewed from the outside, even with a debugger or physical access to the hardware. Only authorised code is permitted to access sensitive data. If the code is altered or tampered with, the operations are denied and the environment disabled.

How does it work?
Confidential computing ensures that when data is ‘in the clear’, which is required for efficient processing, it is protected inside a Trusted Execution Environment (TEE or ‘enclave’) such as Intel SGX or Virtualization Based Security. TEEs ensure that data or operations cannot be viewed from the outside, even with a debugger or physical access to the hardware. Only authorised code is permitted to access sensitive data. If the code is altered or tampered with, the operations are denied and the environment disabled.

As recently announced at the //Build conference in early May, the Azure team, Microsoft Research, Intel, Windows and the Developer Tools group have partnered to bring a new series of Azure virtual machines that are backed by the latest generation of Intel Xeon Processors with Intel SGX technology on which customers can develop enclave-based Windows or Linux applications to address data confidentiality scenarios in the cloud.

How can customers access this service?
Customers can sign up online today to request preview access to get started with our confidential compute platform, software, tooling and developer community. We continue to improve the capabilities of our offering by partnering with this early set of customers and partners. Expect to hear more updates to the offering over the next year.

Microsoft Perspectives: Risk and Regtech

Swiss investment bank UBS is using Microsoft Azure to power risk management

UBS is using Microsoft Azure to reduce dependency on legacy technology, find new ways to leverage digital channels, and rethink how its businesses and people work. By using Azure to power its risk-management platform, UBS has speeded up its calculation time by 100%, saving 40% in infrastructure costs and gaining almost infinite scale within minutes.

“We are building on the industry’s leading cloud platform in terms of innovation, technology, security and regulatory compliance”

Paul McEwen, UBS group head of technology services

Microsoft has taken the proper steps to secure data and mitigate risk. In addition, Azure’s industry-leading compliance portfolio ensures UBS can move to the cloud while meeting current compliance requirements, as well as plan for future regulations.

SHOWCASE: UBS

Agile and scalable

Swiss investment bank UBS is using Microsoft Azure to power risk management

UBS is using Microsoft Azure to reduce dependency on legacy technology, find new ways to leverage digital channels, and rethink how its businesses and people work. By using Azure to power its risk-management platform, UBS has speeded up its calculation time by 100%, saving 40% in infrastructure costs and gaining almost infinite scale within minutes.

“We are building on the industry’s leading cloud platform in terms of innovation, technology, security and regulatory compliance”

Paul McEwen, UBS group head of technology services

Microsoft has taken the proper steps to secure data and mitigate risk. In addition, Azure’s industry-leading compliance portfolio ensures UBS can move to the cloud while meeting current compliance requirements, as well as plan for future regulations.
Regulated industries and public cloud – not an oxymoron

Alan Ross, senior director, financial services industry at Microsoft Azure Engineering, discusses the company’s work with customers and regulators to ensure the cloud offers the security and agility to run mission-critical workloads.

A growing number of banks and capital market firms are realising the benefits of moving to the cloud. Customers are using Microsoft Azure to enable productivity gains and innovation, using intelligent cloud components such as artificial intelligence (AI) and machine learning, and because of Trusted Cloud. Trust is a key ingredient in any cloud environment, and for financial services institutions (FSIs), that means meeting specific needs such as global scale, data residency, compliance and security. At the time of writing, for example, 10 Azure regions are providing a wide range of locations for data; so customers can satisfy data residency requirements. We also have the most comprehensive compliance coverage in the industry, in terms of the number of certifications we have and the services covered by them. It’s not good enough to say we have System and Organisation Controls (SOC) coverage if it doesn’t cover all the services we offer; so we make sure those certifications cover 100% of our generally available services.

Our holistic view of compliance leverages long-standing engagement with customers, regulators, standards bodies, and legislators. We work with customers to understand what they need from Azure and build the products to deliver it. By engaging directly with regulators, we ensure we understand the changing regulatory environment and we influence regulation to make sure it’s compatible with hyperscale public cloud. We engage with the AICPs on SOC standards, sit on the Payment Card Industry Data Security Standard board, and help develop ISO standards. And we provide input to make sure cloud legislation works for our customers, and that it provides the online protections it’s intended to achieve.

A key goal of Azure is to lower the cost of achieving compliance for our customers. For example, we can handle certification and compliance auditing for our cloud customers instead of them having to do it internally as they would with an on-site datacentre.

Right-to-audit is high on the agenda for FSIs too, so Azure provides exclusive rights for both the customer and the regulator, including physical inspections if they want them. But the best way to audit is from the comfort of your own desk. To enable that, Microsoft Compliance Manager provides the same transparency for audit across Office 365, Azure and Dynamics 365. Compliance Manager is designed to help organisations meet complex compliance obligations, including the General Data Protection Regulation (GDPR) which is top of mind for financial firms right now. It performs a real-time risk assessment that reflects the organisation’s compliance against data protection regulations when using Microsoft Cloud services, and provides recommended actions and step-by-step guidance to ensure compliance.

Encryption is also essential, so Azure Key Vault enables customers to process keys in the cloud, using the same hardware security module they would use on the premises. It’s easy to integrate with our other services, and keys can be immediately revoked if needed, rendering any data in the cloud useless.

Continuous innovation is needed to build the advanced features financial institutions want as new threats and opportunities arise. The latest innovations from Azure include Blockchain as a Service; AI and machine learning for doing Anti-Money Laundering and Know Your Customer; Azure Confidential Computing, which ensures that data resting in memory can’t be viewed or tampered with; and one of our most popular offerings among financial firms, High Performance Computing (HPC).

Risk compute workload for regulations like FRTB and Basel can be a massive headache, demanding huge compute capacity that simply isn’t needed the rest of the time. HPC enables them to burst those workloads to the cloud while keeping personally identifiable information on the premises. When they’ve finished, customers can simply shut those machines down, so they don’t have to pay for idle servers. Of course, where there is data, there are threats, and being able to protect, detect and respond to them is paramount. Microsoft applies vast data and intelligence to keeping itself safe, and we surface that intelligence back to customers through Azure Security Center, to protect their environment. For example, if bad actors attempt to attack Xbox through a set of IP addresses, we can surface that data to our enterprise customers so they know those IP addresses are associated with bad actors.

We’ve established that the cloud meets FSIs’ risk and compliance needs, but what happens when workloads need to span on-premises and cloud environments? Our investment in hybrid at the Platform-as-a-Service (PaaS) level enables us to deliver the only consistent hybrid cloud. Azure Active Directory, for instance, enables seamless and secure synchronisation of users’ on-premises and cloud identities. Azure Data Services and SQL Server create a synchronised data platform across both environments. Azure Stack technology enables our core PaaS services to work seamlessly between private and public clouds, while the Azure Management Suite provides security and management across cloud and on-premises infrastructure.

The payoff for all this investment is a cloud that is trusted by the financial services industry and its regulators. As a result, more than 90% of the Fortune 500 companies are on the Microsoft Cloud. Over 85% of the Global ‘Too Big to Fail’ financial institutions (G-SIFIs) are Azure customers and 25 have signed Azure’s G-SIFI production cloud terms.

Showcase: Saxo Bank

Shaping the future of cloud services

Saxo Bank aims to run its entire banking platform on Microsoft Cloud, providing an agile and highly secure environment for the bank to accelerate its digital journey and demonstrate financial services.

“The future of financial services is cloud based, and by partnering with Microsoft we take part in shaping this future,” says Kim Fournais, founder and CEO, Saxo Bank. “Saxo Bank was a fintech long before the term was created, and it is a natural step for us to also pioneer cloud-based solutions in financial services. By leveraging the Microsoft Cloud, we can spend more time on developing technology and less time on running it, allowing us to continue to stay at the forefront of client-focused digitisation and support our ambitious growth plans.

“We are proud to break new ground together with Microsoft and look forward to working with key stakeholders such as regulators to ensure that cloud solutions continue to evolve and support the high regulatory standards that define the financial industry”
Preparing for compliance

As risk analytics gets increasingly complex, banks are discarding rule-based processes in favour of a modern, robust and enterprise-risk based approach.

Financial institutions, markets and regulations have evolved rapidly over the past 10 years, and the business of knowing and mitigating risk has evolved with them. “Effective risk management requires real-time or near-real-time risk calculations and aggregations,” says Ji Li, vice president, product management at Openlink. “The amount of risk data required has dramatically increased, as effective risk management requires not just aggregate data but also drill-down data into every trade, cash flow and stress scenario. We see a lot of interest among our clients who want to embark on a cloud solution that can provide a single source of truth for consolidated risk analytics and reporting to solve those challenges.”

The need for consistent risk data across the enterprise has intensified as regulation extends to new areas of the business. “Ultimately organisations’ processes need consistent data to enable reliable portfolio modelling, pricing of instruments and so on,” says Fabien Couderc, head of enterprise development at Axioma. “Even institutions that are not currently regulated are now trying to be compliant, because they expect to be regulated in the future.”

But while many banks have worked hard to stabilise the beginning and end of the risk analytics process, what happens in between can undermine their best efforts. “A lot of banks have spent time addressing data inputs to make sure everyone is using the same data, and creating data warehouses to store the outputs from those calculations,” says James Church, VP products and R&D at FinCAD. “But if they still have a risk of different analytics systems between those two points, they can’t rely on the consistency of those output results. A central analytics platform provides a consistent way of running all those calculations so the bank really gets value from those data input and storage investments.”

“We while some institutions have shifted their profiles in terms of the asset classes they trade or the services they offer, it’s become clear that technology and better risk analytics are critical to returning profitability to these trading operations,” says Jim Jockle, chief marketing officer and senior vice president, global marketing and corporate communications at Numerix. “As banks have merged market risk and credit risk management, and risk analytics has advanced to fully understand the total cost associated with trading, these developments have done a lot to help improve trading margins.”

Thanks to the cloud, banks of all sizes can take advantage of these capabilities. In fact, says Church, smaller banks are poised to benefit in the short term. “Smaller banks have to comply with the same regulations as big ones, and like all banks they’re dealing with ever higher volumes of data while trying to drive down costs. These banks don’t have the resources to build their own analytics system. A system built on the cloud enables rapid provisioning, elastic capacity to deal with peaks and troughs in compute demand, and the cost-efficiency of a pay-per-use subscription model. It can help those banks to be more competitive as well as compliant.”

As organisations look to harness these risk analytics capabilities, they also understand that the cloud can provide a secure environment to suit specific data segregation requirements. “Banks and hedge funds feel confident with our system because, even if we operate the infrastructure, we don’t own any of the encryption keys and we can’t access their data,” says Couderc. “Their data also resides in client-dedicated environments, separate from other organisations’ data. All of this is feasible thanks to the new operational models in Azure, which make it easy to automate operations and provide custom solutions. It means we can provide solutions to suit institutions with stringent internal policies or regulatory requirements, whose data needs to be segregated.”

As the move towards modern risk analytics continues consistent, carefully-warehoused data brings opportunities for banks to apply other sorts of analyses. “There’s tremendous value in building up this large set of trustworthy data that you can mine in the future,” says Church. “Banks can apply machine learning algorithms to derive new insights on anything from pricing or how to deal with certain counterparties, to predicting what will happen in the market based on past events.”

“Larger banks are exploring new and innovative ways to leverage risk analytics and the cloud, to accommodate the terabytes of derived data that risk analytics for trading and risk authorisation produces,” says Jockle. “We’re at the dawn of looking at artificial intelligence, machine learning and predictive analytics. These capabilities are already embedded in the Azure cloud platform, and institutions are realising it makes more sense to leverage them than to build their own systems.”

“We see a lot of interest among our clients who want to embark on a cloud solution that can provide a single source of truth”

JII LI, OPENLINK

“A system built on the cloud enables rapid provisioning, elastic capacity and the cost-efficiency of a pay-per-use subscription model”

JAMES CHURCH, FINCAD

“Even institutions that are not currently regulated are trying to be compliant, because they expect to be regulated in the future”

FABIEN COUDERC, AXIOMA
Demystifying the alphabet soup

Tackling emerging and constantly changing regulations is a challenge for banks, but new technologies are enabling them to move with the flow.

FTB, BCBS, MiFID II... for financial organisations negotiating the procession of regulatory change can feel like treading water in alphabet soup. With these regulations in various stages of rollout, banks face the challenge of preparing to comply with requirements that haven’t yet been decided.

“We’ve seen the evolution of regulations like Basel 3, Basel 3.5 and FRTB, all of which are still being phased in,” says Jim Jockle, chief marketing officer and senior vice president, global marketing and corporate communications at Numerix. “There are still arguments in the marketplace around different elements of the regulations and their impact on business.”

But the work to comply with those regulations needs to start now. “Even though firms will not need to be compliant on FRTB for the foreseeable future, it could take an institution a multi-year project to put the technology and processes in place,” says Tim Rowlands, director of research at Vector Risk. “That means that banks need to choose the system and approach they are going to take NOW.”

Demystifying the alphabet soup once and for all demands an enterprise-wide view of what the organisation has reported and reconciled, and real-time insights into the compliance and analytics around it. In particular, as banks seek to enable that view, technologies like artificial intelligence and machine learning are coming to the fore. “Five years ago everyone would have been buying off-the-shelf upgrades, but now they’re looking for new technologies that can help them,” says Rowlands. “Many will see an opportunity to restructure the way they do this, as cloud-enabled technologies put them in a better position to move with regulatory decrees. The whole technology and regulatory environment is shaking things up, and the next two to three years in this space will be very interesting.”

In addition to regulatory compliance, banks have an opportunity to put in place technologies that bring wider benefits to the business. “Having a global hub for compliance makes enterprise data available in one format and in one location, and that means you can start to apply other technologies to derive insights on the state of the business itself,” says Arun Karur, vice president at Sapient Global Markets. “At one end of the spectrum you could perform analytics to create a heat map of the business, identify problem areas and measure performance to improve efficiency. At the other, when you combine this organisational data with publicly disseminated data via market repositories, you create market intelligence showing how the business is positioned compared to its peers. Banks can benchmark around that, and we’ve seen several cases where front-office traders are starting to use this information as market intelligence before they start trading.”

As banks that rise to the technology challenge presented by the regulatory environment, many are also embarking on the path to business transformation. “One of the key challenges around regulation right now is strengthening elements of internal technologies to develop compliance,” says Jockle. “For example, stress tests have become an onerous task. I recall the 600,000 hours of annual burden the Fed estimated it would take to fulfill stress test reporting requirements. So the immediate question becomes: how can that process be automated? Achieving that milestone sparks new levels of creativity and becomes a catalyst for a long-term vision of transformation. One thing we’re seeing, especially around FRTB, is that banks are using the regulation as a jumping off point to transform the business for the future.”

“We’re talking about technological revolution. Creating common risk analytic frameworks throughout institutions, unifying front-office trading operations alongside the banking book – all of it is incredibly complex. But the ultimate outcome is more competitive and advanced financial institution, and that’s an extreme positive.”

“There are still arguments in the marketplace around different elements of the regulations and their impact on business”

JIM JOCKLE, NUMERIX

“Five years ago everyone would have been buying off-the-shelf upgrades, but now they’re looking for new technologies that can help them”

TIM ROWLANDS, VECTOR RISK
A complete picture

Regulators are demanding real-time submissions for exposures and trades across the business. As many of these overlap, organisations are calling for a holistic approach to reporting.

Real-time reporting is a three-dimensional challenge for financial organisations. As regulatory scrutiny extends across geographies, touches more business units and processes, and focuses on the accuracy as well as the completeness of data, banks need a strategic infrastructure that can deliver a holistic approach to risk reporting.

“The stability of the organisation’s infrastructure and the scalability of performance will become extremely critical,” says Arun Karur, vice president at Sapient Global Markets. “You cannot look at this as a messaging infrastructure problem, it has to be looked at as a regulatory reporting problem. The infrastructure needs to be designed end-to-end for regulatory compliance, with technologies that are cleanly implemented for regulatory reporting.”

New technologies, such as robotic process automation (RPA), machine learning and artificial intelligence (AI), are becoming critical in meeting those needs. “RPA can automate the compliance process after reporting, whether that’s around reconciliation, report generation or operations,” says Karur. “We’re also seeing machine learning and AI being applied during reporting, to catch any issues ahead in the pipe rather than at the back end. We are including these capabilities in the next version of our Compliance Management Reporting System (CMRS), and we’ve also developed managed services capabilities for compliance as we see an increasing number of firms moving to outsourced operations as well as infrastructure.”

Now is the time for financial firms to act, says Karur. “Measures like the European Market Infrastructure Regulation (EMIR) and MIFID II have driven organisations towards a strategic approach in recent years, but some have been able to manage by connecting together existing point solutions,” he says. “That’s not going to be the case as SFTR, FRTB and others are added to the reporting mix. By the end of 2019 everyone will need to have a strategic solution in place, otherwise the gaps in reporting infrastructure will leave them open to data quality issues, misreporting and regulatory censure.”

“We’re seeing machine learning and AI being applied during reporting, to catch any issues ahead in the pipe”

ARUN KARUR, SAPIENT GLOBAL MARKETS

SHOWCASE: SAPIENT CMRS
Supporting evolving requirements

Leading organisations are using Sapient’s CMRS platform to manage global compliance reporting.

Three of the top five global custodians, a leading UK bank, oil major and numerous self-side institutions use CMRS, a platform developed by Sapient Global Markets. The solution is an integrated global compliance reporting hub that manages and publishes reporting requirements to various regulatory agencies, and offers a single view of compliance across the firm. It can be deployed as a managed service, a client-hosted implementation, or as a client self-service reporting portal.

“We aim to create a broader marketplace where banks can find the vendors, solutions and price points that are right for them”

CRAIG DAVIS, KPMG

Managed services for risk

New technologies are enabling comprehensive cloud-based platforms that give banks economical access to advanced risk and compliance capabilities.

“Traditional approaches to compliance are giving way to more strategic approaches as the growing impact of regulations demands increasing efficiency from banks.”

Tim Rowlands, director of research at Vector Risk, notes a significant change in technology and attitudes that has paved the way for comprehensive risk and compliance services that would not have been possible a few years ago. “Even two years ago, many banks would balk at the thought of moving to the cloud,” says Rowlands. “But now, those same banks are seeing that move as a necessity.”

With a lot of regulatory requirements, there is no value-add for the organisation,” says Craig Davis, head of financial risk management at KPMG. “The calculations required for regulatory reporting are often different to the models the bank uses for pricing and so on. Managing multiple on-premise platforms is costly and cumbersome, but being able to use the cloud as a centralised location to store them all makes a lot of sense because the business can benefit from economies of scale.”

Davis says that Tier 2 and Tier 3 banks will be the first to benefit from the service. “Smaller organisations can’t afford to implement advanced analytics platforms on premise, they don’t have the capabilities in-house to understand what the market is doing, and they don’t have the budget to hire a consultant like KPMG to help them with that,” he says. “We wrap all that together and, though economies of scale provide solutions for those organisations that many wouldn’t be able to achieve on their own.”

As the service evolves, it will develop into a comprehensive virtual marketplace. “We will be onboarding new vendors and solutions to meet other pain points in the future,” says Davis. “As the list grows over time, we aim to create a broader marketplace where banks can find the vendors, solutions and price points that are right for them, to address whatever challenges they face.”

Managed services for risk
An end-to-end technology platform for the risk lifecycle

Microsoft and partner technologies support all stages of the risk lifecycle for financial institutions, says Rupert Nicolay, financial services architect at Microsoft Enterprise Services.

Risk calculations are pivotal at a number of stages in key financial services processes, and financial services organisations share common needs around risk modelling. Risk analysts, quants and traders need to perform ad-hoc risk-related simulation and related analytics to support pricing, deal risk and regulatory compliance. These analysts need appropriate tooling and access to accurate market pricing, policy, and market data along with comprehensive capacity to enable quick interactive data investigations. Increasingly, these analysts are exploring the use of ad-hoc machine learning algorithms for price modelling or to determine market strategy. Models may be developed as purpose-built tools such as those available for market risk modelling. Analysts may also use R, Python or a machine learning modelling tool. Analysts also often need to visualise results data.

For models that must run models repeatedly – for example for financial or regulator reporting – compute capacity is required to rapidly and reliably execute models at an acceptable level of operating cost. Results data is often integrated with other enterprise-wide risk measures for consolidated risk and financial reporting, and may be used to report results in the in the required format and at the required intervals to meet investor and regulatory requirements.

Microsoft and partner technologies support all stages of the risk lifecycle in a bank or insurer.

Azure technologies provide a range of options for managing both the internal and external data used in risk calculations as well as a secure repository for both source data and risk calculation results.

Quants needs are supported at a code level with technologies like R on-premise (which can burst to the cloud for greater compute capacity), and at higher levels with a range of software-as-a-service or on-premise tools that support sophisticated modelling including the requirements implied by FRTB and IFRS17.

For ongoing model execution, the Azure platform supports a number of popular high-performance computing technologies for risk calculations, some of which provide sophisticated auto-scaling capabilities on Azure. Azure’s machine learning workbench with support for Jupyter notebooks and R and Python code allows data scientists and analysts to design and test models with ease.

Notes:
1. Example risk application solutions include Murex, Vector Risk, FinCad etc.
2. Example grid-application solutions include TIBCO Gridserver, IBM Symphony etc.
3. Example solutions include Sapient CMRS and KPMG risk-as-a-service.
Microsoft is using Azure and AI to transform business-critical processes

Moving its financial forecasting processes to Azure yielded an opportunity for the Microsoft Finance group to gain powerful predictive analytic capabilities while making their work more secure. Microsoft IT worked with Microsoft Treasury data scientists to design and build a secure, automated forecasting solution using Microsoft AI Platform.

“Customers are taking notice and are actively looking to deploy AI to drive advanced insights as well as operational efficiencies”

By melding AI Platform powers with machine learning and Microsoft Power BI, the team created a solution that provides accurate and automated forecasts as frequently as the business needs and create insightful visuals with Power BI. Microsoft’s transformation doesn’t stop there. Redesigning its revenue reporting system for cloud infrastructure offerings help customers develop and deploy services, tools and infrastructure making AI development easier. And our Azure cloud platform offers services, tools and infrastructure making AI development easier for developers and organisations of any size.

We also have technologies available to simplify the development process and make it easier for developers and organisations of any size to build and deploy their own AI-powered products. The Microsoft AI Platform offers a growing collection of coding and management tools to make the AI development process easier. And our Azure cloud infrastructure offerings help customers develop and deploy AI algorithms, and store their data and derive insights from it.

As we continue to advance AI to handle ever-more complex tasks, we are also working towards a common framework of principles to guide researchers and developers as they deliver a new generation of AI-enabled systems and capabilities.

Heavily regulated industries like financial services are ideally positioned to benefit from AI and cloud technologies. Microsoft’s own transformation illustrates the potential for AI to transform businesses – and how these tools are becoming essential in negotiaing a demanding, complex and changing regulatory environment. Combined with the cloud, AI is already enabling efficient, intelligent and proactive risk management and compliance for leading organisations – and creating new possibilities for the agile, customer-centric businesses of tomorrow.

Showcase: Microsoft

AI enables transformation at Microsoft

A big data tax solution for Finance with Azure enables Microsoft to report its revenue in every country it operates in, complying with changing requirements.

Microsoft has also migrated its business-critical Treasury apps to Microsoft Azure. This has meant lower costs and increased agility for the Treasury Team as well as making it easier for them to manage the funds the company uses to trade stocks and identify investment opportunities.

Finally, using predictive analytics enabled by machine learning and a variety of inputs including AI Platform, has enabled Microsoft to analyse past sales and predict future ones, improving its sales processes and forecasting.

Customers are taking notice and are actively looking to deploy AI to drive advanced insights as well as operational efficiencies – risk, anti-money laundering, fraud detection and pattern recognition for trading and investment management are some of the use cases in which customers are looking to benefit, with the power of AI.

Showcase: Microsoft

AI enables transformation at Microsoft

Moving its financial forecasting processes to Azure yielded an opportunity for the Microsoft Finance group to gain powerful predictive analytic capabilities while making their work more secure. Microsoft IT worked with Microsoft Treasury data scientists to design and build a secure, automated forecasting solution using Microsoft AI Platform.

“Customers are taking notice and are actively looking to deploy AI to drive advanced insights as well as operational efficiencies”

By melding AI Platform powers with machine learning and Microsoft Power BI, the team created a solution that provides accurate and automated forecasts as frequently as the business needs and create insightful visuals with Power BI. Microsoft’s transformation doesn’t stop there. Redesigning its revenue reporting system for cloud infrastructure offerings help customers develop and deploy services, tools and infrastructure making AI development easier. And our Azure cloud platform offers services, tools and infrastructure making AI development easier for developers and organisations of any size.

We also have technologies available to simplify the development process and make it easier for developers and organisations of any size to build and deploy their own AI-powered products. The Microsoft AI Platform offers a growing collection of coding and management tools to make the AI development process easier. And our Azure cloud infrastructure offerings help customers develop and deploy AI algorithms, and store their data and derive insights from it.

As we continue to advance AI to handle ever-more complex tasks, we are also working towards a common framework of principles to guide researchers and developers as they deliver a new generation of AI-enabled systems and capabilities.

Heavily regulated industries like financial services are ideally positioned to benefit from AI and cloud technologies. Microsoft’s own transformation illustrates the potential for AI to transform businesses – and how these tools are becoming essential in negotiating a demanding, complex and changing regulatory environment. Combined with the cloud, AI is already enabling efficient, intelligent and proactive risk management and compliance for leading organisations – and creating new possibilities for the agile, customer-centric businesses of tomorrow.

Showcase: Microsoft

AI enables transformation at Microsoft

Moving its financial forecasting processes to Azure yielded an opportunity for the Microsoft Finance group to gain powerful predictive analytic capabilities while making their work more secure. Microsoft IT worked with Microsoft Treasury data scientists to design and build a secure, automated forecasting solution using Microsoft AI Platform.

“Customers are taking notice and are actively looking to deploy AI to drive advanced insights as well as operational efficiencies”

By melding AI Platform powers with machine learning and Microsoft Power BI, the team created a solution that provides accurate and automated forecasts as frequently as the business needs and create insightful visuals with Power BI. Microsoft’s transformation doesn’t stop there. Redesigning its revenue reporting system for cloud infrastructure offerings help customers develop and deploy services, tools and infrastructure making AI development easier. And our Azure cloud platform offers services, tools and infrastructure making AI development easier for developers and organisations of any size.

We also have technologies available to simplify the development process and make it easier for developers and organisations of any size to build and deploy their own AI-powered products. The Microsoft AI Platform offers a growing collection of coding and management tools to make the AI development process easier. And our Azure cloud infrastructure offerings help customers develop and deploy AI algorithms, and store their data and derive insights from it.

As we continue to advance AI to handle ever-more complex tasks, we are also working towards a common framework of principles to guide researchers and developers as they deliver a new generation of AI-enabled systems and capabilities.

Heavily regulated industries like financial services are ideally positioned to benefit from AI and cloud technologies. Microsoft’s own transformation illustrates the potential for AI to transform businesses – and how these tools are becoming essential in negotiating a demanding, complex and changing regulatory environment. Combined with the cloud, AI is already enabling efficient, intelligent and proactive risk management and compliance for leading organisations – and creating new possibilities for the agile, customer-centric businesses of tomorrow.
Risk management of the future: digital, lean and ecosystem focused

Significant regulatory changes, emerging risks, cost pressures and digital enablement are driving fundamental changes to capital markets business models. EY’s Sonja Koerner, Shaun Abueita and Imran Mansoor discuss how this shapes future requirements in risk management.

Capital markets has always been a data-driven business. From processing broadsheets of stock prices to knowing which trading venue offers the fastest execution time to the nearest millisecond, banks have continually sought quicker access to more granular data as a competitive advantage.

In recent years, technologies such as big data, automation, artificial intelligence (AI) and machine learning, as well as cloud, have precipitated a paradigm shift in data usage across capital markets. Trading functions are using big data and AI to identify and exploit arbitrage opportunities; through machine learning and automation, trading systems are becoming faster and smarter; and front offices are investing in data visualisation and augmented reality tools to run their businesses better and more effectively, and to analyse and explain profit and loss (P&L) analytics via multiple digital channels.

Risk technology initiatives have typically sought to solve specific point problems in isolation and in a piecemeal way. Moreover, a patchwork of legacy systems, poor data quality, convoluted, partial manual processes and organisational interdependencies has often made strategic technology change expensive and fraught with delivery risks.

Against this background, digitalisation remains a significant and fundamental challenge for risk management functions. And yet, the business benefits of digitalisation of risk management cannot be overstated.

Digitally enabled front-office trading activities are rapidly evolving and generating new and dynamic risks that must be managed, ideally in real time. In addition, regulations such as the Basel Committee on Banking Supervisions 239 (BCBS) and the Fundamental Review of the Trading Book (FRTB) have demonstrated the scale of modernisation risk management cannot be overstated.

Digital risk management

The hallmark of a digital risk management function will be the ease with which it can process data. It will have a data-led architecture with the ability to work with truly vast amounts of data – both structured and unstructured. Powered by highly elastic computer infrastructure, processing of risk data will be lean, automated and seamlessly integrated with other functions, and overlaid with AI and machine learning capabilities. Users will have the ability to investigate and interact with data through smart visualisation tools, and powerful near real-time analytics via multiple digital channels.

Ecosystem-focused risk management

Financial services is going through a phenomenal transition, and much of this is happening outside the four walls of banks. Fintechs don’t have archaic legacy systems and data architectures to deal with. They are able to deploy new disruptive technologies and design intelligent and novel solutions much faster than their larger and older peers. Financial crime and surveillance are two areas that have been transformed by fintechs. At the same time, cost pressures, and technology and market evolution, are making industry utilities, managed operations and ‘as a service’ offerings more viable and attractive. The risk function of the future will be characterised by an operating model that leverages external technologies and service providers to source or utilise activities where feasible, reduce cost and improve operational efficiency.

Lean risk management

As risk functions become more digitised and adopt an ecosystem mindset, the operating model and talent paradigm will need to shift. Processes will be more streamlined, automated and seamlessly integrated with other parts of the organisation. There will no longer be large offshore teams focused on data remediation and reconciliation. With re-engineered processes (including externalisation) and a data-led architecture, risk functions will be leaner in terms of headcount, and talent mix will be skewed toward high-value analytics activities. Spend on technology will be significantly lower with adoption of cloud platforms. The risk function of the future will be characterised by leaner headcount, re-engineered processes and significantly reduced spend on technology.

So what will the digitalisation journey look like? This transformational journey does have a higher initial cost; however, there are opportunities to recover the digitalisation investment over time through savings elsewhere across the technology and data stacks, and the operating model.

Digitalisation will allow risk to evolve from an ‘oversight’ to an ‘advisory’ function at the enterprise level. This evolution needs to be phased to avoid past mistakes of large and non-integrated transformation programs.

However, with all of the above in mind, digital, lean and ecosystem focused organisations cannot be adequately implemented without addressing the current deficiencies of the average risk function (data issues, disjointed and patchy technologies, etc.). Rather, a remediation of these issues must be tackled in parallel with the implementation of the three identified components of the risk management of the future. Failing to implement these required changes will be even more costly and may put lagging institutions out of the competition.