

INVENTIVE FINANCE, RISK & COMPLIANCE

Building an end-to-end data-centric operating model for FRC functions



Capgemini  invent

CONTENT SUMMARY

```
def _operation == "MIRROR_X":
    mirror_mod.use_x = False
    mirror_mod.use_y = True
    mirror_mod.use_z = False
elif _operation == "MIRROR_Z":
    mirror_mod.use_x = False
    mirror_mod.use_y = False
    mirror_mod.use_z = True

#selection at the end -add back the deselected mirror
mirror_ob.select= 1
modifier_ob.select=1
bpy.context.scene.objects.active = modifier_ob
print("Selected" + str(modifier_ob)) # modifier ob is the active
#mirror_ob.select = 0
done = bpy.context.selected_objects[0]
bpy.data.objects[done.name].name = 1
```

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IT'S TIME TO ADAPT

As regulation increases and innovation gathers pace, the landscape of finance, risk and compliance is changing. Staying competitive means harnessing data and AI.

Page 8-11

NEW SOLUTIONS FOR FINANCE, RISK AND COMPLIANCE

Our expertise and digital capabilities empower you to drive efficiencies and unlock growth – leveraging your existing data foundry with our AI and data-driven solutions.

PAGE 12-23

MEETING THE NEEDS OF EVERY FUNCTION

Think, create and scale with an end-to-end partner – working with you to prototype, implement, and industrialize new solutions

PAGE 24-27

REALIZING BUSINESS BENEFITS FROM DATA & AI

With our multidisciplinary knowledge and capabilities we offer you a unique hybrid approach

INVENTIVE FINANCE, RISK & COMPLIANCE

In a world of increased transparency and a need for greater consumer protection, the regulatory burden and need to comply is growing.

Also, Finance, Risk and Compliance (FRC) functions within banks need to move fast to stay compliant at minimum cost, but ideally they also need to help their entire organizations compete through digital innovation. The key is for the FRC functions to add value by leveraging data solutions embedding regulatory competences.

The essential enabler for solving these challenges is building or extending data foundries to create a new management framework. By using this framework, organizations can become service-centric and bring more efficiency to their processes, as well as guaranteeing continued fulfillment of FRC regulations. Benefits include significant risk reduction, a 5–15% cost reduction, and increased speed.

To transform their business functions, banks need to be inventive. We identified five areas in which financial institutions have the opportunity to level-up their business and bring to life what's next:

FRC DATA PLATFORM

CREDIT RISK

OPERATIONAL RISK

COMPLIANCE

FINANCE

Our inventive approach empowers banks to tackle the challenges of transformation. We welcome you to read on and find out more.



DON'T WASTE THE POTENTIAL OF YOUR FRC DATA PLATFORM

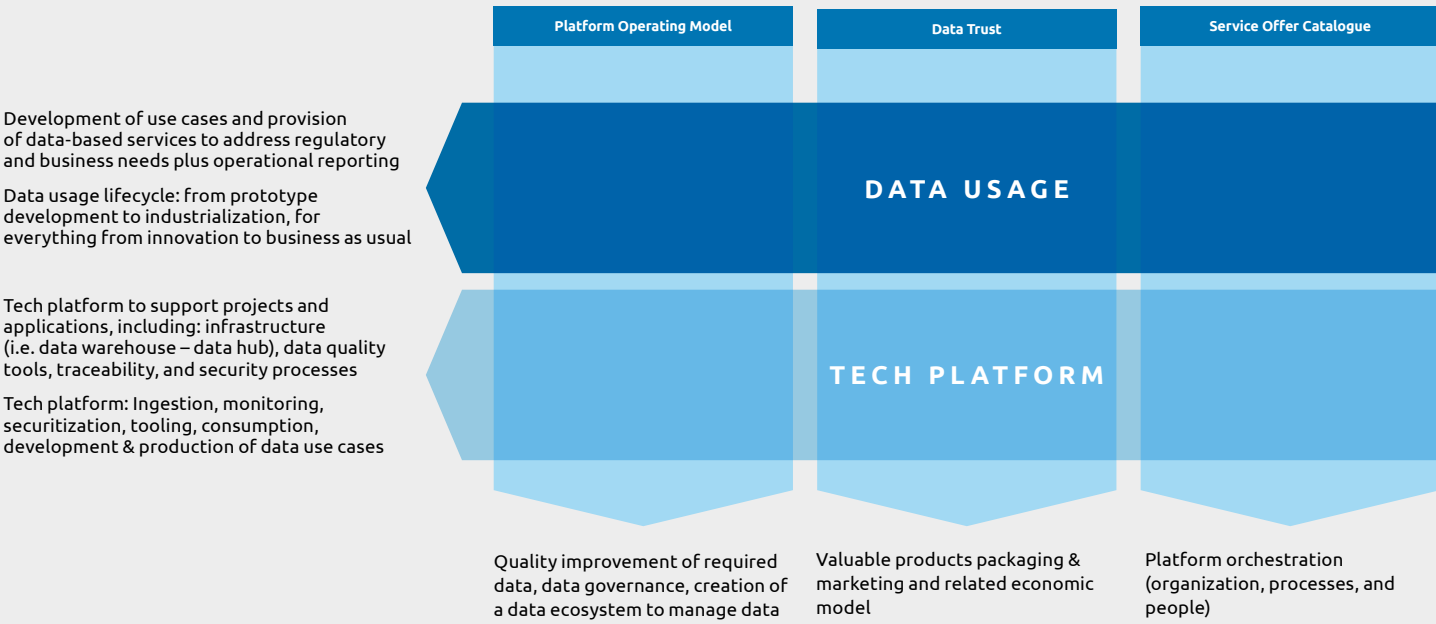
In recent years, banks have taken the first steps towards establishing data foundries for FRC functions, with organizations typically investing about 5–10%* of their budget in this area. These early initiatives were about better managing data inside and outside the FRC organization, mainly to address regulatory programs such as BCBS 239. However, the initiatives were also about using data differently and creating innovative solutions to support regulations effectively and efficiently.

These initiatives have paid off in terms of helping banks comply with regulations, but first steps in data management and especially data usage have proved expensive to implement. Most of the innovative use cases created have ended up as proofs of concept, and have never been industrialized to form part of the business-as-usual processes.

Banks now have the opportunity to increase the return on their investments by strengthening their data foundries. The data platform must become a data-centric asset that enables the development of various data prototypes (reporting, business intelligence, data science) in an accelerated, secure way, making it possible to take each use case all the way from prototype to live solution.

- The construction of the improved data platform should be coordinated by the organization's IT management. It will rely on five pillars:**
- Technological platform and operations (e.g. cloud or on-premise services) enabling data sourcing, storage, quarantine zone (data prep), development environment (data science), and user interface
 - Data usage resources (e.g. data scientists, developers), services (e.g. Dataiku, Google Cloud Datalab, Microsoft Azure), and consumption monitoring, all of which will facilitate the delivery of data use cases
 - Data trust governance, process, and tools that enable security and compliance all along the value chain (e.g. identity access management (IAM), auditability)
 - An economic model for accessing data platform services that make it either neutral or profitable in terms of costs
 - A data platform operating model to orchestrate end-to-end delivery

A DATA PLATFORM TO ACHIEVE A LEVEL OF AUTONOMY ALLOWING USE OF DATA THROUGH INDUSTRIALIZED USE CASES:

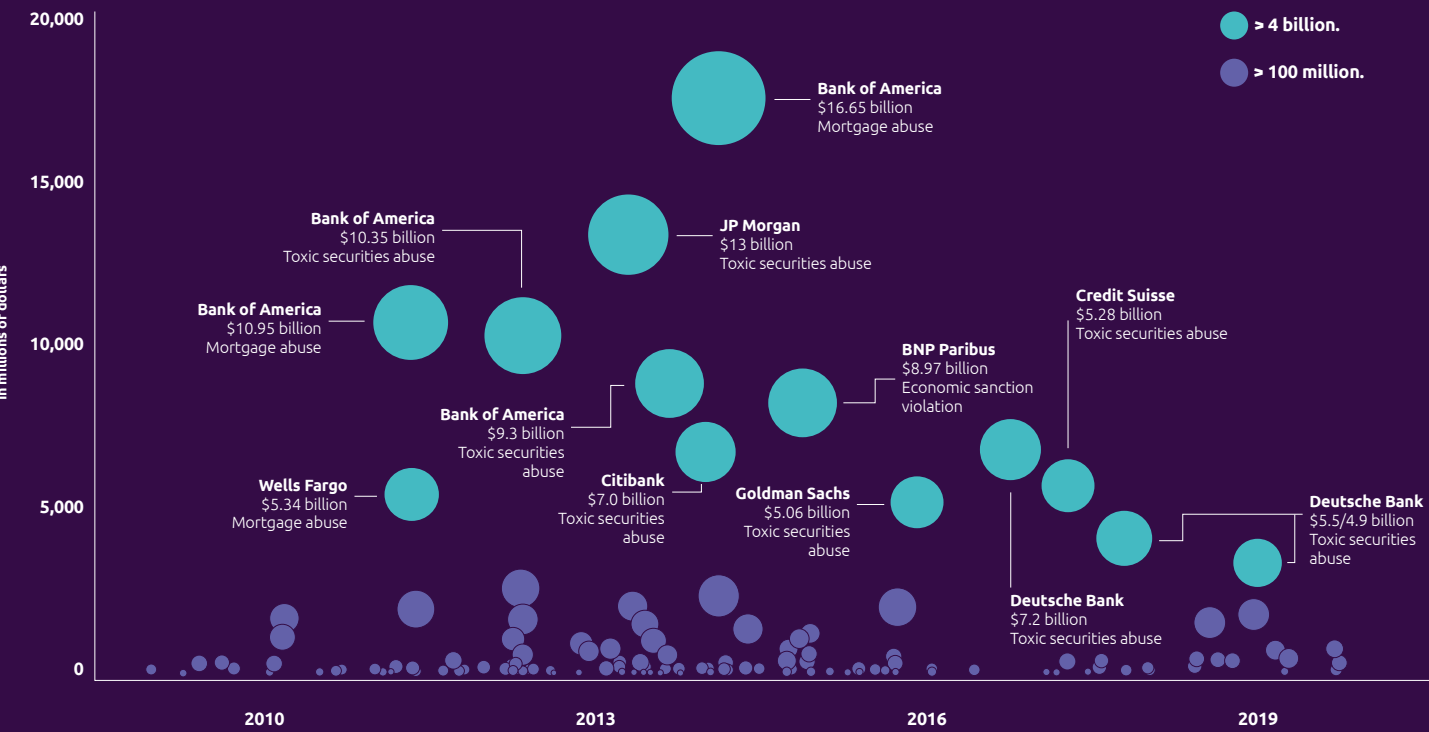


Non-compliant behavior results in substantial fines

Of course, nobody can afford to take their eyes off the goal of finance, risk, and regulatory compliance, because the regulations are constantly changing, and because non-compliance can be extremely expensive. Just in the past couple of years, we've seen major financial institutions face regulatory fines over issues like money laundering – fines large enough to wipe out a bank's project budget for the entire year.

So there can be no question of cutting-back on compliance. In fact, given today's demand for increased transparency and consumer protection, the regulatory burden is growing and the need to comply is becoming more pressing. However, costs are also critical.

BANK PENALTIES OVER \$100 MILLION SINCE 2009*



*Source: Violation Tracker (2019), URL: <http://bit.ly/violationtracker2019>

REDUCE COST, IMPROVE EFFECTIVENESS AND COMPLIANCE

Banks can reconcile these conflicting pressures – the need for thorough compliance with evolving regulations on the one hand, and cost savings on the other. It’s a matter of using their FRC data platform and associated solutions and assets (such as data lakes) in new ways:

- Cost control:**
To reduce the costs of FRC processes while ensuring the highest levels of regulatory compliance to avoid penalties.
- Efficiency:**
To embed new or enhanced regulations and then maintain ongoing compliance as efficiently and effectively as possible.
- Innovation:**
To support end-to-end-business processes and launch new services that will add value for the organization as a whole.



Significant cost reductions can be achieved by, for example, enhancing data solutions based on your existing foundry with AI to facilitate greater automation. And that same approach will help you leverage the potential of your existing tools and find completely new ways to make FRC – and the whole organization – more efficient and effective.

BENCHMARK STUDY SHOWS: COST REDUCTION IS KEY

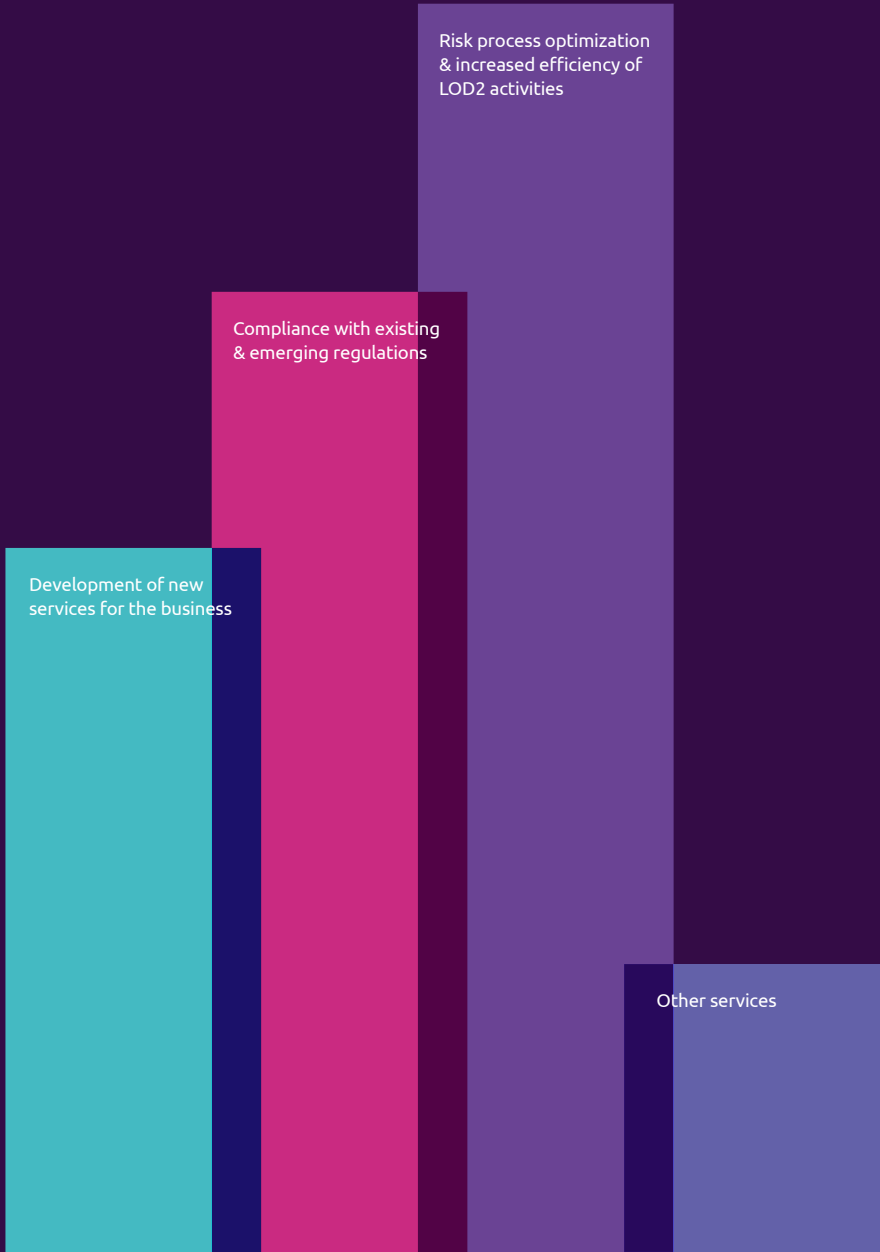
Capgemini Invent performed a benchmark study aiming to assess the maturity of banks’ risk functions and understand their challenges regarding data and AI adoption. This study found that banks are extremely keen to develop their data and AI capabilities further and their ambition is very much focused on cost reduction.

These are the most relevant conclusions of the benchmark study.

1. Strategic challenges through data: for ~40% of the banks’ risk functions, operational efficiency is the top priority. (See chart)
2. For 9 out of 11 of them, data is a major lever to reach operational efficiencies (support decisions, analyze complex models, automate and replace some controls)
N.B switch from a 70/30 model between information production and analyses to a 30/70 by 2022
3. 8 out of 11 banks are developing/have developed a data platform within risk department
4. Today, 9 out of 11 of risk functions dedicated investments to support their data ambition (from 5% to 10% of their budget)

! The main obstacle identified is the complexity of the articulation with IT legacy

1. Strategic challenges




CHALLENGES IN EXPLOITING THE DATA PLATFORM

Why aren't FRC departments already exploiting these new uses for their data platforms – uses such as reducing their costs, taking regulatory compliance to the next level, and offering new services to the rest of the business?


A few challenges need to be overcome when you first decide to try this.
For example, you need to:

- 1


Focus on needs:
Work out which of your needs can benefit most from innovation then perhaps prioritize just one or two initially.


- 2


Know how to organize the process:
Orchestrate and tune activities such as ideation to ensure the business gets what it really wants.


- 3

Assess feasibility:
Work out what you can do with the tools you already have in your data platform; if complementary tools are needed, know which ones to pick. It's often better to start small, e.g. within your own function, rather than try to satisfy the whole organization's needs at once.


- 4

Be confident you can scale:
Having developed a good pilot, you need to be able to make sure you can industrialize it across other parts of the organization and integrate it into the overall IT landscape without too much effort.



THE SOLUTION: AN INDIVIDUALIZED APPROACH WITH CATALYSTS FOR CREATIVITY AND INNOVATION

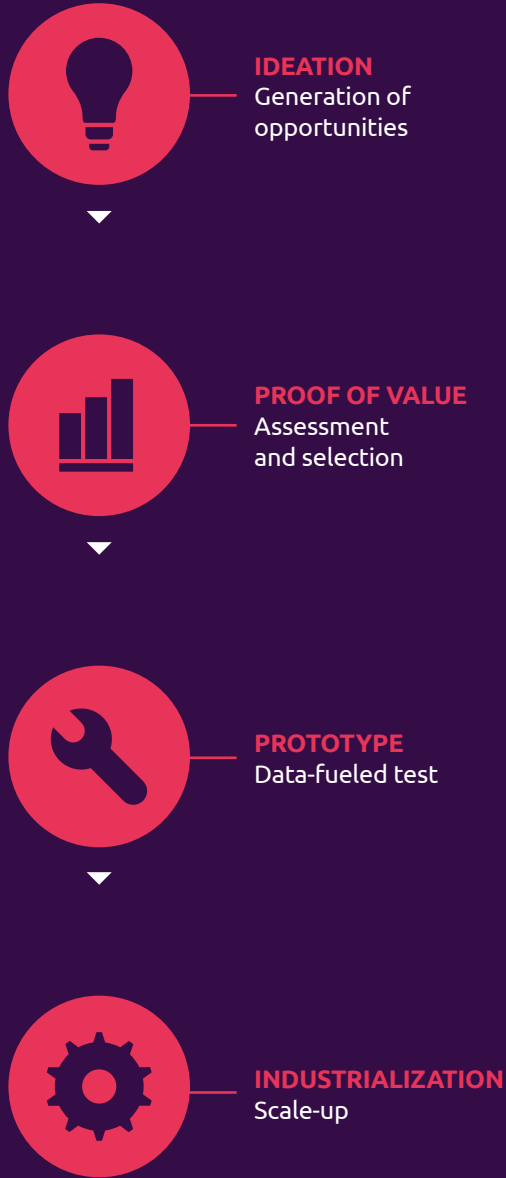
What's needed is an end-to-end approach that helps you to ideate the concepts that make sense for your organization, then prototype extensively, scale, and implement to deliver value – all at acceptable cost and with minimal risk.

Clearly there can't be any off-the-shelf answers, as every company's FRC department, and indeed every function within an FRC department, needs its own tailored solutions. What you can do, however, is look for pre-developed catalysts for your creativity, such as prototypes showing what's possible and what's already been done elsewhere.

During implementation, there should be a double aim:

1. **Optimize FRC functions so they become more efficient.** Reduce the risk and cost associated with control functions by creating a data platform together with data management capabilities.
2. **Develop FRC functions to the point where they can provide new services.** Enhance FRC functions through innovation to develop AI & data solutions industrialized in the data platform.

OUR END-TO-END PROCESS:



MEETING THE NEEDS OF EVERY FUNCTION

Each function within an FRC department needs its own inventive approach, making optimum use of data science and AI, and spanning everything from ideation to industrialization. These inventive approaches need to get the organization compliant quickly while improving efficiency and effectiveness, so as to reduce risks and costs and accelerate processes.

With **Inventive Finance Risk & Compliance** we tackle these challenges with proven concepts, methods and prototypes to level-up the performance of financial institutions as per the following inventive approaches:

FRC DATA PLATFORM

Designing data solutions to unlock the value of data through efficient data strategies by making data not only available but also manageable

CREDIT RISK

Transforming the way the credit process is performed through AI use cases that deliver cost reduction and improved risk management, for both the business and the risk function

OPERATIONAL RISK

Improving the use of operational risk data to understand, detect and predict operational risk events to become auditable and transparent

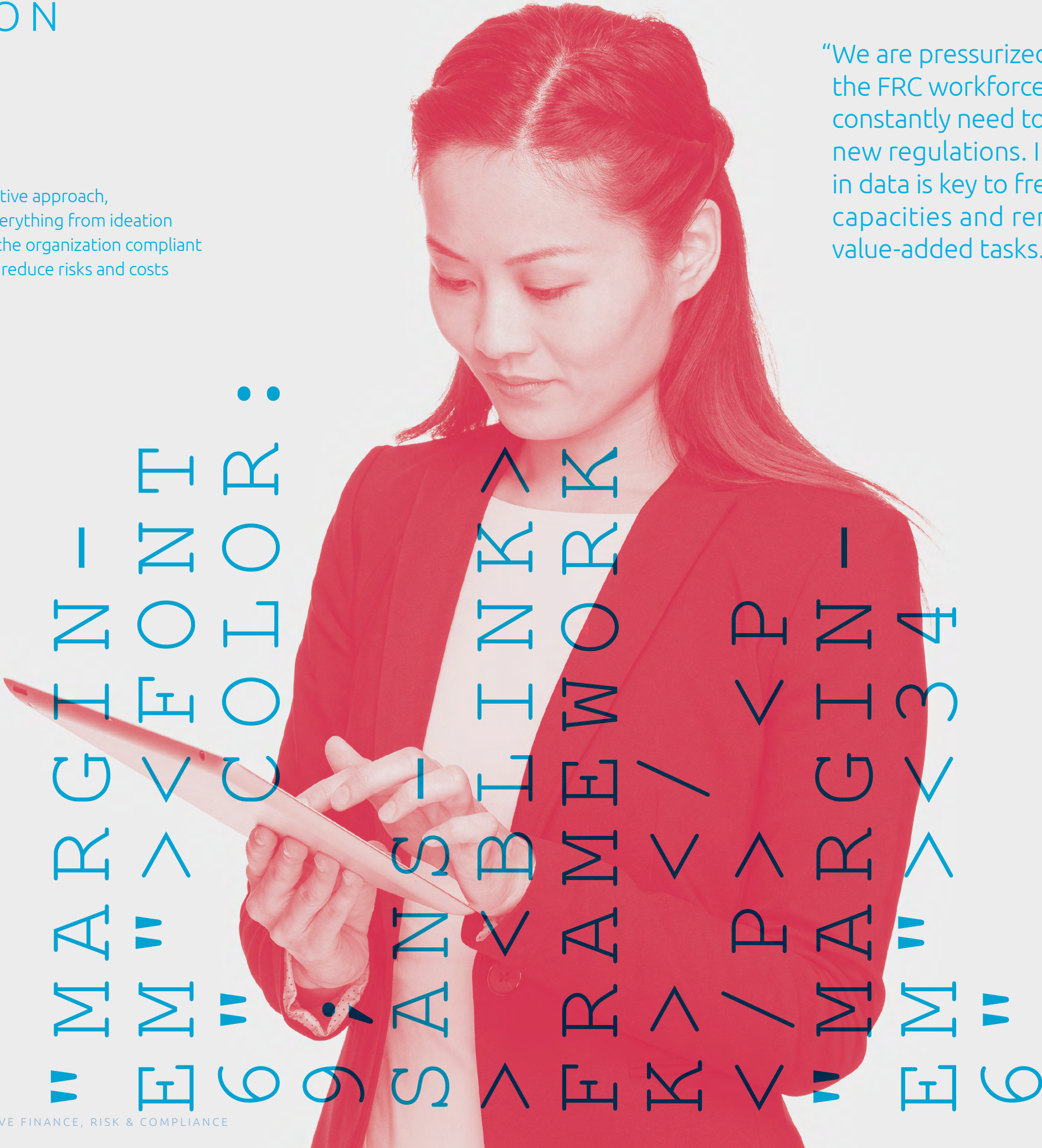
COMPLIANCE

Enhancing the compliance function's ability to perform its key processes and monitor its key KPIs via AI use cases and data visualization

FINANCE

Enhancing the digital transformation and the efficiency of the Finance department by optimizing the use of Finance data combined with AI technologies

"We are pressurized to reduce the FRC workforce, but we constantly need to invest in new regulations. Investment in data is key to free some capacities and remove low value-added tasks."



FRC DATA PLATFORM

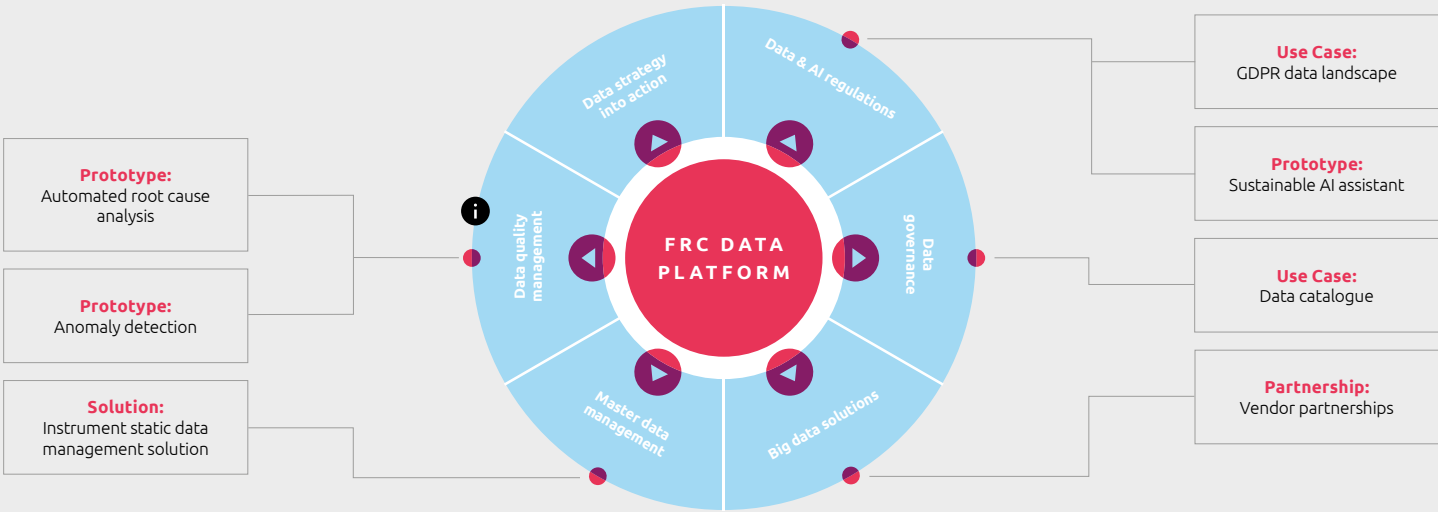
Data Management functions need solutions that leverage group-wide data capabilities such as data strategy, data governance, data catalogues, data quality management, master data management, and data platforms. Such solutions will lay the foundation for most of the business use cases that Data Management will encounter.

The challenge for FRC Data Departments

If you can't trust your data, you can't trust your decisions, your strategy, or your compliance. Data really is an asset these days, and no one contradicts this idea, but not everyone acts accordingly. Hence, effective data management can be a real business advantage. The reason so many organizations fail to treat data as an asset is that data, its processes, and its interconnections are complex and difficult to handle.

When data creation, data processing, and data usage is spread around the whole organization and beyond, a collaborative approach with clear governance is inevitable. However, a step-by-step approach is still necessary: Starting big won't be successful. The common advice "Think big, design for industrialization, start small, and scale fast" is relevant here.

A range of options we offer to solve the challenge



i One option in detail: Data quality management

When a financial institution is transforming to become data-driven, data quality problems can be a significant obstacle. Traditional data quality rules tackle the problem only superficially: reactively and at an individual field level. What is needed is proactive and sustainable remediation. Machine learning and AI methods offer new possibilities for identifying, analyzing, and solving data quality issues – but they themselves depend on data of sufficient quality.

Analytical data quality management provides analytical methods applicable to a variety of business problems related to data quality issues. It employs information about the data to evaluate multiple quality dimensions (e.g. consistency, accuracy, completeness, and validity) and tackle both known and unknown data quality incidents. Algorithms detect patterns in data quality issues, enabling sustainable, proactive remediation.

CREDIT RISK

Credit Risk functions need to transform their processes using AI in order to achieve both cost reduction and risk management improvement, for both the business and the risk function itself.

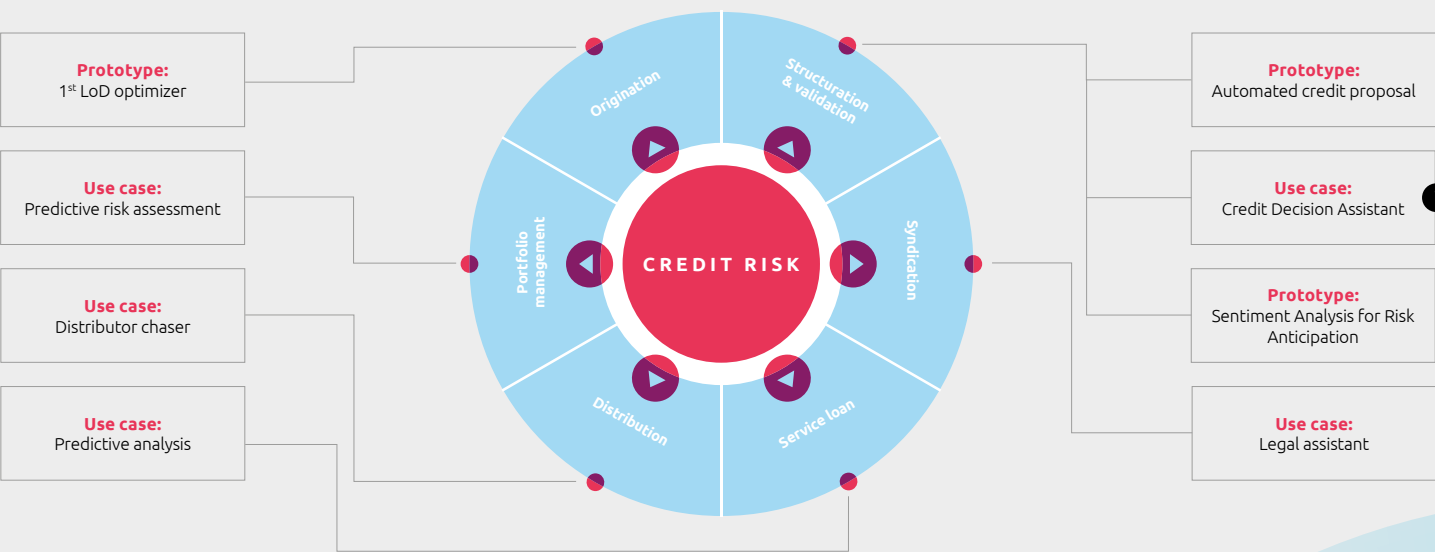


The challenge for Credit Risk Departments

The credit process has become a complex set of activities, notably because of the volumes and criticality of the data that must be gathered and used along the chain. Meanwhile, Individuals, Retail and Corporate clients now expect more and more transparency, personalization and rapidity on their credit requests. To end with, pressure from the Regulator has never been higher and costs reduction stakes are only increasing.

Credit Risk professionals know that digitization of credit processes is a must to withstand Fintech pressures and safeguard future P&L. As part of the front-to-back digital transformation of corporate banking, the whole Corporate Credit Process (CCP) needs to be reinvented. Maximizing the value from data throughout end-to-end data usage approach enables not only to meet these challenges, but also open up new options for efficiency and performance.

A range of options we offer to solve the challenge



i One option in detail: Credit decision assistant

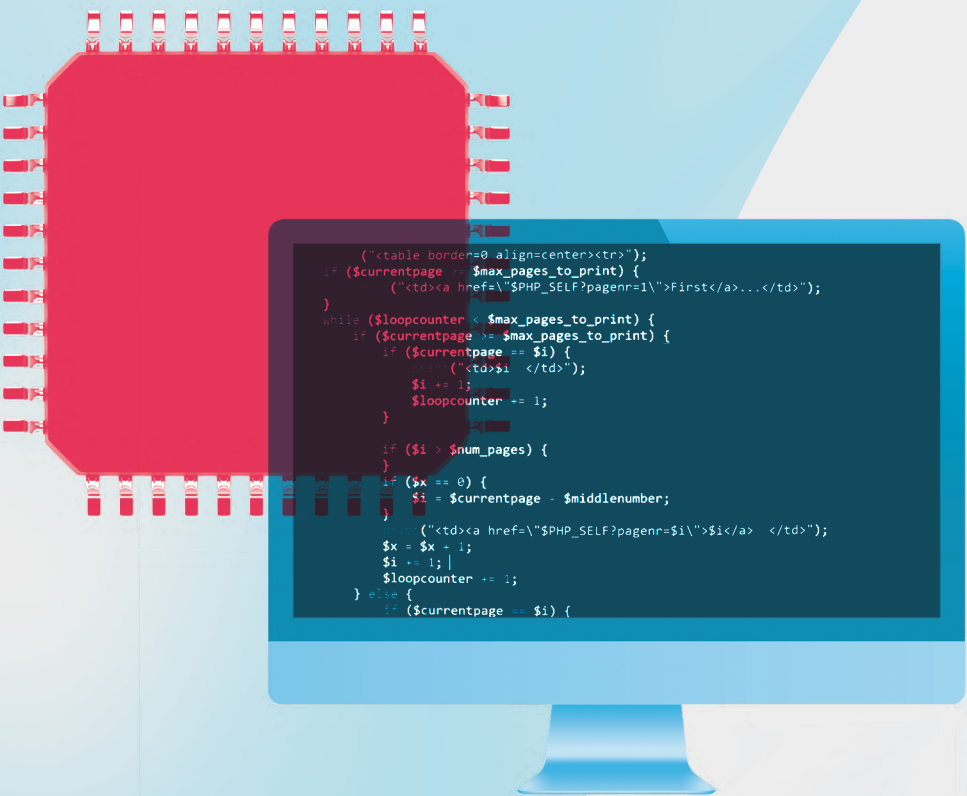
This product acts as an advanced assistant, that provides the risk officer with a decision proposition on any credit request. By using advanced machine learning algorithms, the assistant will mimic the thought process of a Risk officer on all variables of a given request to generate a Go/No Go proposition on the deal.

The first, immediate output of setting up this improvement is to strongly decrease the time needed to take a decision while improving the quality of the decisions. What is more, it also contributes to homogenizing the credit analysis and decision policies across geographies.

All in all, more efficiency, thorough and clear analysis, and overall improvement of risk officers performance.

OPERATIONAL RISK

Operational risk functions need to improve the way they use operational risk data to understand, detect, and predict operational risk events. Across the globe, operational risk-related losses are increasing at alarming rates. Between 2011 and 2017 alone, the total amount of damage caused by inadequate operational risk management was more than €500 bn, and much of that damage resulted from inadequate or failed internal processes or from people, systems, or external events.



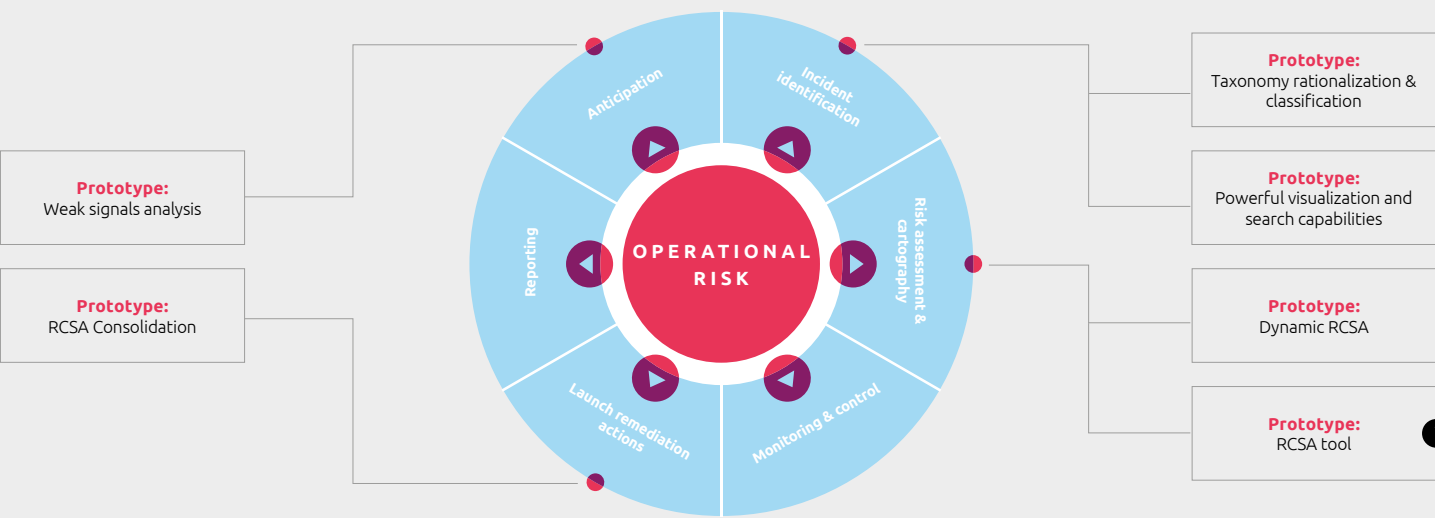
The challenge for Operational Risk Departments

Data breaches, cyberattacks, and system failures, as well as external and internal fraud, represent the top challenges organizations and especially financial institutions are currently facing. Businesses are becoming victims of ransomware attacks at the alarming rate of one every 14 seconds.

By far the most critical success factors for transformation towards an effective operational risk management approach

are the right organizational culture and an adequate governance structure with “tone from the top”. In addition, a holistic and comprehensive view of all risks is important. The first step is usually to take a critical review of the existing business model, then determine risk capacity and appetite.

A range of options we offer to solve the challenge



One option in detail: Risk control self-assessment (RCSA)

Banks must find ways to qualify and anticipate operational risks better, both for the benefit of their own businesses and to satisfy authorities like the European Central Bank (ECB). It's therefore necessary to improve the way external operational risk databases are used for risk control self-assessment (RCSA) and scenario quantification. The required external data is available from a consortium of international banks, but it's currently hard to exploit because the data is not aligned with an individual bank's internal taxonomy.

This AI solution provides automated external data collection and harmonization with internally used taxonomies to enable the bank to act in a more risk-oriented way and anticipate risk better. External data is cleaned up to delete redundant incidents and generate a unique data model.

Among the many challenges that financial institutions face in achieving regulatory compliance, one of the most important is compliance functions' need to improve the way they perform key processes such as Know Your Customer (KYC). To do so, they must make full use of a range of technologies – for example, crawling, artificial intelligence (AI), robotic process automation (RPA), optical character recognition (OCR), intelligent character recognition (ICR) – as well as implementing efficient data quality management.

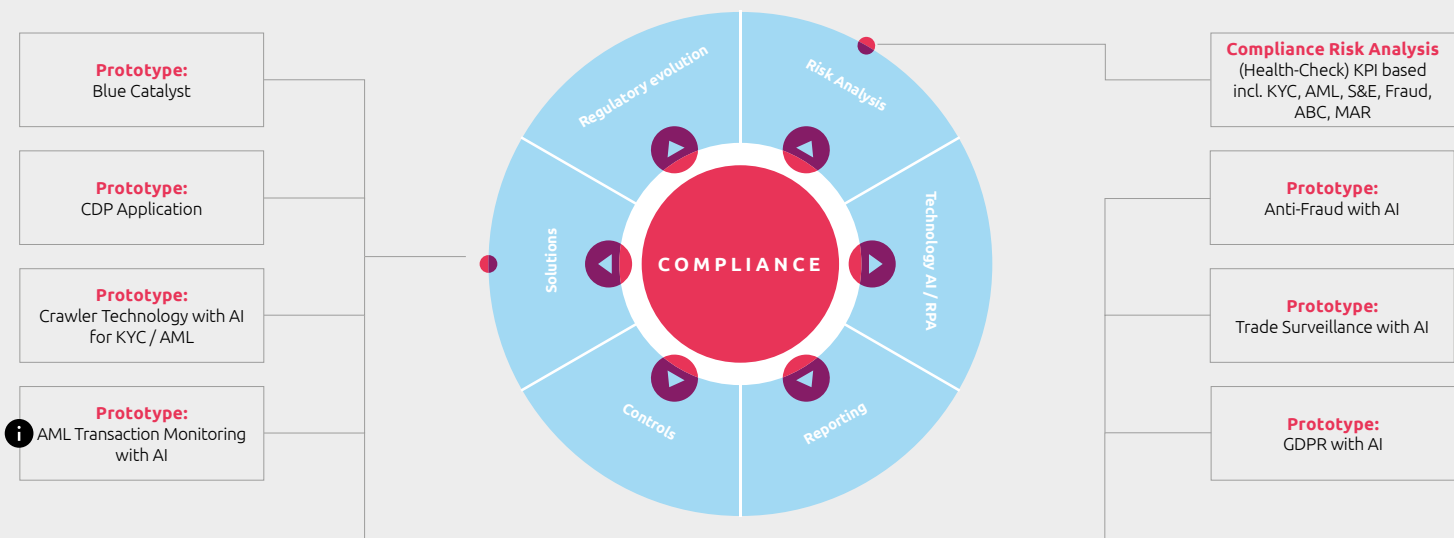


The challenge for Compliance Departments

Steadily increasing compliance requirements cannot all be addressed manually. Efficiently obtaining, managing, and utilizing due diligence data collected from customers results in lower compliance costs, improved risk management, and better decision making. Reducing friction during onboarding results in a better onboarding experience for the institutions' prospective clients.

While technologies like AI and Machine Learning (ML) are obviously potential accelerators, they challenge financial institutions in terms of aligning their system architecture and operating models.

A range of options we offer to solve the challenge



One option in detail: Anti Money Laundering Transaction Monitoring with AI

The finance industry is faced with increased regulatory pressure (e.g. AMLD4 & AMLD5, MAR, CSMAD, MiFID). Inadequate risk coverage can lead to legal, financial, and reputational losses.

Currently the compliance function is characterized by:

- Significant manual effort in identifying relevant customer data
- Manual document analysis and pattern recognition
- Manual customer scoring

Compliance functions need to improve the performance of compliance tools and simultaneously drive out costs by reducing the manual activity and investigation effort involved in their processes.

To do this, they need fast ways to:

1. Collect available public and private data
2. Identify compliance-relevant signals from the data they have available with a minimum of false positives
3. Automatically score clients

Based on AI methods, the AML Web Crawler enables compliance to score individuals and companies by screening them against various APIs and all common market intelligence lists, while simultaneously using search engines to identify compliance-relevant signals. This helps to ensure the industry's ever-increasing AML requirements are fulfilled.

Finance functions need to enhance efficiency and achieve digital transformation by optimizing usage of finance data combined with AI technologies.

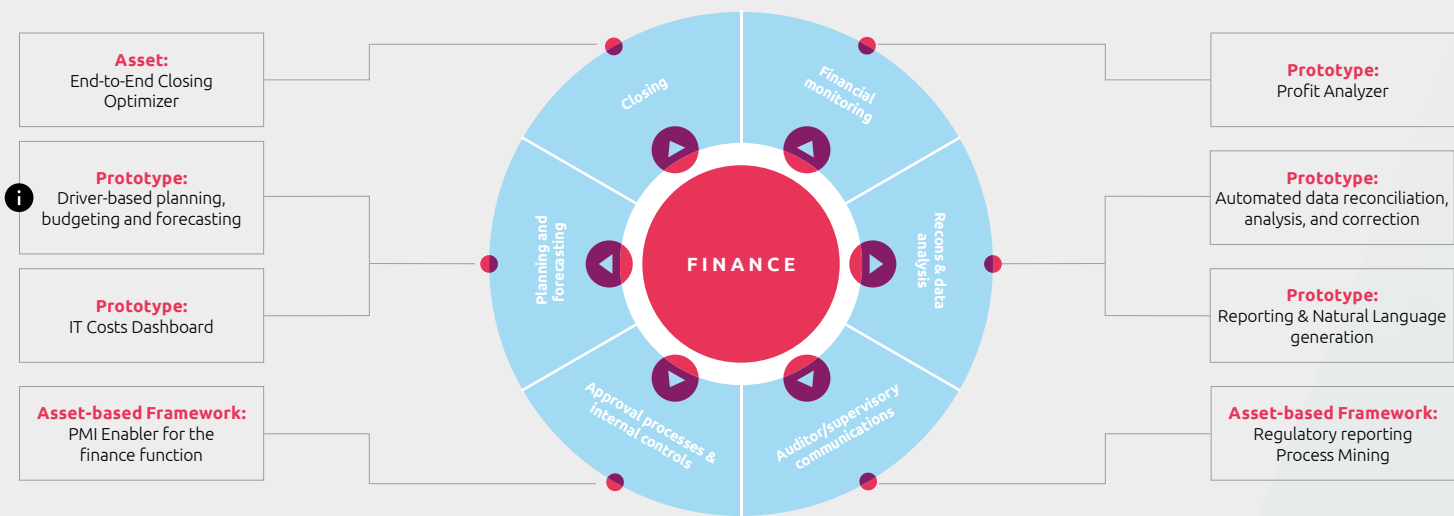


The challenge for Finance Departments

Banks’ profits depend heavily on how well they understand their results and the reasons for them. This understanding determines their ability to manage and steer the business, and to further decrease costs and increase profitability. However, it is often challenging for users who are monitoring results to be sure that they are using the best approach and the right technology to make far-reaching decisions.

What is needed are solutions that help the finance function to better assess the current situation along the finance value chain – from financial monitoring to reconciliation. The software tools used should provide the ability to deep-dive into the underlying information, and then suggest suitable actions that the user can pursue.

A range of options we offer to solve the challenge



One option in detail: Driver-based planning, budgeting, and forecasting

Universal banks perform their assumption-based business planning top-down, bottom-up, or both to estimate their revenues, costs, risks, and returns. These approaches are often over-simplistic and do not match the complexity of today’s banking business.

The usual control methods come with two main weak points:

1. They are time-consuming and resource-intensive increasing non-productive work
2. The outputs are not strongly representative for future developments, given that most underlying assumptions are set by looking in the rearview mirror

By leveraging the increasing number of available data sources, we help banks to reduce costs, increase business opportunities, and gain insights on what drivers are truly shifting their business by:

- Identifying and detailing the logic (causality) and quantitative impact (statistical) of drivers, and mapping them to key metrics (e.g. correlation of unemployment, GDP, etc., with portfolio volumes)
- Identifying the required data sources and selecting solutions and technology partners to best interpret what the data is telling the bank

- Creating minimum viable products (MVPs) and refining the logic iteratively to suit the specific focus and marketplace of the bank, continually improving the accuracy and reliability of predictions

REALIZING BUSINESS BENEFITS FROM DATA & AI

BENEFITS THAT CAN BE EXPECTED FROM THIS APPROACH INCLUDE:

Increased earnings and margins for the business:

We use data science to position control functions as partners for the business, with joint use cases reaching improvements of 5-15% profitability and wins in market shares. Notably, the approach also unlocks new ways to target profitable, credit-worthy prospects.

Decreased costs via major efficiency gains:

We reach up to 20% improvement in efficiency thanks to smart automation of complex manual tasks, using technologies such as Natural Language Processing (NLP), Optical Character Recognition (OCR), Natural Language Generation (NLG), and Machine Learning (ML) on the core processes of the control functions.

Decreased cost of risk:

By setting up levers such as use cases focusing on data quality improvement, advanced automation, and risk anticipation, we enable control functions to significantly reduce the cost of risk to the bank.

HOW CAPGEMINI INVENT CAN WORK WITH YOU TO REALIZE THIS APPROACH

Unrivaled Offering

Capgemini Invent has developed an offer called Inventive Finance, Risk & Compliance to help you implement the approach described in this document. We have already done a lot of the work before the engagement starts, and can offer working prototypes to speed up the end-to-end process of ideation and development. The prototypes aren't "off-the-shelf" solutions – rather, they are catalysts to trigger your creativity and show what's possible. We then work with you to help you implement your own ideas in a way that suits your requirements and maturity. For example, you may want to start by either improving the foundry or focusing on the solution, or else work on both in parallel – it's completely up to you.

Working with us, you can extend a business function's capabilities efficiently and with minimal risk.

Our multidisciplinary approach

Capgemini's multidisciplinary, end-to-end approach gives you an unparalleled way to bring your ideas to life, and then, if required, scale them to meet the needs of your whole organization.

Capgemini can help FRC add value to the business by realizing the full potential of your existing data platform, and of structures such as data lakes. We can do this because we have the global regulatory expertise – with 300+ experts working in this area worldwide. Our engagements are always interdisciplinary so that the teams comprise the right mix of regulatory and sector expertise with the required data science, IT, and business transformation specialisms.

Already proven

What's more, the work we've already done with client banks to help them get more from FRC data foundries means we know exactly what's possible and the best way to do it.

We don't just advise you on what you could do, though – we can actually work with you to carry out the transformation projects, collaborating with all your management board members and speaking to each one in their own language so that everyone gets on board with the transformation.

In other words, we know what to do and can help you formulate a more collaborative approach.

Now is the time to make it happen, together.

LEARN MORE

Exploiting the FRC data platform fully can help the FRC function and the business as a whole stay competitive and compliant, and even achieve digital transformation through innovation.

To make it happen, we help you explore your organization's specific needs and ideas, then prototype possible solutions, which can then be scaled and implemented in a way that delivers real business value.

Our approach gives you tried and tested ways to tackle these challenges and many more, so that you can get started fast and reap major rewards. Find out what some other banks are already doing or read more on our website.

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ABOUT CAPGEMINI INVENT

As the digital innovation, consulting and transformation brand of the Capgemini Group, Capgemini Invent helps CxOs envision and build what's next for their organizations. Located in more than 30 offices and 22 creative studios around the world, its 6,000+ strong team combines strategy, technology, data science and creative design with deep industry expertise and insights, to develop new digital solutions and business models of the future.

Capgemini Invent is an integral part of Capgemini, a global leader in consulting, technology services and digital transformation. The Group is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of over 200,000 team members in more than 40 countries. The Group reported 2018 global revenues of EUR 13.2 billion.

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