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- Operational risk and governance, risk and compliance (GRC)
- Market risk
- Asset and liability management (ALM) and liquidity risk
- Energy and commodity trading risk
- Financial crime including trader surveillance, anti-fraud and anti-money laundering
- Cyber risk management
- Insurance risk
- Regulatory requirements including Basel 2 and 3, Dodd-Frank, MiFID II and Solvency II

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The firm has brought together a leading team of analysts and advisors from the risk management and financial services industries. This team has hands-on experience of implementing and developing risk management systems and programs for Fortune 500 companies and leading consulting houses.

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About BearingPoint

BearingPoint®

With its RegTech product line, BearingPoint is a leading international provider of innovative regulatory and risk technology solutions (RegTech and RiskTech) and services across the entire Regulatory Value Chain for Financial Services. Customers representing 6,000 firms worldwide, among them large international banks, a major part of the largest European banks, leading insurance companies as well as supervisory authorities and central banks, trust BearingPoint's RegTech products and services. We work closely with regulators and as a member of standardization bodies like XBRL consortium, we actively contribute to the process of standard setting. We combine our regulatory expertise with our proven, reliable and future-oriented RegTech product line and expert consulting capabilities as well as training seminars and managed services.



About the BearingPoint contributor

Maciej Piechocki

For the last 10 years, Maciej has specialized in the areas of digitalization and regulation, especially in the financial services sector. In his role, he is responsible for delivering services and solutions to regulatory clients such as banks, insurance companies, central banks and supervisory authorities in the areas of regulatory reporting, regulatory management and regulatory analytics. He covers regulations such as Basel 3, Solvency 2, IFRS and MiFID but also implements standards such as XBRL or SDMX.

During his career Maciej has worked with several regulators worldwide, including Deutsche Bundesbank, the European Banking Authority, the European Central Bank, the Polish Central Bank, the SEC in the US, Japan's FSA, and the Chinese Ministry of Finance. He has also worked with a number of large banks, insurers and listed companies, and in consulting, software development, accounting standard setting and academia.

Says Maciej of this particular project: 'Risk data aggregation and reporting (RDAR) has been the focus of BearingPoint's RegTech business for 25 years now. Since the financial crisis 10 years ago, we have seen a permanent stream of new regulations, accompanied by high costs for RDAR solutions, and analysts predict that this development will continue. Therefore, we believe, it is even more important for financial institutions to count and cut their compliance costs. Our solutions, serving 6,000 firms globally - financial institutions and regulators - tackle these regulatory challenges. Standardization and industrialization are major issues in this context, in addition to outsourcing, from RaaS (Risk/Regulatory-as-a-Service) to regulatory utilities. Yet until now there were no studies available in the market that allow financial institutions to exactly quantify the cost of compliance and identify the most worthwhile areas for investment. That was our motivation to conduct this research together with Chartis.'

Table of contents

1. Executive summary	6
2. Research approach and key findings.....	8
3. Context: a problem with no obvious solution.....	13
4. Modeling and benchmarking	16
5. Appendix A: Methodology and approach	26
6. Appendix B: Bibliography	34
7. Appendix C: Glossary	36
8. How to use research and services from Chartis.....	37
9. Further reading	39

List of figures and tables

Figure 1: Adjusting the compliance levers	11
Figure 2: Simplified methodology for the Chartis Research cost-of-compliance model	16
Figure 3: Reporting platform structures	17
Figure 4: Centralization of relative platform structures	17
Figure 5: Data flows across business-focused risk and P&L.....	28
Figure 6: Data flows across enterprise risk	28
Figure 7: Data flows across finance	28
Figure 8: RDAR technology structure	29
Figure 9: The organizational processes and business services supporting RDAR	30
Figure 10: Defining the value chain for RDAR compliance cost	31
Table 1: Spending components	17
Table 2: Expenditure on compliance reporting by type of reporting platform.....	18
Table 3: Expenditure by FIs' business and geographical focus	19
Table 4: Expenditure on data flow segments by type of FI	20
Table 5: Expenditure on business services by type of FI	21
Table 6: Benchmarking the levers	22
Table 7: RDAR component benchmarks by type of FI.....	23
Table 8: Hypotheses and results	24
Table 9: The key functional areas of the RDAR value chain	27

Percentage of FIs' risk budgets represented by RDAR compliance...

80%



Annual technology and operational costs of RDAR compliance for global FIs...

\$70bn

For financial institutions, the regulations keep on coming, the regulatory landscape grows ever more complex, and the days of 'blank check' compliance spending are over. Current compliance-costing models give them the bigger picture, but none of the fine detail; nor do they offer advice on which operational areas to target. Based on research with a range of banks and institutions from Europe and the US, Chartis has developed a cost-attribution framework that firms can use as a diagnostic tool to benchmark themselves against their peers and competitors, and ultimately to cut their cost of compliance.

Total Compliance Technology Spend comprises...

Data Management
Infrastructure

22%

Data Input

11%

Data Enrichment

6%

1. Executive summary

Financial Institutions (FIs) exist in a challenging environment. Following the last financial crisis, multiple waves of new national and supranational regulation have constricted FIs' profits through, for example, the imposition of minimum capital requirements. Simultaneously, they have driven up general compliance expenditure. And, as regulations have continued to proliferate, most firms acknowledge that it is not enough merely to comply with current regulations – they must budget for future ones too.

Against this backdrop, attitudes to compliance spending within FIs are changing. The sheer necessity of compliance pushed many FIs to adopt a 'blank check' approach – spending what had to be spent to stay within the law and avoid weighty fines. However, with the global regulatory push showing no sign of relenting soon, compliance costs must be controlled.

For FIs, a big part of the answer lies in being able to pinpoint exactly where their compliance costs sit, across the technology, processes and operations that absorb this expenditure. Going forward, high-performing firms will demonstrate an ability to manipulate the right organizational 'gears' or 'levers' to optimize their total cost of compliance, taking a vital step toward achieving efficient compliance and reducing overall expenditure.

A thorough review of the available literature in this space revealed many limitations. We found that many of the models designed to help FIs tackle these issues are limited in three critical ways:

- Firstly, many tend to be **too descriptive in their approach**, lacking meaningful actionable insight, and correlating an overall cost of compliance with an external variable (such as a specific regulation). In the absence of targeted use cases, analysis remains academic at best, and difficult for decision makers to translate into action.
- Where recommendations are offered, they also tend to be linked to organizational characteristics – such as size – which in reality are **extremely difficult to implement** without major institutional transformation.
- And, where it is offered, **advice tends to be too broad**, neglecting to take into account granular 'nuts and bolts' issues that exist within FIs, such as the question of data centralization versus localization and the nature and impact of Application Programming Interfaces (APIs) and feed handlers. Rather, they call instead for sweeping changes at divisional levels, or tweaks to more nebulous factors such as corporate culture.

To address these challenges, Chartis Research, in collaboration with our research partner BearingPoint, has developed a focused cost-attribution model that FIs can use as a diagnostic tool to benchmark their Risk Data, Aggregation and Regulatory Reporting (RDAR) processes and 'levers' against those of peer institutions. RDAR, we believe, represents the largest block of compliance expenditure within FIs, presenting a solid target for our study to address, and helping us bring focus to our study.

In the context of RDAR expenditure, we drew a range of important conclusions, including:

- **Choosing the right operational structure for compliance is critical** – narrow, regional reporting platforms deliver lower core spending overall than global reporting platforms, but at a much higher residual cost, and higher compliance costs overall. Integrated platforms delivered the lowest overall cost by some margin.

- **Demand is growing for utilities**, driven by the relentless need to reduce cost, particularly in peripheral processes – such as capital markets reports for small regional banks – and non-core regions for large international banks. As a result, banks will be able to achieve better optimized trade-offs between key operational concerns (e.g. centralization vs. localization) at a lower cost.
- In all scenarios, **complexity emerged as a major determining factor of cost** – asset managers and investment banks, utilizing simpler, more centralized reporting platforms, fared much better than retail banks, as did those with a smaller geographical footprint. For large, universal banks, the benefits of a fully integrated solution over narrow, regional compliance centers will be material.

This sample of headline results highlights just some of the key drivers of compliance cost uncovered by our model, and some of the key considerations for FIs to tackle as they seek to achieve enhanced cost efficiency. However, beyond these findings, our model has allowed us to isolate specific levers and drivers of cost reduction (and cost intensity), effectively showing which levers can be pulled to what effect. In terms of turning theory into action, this is the crucial next step.

'To cut costs you need an accurate view of what they are.'
Representative of a US-based global bank

As described later in this document, we settled on five key organizational levers and the areas of cost impact controlled by each. Of the five, three emerged as being crucial drivers of cost:

- **Centralization of data storage.**
- **Uniformity of the feed handler environment.**
- **Availability of APIs.**

So, while FIs using integrated platforms for data management have lower overall compliance spending, less efficient regional spenders could still make significant cost gains through the use of APIs, spending significantly less on data input, enrichment and distribution than those without them. The efficient use of feed handlers simply magnifies this positive effect.

This report, which should be read in conjunction with our position paper¹, outlines the key issues facing the industry in RDAR cost compliance, details a robust methodology designed to highlight the core trends and 'levers' governing RDAR compliance costs, and offers clear, actionable insight to readers tackling a critically important challenge. In creating this report, we also hope to have added something new to the debate around compliance cost, and would welcome the opportunity to discuss our findings with you.

¹ *Counting and Cutting the Cost of Compliance: How to accurately assess the cost of Risk Data Aggregation and Regulatory Reporting.*

2. Research approach and key findings

Inputs

Our first consideration for this report was deciding where to focus. RDAR was an easy choice. We estimate that RDAR represents around 80% of FIs' risk budget², with associated operations and technology expenses driving around \$70bn³ of their annual cost. RDAR is a core part of FIs' operations, and can be assessed and controlled more easily than ill-defined strategic and business-model elements. This helps to ensure that this report delivers the actionable insight missing from others in this field.

Our model has two components:

- A **descriptive component** that enables FIs to assess their compliance spending against their closest peers – especially competitors with similar business models and geographical focus.
- A **practicable component** that gives FIs a set of organizational 'levers' they can adjust to reduce their compliance spending while maintaining their reporting functionality and standards.

In building the model we employ two key categorizations:

- Categorizing **reporting platforms** according to their complexity (the level of decentralization of reporting staff and reporting channels).
- Categorizing **organizations** into three types, based on their operational and geographic focus: complex international, regional and limited regional.

'Flexibility and control is not just an organizational issue, it's something that you must enforce through the technology architecture.'

Head of market risk program at a central European bank

By analyzing correlations between quantitative data on FIs' RDAR compliance costs, and qualitative examinations of their reporting structures, we were also able to divide expenditure into two broad categories: *core* reporting systems, platforms and processes; and *residual* spending on product control, valuation services and risk IT.

Using these inputs, we identified five organizational 'levers' that are vital components of an FI's compliance expenditure.

- Data centralization.
- Availability of Application Programming Interfaces (APIs).
- Feed handler standards.
- Number and diversity of supported reports.
- Use of existing utilities.

² Chartis GRIT Expenditure Report, 2017.

³ Chartis GRIT Expenditure Report, 2017 and early data from survey fieldwork conducted for this report.

Benchmarks were calculated for each of these levers, on a scale from 1 to 10, according to the level of implementation of the appropriate systems, followed by average benchmarks for each of our organizational categories. This enables FIs to benchmark their own implementation level for each lever, and to benchmark themselves against their peers and competitors. Using the tables of relative expenditure provided in this report, FIs can assess their spending against these peers and competitors.

The underlying model itself is based on three core dimensions:

- **Define business divisions/functions.** We chose to focus on the business divisions of enterprise risk, finance and business-focused P&L, as these have the greatest impact on the RDAR value chain. Within these we identified key processes (such as risk attribution, model validation and balance sheet optimization) that FIs should examine when assessing their compliance costs.
- **Detailed questionnaire.** Having identified and defined our focus areas, we developed a detailed questionnaire as the basis for a series of interviews with representatives from several different divisions within a range of FIs. The questions we asked covered their organization, client base, technology infrastructure and regulatory reporting processes.
- **Other core inputs.** The data gathered from these detailed interviews was used to build our model, along with research carried out for Chartis' Global Risk IT Expenditure analysis. Other key inputs into the model included data flow across key RDAR operational segments, specifics of the RDAR technology architecture, and FIs' organizational structure.

Applying the benchmarks to the five organizational levers, we identified key areas in which spending can be affected – notably the centralization of data storage, the uniformity of the feed handler environment and the availability of APIs. FIs using integrated platforms for data management have lower overall compliance spending, while FIs with higher availability of API benchmarks – those in the limited regional category – spend significantly less on data input, enrichment and distribution, as do those with higher benchmarks for feed handler standards. Finally, FIs using narrow regional platforms and global platforms have low centralized data scores but different levels of compliance spending on technology.

FIs can also compare their total levels of spending on compliance – and on individual system and process components – to those of their peers. If an FI determines that it has a high score on a lever relative to its comparable competitors, it can identify targets for spending cuts.

Outputs

As noted above, since RDAR represents 80% of FIs' risk budgets, and \$70bn of annual operations and technology costs, the scope for savings in this area is enormous.

For example, in applying our model, we found that complex international FIs, on average, spend \$550m on data management infrastructure (22% of their total technology spending; data input and enrichment account for 11% and 6% respectively), with a benchmark score for data centralization of 5. By benchmarking itself against this category, a similar FI can assess whether its current level of spending is too much or not enough, and make carefully considered tactical decisions about which elements of this area to target.

Behind the model, our interviews also highlighted several important themes driving FIs' compliance spending.

- To begin with, **expenditure on new reporting requirements was concentrated in FIs' setup costs**. Figures from one FI in the sample put the share of initial spending at 50% of the total running cost, a split that Chartis believes is broadly similar across FIs.
- Notably, FIs in the 'international' category – those with a global presence serving multiple sectors – **spent most on operations to support their reporting processes**, and on associated data management. In contrast, FIs with a more circumscribed focus spent less in these areas.
- **FIs also outsource most of their compliance reporting to India**, where compliance teams are between two and eight times the size of those at FIs' main operating headquarters. There was also **considerable demand for utilities at the national level** to support the RDAR process. Many jurisdictions restrict the exfiltration of data for processing in foreign locales. This limits FIs' ability to offshore their regulatory reporting processes from these countries, and lies behind the common desire to use domestic utilities.
- FIs using **narrow regional reporting platforms tended to have lower core spending** than those using global reporting platforms. However, their residual expenditure was significantly higher, resulting in a higher level of overall compliance expenditure. FIs using **integrated platforms tended to have the lowest costs in both categories by some margin**. FIs with a strong focus on asset management and investment banking have simpler, more centralized reporting platforms. The nature of these sectors is highly conducive to the centralization of resources.

'The biggest benefit of offshoring, outsourcing or using external entities like utilities is not the cost-reduction but the standardization of processes it imposes on the organization.'
Risk head at a large European bank

An FI's location can also have a considerable influence on its compliance operations and spending.

- **US FIs have more complex, decentralized reporting platform structures**, largely because of historical regulation that encouraged them to expand into Asia and Europe, forcing them to comply with many different regulatory regimes. The relative complexity of their reporting platforms has resulted in significantly higher expenditure on regulatory reporting.
- By contrast, **European FIs tend to have a very narrow focus outside their home markets**, and have simpler, more centralized reporting platforms. The EU's attempts to harmonize and integrate financial regulation provides further impetus for adopting a more centralized platform. Institutions like the European Securities and Markets Authority, which are aimed at promoting stability across the EU, have further stimulated the integration of diverse platforms into more centralized reporting systems.

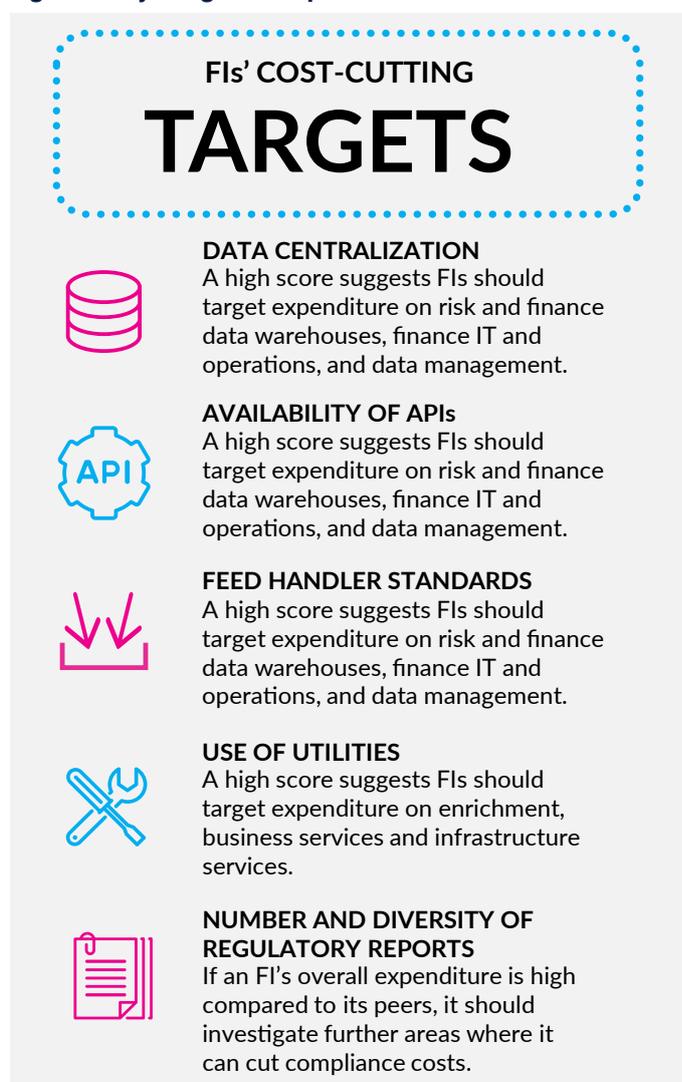
Next steps

Our results highlight several areas where FIs need to think carefully in order to optimize their compliance costs. FIs looking to expand their services or geographical presence, for example, must prepare for an increase in compliance spending across the board, as expenditure on both supporting operations and technical data management is likely to rise. And one area for cost reduction is to ensure that a large proportion of reporting expenditure is channeled into start-up costs.

The 'lever' component of the model highlights key areas where FIs can target their expenditure adjustments to bring down their overall cost of compliance (see Figure 1).

- A high score on each of the following suggests that an FI should consider targeting risk data warehouses, finance data warehouses, finance IT and operations, and data management for cost cutting:
 - Data centralization.
 - Availability of APIs.
 - Feed handler standards.
- A high score on use of utilities suggests that an FI should consider targeting expenditure on enrichment, business services and infrastructure services for cost cutting.

Figure 1: Adjusting the compliance levers



Source: Chartis Research

In an increasingly complex and often confusing regulatory environment, the Chartis model can enable FIs to diagnose their compliance spending and identify areas where they can work to reduce it. This is a vital step on the route to compliance-cost reduction. The next is equally important – armed with this information, FIs must think about the physical practicalities: the precise actions they should take to make these changes real.

3. Context: a problem with no obvious solution

No more blank checks

In the decade since the financial crisis, regulations governing banks and other FIs have proliferated. No sooner have FIs implemented reporting structures for one regime than it is time to prepare for the next. Legislation and directives at the national and supranational levels⁴ have had two broad effects. Not only have they constricted FIs' profits by imposing minimum capital requirements, they have also driven up expenditure on compliance as FIs have scrambled to produce the required regulatory reports.

A decade after the first symptoms of the credit crunch became apparent, regulators continue to promulgate new rules and regimes. The advent of the US Current Expected Credit Loss (CECL) regulation and the EU's revised Markets in Financial Instruments Directive (MiFID II) are just two waves in the constant incoming tide of regulation, in which a swathe of more limited rules accompanies the swell of major new standards. Facing such a large volume of regulations with which they must comply, FIs find themselves running on a treadmill of new rules.

Not least because they face heavy fines for compliance breaches – hundreds of billions of dollars since 2008 – FIs have been sinking money into their compliance divisions. As a result, the cost, size and complexity of FIs' compliance functions has ballooned. What's more, shareholders, who gave this approach carte blanche after the financial crisis, have begun to question FIs' continued compliance spending. Whereas before they saw compliance-related expenditure as a necessary component of business operations, they now argue that FIs risk overspending by taking a 'blank check' approach.

Controlling costs, now and in future

Despite this, many FIs still lack the tools to inspect their compliance spending. Although FIs may employ cost-reduction strategies in broad areas, they struggle to understand how individual facets of their business model, like institutional structure or client base, affect their compliance costs. They are also unable to attribute costs back to the smaller constituent 'gears' and 'levers' of their reporting operations. As a result, they cannot pinpoint precise target areas where they can cut costs quickly. They are also losing out on the potential competitive advantage in being able to accurately count and cut their costs of regulatory compliance.

In an era of unwieldy compliance divisions and hefty fines for regulatory breaches, cost attribution is increasingly important. Chartis' analysis has shown that the financial industry as a whole spends approximately \$70bn each year on risk, risk data and regulatory reporting, excluding associated expenditure on operations. By breaking this sum into its constituent parts, FIs could make significant cost savings.

In addition, accurate cost attribution will enable FIs to identify areas where a lack of funding could result in non-compliance. Regulators have already issued almost all of the largest full-service Tier 1 banks with fines of \$1bn – fines from global regulators in the past 10 years have reached into the hundreds of billions of dollars. To weather the storm of regulatory enforcement, FIs will require the right tools to understand their compliance spending: a sturdy, targeted cost-attribution framework that can locate the sources of possible future compliance breaches. By understanding the distribution of expenditure within the compliance function's structure, FIs will be able to adapt more efficiently and swiftly to future regulations.

⁴ Notable regulations include Basel 1, 2, 3 and 4, FRTB, BCBS 239, AnaCredit, Solvency II and Dodd-Frank.

For even the smallest institution, technological infrastructure and operational frameworks present prime opportunities to lower their cost of compliance. Most of FIs' expenditure on compliance technology and operations is spent on Risk Data Aggregation and Regulatory Reporting (RDAR): the process of gathering, analyzing and publishing the data needed for regulatory reports. Unlike an FI's business focus or broad organizational structure, these RDAR processes are characterized by components and mechanisms that can be rapidly adjusted, reformed or replaced to reduce compliance expenditure.

Existing literature: two main flaws

When considered in the context of developing a cost-attribution framework aimed at minimizing expenditure, the existing literature on compliance costs has two major flaws. The first lies in the predominantly descriptive nature of many compliance-cost studies⁵. Work conducted and published by regulators, financial oversight bodies and research houses often examines the relationship between compliance expenditure and an external variable (such as the implementation of a given regulation). These studies make no effort to suggest actions that FIs could take, because their goal is solely to derive a cost of compliance figure or formula and determine how it relates to the external variable. Any practical cost-reduction insights that these studies may provide are incidental to the main thrust of the work.

Other studies explore the correlation between compliance cost and an inherent characteristic of the institution being examined, such as its size. Often, the characteristic is so integral to the institution's operations that it cannot be a target for actionable advice. A variable like size, for example, is the product of all of an FI's organizational components and objectives taken together. It is so enmeshed in the FI's operating model that changing it would require an inordinate amount of time and effort, or substantial shifts in the business' strategic goals. Although the cost of compliance, as a proportion of assets, is higher for small banks than for their larger counterparts, few would suggest that a community retail bank should aim to reduce its compliance costs by attempting to grow into a sprawling global one-stop-shop FI. These studies may attribute compliance cost back to an internal variable, but this insight cannot be applied to the institution itself except at the broadest organizational and strategic levels. In these studies the emphasis is very much on the counting, not the cutting.

Practical advice too broad?

One common trait among the methodological approaches mentioned above is that they eschew practical advice. In many of the reports that do attempt to reach actionable insights FIs can use, there lurks the second broader flaw with these studies. Because they use total compliance cost, their suggestions for cost reduction are often overly broad, and fail to attribute costs narrowly enough to be immediately useful. They often lack examinations of causal chains and dynamics deep within the FI's compliance function, so are limited to suggesting actions at the divisional level or changes to 'softer' factors like risk culture. This breadth and imprecision limits how useful the insights are in the short to medium term.

A number of studies within this group identify technology as a key source of compliance costs. Their suggestions tend to position technology as foundational to driving greater efficiency within the compliance function. But they lack the nuts-and-bolts suggestions for how technical architectures could be altered to create rapid cost reduction. Technology is not a magic solution – FIs must design systems knowing what the component costs are, and deploy them with an understanding of the interoperating components.

⁵ For a bibliography see Appendix B.

A solution: the Chartis model

A focus on RDAR

The model proposed in this report distinguishes itself from existing work by examining the internal components of the systems and processes that support RDAR. This set of operations and technical components covers all of an FI's regulatory reporting function and credit, market, liquidity and operational risk functions. Finance, control and risk and P&L are also partially within the scope of RDAR processes.

By narrowing the scope to only those costs directly associated with RDAR, the Chartis model provides⁶:

- A descriptive framework for counting the cost of regulatory compliance and its components.
- A set of practical changes that FIs can make to RDAR systems to cut their overall cost of compliance.

The **descriptive component** enables FIs to assess their spending on compliance against that of their closest peers, and especially competitors with similar business models or geographical focus. The model also provides an abstraction to capture how compliance costs vary by the structure of an FI's regulatory reporting platform. FIs thus have two angles from which to examine their compliance costs.

The **practicable component**, through the granularity of the RDAR approach, offers a set of levers FIs can use to adjust their data and reporting systems, and assesses how applicable these levers are to different FIs. Using the structural and component changes best suited to their compliance function structure, client base and geographical revenue distribution, FIs can maintain their existing functionality and reporting standards while reducing their RDAR spending.

A more proactive approach

If compliance managers know what they can change within their RDAR processes, not only can they make targeted cost reductions, they can also prepare to adapt their systems to new regulatory demands. By understanding their expenditure distribution, managers will be better placed to make decisions about how to incorporate upcoming rounds of regulation into their reporting processes, and allocate their expenditure appropriately. This enables FIs to take a proactive approach to regulation, and being able to anticipate and plan more precisely which new functionality to integrate brings a competitive advantage.

Examining RDAR system components is a novel framework in which to consider compliance spending. Thanks to the conceptual granularity of the processes being inspected, FIs applying this framework can make targeted cost breakdowns. However, that same granularity places constraints on the availability of data that would further develop the model. The depth at which expenditure breakdowns are buried within an FI, and the fact that they are spread across multiple disparate business and geographical functions, makes it harder to gain a full understanding of the precise figures on compliance spending.

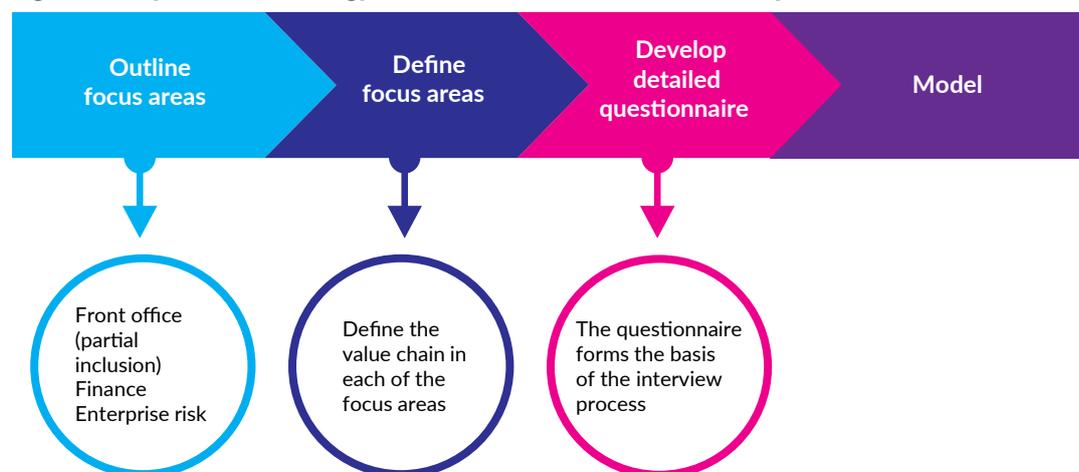
⁶ Note that we developed the conceptual underpinnings for our cost of compliance model through detailed interviews and surveys. The diffuse nature of compliance spending, however, means that we had to extrapolate the figures we found to generate real insights. So the model this report offers should be considered as a foundation and a set of 'blueprints' that FIs can build on, rather than a complete structure.

4. Modeling and benchmarking

Broadly, our methodology had four key steps (see Figure 2):

- Outline the focus areas.
- Define the focus areas.
- Develop a detailed questionnaire.
- Develop the model.

Figure 2: Simplified methodology for the Chartis Research cost-of-compliance model



Source: Chartis Research

The methodology we used to develop the model, as well as its key inputs and outputs, is detailed in Appendix A. Because compliance spending is a complex system covering many areas and processes, having conducted the interviews and gathered the data, we used the model to approach it from two angles: *reporting platform* (and its associated expenditure) and *organizational structure*. We then considered the specific *organizational levers* that FIs can target to adjust their compliance spending. The following sections consider each of these in turn, together with the key findings from the model in each case.

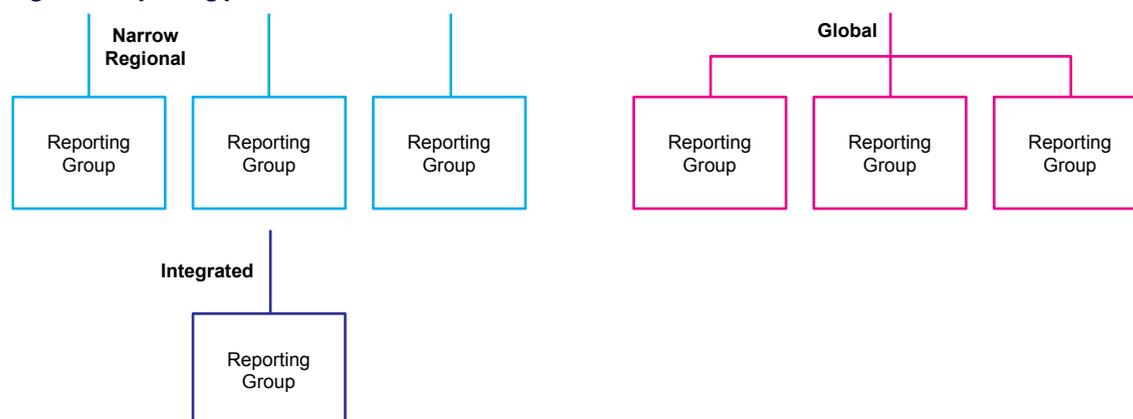
Reporting platform structure

We used the model to classify each FI in our sample into one of three groups, according to the structure of its compliance function's reporting platform. The simple schematic in Figure 3 illustrates the different reporting platform structures, while Figure 4 illustrates the relative centralization of each structure.

- **Narrow regional platform** – decentralized staff, decentralized reporting channels. This is the most complex structure. Multiple reporting teams are distributed across different locations, each reporting on a segregated channel.
- **Global platform** – decentralized staff, centralized reporting channel. This structure is characterized by multiple reporting teams in distinct locations that pool their reports into a unified channel.

- **Integrated platform** – centralized staff, unified reporting channel. The least complex structure. The reporting team is sited in one location and the reporting function along one channel.

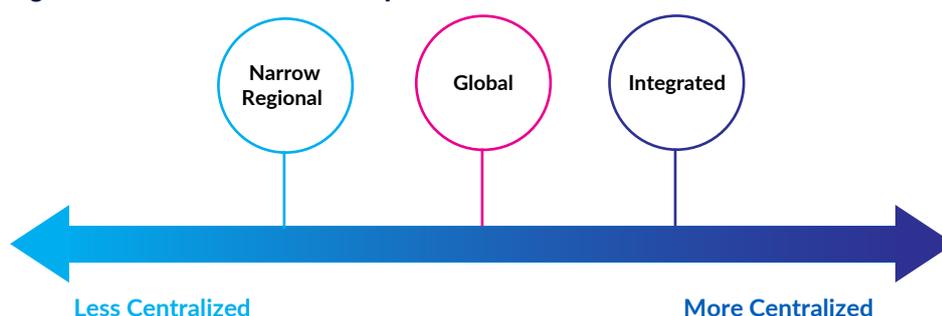
Figure 3: Reporting platform structures



Source: Chartis Research

'We have very flexible reporting framework because we have one database for everything.'
 Representative of a large universal bank

Figure 4: Centralization of relative platform structures



Source: Chartis Research

By analyzing the correlations between quantitative data collected on FIs' RDAR compliance costs, and making qualitative examinations of their reporting structures, we can determine average expenditure by category. Splitting these overall RDAR cost figures into numbers for *core* and *residual* expenditure gives us further insight into how a given reporting structure affects spending dynamics (Table 1 shows the components of each category). This process generates a broad benchmark level of compliance spending by reporting structure.

Table 1: Spending components

Core	Residual
Reporting systems and processes	Product control
Reporting platform	Valuation services
	Risk IT

Source: Chartis Research

This categorization of the sample FIs' regulatory reporting structures and the resultant cost dynamics gives us a tool we can use to assess the links between specific business drivers and RDAR expenditure. The main drivers we considered were an FI's organizational structure and its client base – the model uses revenue distribution across business lines and regions as quantitative proxies for these inputs. By examining how these factors differ by reporting structure we gain an insight into how a given FI's benchmark expenditure varies according to its key drivers.

The effect of reporting platforms

In the process of constructing the model we identified a key cost dynamic: levels of spending on compliance reporting differ considerably across different platforms (see Table 2).

Table 2: Expenditure on compliance reporting by type of reporting platform

Type of reporting platform	Average core spending (millions of USD)	Average residual spending (millions of USD)	Average total spending (millions of USD)
Narrow regional	125	550	675
Global	175	240	415
Integrated	75	220	295

Source: Chartis Research

FIs using narrow regional reporting platforms tended to have lower core spending than those using global reporting platforms. However, their residual expenditure was significantly higher, which in turn resulted in a higher level of overall compliance expenditure. FIs using integrated platforms tended to have the lowest costs in both categories by some margin.

We found several important correlations between the type of FI and the reporting platform, including:

- FIs with a strong focus on asset management and investment banking have simpler, more centralized reporting platforms. The nature of these sectors is highly conducive to the centralization of resources.
- US FIs, particularly those with a stronger retail focus, have more complex, decentralized reporting platform structures. Throughout much of the twentieth century, US laws restricted FIs from growing domestically. Rules preventing banking across state lines, born of a strong belief in the importance of local community banks, imposed particularly stringent limits on growth. Federal regulation thus spurred US FIs to expand abroad, into Asia and Europe. And because FIs operated in many diverse jurisdictions, they had to comply with many different regulatory regimes. Their reporting structures are products of tight domestic regulation that the federal government only relaxed in the 1980s and 1990s after the Riegle-Neal Act was passed and the Glass-Steagall Act was reinterpreted. This complexity in reporting platforms results in significantly higher expenditure on regulatory reporting.
- European FIs have simpler, more centralized reporting platforms. In contrast to their American counterparts, these FIs tend to have a very narrow focus outside their home markets. The EU's attempts to harmonize and integrate financial regulation provides further impetus for adopting

a more centralized platform. Institutions like the European Securities and Markets Authority, which are aimed at promoting stability across the EU, have further stimulated the integration of diverse platforms into more centralized reporting systems.

Inspecting individual RDAR components

We sorted the sampled FIs into three groups according to their overall organizational structure – their business focus and distribution of client base – before analyzing correlations between these categories and RDAR system spending.

The three categories of organizational structure are:

- **Complex international** – FIs with operations across multiple business lines spanning the globe. These FIs provide a wide range of services that run the gamut of banking products to a client base that is highly geographically distributed.
- **Regional** – FIs with operations that focus on one area of banking and that are generally concentrated in one region. While these FIs provide services in other sectors and have clients in multiple regions, they have a clear focus on a limited set of business lines in a specific region.
- **Limited regional** – FIs with operations that are heavily focussed on one area of banking and highly concentrated in one region. These FIs provide very limited services outside their main business and geographical focus.

The role of organizational structure

By looking beyond reporting platform expenditure to examine operations spending and data management infrastructure in the context of institutional focus, we obtain a further layer of expenditure data (see Table 3).

Table 3: Expenditure by FIs' business and geographical focus

FI type	Average total technology spending (millions of USD)	Average business and risk operations spending (millions of USD)	Average data management infrastructure spending (millions of USD)
Complex international	675	1,100	550
Regional	495	638	215
Limited regional	375	415	130

Source: Chartis Research

This reveals a similar trend to that found above. The *complex international* category – FIs with a global presence serving multiple sectors – had by far the highest spending on operations to support reporting processes, and on the required data management. Conversely, those FIs with more circumscribed focuses spent less in these areas.

This trend makes intuitive sense – those FIs operating in many regions serving diverse clients are required to comply with a greater volume of regulation. This is due to both the number of regulatory authorities to which they are subject and the number of sectoral regulations each authority applies. Their more focused counterparts, by contrast, enjoy lower compliance spending at the cost of operating in a more restricted market.

So FIs looking to expand their services or geographical presence must prepare for an increase in compliance spending across the board. Expenditure on both supporting operations and technical data management will likely rise. Though one may partially offset the other (a well-designed data warehousing strategy, say, may lower the numbers of supporting staff required), these increases point to prime areas where FIs can trim any extra fat.

To provide further granularity, Tables 4 and 5 give an idea of the proportion of technology spending that each type of organization makes on specific components of the RDAR data-flow process chain. These are especially useful when applied in tandem with the levers outlined in the next section.

Table 4: Expenditure on data flow segments by type of FI

	Complex international (% of total spending)	Regional (% of total spending)	Limited regional (% of total spending)
Data input	11	14	10
Data enrichment	6	8	3
Calculation	36	30	42
Distribution	3	3	2
Business services	33	33	34
Client infrastructure services	11	12	9

Source: Chartis Research

Table 5: Expenditure on business services by type of FI

	Complex international (% of total spending)	Regional (% of total spending)	Limited regional (% of total spending)
Front-office risk components	12	18	24
Enterprise platforms	8	10	12
Risk data warehouse	8	6	4
Finance data warehouse	10	6	4
Finance IT and operations	40	36	38
Data management	22	24	18

Source: *Chartis Research*

Benchmarking the levers

The key to attributing cost within RDAR is to define a set of important technical levers that FIs can assess and adjust. With data aggregation comprising 80% of risk system implementation⁷, many of our levers concentrate on how data is treated as it passes through gaps between the functions that are involved in the regulatory reporting process.

We have identified these levers as:

- Centralization within the key processes shown in Figure 2 (front office, risk analytics and aggregation and finance repository).
- Availability of Application Programming Interfaces (APIs).
 - Are the data interfaces between functions clearly defined?
 - Is data passed to the receiving function in a standard format?
- Feed handler standards.
 - How complex is each feed handler?
- Number and diversity of supported reports.
 - How many reports does an FI produce?
 - Can these reports be grouped into sets with broadly similar structures and requirements?
This will often be a function of the number and size of jurisdictions in which an FI operates.
- Use of existing utilities.

⁷ *Chartis GRIT Expenditure report, 2017.*

For each of these levers, Chartis defined a scale from 1 to 10, with 1 equating to minimal, ineffective implementation or usage and 10 equating to maximal, effective implementation or usage. Table 6 illustrates what we consider to be accurate benchmarks at each end of the range, and at the median.

Table 6: Benchmarking the levers

	Benchmark value		
	1	5	10
Data centralization	Discrete data warehouses used for each jurisdiction in which the FI operates. At least 10 total data warehouses.	Data warehouses used for each business line. Fewer than 5 total data warehouses.	One enterprise data warehouse serving all business lines and jurisdictions.
Availability of APIs	No standard API definition. Custom interfaces between functions. Interface design driven by the specific application used and direct code or data access.	More than 25% of applications have well-defined APIs through which internal functionality is programmatically exposed.	More than 90% of applications have well-defined APIs. Uniformly well-defined API structure.
Feed handler standards	Fewer than 10% of feeds handled by standardized protocols. Data extraction primarily performed with SQL.	50% of feeds handled by standardized protocols. Protocols distributed by standard message bus.	More than 90% of feeds handled by standardized protocols.
Number and diversity of supported reports	FI operates in one jurisdiction and produces more than 10 reports.	FI operates in 5-10 jurisdictions and produces 50-200 reports.	FI operates in more than 50 jurisdictions and produces more than 1,000 reports.
Use of existing utilities	No use of third-party or internal utilities.	Some use of internal, shared services platform. No use of external utilities.	Use of more than one internal shared services platform. Use of several external utilities. Each utility used in multiple jurisdictions and by multiple business lines.

Source: Chartis Research

'Our flexibility is based on data standardization and a single view of the data, regardless of the technology used to store, manage and distribute it.'

Representative of a large European bank

Benchmarking with peer organizations

Using Table 7, FIs can then benchmark their own organizational structures to reveal those areas with the most potential for cost cutting. The table shows the average benchmark values for each system

component by type of reporting platform. A score of 1 indicates that the component has not been implemented, while 10 denotes complete and effective implementation.

Table 7: RDAR component benchmarks by type of FI

	Complex international	Regional	Limited regional
Data centralization	5	5.5	7
Availability of APIs	7	8	9
Feed handler standards	7	8	9
Number and diversity of regulatory reports	9	6	5
Use of existing utilities	5	5	7

Source: Chartis Research

Testing the hypotheses

Before we gathered the data required to apply the model, we generated hypotheses for each lever.

- More centralized data storage results in lower compliance spending.
- More widespread use of APIs to pass data between functions results in lower spending on data input, enrichment and distribution.
- More uniform feed-handler environments across functions results in lower spending on data input, enrichment and distribution.
- Greater deployment of utilities results in lower compliance spending.

We then constructed and ran the model to determine the relative influence and importance of the areas and hypotheses discussed (see Table 8).

Table 8: Hypotheses and results

Hypothesis	Result
More centralized data storage results in lower compliance spending.	<p>FIs using integrated platforms have lower overall compliance spending (see Table 2), supporting this hypothesis.</p> <p>Regional and complex international FIs both have low centralized data scores but different levels of spending on compliance technology.</p>
More widespread use of APIs to pass data between functions results in lower compliance spending.	FIs with higher availability of API benchmarks – limited regional – have significantly lower spending in these areas (see Tables 3 and 7*).
More uniform feed-handler environments across functions results in lower spending on data input, enrichment and distribution.	FIs with higher benchmarks for feed handler standards have significantly lower spending in these areas (see Tables 4 and 7).
Greater deployment of utilities results in lower compliance spending.	<p>FIs using integrated platforms have lower overall compliance spending, supporting this hypothesis.</p> <p>Regional and complex international FIs both have low centralized data scores but different levels of spending on compliance technology.</p>

* For supplementary data, see also Tables 4 and 5.

Note that if FIs want to use benchmark scores to decipher spending trends they should use them in tandem with internal expenditure figures.

Source: Chartis Research

By examining how their deployments of technical components – the levers – compare to the benchmarks for their peer institutions, FIs can determine the data flow segments and business services on which they are spending more than required. The list below delineates how these technical components relate to these areas. If an FI determines that it has a high score on a lever relative to its comparable competitors, it can use this list to identify targets for spending cuts.

APIs, for example, feature heavily in the operation of risk and finance data warehouses, finance IT and operations, and data management. If an FI scores highly for ‘availability of APIs’ it is likely to be performing better in some or all of these areas than its peers, making them potential targets for cuts.

- A high score on **data centralization** suggests that an FI should consider targeting expenditure on **risk data warehouses, finance data warehouses, finance IT and operations, and data management** for cost cutting.
- A high score on **availability of APIs** suggests that an FI should consider targeting expenditure on **risk data warehouses, finance data warehouses, finance IT and operations, and data management** for cost cutting.
- A high score on **feed handler standards** suggests that an FI should consider targeting expenditure on **risk data warehouses, finance data warehouses, finance IT and operations, and data management** for cost cutting.

- A high score on **use of utilities** suggests that an FI should consider targeting expenditure on **enrichment, business services, and infrastructure services** for cost cutting.
- Scoring highly on **number and diversity of regulatory reports** results in somewhat different suggestions, as it is difficult to tie this measure back to individual components. However, this benchmark can be compared to spending by reporting platform structure and FI type. If an FI's overall expenditure is high compared to its peers according to these metrics, it should investigate further areas where it can cut compliance costs.

'Data modeling is the most labor-intensive element of regulatory reporting: anything that simplifies and automates that will help in containing costs.'
Large central Europe-based global bank

Beyond scoring themselves relative to benchmarks, FIs can also compare their total levels of spending on compliance to those of their peers using Tables 2 and 3. In addition, FIs can inspect their spending on individual system and process components using Tables 4 and 5.

Onwards and upwards...

For FIs, armed with their benchmarks and a real sense of where to target in their drive to reduce compliance costs, the next stage concerns practicalities. They need to consider the actual steps they can take to make the necessary lever adjustments effectively a reality. But by using this tool they will have taken a vast and important step toward counting and cutting their cost of compliance, and a stronger footing on the perilous regulatory landscape.

5. Appendix A: Methodology and approach

This section provides more detail on the various stages of the data gathering and analysis approach summarized in Figure 2 on page 16:

- Outline the focus areas.
- Define the focus areas.
- Develop a detailed questionnaire.
- Develop the model.

Outline the focus

First, we drilled down into the discrete business units and operational and technology areas we will include in our analysis, and which we focused on during the survey for the model. The focus of our research is the costs arising from the IT and operational units that are closely associated with FIs' RDAR. The broad divisions and verticals we considered in our analysis were:

- Enterprise risk.
- Finance.
- Business-focused risk and Profit and Loss (P&L) groups.

We did not include audit and compliance departments in our scope. There are clear inputs from the compliance group into areas of management reporting, and Anti-Money Laundering (AML) is reported to regulators. But the overall impact of these groups on the RDAR value chain is marginal. They make up only a small component of systems and, therefore, overall operational spend.

Next we outlined the key activities in each of these selected groups that we will analyze, and the key processes we will examine when calculating costs (see Table 9). Restricting our scope to those functions that support RDAR processes, we mapped spending on technology and operations to individual system components. By aggregating these costs we devised multiple dimensions by which we could examine the distribution of expenditure. With this in mind, the model examines costs from a number of angles.

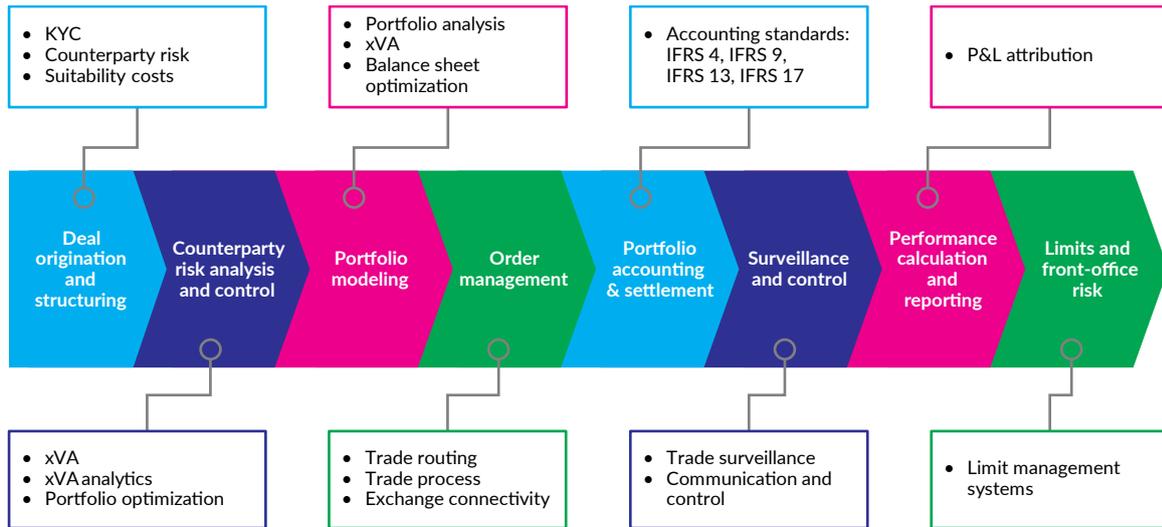
- **Sequential flow of RDAR data across the following operational segments** (see Figures 5, 6 and 7):
 - Business-focused risk and P&L.
 - Enterprise risk.
 - Finance.

Table 9: The key functional areas of the RDAR value chain

Functional areas	Value chain segments	Regulatory drivers
Enterprise risk	<ul style="list-style-type: none"> • Data collection – transaction data, market data, CSA • Pre-risk data warehouse • Pricing valuations and P&L support • Risk engines (covering market, counterparty, credit and liquidity risk) • Risk attribution • Data distribution (to finance department and front office) 	<ul style="list-style-type: none"> • Basel 1/2/3 • MiFID II • FRTB • BCBS 239
Finance	<ul style="list-style-type: none"> • Data collection across different departments • Data quality, consolidation and integration • Internal audit • Model validation 	<ul style="list-style-type: none"> • Basel 1/2/3 • MiFID II • FRTB • BCBS 239 • SOX
Business-focused Risk & P&L	<ul style="list-style-type: none"> • KYC and counterparty risk • xVA • Balance sheet optimization • Accounting standards • Trader surveillance • P&L attribution • Limits management 	<ul style="list-style-type: none"> • MiFID II • MAD/MAR • FRTB

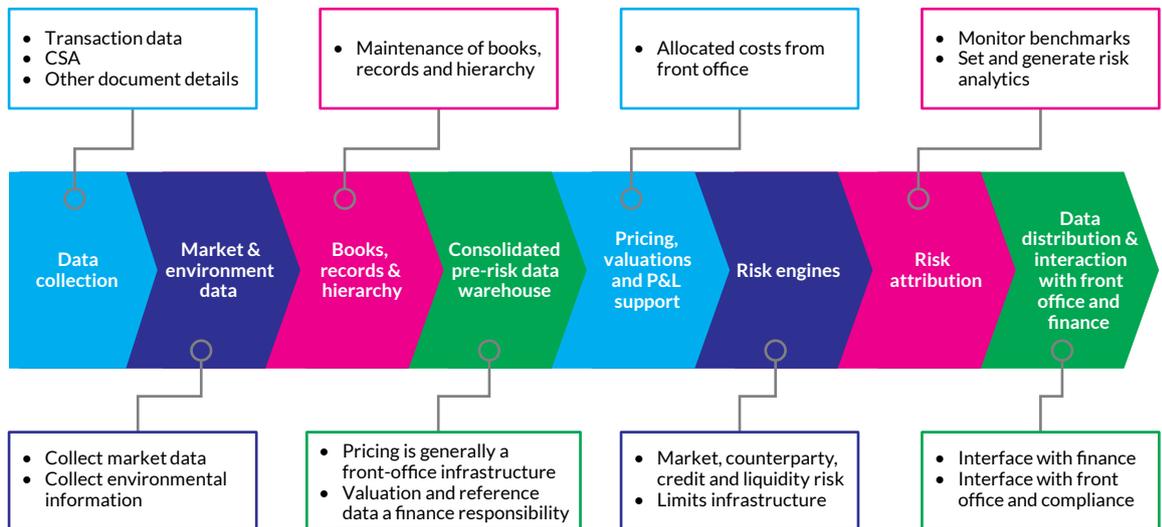
For definitions of the acronyms used in this table, see Appendix B.
Source: Chartis Research

Figure 5: Data flows across business-focused risk and P&L



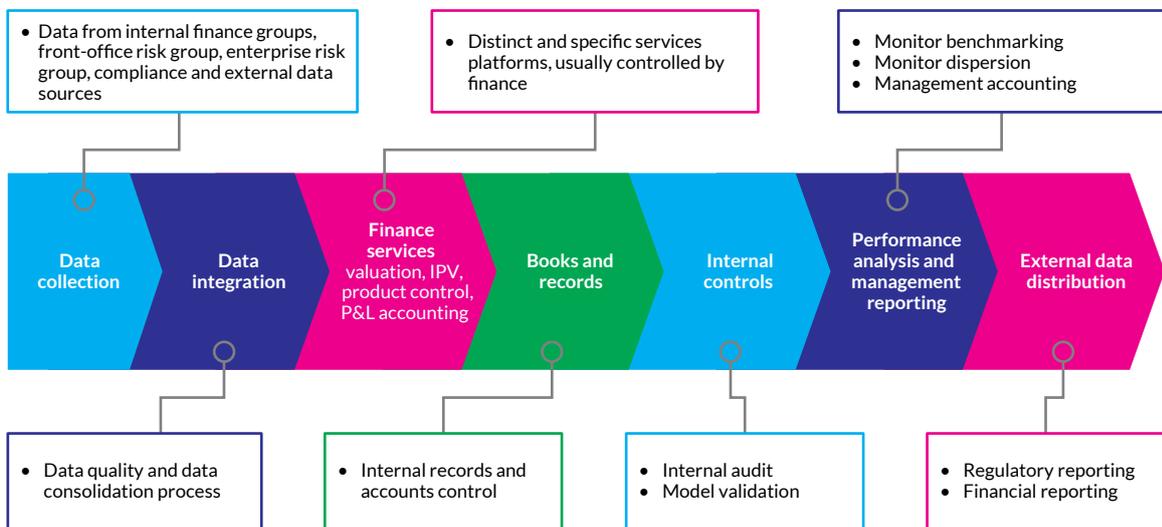
Source: Chartis Research

Figure 6: Data flows across enterprise risk



Source: Chartis Research

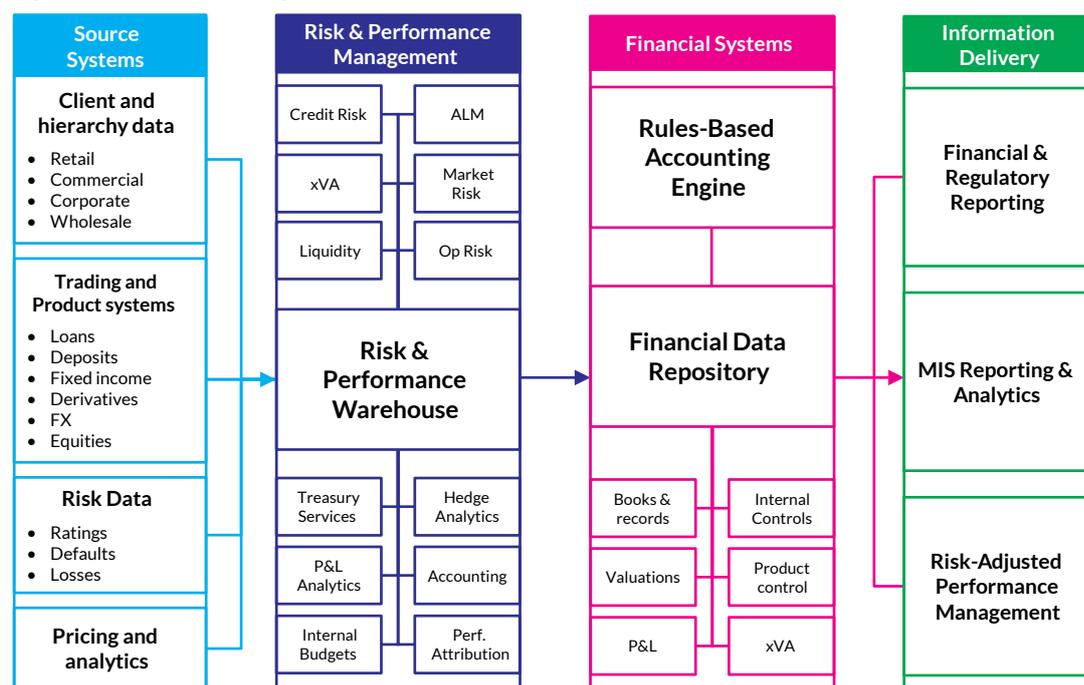
Figure 7: Data flows across finance



Source: Chartis Research

- **Overall RDAR technology architecture.** By considering the data flows addressed above in sequence, from business-focused risk and P&L through enterprise risk to finance, FIs can access their RDAR activities across the entire reporting process. Data on transactions made by the front office is aggregated before being passed to the enterprise risk function, which performs risk analytics on the data set it receives, before sending the resulting data package to finance and reporting so they can produce the required reports (see Figure 8).
- A large proportion of RDAR spending is focused on data aggregating, processing and packaging data so it can be transferred along the reporting process chain. This top-down understanding is crucial to putting the bottom-up data flow in context.

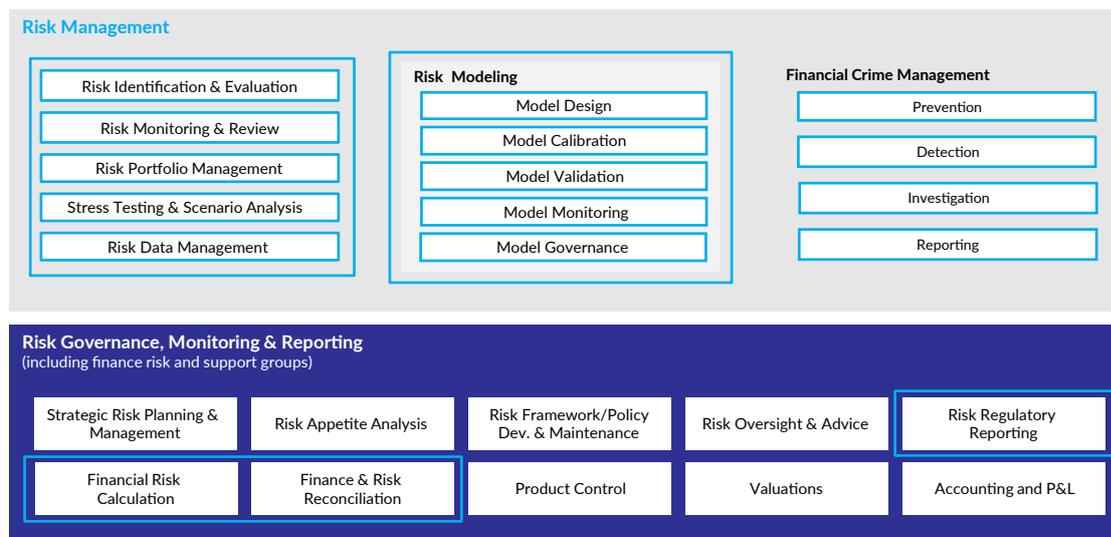
Figure 8: RDAR technology structure



Source: Chartis Research

- Above this RDAR structure sits an **abstract organizational layer** that gives us a further dimension through which we can examine compliance spending (see Figure 9).

Figure 9: The organizational processes and business services supporting RDAR



Source: Chartis Research

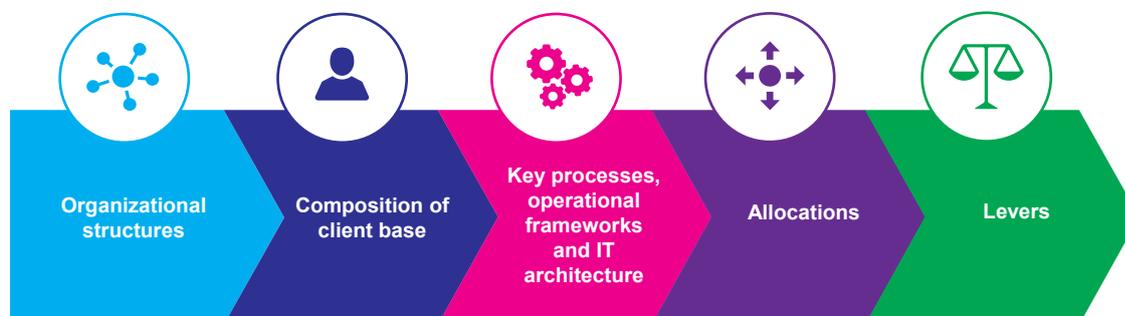
Define focus areas

By clearly identifying the relevant business lines and functional areas we want to cover in the research, we can outline the structure of the research itself. This begins with the value chain, which passes through five stages (see Figure 10):

- **Organizational structures.** The structure within the FI, as well as its business lines. Whether a bank is retail- or wholesale-focused, for example, will be directly relevant.
- **Composition of client base.** The nature and size of the client base. Our observation, based on the institutions analyzed, is that the nature of the client base hugely impacts the IT infrastructure. Those servicing a predominantly brokerage client base, for example, will have a relatively lower cost of RDAR because of their more simplified IT architecture.
- **Key processes.** The detailed processes and architectural components we identified will be covered in the context of three organizational units – Business-aligned risk and P&L, Enterprise risk and Regulatory reporting.
- **Allocations.** Having developed the overall cost model, we will then allocate costs back to the specific operations and processes identified.
- **Levers.** The levers are the mechanisms that institutions can adjust to make changes to their existing organization, technology or people, ultimately changing their overarching cost of RDAR compliance. Levers considered in this study include:
 - Centralized data warehouses vs. decentralized data sources.
 - Availability of Application Programming Interfaces (APIs).
 - Feed-handler environments.

- The variety and diversity of supported reports.
- The utilization of shared services and utilities.

Figure 10: Defining the value chain for RDAR compliance cost



Source: Chartis Research

In addition to these primary inputs, we also used data from the *Chartis Research Global Risk IT (GRIT)* expenditure analysis, to supply cost data for a broad set of FIs, including regional banks, universal banks⁸ and retail-focused banks.

Data collection

Chartis constructed the cost of compliance model using data from four key sources:

- Detailed interviews with senior risk managers across a sample of Tier 1 FIs in North America and Europe. We considered a range of geographical revenue distributions, from FIs heavily concentrated in one region to those with a global presence.

The sample also included FIs with substantially different business-line focusses. Those specializing in asset management and retail banking were well represented, as were universal FIs operating across multiple banking sectors. In most cases Chartis spoke with several individuals within the institution, giving us a broad view of the FI's compliance expenditure. To power our methodology we collected a range of key data items from a variety of FIs, from global Tier 1 institutions to supra-regionals and narrowly focused local firms. In many instances – particularly for the Tier 1 firms interviewed – we had several contacts within the institution, enabling us to develop a broad understanding of the overarching organizational structure.

Interview questions explored the following areas:

- Broad institutional characteristics, such as size and business focus.
- The structure of regulatory reporting platforms – the distribution of technical infrastructure and staff.
- The use of outsourcing, offshoring and utilities in compliance reporting.
- Technical systems' architectures, and the different ways in which structures and components were deployed.

⁸ Including institutions with large brokerage units.

- Detailed survey responses across a sample of FIs with assets ranging from less than €10bn to €250-500bn. The survey focused on the interview areas listed above. In-depth questions about institutional characteristics, technical infrastructure, strategy and operational structures gave us figures from diverse FIs.
- Chartis' *Global Risk IT (GRIT) Expenditure in Financial Services 2017* report. We used data in the report to validate the spending figures we arrived at through the interviews and survey. We also used information from the GRIT report to provide further data points and to extrapolate figures in areas where the data collected proved inadequate to arrive at a sufficiently rigorous model.
- FIs' annual reports. These provided information about revenue distribution by business line and geography that we used to assess correlations between institutional focus, client base and spending on compliance.

RDAR-specific discussions

We asked our sample of FIs a comprehensive set of questions and cross-referenced the answers against the GRIT expenditure database. Questions we asked included the following:

- Which is most important to you from a regulatory reporting technology perspective: accuracy, cost or flexibility?
- Could you broadly outline (to the best of your knowledge) your organization's regulatory reporting architecture?
- What in your view are the main cost drivers?
- What is your perception of utilities?

Key areas of insight included:

- **Organizational definition**, across several dimensions:
 - A high-level functional definition (e.g. retail, capital markets-oriented, universal, etc.).
 - Jurisdictional coverage. Institutions operating in hundreds of jurisdictions, for example, tended to be universal banks with complex organizational processes and substantial regulatory reporting costs.
 - Regulatory focus. An institutional focus on MiFID, for example, tended to create more costs for capital markets-oriented institutions.

We also approximated the FIs' current operational costs and analyzed the structure of their existing regulatory reporting processes.

- **Client base.** One of our assumptions was that the size and nature of an FI's client base has a significant impact on the type and volume of the data passing through the regulatory reporting process. We profiled the clients that FIs service in each of their business lines.

- **Infrastructure.** Key elements of an FI's infrastructure include:
 - Workflow.
 - Aggregation architecture.
 - Supporting operations for workflow and aggregation architecture.
 - Potential use of utilities.
 - Nature of supporting personnel.
 - Availability of external support, either IT support or systems support (via utilities) or outsourcing.
- **Nature of regulatory reporting.** To define and outline the regulatory reporting process we examined key issues such as:
 - The personnel handling the bank's regulatory reporting needs.
 - The level of standardization.
 - The approach to and impact framework for new regulation.
 - Data quality processes and standards.
 - New product approval processes and systems.
 - The overarching data management process.
 - The use of statistical methods⁹ or Artificial Intelligence (AI) to support risk and compliance data management processes, and the potential use of automation.

⁹ Such as factor or cluster analysis.

6. Appendix B: Bibliography

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7. Appendix C: Glossary

Term	Meaning
API	<i>Application Programming Interface</i> . In our definition, a standardized interface that allows programmatic access to data or computational processes, rather than ad-hoc or direct access. A database with an API will have a standardized interface through which an application programmer can request data by changing settings or making a request through a scripting or programming language (such as SQL, R or Python). However, the same data could have been extracted – and exported – in a non-standard mechanism as a file.
BCBS	Basel Committee on Banking Supervision
CECL	Current Expected Credit Loss
FRTB	Fundamental Review of the Trading Book
GRIT	Global Risk IT
MAD	Market Abuse Directive
MAR	Market Abuse Regulation
MiFID II	Revised Market in Financial Instruments Directive
P&L	Profit and Loss
Platform	The platform is the core element of the reporting management framework at the heart of an institution's overarching RDAR process. This framework could include a data warehouse, a data lineage engine, shared services for data quality, and API management capability. But central to any platform is a single operating framework – even though the platform itself may involve several distinct business lines and different applications. For instance, the regulatory reporting 'platform' may transition between finance, risk and shared services but share a common data management structure.
RDAR	Risk Data Aggregation and Regulatory Reporting
SOX	Sarbanes-Oxley Act
Utilities	Utilities may be either internal or external; in our definition, they are applications which centralize a set of processes and create standard interfaces, common data outputs/inputs and a common processing framework, regardless of the nature of reporting or processing required. For the purposes of this study, we focused on external utilities such as AuRep in Austria, which centralizes regulatory reporting from a COREP and FINREP perspective and provides a single window for prudential reporting requirements for all Austrian banks. For the purposes of this study, we treated standardized or centralized internal platforms as 'shared services platforms' rather than utilities.

8. How to use research and services from Chartis

In addition to our flagship industry reports, Chartis also offers customized information and consulting services. Our in-depth knowledge of the risk technology market and best practice allows us to provide high-quality and cost-effective advice to our clients. If you found this report informative and useful, you may be interested in the following services from Chartis.

For risk technology buyers

If you are purchasing risk management software, Chartis's vendor selection service is designed to help you find the most appropriate risk technology solution for your needs.

We monitor the market to identify the strengths and weaknesses of the different risk technology solutions, and track the post-sales performance of companies selling and implementing these systems. Our market intelligence includes key decision criteria such as TCO (total cost of ownership) comparisons and customer satisfaction ratings.

Our research and advisory services cover a range of risk and compliance management topics such as credit risk, market risk, operational risk, GRC, financial crime, liquidity risk, asset and liability management, collateral management, regulatory compliance, risk data aggregation, risk analytics and risk BI.

Our vendor selection services include:

- Buy vs. build decision support
- Business and functional requirements gathering
- Identification of suitable risk and compliance implementation partners
- Review of vendor proposals
- Assessment of vendor presentations and demonstrations
- Definition and execution of Proof-of-Concept (PoC) projects
- Due diligence activities.

For risk technology vendors

Strategy

Chartis can provide specific strategy advice for risk technology vendors and innovators, with a special focus on growth strategy, product direction, go-to-market plans, and more. Some of our specific offerings include:

- Market analysis, including market segmentation, market demands, buyer needs, and competitive forces
- Strategy sessions focused on aligning product and company direction based upon analyst data, research, and market intelligence
- Advice on go-to-market positioning, messaging, and lead generation
- Advice on pricing strategy, alliance strategy, and licensing/pricing models

Thought leadership

Risk technology vendors can also engage Chartis to provide thought leadership on industry trends in the form of in-person speeches and webinars, as well as custom research and thought-leadership reports. Target audiences and objectives range from internal teams to customer and user conferences. Some recent examples include:

- Participation on a 'Panel of Experts' at a global user conference for a leading Global ERM (Enterprise Risk Management) software vendor
- Custom research and thought-leadership paper on Basel 3 and implications for risk technology.
- Webinar on Financial Crime Risk Management
- Internal education of sales team on key regulatory and business trends and engaging C-level decision makers

9. Further reading

- *Counting and Cutting the Cost of Compliance: How to accurately assess the cost of Risk Data Aggregation and Regulatory Reporting*
- *RiskTech100® 2018*
- *Data Integrity and Control Solutions in Financial Services: Market Update 2018*
- *Enterprise GRC Solutions: Market Update 2017*
- *Spotlight: quantifying cyber risk in financial institutions*
- *Risk Data Aggregation & Reporting Solutions 2016*

For all these reports see www.chartis-research.com.