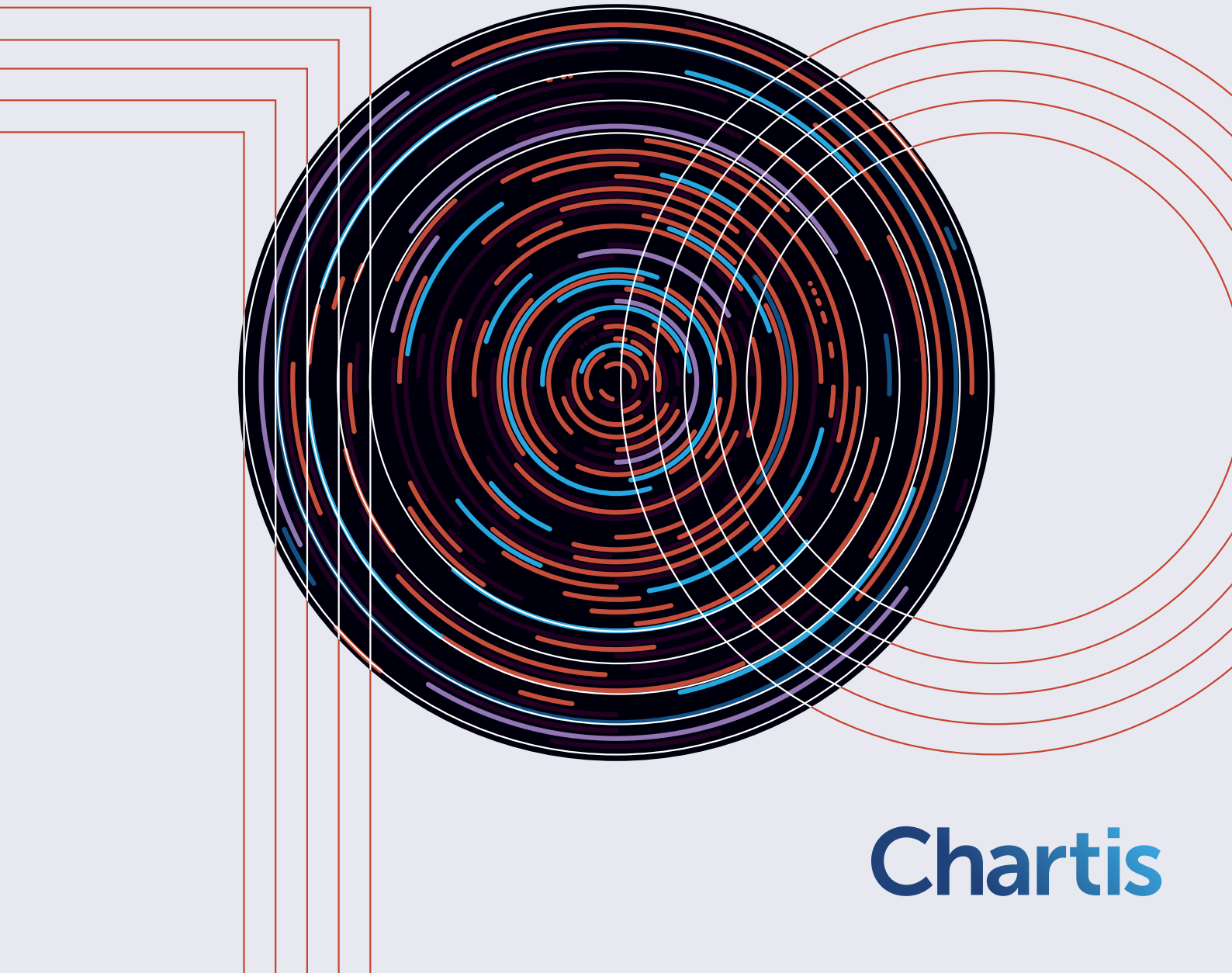
Chartis RiskTech100 2024



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- Operational risk and governance, risk management 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.
- Wealth advisory.
- Asset management.

Chartis focuses on risk and compliance technology, giving it a significant advantage over generic market analysts.

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 developing and implementing risk management systems and programs for Fortune 500 companies and leading consulting firms.

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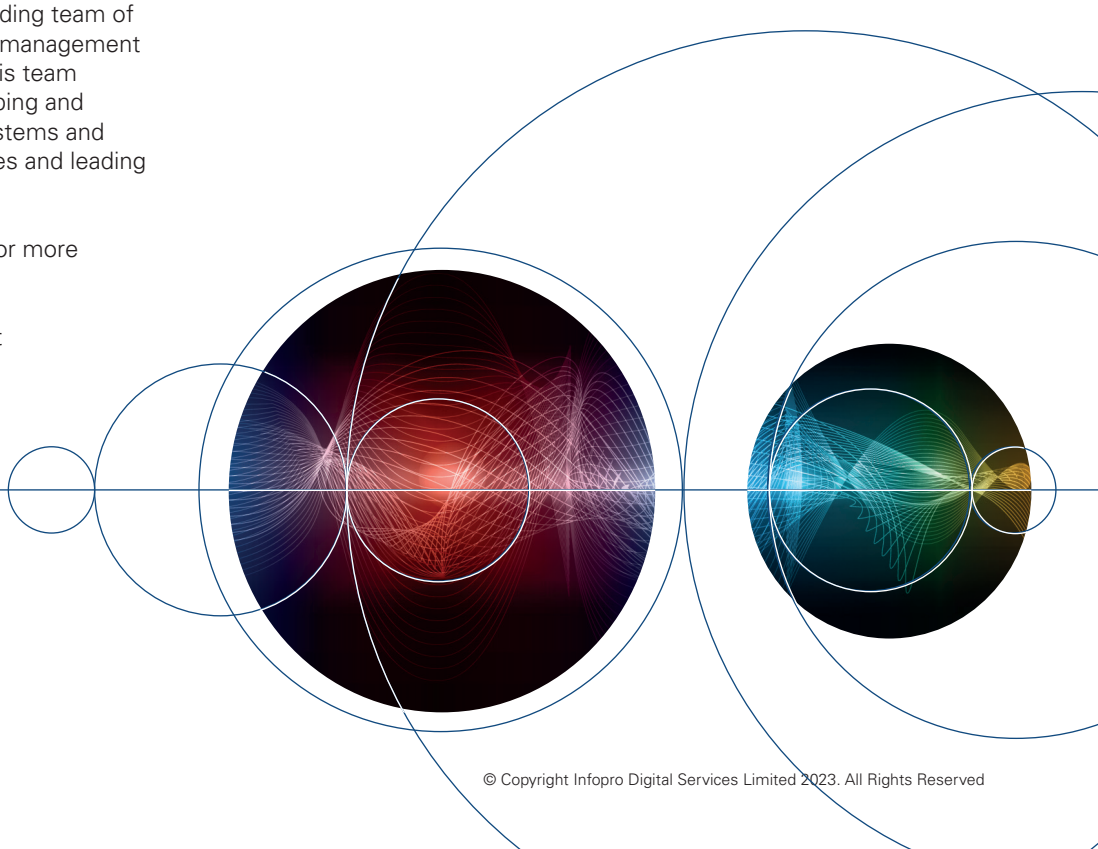

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1. Foreword

Mark Feeley
Global Brand Director

I'm delighted to welcome you to RiskTech100® 2024. The most comprehensive independent study of the world's major players in risk and compliance technology, RiskTech100® is globally acknowledged as the go-to place for clear, accurate analysis of the risk technology marketplace. Together with its accompanying awards, the RiskTech100® ranking provides a valuable assessment and benchmarking tool for all participants in risk technology markets.

This year, change is again on the agenda. As we outline in our featured article, the main themes in the technology landscape recently have been change and choice. While financial firms are enjoying ever more risk technology options, the sheer range available can be confusing. In our article we discuss some of these options, and what they might mean for the future of the landscape. And when we consider changes that are shaping risk and analytics markets, we don't just look at the first-order changes (such as the growth of AI or the cloud), but also the many structural changes occurring in the overarching ecosystem (including the technology foundations and impacts on business structure).

In some ways, the RiskTech100® report itself has changed too (and not just in its color scheme). It now focuses mainly on Chartis' view of the market, and its ongoing research, and how these will guide and shape our future endeavors. And, as always, we highlight the innovation and expertise of the companies that continue to do great things within this space.

Finally, it only remains for me to congratulate all the featured vendors, and to look forward to another vibrant and successful year.

Enjoy the report!

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2. Introduction: 2024 and beyond

Sid Dash
Chief Researcher

For almost 20 years, RiskTech100® has been a lens through which we can examine the risk technology landscape and ecosystem. As always, it seeks to capture and analyze trends and dynamics in the evolution of risk management technology across a variety of institutions. Capturing all of the many themes and sub-themes in the market is a challenge. But the goal of this ranking report, and our follow-up in-depth research, is always to accurately reflect how the development and consumption of technology has been changing.

In some ways, the broad, overarching themes that have shaped RiskTech100® 2024 – and which we explore in our research and summarize in this report – are the consequences of digitization. This major trend has catalyzed several key structural developments in risk technology implementation by:

- Opening a new chapter on governance and control.
- Increasing the commoditization and standardization of data-parallel programming.
- Allowing more granular process control and access to operational data.
- Enabling the continued expansion of database and data management options, and an increasingly multi-lingual programming environment.

And, of course, it has enabled the rapid and wide availability of 'industrialized' artificial intelligence (AI), which has made several technologies and development environments more available (and familiar).

These supply-side trends and dynamics have been evolving for many years and, as our readers will recognize, have been a significant focus of our research for some time. Crucially, we believe that the confluence of these themes we are seeing today has become entrenched, and that these intersecting trends are now truly mature.

Technology has driven the evolving supply side, but equally powerful forces have been at work on the demand side too: structural shifts in credit markets, the broadening of analytics styles, volatility in interest rates and the macroeconomic environment, and the overall regulatory response to these changes. These have been creating their own shifts in the risk technology landscape. Increasingly, we believe that regulators will react to the restructured credit markets (and other market changes) by heightening regulatory and disclosure requirements, and possibly even providing access to central bank liquidity for non-banking institutions.

Meanwhile, the drive toward net zero (and the restructuring of energy markets) will have major consequences for all markets and the operational components of all organizations. Combined with a heightened focus from regulators on financial institutions' operational frameworks, the continuing expansion of the risk and regulatory ecosystem will pose important structural questions for financial institutions. Chartis – as it always does – aims to answer them.

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3. Overview

The companies in RiskTech100® are drawn from a range of risk technology specialisms, and meet the needs of financial and non-financial organizations. They share a number of qualities that rank them among the top 100 risk technology providers in the world.

We determine our rankings based on the classifications shown in Figure 1 on the next page, and focus on solutions, industry segments and success factors.[1]

Note that the RiskTech100® report only includes companies that sell their own risk management software products and solutions.

RiskTech100 2024®: highlights

Moody's remained in the number 1 spot, while SAS rose one place into second, and Murex and Adenza moved into the top 10.

There were **19 new entrants** this year:

- TCS (ranked 29)
- KPMG (46)
- CRISIL (49)
- Fintellix (50)
- EY-Nexus (54)
- SIX (56)
- Provenir (61)
- Oxane Partners (72)
- MatLogica (74)
- ZE (75)
- Fusion (77)
- Scila (82)
- ActiveViam (84)
- Tookitaki (88)
- Global Valuation (91)
- Xapien (94)
- Topaz (95)
- Encompass (98)
- MyComplianceOffice (100)

24 firms **rose** in the rankings **by 5 places or more**:

- Diligent moved up 29 places, from 92 to 63.
- Featurespace moved up 26 places, from 94 to 68.
- ServiceNow moved up 15 places, from 37 to 22.
- Integro moved up 15 places, from 80 to 65.
- Feedzai moved up 13 places, from 48 to 35.
- Archer moved up 13 places, from 57 to 44.
- zeb moved up 13 places, from 99 to 86.
- QRM moved up 12 places, from 53 to 41.
- PwC moved up 11 places, from 39 to 28.
- RiskSpan moved up 11 places, from 62 to 51.
- Ripjar moved up 10 places, from 72 to 62.
- Azentio moved up 9 places, from 66 to 57.
- CubeLogic moved up 9 places, from 75 to 66.
- SAP moved up 7 places, from 46 to 39.
- ICE moved up 6 places, from 32 to 26.
- Regnology moved up 6 places, from 33 to 27.
- MathWorks moved up 6 places, from 70 to 64.
- Surya moved up 6 places, from 76 to 70.
- BCT Digital, Bahwan CyberTek Group moved up 6 places, from 77 to 71.
- RiskScreen moved up 6 places, from 85 to 79.
- Camms moved up 6 places, from 86 to 80.
- Quantifi moved up 5 places, from 36 to 31.
- Abrigo moved up 5 places, from 41 to 36.
- Appian moved up 5 places, from 50 to 45.

[1] *Note that some categories in energy and quantitative methods are now covered in our Energy50 and STORM rankings and analysis.*

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Figure 1: RiskTech100® 2024 taxonomy

Source: Chartis Research

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4. Context: Spoiled for choice? Picking the right risk management solution

A combination of structural and other factors is throwing open the technology landscape and presenting users and vendors with a glut of options to choose from. For many firms, this new tech diversity may be too much to cope with, but choosing the right strategy is now more important – and challenging – than ever.

Option overload: making sense of a changing tech landscape

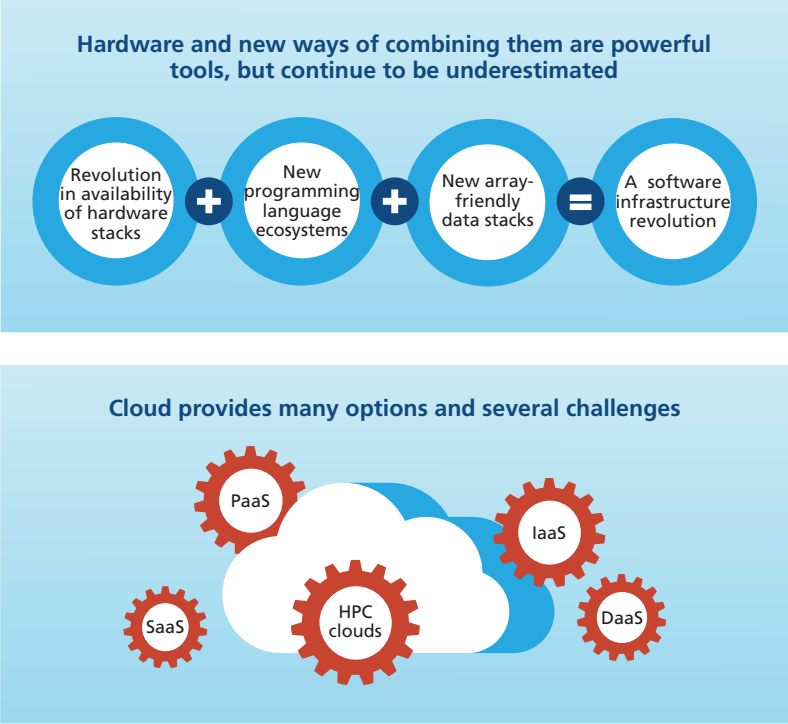
The history of risk management software has been characterized by a relative dearth of suitable technology, and a misalignment of available technologies with firms' algorithmic and data requirements. With some notable exceptions, risk management analytics (and all related areas of technology) are oriented strongly toward data-parallel algorithms and array-oriented data management frameworks. But the technology available to firms has rarely aligned with these broad structural requirements.

Specialist platforms have always been available, of course, and array-oriented software and tools have been standard for some time in some industries (such as healthcare). And many niche tools have provided appropriate capabilities for areas of financial analytics that could not operate without these options.

More recently, however, a combination of factors – overarching structural change, the emergence of enabling technologies in risk management, and the maturation of other key technologies – is creating a vast and varied set of options and choices. We have moved from a broad technological perspective with relatively few choices to a glut of possibilities (see Figure 2).

But varied as they may be, these options can be as confusing as the vast array of products on display on supermarket shelves. There are even many and varied options in each technology sub-segment. In this article, a precursor to a more in-depth analysis, we examine the various options available in all major areas of technological change, and what firms should consider as they peruse the shelves and attempt to decide the options that are best for them.

Figure 2: The technology ecosystem now has multiple options



Source: Chartis Research

What's changed, and what does it mean?

In the past several years, changes in four main areas have altered the way that risk management systems are built:

- Artificial intelligence (AI) and associated techniques (including machine learning [ML], natural language processing [NLP] and, more broadly, heuristics).
- The cloud ecosystem (including grid on the cloud).
- Open-source ecosystems.
- Data, including:

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- Architectures.
- Databases and data management infrastructure.
- Data-parallel hardware and programming.
- The expanded commercial universe.

These changes have helped to trigger a huge increase in the technological options available.

Besides an overwhelming range of technological changes, in the past decade we have also seen deep and significant changes in market structure and the organization of financial intermediaries. (The structural changes in credit intermediation, for example, provide hints as to the enormous diversification that has occurred among intermediaries.)

Finally, alongside this has been an equally dramatic, and related, growth in the range of commercial and institutional architectures now in use. This diversity is also increasing exponentially in many other areas, each of which is becoming a complete 'universe' in itself – and each of which will require detailed exploration and a proper understanding.

Over the past few years we have established that for most market participants, this diversity in many areas – compared with the reasonably broad technology options previously available – often gives them more choice than they care to evaluate.

Developers of risk management solutions must now closely examine the options they have for databases, and in particular vector and array databases. Equally, they need to examine their hardware environment to determine their acceleration options and data-parallel programming style. For both users and suppliers of risk technology, the act of choosing the right strategy (and its analytical and data components) is more challenging – and pertinent – than ever before.

To help with these decisions, we provide – both here and in future reports – a high-level overview of different commercial and distribution options and consumption trends. We examine some of the options available in each of these areas and argue that, regardless of the nature of the business or specific analytical methodology employed, careful examination of the available options is critical.

Exploring the four areas of change, and their implications

AI: more use, more questions

The term 'artificial intelligence' covers a wide range of statistical techniques, and there is still considerable disagreement about which actually qualify as 'AI'. AI tools are used extensively in financial services (in a broad range of areas, but with data and data management being the main drivers), creating demand for specific hardware. The most recent AI techniques (such as generative AI) have fueled demand for a shift in data architecture, and specifically the requirement for array or vector databases.

In any case, ideal environments for ML-type models feature a data-parallel framework (employing both computational and data infrastructures), the most powerful of which is the graphics processing unit (GPU). But despite the seemingly easy fit between original AI algorithms and GPUs, many ML models employ a different form of data parallelism. Some alternative AI stacks use field-programmable gate arrays (FPGAs) as a computational core, allowing developers to custom design their data-parallel frameworks.

The general adoption of AI, and generative AI in particular, is having a deep impact on the underlying technology superstructure (such as data, hardware adoption and cloud and cloud infrastructure). As far as the risk management ecosystem is concerned, this may be even more consequential than the impact on risk models and methodologies.

The grid, the cloud and managed services: interlinked but distinct

At a conceptual level, grids, the cloud and managed services transform and change the way that firms consume compute and data services, by abstracting, distributing or blending computational services with operational support.

In some ways, the most important transformation in the risk management environment in the past decade has been the emergence of grid computing on the cloud. Historically, much attention has been paid to 'shared-nothing' grids, which are relatively easy to assemble. However, many institutions that are running all their grids on-premise have faced limits to how much they can easily scale them in the short term. As a result,

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they have expended considerable effort attempting to harden grids, build optimal grid architectures, or ensure that the peculiarities of grid demand are taken into account during software design.

Grid demand could, for example, experience low utilization throughout the day, but high utilization at very specific points – and this could overwhelm the communication infrastructure. Consequently, certain grids may use special-purpose interconnects to enable high data transmission during periods of significant demand for particular goods or resources.

Design decisions

Grid design has been a significant dimension of more sophisticated risk systems and has often been viewed as a competitive advantage for risk management frameworks. In some ways, the design of grids has become less particular, focused and structured, because vendors can spin up new nodes on demand. Longer-term, however, this can leave them economically exposed. In practice, the continually falling cost of computational power has allowed firms that may or may not have the most optimally designed grid architecture to deliver their analytics at a reasonable scale with the key elements of timing, scalability and speed. They can also avoid worrying too much about the deep internal components involved, or the optimal computing environment they require.

Chartis believes that while this period of grid development will never truly end, anyone who wants to spin up new resources on a cloud will continue to be able to do so quickly, and this will remain an important variable in the future. However, we also believe that firms should pay attention to key design issues, because over the long term costs will mount, impacting operating margins.

Open source ecosystems: flexible and powerful

The open-source software ecosystem is now so varied that firms and users require separate tools to keep track of the range and variety of open-source projects now available (more than a million projects, by some measure). In our view, while it is now increasingly possible to use open-source stacks in every aspect of the risk management ecosystem, the real opportunity exists in leveraging open-source frameworks as benchmarks, and as the basis of more complex build-outs.

Open-source software can offer other competitive benefits for firms – its flexibility allows users to rapidly develop highly customized, institution-specific solutions. Here, the innovation is in accommodating institutions' specific needs (such as requirements around trust and security, scale, the mix of asset classes, and so on).

This potential for customization by internal developers who best understand an institution's particular requirements helps to facilitate shorter implementation timelines, while making it easier for firms to tailor the solution to their exact needs. Rather than waiting for a vendor to respond to market demand and move to production, IT leaders in capital markets divisions can quickly identify avenues for advancement and start to construct systems that are optimized to exploit these opportunities within a specific institutional context. Equally, for vendors, the ability to scale and provide flexibility in non-standard ways is critical.

The data dimension

Shifting data architectures and the problem of plenty

The architecture and economics of the enterprise compute layer based on public, private, hybrid or special-purpose data centers is now being examined far more closely than ever before, and again – as with all parts of the technology ecosystem – there is a bewildering array of options.

Public clouds from a variety of hyperscalers are strong components, but not the only option. Even when a software developer (a vendor or an institution) selects a public cloud, there are many alternatives – including the extent to which they adopt the cloud provider's tech stack.

However, special-purpose data centers are making something of a comeback (in many ways they never went away). In contexts where data interchange is critical, or the data is exchanged between operating infrastructure and cloud/remote-service infrastructure (such as manufacturing, certain types of trading and energy systems), special-purpose data centers are strong contenders. Moreover, institutions are (or certainly should be) closely examining the economics of architectural choices on the cloud.

Structural bottlenecks

While analytical models more often than not demand data in vector or array formats, relational databases serve up data in a relational format, which can then be translated into an array or vector structure in-memory and served up to a specific analytical application. But this creates structural

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bottlenecks – and for many of the historical risk management systems built in the 1990s and early 2000s, overcoming these was a critical variable. How a system managed the transition between relational and analytical infrastructure determined its speed, performance and scalability.

Several special purpose-built array databases have been designed to handle specific time series throughout the financial services space, despite not being optimal for other types of time series. Slowly, however, we have started to see an emergence of more general-purpose vector and array databases. As new applications (such as geological or geospatial systems) have become more important, or now support ML and NLP frameworks, the range of available array-oriented databases is now much broader (see Figure 3).

And while most of these array databases were built to handle specific business and technological niches, there was some (albeit limited) cross-leverage (borrowing from healthcare, for example). Certain systems developed highly scalable array databases oriented around large complex datasets.

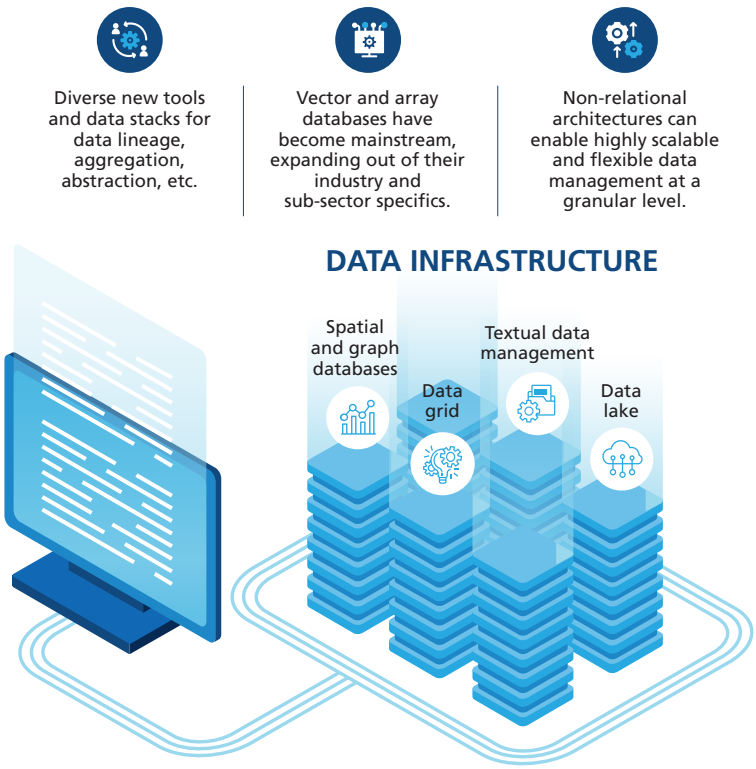
Array and vector databases go mainstream

We have seen a huge increase in the number of vector databases in recent years. General-purpose vector databases have been rapidly evolving and new tools to build on them are emerging. This shift has been heavily influenced by the development of large language models (LLMs). Nevertheless, this huge growth disguises several structural problems.

Different types of array structures are optimal in specific contexts, which means that two array databases may not exactly fulfill the same programming requirements. In this context it's important to understand several things: the nature of the array framework that has been enabled, if and how matrix management has been enabled, and the specific nature of the array optimizations that have been enabled within the database. Without a clear understanding of this, firms will likely develop implementations of the vector database that are sub-optimal.

The evolution and more widespread understanding of vector frameworks for data is one of the more powerful dynamics that we believe provides an enabling environment for risk management applications going forward. It enables programmers to build and optimize array-oriented structures that are specific to their needs and business contexts.

Figure 3: The range of available database and data management options has broadened dramatically



Source: Chartis Research

While the drivers for this development have been applications in other areas (such as data management, chatbots and games), users of risk management applications can use these to understand (and where appropriate) exploit the strengths, weaknesses and variation offered by the widespread universalization of vector capabilities.

The increased standardization and industrialization of vector databases is both a vindication and a challenge for specialized pioneers in this space. Nevertheless, this phenomenon opens up new avenues and rapid development options for vendors and financial institutions. The widespread use of LLMs is driving a broader adoption and availability of GPUs generally and vector databases specifically, giving developers of risk systems new and broader options.

Data-parallel programming: market momentum

The story here is similar. Several approaches that once focused on specific niches are now part of the mainstream programming ecosystem. Nevertheless, too many market participants seem to underplay – or do not even consider – the long history of data-parallel approaches and available frameworks and tools.

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The widespread availability of vector capabilities also means that they are natural maps for GPUs. Consequently, we believe that data-parallel programming will give risk management systems considerable momentum, power and scalability in the long term (Figures 4 and 5).

But while data-parallel programming for many is currently synonymous with GPUs, this is not necessarily accurate. GPUs represent one style of data-parallel programming. There are in fact several different and distinct contexts in which data-parallel hardware can operate:

- GPUs.
- A combination of CPU plus GPU.
- FPGAs, with which users can – in essence – build a custom data-parallel architecture.

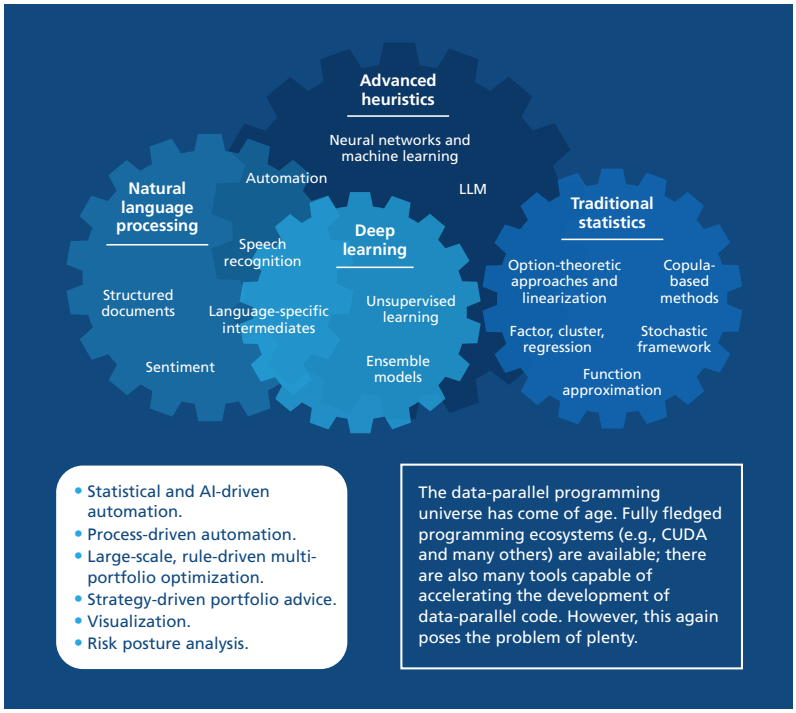
The GPU style of data-parallel programming has become the dominant option, partly because there is a very large industry outside finance that supports GPUs – namely gaming. The CUDA ecosystem has proved to be immensely popular and – despite the alternatives – has helped to build a complete software ecosystem that has driven the industrialization of data-parallel programming.

The expanded universe of commercial data

Commercial data is often closely connected with market data (the prices of bonds, securities, equities and derivatives). However, the universe of commercial data is actually far broader (see Figure 6), and includes illiquid transactions, such as real estate, physical commodities and logistics markets (which in themselves are substantially larger than the market for securities). This is alongside other types of dataset, such as entity data (enriched and otherwise), energy and commodities data, physical and spatial data, and operational datasets (which cover a very broad universe and can include everything from balance sheet data to data about firms' warehouse holdings).

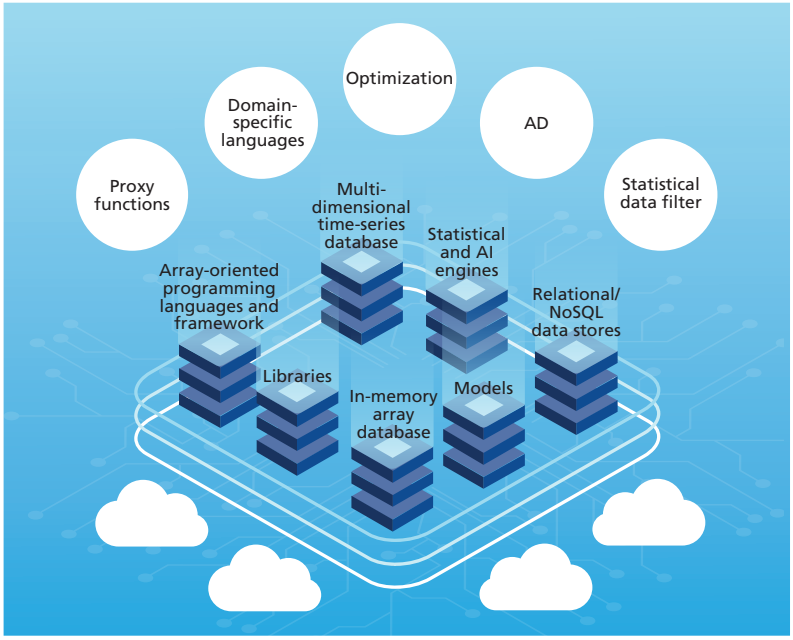
Commercial data is an increasingly critical component of decision-making across institutions, and not just in trading units, Indeed, it is important for many firms that lack any significant trading businesses, and increasingly important for non-finance firms.

Figure 4: A wide array of data-parallel programming accelerators and pull factors



Source: Chartis Research

Figure 5: Enabling tools for parallel programming come in many flavors



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The expansion of commercial data includes what is commonly referred to as 'alternative data', and this is complicated by a mixed assortment of firms and data types (by some counts there are more than 4,000 alternative data firms in the market).

Our core observation, however, is that not only is a broad set of firms looking to leverage this opportunity, a very broad set of providers with varying visualization, quantification, enrichment and delivery models is providing these data services. As we have noted before, the expansion in available and distributed data has had a complex and relatively virtuous relationship with the growth in analytics.

This shift has been reflected in our RiskTech100 across the years, as we have deepened our analysis of the data-provision landscape and its associated analytics and enriched datasets.

Credit considerations

Credit data is a large and complex ecosystem, and within that universe, there is a significant and growing market for loans and loan data (see Figures 7 and 8). This market has expanded further as International Financial Reporting Standard (IFRS) 9 and Current Expected Credit Losses (CECL) have forced financial institutions to increase their disclosure requirements, calculate a significant set of loan portfolio values and more effectively run their loan books. As credit intermediation is increasingly managed by a broader range of institutions (as seen in the growth of private credit/direct lending, etc.), we will see data needs broaden.

As the range and variety of credit intermediaries broadens, and the nature of intermediation continues to transform, we will continue to see growth in demand for credit data. Some specific types of credit data (such as commercial real estate) may experience short-term demand volatility; broadly, however, we see secular and long-term growth.

Other drivers of the expanding universe of credit data include the growing importance of credit issues in non-traditional areas (such as the supply chains of non-financial companies) and the counterparty risk challenges facing energy firms.

Factors driving the rapidly growing credit data ecosystem include the datasets (and often complex derived data) required for various credit monitoring and control activities, such as early-warning systems, credit portfolio management, limit management and collateral management.

Figure 6: The rapidly growing universe of commercial data

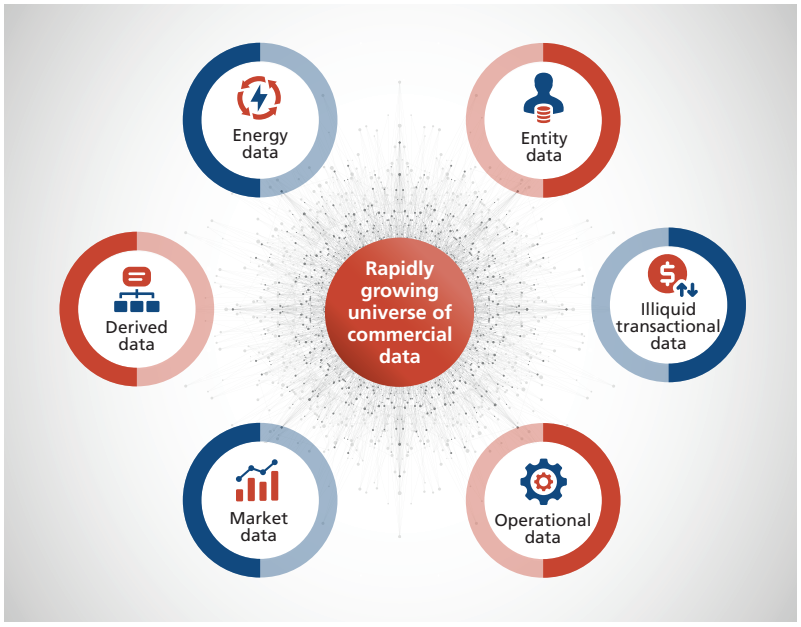

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Figure 7: The ongoing transformation of the architecture of lending and credit risk

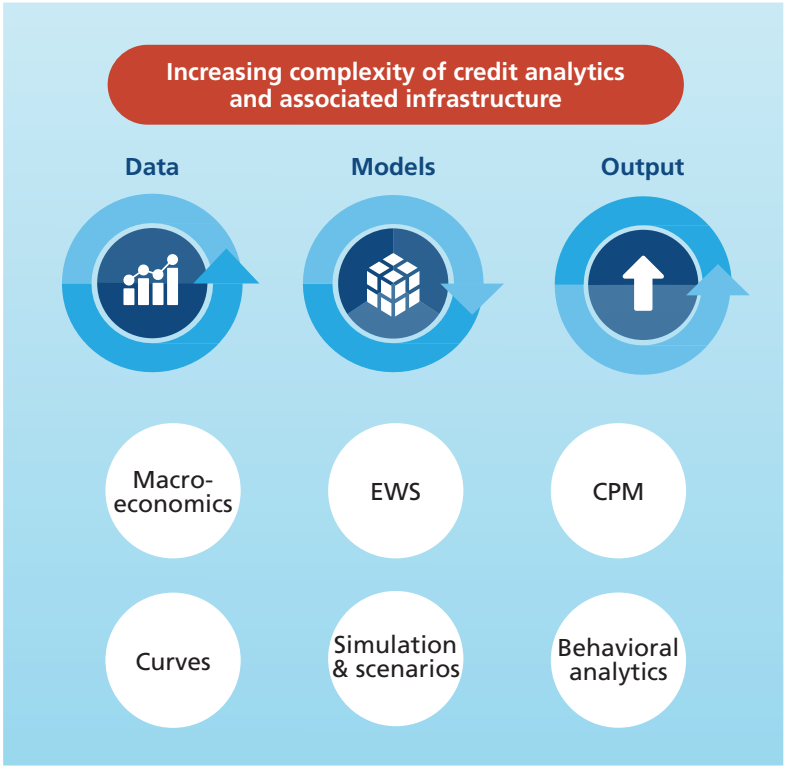

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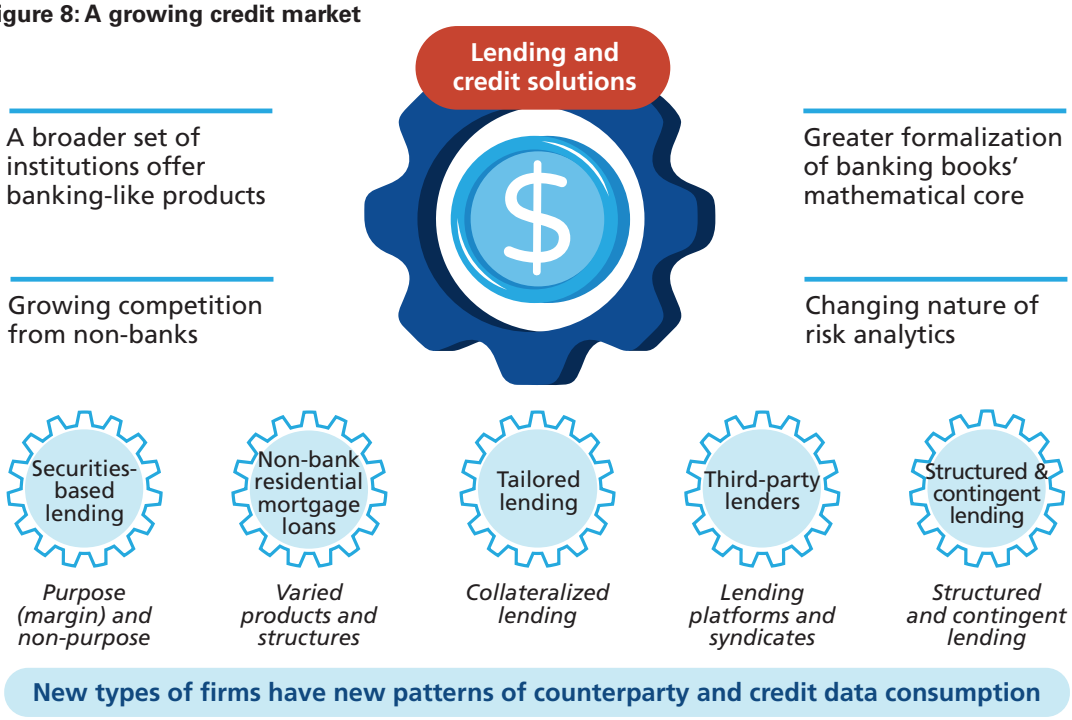
Figure 8: A growing credit market



Source: Chartis Research

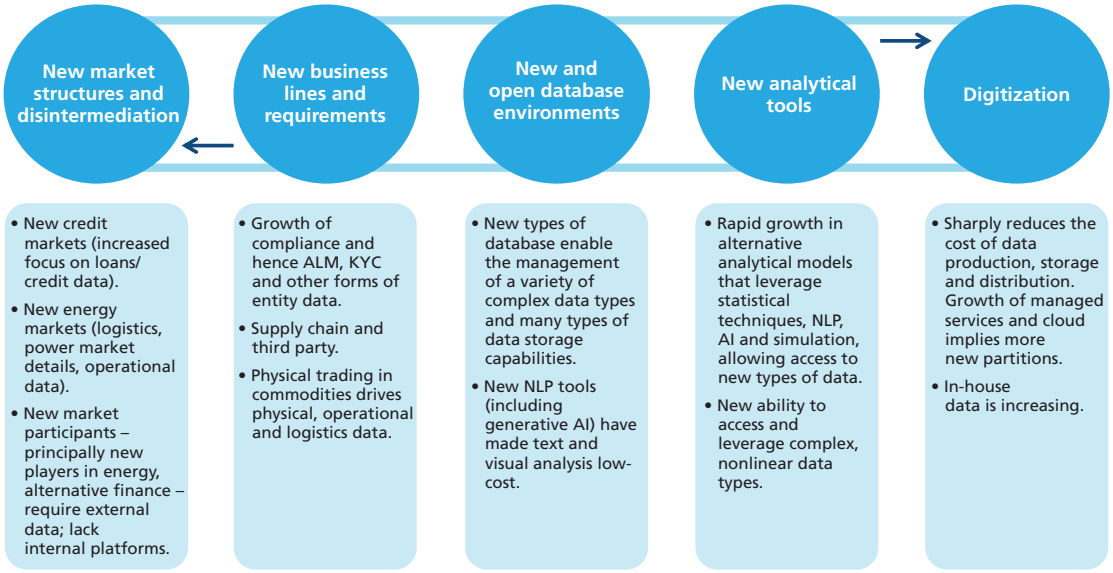
Credit risk models are becoming increasingly formal and structured, requiring a supporting infrastructure of formal behavioral models (including retail client aggregation frameworks, prepayment analytics, simulation engines, scenario and stress testing capabilities, obligor curve management and credit data management capabilities).

Finally, beyond transactional liquid or illiquid data, there is a significant market for data in areas such as energy, operational risk, environmental, social and governance (ESG), climate risk and cyber risk. Equally, there is a very large market for entity data, the biggest users of which tend to be in the compliance environment. But there are also strong overlaps among entity data consumers within credit, particularly in the retail sector.

Transformation and expansion

What's driving this growth and transformation? First, new types of analytics are enabling new types of data to be published and commercialized (see Figure 9). In some ways it is a virtuous cycle in which the availability of new types of data enables new analytics, and vice versa.

Figure 9: Commercial data, and why the landscape is changing



Source: Chartis Research

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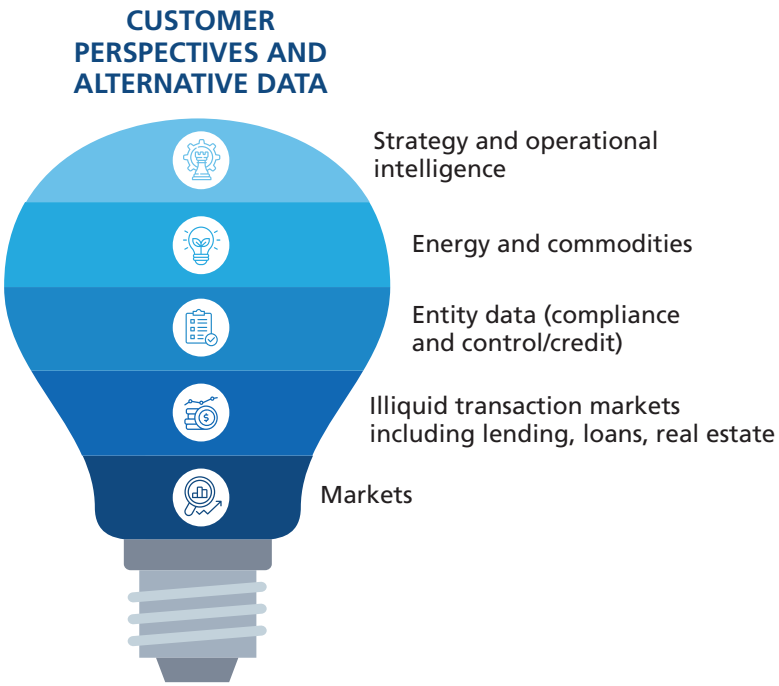
In addition, new regulations and institutional types have become more important. Together, these parameters have sharpened the overarching focus on the expanded universe of commercial data.

This universe of data – and particularly credit and operational data – has been expanding rapidly (see Figures 10 and 11), driven by both supply forces (digitization allows easier-to-access and valuable operational data, for example) and demand ones (such as new types of analytics). As organizations continue to think about analytics in new ways (including cyber risk quantification, incorporating alternative data into credit and enhanced fraud analytics, and a focus on entity-centric ways of thinking about individuals and firms), companies will need new streams of both standard and aggregated data.[1]

Figure 10: Explosive growth of the data ecosystem



Source: Chartis Research

Figure 11: Analytical techniques as a driver

Source: Chartis Research

[1] *This article is a preview of a longer, more detailed supplement due from Chartis Research.*

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5. Chartis' research: Key highlights

This section summarizes some of the research that Chartis has published since the last iteration of RiskTech100®.[2]

Enterprise fraud

In a market still largely characterized by the large, complex frauds occurring in investment banking, financial institutions and vendors are developing technological capabilities to address an ever-evolving landscape of fraud. As regulators focus on the importance of model risk management, firms and vendors are having to integrate, test and explain more complex models, and deal with challenges around the vast quantities of data they must now analyze and interpret. The increasing 'commodification' of AI, in the form of consumer-friendly apps such as ChatGPT, could trigger a new wave of fraud as criminals adopt these powerful tools.

Meanwhile, the increasing speed with which companies and individuals can carry out payments is creating more opportunities for criminals to act faster than some fraud systems can handle. Many firms are beginning to realize that the cloud's benefits – scalability, flexibility and security – must be balanced with their own specific requirements. These dynamics are generating several themes in the vendor landscape, as technology providers address specificity, scale and connectivity, while also focusing more attention on model agility, analytics and multi-channel capabilities.

Entity management and analytics

As financial institutions tighten up their enterprise risk management, sanctions and anti-money laundering (AML) risks have emerged in unexpected places. Consequently, firms are beginning to take a more holistic view of intersecting operational and other risks and are starting to develop an integrated approach, commissioning and adapting platforms to create more effective FinCrime risk and compliance programs. But to improve their detection of money-laundering exposure, firms will need new tools, including specialist entity data and digital identity indicators.

The need for broader, more efficient product offerings has encouraged vendors to adopt entity management and analytics systems, although relatively few have deployed entity management and analytics capabilities across their workflows. Fortunately for many vendors, the diversity of data, workflows and decisions that financial institutions require has created a range of exploitable artificial intelligence (AI)-related opportunities that provide a variety of niches for interested companies.

Identity verification solutions

Firms increasingly view the detection and verification of identity as vital in the successful mitigation of risk. Identity verification (IDV) solutions are crucial for filtering out fraud early on, and for addressing vulnerabilities that have become exposed in organizations, such as document manipulation, copy recognition and incompatible data. Several market, regulatory and technology dynamics are helping to enable financial firms and vendors to find a balance between risk, compliance and user experience. While IDV was often a slow and manual process, leading to long waiting times for customers and an increased risk of fraud, solutions can now automate the IDV process, making it much faster and more accurate.

But when choosing an IDV solution, firms must also consider the complexity of the data, as well as a solution's accuracy and geographic coverage. The best solution for a particular business or individual will depend on their specific needs. Given that IDV can be subject to many nuances and regulatory requirements, vendors are increasingly partnering with each other to offer customers a more comprehensive and reliable service. To meet the challenges of the evolving IDV landscape, vendors must also keep the end user in mind, ensuring that their solutions are easy to use and provide a positive customer experience.

Payment risk

The landscape for payments is becoming more complex, as the number of alternatives grows. Firms must now support more protocols and regional geographies, and increasingly at scale as the infrastructure becomes disaggregated.

[2] *Note that the text in this section is taken from published reports, and therefore reflects Chartis' analysis and viewpoints at the time.*

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Ongoing payment risks not only include standard fraud and anti-money laundering (AML) risks, but also those emerging from firms' interactions with many third parties, as they – in effect – outsource much of their operational risk.

Currently, three macro themes are evident in the payments landscape:

- Shifts in payment architectures.
- The widening of payment protocols.
- An increasing focus on software integration into the payment stack.

Core payment protocols and elements of the process differ by region or jurisdiction, making software integration within the payment stack increasingly common and also shaping the way that firms integrate software into the stack itself.

Trade surveillance for equities

Developments in equity trade surveillance technology are being driven largely by the increasing availability of data. As new data sources emerge and data collection tools proliferate, financial institutions now have access to vast amounts of data they can use to detect and prevent potential trading misconduct. As a result, solutions are becoming increasingly sophisticated, and can now identify patterns and anomalies in real time. Challenges, however, lie in huge quantities of data, complex market structures and the growing need for real-time analysis. To address them, solutions are being developed with key areas of focus, including real-time data ingest capabilities and a focus on time-series data.

For vendors, key dynamics include the growing importance of speed and scalability for trade reconstruction and other capabilities, new ways to execute and integrate functionality, and the growing importance of infrastructure and processing capability in institutions' systems. And crucially, while the equity trade surveillance marketplace is characterized by several established players and remains relatively static, there is a slow movement toward demand for more flexibility within the space.

Collateral management for capital markets

Several broad themes are shaping the current market for collateral management systems. In volatile markets, the uncontrolled deterioration of collateral can spread rapid contagion, so regulators want a more complete view of collateral usage. Many firms are reviewing their collateral management processes, not only to meet regulations but also because leveraging collateral revenue possibilities can contribute to investment returns. Collateral can open avenues for strategic trades that maximize investment profits with well-analyzed and designed funding channels.

To realize the revenue and cost benefits that can be achieved by organizing collateral at the enterprise level, financial institutions and investment managers are implementing solutions that can handle greater volumes and allocate collateral with auditable location tracking for recalls/substitutions when necessary. Competition among vendors to offer a full, optimized solution is transforming the landscape. Vendor offerings range from specialty point solutions that target specific collateral issues (such as initial margin, variation margin or tri-party repo) to integrated collateral management solutions with portfolio management applications.

ESG data and scoring

The increasing need to align investments to environmental, social and governance (ESG) regulatory reporting requirements and sustainability preferences among investors is likely to spur demand for ESG-aligned investment strategies – and ESG data and scoring products. ESG has expanded from the core equity picture across asset classes, including into several fixed-income categories and assets such as real estate, leading investors to consider more carefully how to integrate ESG metrics across asset classes. Different materiality factors are driving ESG analysis in different asset classes, and ESG investment strategists are looking at ESG factors with greater specificity, as vendors align their strategies accordingly.

A full ecosystem of solutions has grown around the sustainable investment management lifecycle, including investor suitability checks and questionnaires, ESG investment consensus ratings, ESG market risk solutions, ESG factors, managed ESG reference data services

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and composite ESG scoring engines. Data management is becoming an increasingly important consideration, as asset managers attempt to build data platforms by combining best-of-breed components from multiple vendors, which are beginning to incorporate data management and data science capabilities to enhance their solutions' comprehensiveness.

Order execution management systems

Although order management systems (OMSs) and execution management systems (EMSs) have specialized features, merging them into the order execution management systems (OEMSs) category aligns with the evolution of the investment management lifecycle and the cross-functionality between the sell-side and the buy-side, and better addresses modern investment management trading requirements. Integration across portfolio management systems (PMSs), OMSs, EMSs and interoperable service modules helps managers improve efficiency and control system costs.

Investment managers are also eyeing trade desk outsourcing as an alternative that offers a more dynamic and agile front-to-back technology platform. Moreover, as the number of merger and acquisition deals grows, so too does the need to have a more dynamic and agile technology stack that can allow disparate regional and remote teams to swap in and out of virtualized interoperable microservice containers, within a cloud-native infrastructure.

Digitalization and control

The digitalization of finance and the financial components of corporations has transformed enterprises' exposure to information risk and led to the introduction of new control strategies to mitigate that risk. The digitalization of business information, along with the transformation of workflows to digital environments, has made firms more able to track and mitigate information-related risks. But companies are now more exposed to threats of information dissemination, unauthorized access and unauthorized use, from both internal and external sources.

Governance, risk management and compliance (GRC) vendors have attempted to address these risks by applying controls across various business workflows and employing statistical (and machine learning [ML]/deep learning) techniques. In addition, such tools and techniques as workflow languages, natural language processing (NLP) technologies and easily accessible AI tools are increasingly available, transparent and designed for general-purpose use. Consequently, digitalization and controls are distinct yet intersecting movements within GRC.

GRC for energy

Demand for governance, risk management and compliance (GRC) systems for energy organizations has grown dramatically in recent years. The increased digitalization of the energy ecosystem, and greater interaction between the physical and digital worlds, has completely transformed the risk profile of energy firms and created new complexities for them, some of which are unfamiliar.

The key challenge in the energy sector, however, is not necessarily new types of risk, but ensuring the reliability and stability of physical systems. Central to the availability of GRC systems for the energy ecosystem is the interaction between physical platforms (networks, pipes, production systems, etc.) and digital/software environments – alongside the need to control the risk management requirements it necessitates.

Model risk management

Chartis splits model risk management (MRM) into validation and governance solutions, to reflect the different types of vendor functionality in the market, although elements of model validation and governance are increasingly converging. While governance practices are formalized in regulatory guidelines and business practices, they are also tightly coupled with underlying theoretical modeling frameworks.

As a result, model risk governance requires specialist tools such as inventory management and regulatory intelligence, which are not covered by general GRC workflow tools. This has resulted in two types of technology vendor to operate in the space: conventional GRC vendors and quantitative modeling vendors that have developed an additional governance solution.

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KYC data and solutions

Complex products and services have complicated the processes of identifying and managing risks, including those related to money laundering and terrorist financing. To mitigate these risks, companies are prioritizing supply chain due diligence, which increasingly encompasses supplier and customer assessments, transaction monitoring and compliance programs. This is causing financialized corporations to intensify their focus on compliance and customer onboarding to address the risks inherent in the supply chain and complex transactions. More firms are now looking at hybrid solutions or staying with on-premise deployments.

Some vendors are cautiously exploring the use of generative artificial intelligence (AI) in KYC processes, particularly for generating reports and analyzing negative news. While this technology offers new possibilities, it requires careful implementation and meticulous error-checking. The depth of data and its geographical specificity are expanding to encompass such areas as bribery, corruption, forced labor and regional specifics. KYC solutions, meanwhile, are becoming more complete, and now emphasize case management, workflow, analytics, screening and due diligence.

Actuarial modeling and financial planning

The implementation of risk-based capital calculations and risk-aware accounting standards has put additional pressure on insurers to model complex contingent cashflows accurately, and to manage and hedge financial guarantees. Overall, there is an ongoing restructuring and modernization of the analytical environment for insurers generally and life insurance firms in particular.

New product strategies, complex market dependencies, increased data availability and evolving capital and risk requirements are all shaping firms' analytics demands and methodologies. The actuarial modeling and financial planning market is mature and dominated by large, established players. Nevertheless, established vendors are being challenged by changing market standards (including an expectation of being able to accommodate faster calculation speeds), evolving product types and technology innovation.

ALM technology

The banking industry has faced substantial balance sheet challenges in recent years, triggered by ongoing volatility and uncertainty around interest rates. Liquidity risk has evolved into high-profile deposit outflows, with ensuing solvency incidents for institutions such as First Republic and Silicon Valley Bank (SVB). For more than a decade, the banking sector has operated in a low interest rate environment, with the last comparable surge in interest rates dating back to the 1980s. Current continued hikes in interest rates by central banks, as they battle persistent inflation, mark the end of the 'interest rate holiday' and the era of cheap money.

The ramifications of relaxed balance sheet rigor and investment approaches designed for lower, more stable interest rate regimes are playing out in the mark-to-market losses for US banks, prompting a wide range of institutions – including those in the 'shadow banking' industry – to re-evaluate their asset and liability management (ALM) and investment strategies. The complex ALM framework broadly comprises funds transfer pricing (FTP), liquidity risk management (LRM) and reporting, capital and balance sheet optimization, and ALM analytics and quantification, and among the key trends in the market is a renewed focus on LRM and the adjacent focus on interest rate risk, as well as trends in the regionally defined, fragmented vendor market.

Credit risk reporting

The credit frameworks built by financial institutions are going through a technological revolution in how they are used and analyzed. The influence of emerging and innovative technologies is reshaping the credit landscape, as financial institutions adopt cloud, managed services and emerging technologies, and add data and analytics elements to the entire credit value chain. This is making the credit lending business more efficient and profitable, while at the same time mitigating the associated credit risk and enabling firms to comply with regulatory requirements.

In this context, the market landscape for credit risk and its associated reporting has changed significantly in the past couple of decades. Historically, financial institutions relied on and invested in a combination of in-house and standalone solutions before switching to specialist offerings that cover enterprise-wide risk solutions. Firms now try to manage and grow their portfolios by employing a strategy that balances risk, liquidity and profitability.

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Energy markets

In a time of unprecedented change for energy markets, we are seeing transformative new developments in technology (notably analytics) that are creating new opportunities in the space, but also bringing potential new risks – not least in operational areas.

The ongoing influence of the pandemic and the move to energy transition, as well as geopolitical upheavals and shifts, mean that we can expect more change in this sector over the coming years. Chartis will continue to analyze and assess this evolution, as new vendors emerge and established ones develop their offerings to address the changing dynamics of this new energy landscape.

CTRM solutions

The drive toward a new energy infrastructure/energy transition/the push for net zero, a growth spurt in futures markets and enhanced liquidity in a range of asset classes have created flux in the CTRM market. An increase in CTRM solutions that include enterprise resource planning (ERP)-like functionality (such as tax processing, some operational analytics and inventory management) has led to CTRM systems becoming trade-management 'cockpits' or control centers, while greater liquidity and increased financialization across a broader set of commodities have sparked a strong trend toward futures and options-focused platforms.

Meanwhile, other key drivers of the rich trading-system-like environment have included an increased focus on complex cross-asset trading and transactions and a desire to integrate varied data and analytics sources to create broader quantitative frameworks. Many firms will require a separate risk system, however, and firms with significant trading capacity have been looking to separate their analytics and risk environments. These changes are intensifying a shift in which CTRM solutions are increasingly merging with other enterprise systems, such as procurement and logistics. While this development is further fragmenting the solutions market, it is also creating opportunities for vendors of all sizes to adapt and potentially consolidate.

Statistical techniques

Analytics and computational technologies continue to evolve. Statistical techniques are developing and interacting with the wider technological environment in interesting respects – both in terms of scalability and from the standpoint of providing new computational strategies. This fundamental interaction is growing in complicated and intriguing ways, including issues around different programming styles that exploit data-parallel programming. Graphics processing units (GPUs), Advanced Vector Extensions (AVX), special-purpose AI chips, field-programmable gate arrays (FPGAs) and application-specific integrated circuits (ASICs) are all examples of the expanded hardware-accelerated computing universe that is now available, and which offers an expansive set of tools that include accelerators, libraries and programming languages. The key issue for firms is how to make strategic choices between them.

From a software perspective, technology vendors have responded to the rapidly expanding options differently. There has been considerable algorithmic evolution in recent years – notably, the introduction of advanced statistical techniques into AI has become ubiquitous. The techniques now driving AI are having the greatest impact in the retail finance industry, while also having significant effects in the insurance and capital markets sectors.

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6. RiskTech100® 2024 rankings

2024 Rank	2023 Rank	Company	HQ	Overall score	Functionality	Core technology	Strategy	Customer satisfaction	Market presence	Innovation
1	1	Moody's	US	79.75%	95.00%	71.00%	84.00%	66.00%	87.00%	75.50%
2	3	SAS	US	76.86%	92.15%	84.00%	71.00%	63.00%	79.00%	72.00%
3	2	FIS	US	76.71%	92.34%	79.90%	69.50%	62.50%	88.00%	68.00%
4	4	Oracle	US	75.19%	89.11%	90.00%	69.00%	59.50%	72.50%	71.00%
5	5	FICO	US	72.46%	80.75%	68.01%	70.50%	67.00%	69.00%	79.50%
6	6	S&P Global	US	72.33%	85.50%	71.00%	74.00%	63.00%	69.00%	71.50%
7	7	ION	US	70.60%	83.60%	74.00%	70.00%	55.00%	78.00%	63.00%
8	11	Murex	France	70.08%	76.48%	74.00%	70.50%	64.00%	69.00%	66.50%
9	10	Bloomberg	US	69.73%	78.38%	73.00%	69.00%	63.50%	67.00%	67.50%
10	12	Adenza	US	69.56%	78.61%	68.00%	72.50%	68.00%	70.50%	59.75%
11	9	Wolters Kluwer	Netherlands	69.49%	83.13%	69.50%	60.00%	67.30%	74.00%	63.00%
12	14	MetricStream	US	69.33%	71.49%	64.50%	74.50%	73.00%	70.00%	62.50%
13	8	LexisNexis Risk Solutions	US	69.18%	79.09%	67.50%	65.50%	61.00%	76.00%	66.00%
14	16	MSCI	US	69.10%	83.60%	64.00%	73.00%	61.00%	69.50%	63.50%
15	15	NICE Actimize	US	68.94%	73.15%	66.00%	70.00%	60.00%	76.50%	68.00%
16	13	Numerix	US	68.53%	73.15%	64.00%	68.00%	69.00%	71.00%	66.00%
17	19	SS&C	US	66.54%	77.71%	61.00%	71.50%	60.00%	71.00%	58.00%
18	18	Nasdaq	US	66.33%	62.70%	68.00%	70.50%	61.00%	67.00%	68.75%
19	21	Finastra	UK	65.41%	76.48%	69.00%	61.00%	52.00%	77.00%	57.00%
20	22	Prometeia	Italy	65.21%	71.25%	65.00%	61.00%	72.50%	53.50%	68.00%
21	23	Dun & Bradstreet	US	64.87%	76.95%	65.50%	67.75%	55.50%	67.00%	56.50%
22	37	ServiceNow	US	64.80%	60.80%	70.50%	70.00%	56.50%	68.00%	63.00%
23	20	LSEG	UK	64.71%	80.28%	65.50%	56.00%	54.50%	76.00%	56.00%
24	17	IBM	US	64.56%	64.60%	84.25%	66.00%	50.50%	59.00%	63.00%
25	26	Quantexa	UK	64.39%	60.33%	70.50%	64.00%	60.50%	60.50%	70.50%
26	32	ICE	US	64.11%	72.91%	60.00%	70.50%	53.75%	64.50%	63.00%

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2024 Rank	2023 Rank	Company	HQ	Overall score	Functionality	Core technology	Strategy	Customer satisfaction	Market presence	Innovation
27	33	Regnology	Germany	63.93%	69.59%	63.00%	64.50%	70.50%	56.00%	60.00%
28	39	PwC	UK	63.75%	75.53%	70.00%	64.50%	59.00%	57.00%	56.50%
29	–	TCS	India	63.67%	75.53%	78.00%	59.50%	57.00%	54.00%	58.00%
30	24	Beacon Platform	US	63.60%	64.60%	69.00%	56.00%	64.00%	60.50%	67.50%
31	36	Quantifi	US	62.64%	69.83%	65.50%	53.50%	63.50%	57.50%	66.00%
32	34	Intellect Design	India	62.59%	71.27%	64.50%	61.00%	61.00%	57.75%	60.00%
33	25	Qontigo	Germany	62.48%	68.40%	60.50%	63.50%	61.50%	58.00%	63.00%
34	29	Cboe	US	62.41%	57.95%	66.00%	66.00%	62.00%	59.50%	63.00%
35	48	Feedzai	Portugal	62.08%	66.98%	64.00%	61.00%	64.50%	57.00%	59.00%
36	41	Abrigo	US	61.94%	64.62%	60.00%	61.50%	63.00%	67.00%	55.50%
37	31	Sensa-NetReveal[1]	US	61.83%	66.50%	67.00%	57.00%	54.50%	60.00%	66.00%
38	28	Fenergo	Ireland	61.64%	64.60%	62.00%	60.00%	56.00%	65.75%	61.50%
39	46	SAP	Germany	61.43%	74.10%	70.00%	57.50%	51.00%	62.00%	54.00%
40	38	Fiserv	US	60.55%	70.80%	63.00%	51.00%	61.50%	68.00%	49.00%
41	53	QRM	US	60.48%	69.35%	53.00%	57.00%	54.00%	69.00%	60.50%
42	44	Workiva	US	60.37%	53.20%	51.00%	59.00%	72.00%	65.00%	62.00%
43	35	GBG	UK	60.21%	62.23%	60.00%	65.01%	55.00%	54.50%	64.50%
44	57	Archer[2]	US	60.03%	62.70%	58.50%	54.50%	59.00%	67.50%	58.00%
45	50	Appian	US	59.87%	53.22%	66.00%	66.00%	58.00%	52.00%	64.00%
46	–	KPMG	Netherlands	59.73%	69.35%	67.00%	57.50%	56.00%	54.00%	54.50%
47	49	Conning	US	59.60%	64.60%	59.00%	63.00%	54.00%	55.50%	61.50%
48	43	Confluence	US	59.33%	61.99%	53.50%	61.00%	60.50%	56.50%	62.50%
49	–	CRISIL	India	59.17%	57.00%	60.00%	65.00%	57.00%	56.00%	60.00%
50	–	Fintellix	India	58.34%	61.04%	62.00%	57.00%	64.50%	49.50%	56.00%
51	62	RiskSpan	US	58.21%	56.76%	61.50%	59.50%	65.00%	50.00%	56.50%
52	54	Mitratech	US	58.06%	71.25%	49.00%	58.50%	51.60%	71.00%	47.01%
53	56	Loxon	Hungary	58.01%	65.55%	68.00%	48.00%	73.50%	48.50%	44.50%

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2024 Rank	2023 Rank	Company	HQ	Overall score	Functionality	Core technology	Strategy	Customer satisfaction	Market presence	Innovation
54	–	EY-Nexus	UK	57.90%	59.38%	71.00%	55.50%	54.00%	53.00%	54.50%
55	55	Eastnets	UAE	57.85%	65.08%	53.00%	55.00%	61.00%	60.00%	53.00%
56	–	SIX	Switzerland	57.69%	64.13%	60.00%	53.00%	52.00%	65.00%	52.00%
57	66	Azentio	Singapore	57.38%	61.30%	54.00%	53.00%	61.00%	67.50%	47.50%
58	51	Sayari	US	57.25%	47.50%	64.00%	57.00%	61.00%	43.00%	71.00%
59	52	Empyrean Solutions	US	57.20%	67.69%	58.25%	58.50%	61.25%	37.25%	60.25%
60	61	SAI360	US	57.10%	66.50%	50.00%	59.50%	50.60%	72.00%	44.00%
61	–	Provenir	US	56.92%	47.50%	51.50%	57.50%	63.00%	50.00%	72.00%
62	72	Ripjar	UK	56.88%	46.79%	58.00%	56.50%	68.00%	46.00%	66.00%
63	92	Diligent	US	56.77%	64.60%	58.50%	58.50%	53.00%	58.50%	47.50%
64	70	MathWorks	US	56.68%	55.10%	64.00%	49.00%	60.00%	53.00%	59.00%
65	80	Integro	India	56.65%	48.93%	60.00%	60.00%	61.50%	54.50%	55.00%
66	75	CubeLogic	UK	56.57%	63.41%	57.50%	56.50%	62.00%	48.50%	51.50%
67	60	Broadridge	US	56.54%	62.23%	56.50%	60.00%	57.50%	58.50%	44.50%
68	94	Featurespace	UK	56.43%	46.55%	50.50%	56.50%	72.00%	46.00%	67.00%
69	65	Evalueserve	Switzerland	56.33%	57.95%	59.00%	57.00%	55.00%	51.00%	58.00%
70	76	Surya	India	56.27%	59.38%	61.00%	55.25%	60.00%	41.00%	61.00%
71	77	BCT Digital, Bahwan CyberTek Group	India	56.12%	57.24%	57.50%	52.00%	58.50%	55.50%	56.00%
72	–	Oxane Partners	UK	56.00%	62.51%	55.00%	61.50%	60.00%	50.00%	47.00%
73	67	Pegasystems	US	55.85%	55.58%	67.50%	59.00%	48.00%	48.00%	57.00%
74	–	MatLogica	UK	55.73%	50.35%	61.00%	60.00%	60.00%	51.00%	52.00%
75	–	ZE	Canada	55.71%	52.25%	60.50%	52.00%	65.00%	48.00%	56.50%
76	73	Quantifind	US	55.67%	47.50%	65.00%	55.00%	57.50%	45.00%	64.00%
77	–	Fusion	US	55.49%	61.42%	63.50%	55.00%	56.00%	45.50%	51.50%
78	69	MORS Software	Finland	55.40%	68.88%	67.50%	44.00%	68.00%	32.50%	51.50%
79	85	RiskScreen	UK	55.33%	48.45%	51.00%	61.00%	56.00%	60.00%	55.50%
80	86	Camms	Australia	55.05%	62.23%	54.00%	57.50%	47.60%	63.00%	46.00%

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2024 Rank	2023 Rank	Company	HQ	Overall score	Functionality	Core technology	Strategy	Customer satisfaction	Market presence	Innovation
81	82	Clari5	India	54.97%	60.80%	63.00%	45.00%	57.50%	48.50%	55.00%
82	–	Scila	Sweden	54.96%	47.74%	62.50%	49.00%	59.00%	53.50%	58.00%
83	84	SureCloud	UK	54.90%	60.80%	51.50%	55.50%	52.60%	63.00%	46.00%
84	–	ActiveViam	US	54.87%	53.20%	64.00%	48.00%	64.00%	47.50%	52.50%
85	74	Supply Wisdom	US	54.74%	59.85%	52.00%	55.50%	51.10%	65.00%	45.00%
86	99	zeb	Germany	54.73%	73.63%	67.25%	42.25%	53.75%	41.25%	50.25%
87	90	MEGA	France	54.53%	63.65%	59.50%	53.00%	55.00%	44.50%	51.50%
88	–	Tookitaki	Singapore	54.46%	46.79%	60.50%	49.00%	59.00%	53.50%	58.00%
89	79	AML Partners	US	54.30%	55.81%	58.00%	57.50%	55.00%	40.50%	59.00%
90	93	CareEdge Risk Solutions	India	54.29%	52.73%	57.50%	56.50%	62.50%	44.00%	52.50%
91	–	Global Valuation	US	54.11%	50.16%	59.00%	49.50%	59.00%	50.00%	57.00%
92	91	Aptitude Software	UK	54.10%	74.10%	59.50%	49.00%	54.50%	36.00%	51.50%
93	81	Aravo	US	54.09%	58.43%	49.50%	57.00%	50.60%	63.00%	46.00%
94	–	Xapien	UK	53.94%	44.65%	61.00%	56.00%	58.00%	37.00%	67.00%
95	–	Topaz	UK	53.93%	60.80%	62.00%	36.25%	57.50%	45.00%	62.00%
96	98	ReadiNow	Australia	53.78%	56.05%	54.00%	54.00%	52.60%	59.00%	47.00%
97	83	Manipal Technologies	India	53.61%	54.15%	56.00%	48.50%	56.00%	51.50%	55.50%
98	–	Encompass	Australia	53.26%	46.55%	49.00%	58.00%	52.00%	66.00%	48.00%
99	97	ComplyAdvantage	UK	53.14%	50.35%	46.00%	56.00%	61.00%	45.50%	60.00%
100	–	MyComplianceOffice	US	53.08%	42.99%	54.00%	54.50%	66.00%	36.00%	65.00%

[1] Owned by SymphonyAI.
[2] Featured in RiskTech100® 2023 as part of RSA.

Note that because of the continued expansion of vendor functionality, we have applied a standard normalization across all Functionality scores to keep them within the approriate range (an upper band of 100).

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7. Category winners

Category award	2024 winner
Overall Winner	Moody's
Chartis categories	
Functionality	Moody's
Core Technology	Oracle
Strategy	Moody's
Customer Satisfaction	Loxon
Market Presence	FIS
Innovation	FICO
Industry categories	
Banking	Moody's
Buy-side	Bloomberg
Corporations	ServiceNow
Insurance	Moody's
Trading and Capital Markets	Murex
Solution categories	
Artificial Intelligence for Banking	SAS
Artificial Intelligence for GRC	TCS
Artificial Intelligence for Unstructured Data	S&P Global
Asset and Inventory Management	SAP
Balance Sheet Risk Management	SAS
Behavioral Modeling	SAS
Capital Optimization	QRM
CECL	Moody's
Climate Risk	Moody's
CLM for Investor Services	Deep Pool
CLM for Markets	Fenergo
CLM for Wealth Management	Delta Capita

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Category award	2024 winner
Commodity Trading Risk Management (CTRM)	ION
Communications Archiving and Controls	Global Relay
Communications Monitoring	NICE Actimize
Conduct and Controls	TCS
Credit Data – CLO	Moody's
Credit Data – CMBS	Trepp
Credit Data – Corporate Bonds	Bloomberg
Credit Data – Credit Curves	Bloomberg
Credit Data – SME	Dun & Bradstreet
Credit Data – Wholesale	Moody's
Credit Risk for the Banking Book	Moody's
Cyber Risk Quantification	ISS
Data Integrity and Control	Oracle
Enterprise Cashflow Management	Surya
Enterprise GRC	MetricStream
Enterprise Stress Testing	SAS
Environmental, Social and Governance (ESG)	MSCI
Evaluated Pricing and Data – Credit	S&P Global
Evaluated Pricing and Data – Fixed Income	Bloomberg
Evaluated Pricing and Data – Multi-asset	ICE
Evaluated Pricing and Data – OTC Derivatives	LSEG
Facility Management and Control	SAP
Finance and Accounting – Accounting Frameworks	Oracle
Finance and Accounting – Cross-industry Support	SAP
Finance and Accounting – Data Management	Oracle
Financial Crime – AML	Oracle
Financial Crime – Data	Moody's
Financial Crime – Enterprise Fraud	Feedzai

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Category award	2024 winner
Financial Planning Systems	Oracle
Front Office Risk Management	Numerix
FX Risk and Trading	ICE
GRC – Analytics	TCS
GRC – Audit	MetricStream
GRC – Content	SAI360
GRC – Data Privacy Management	RadarFirst
GRC – Digitization and Control	TCS
GRC – EGRC	MetricStream
GRC – IT Risk	ServiceNow
GRC – Operational Resilience and Business Continuity	ServiceNow
GRC – Operations Risk and Process Control	TCS
GRC – Supply Chain Risk	SAP
GRC – Vendor/Third-party Risk	SAP
IFRS 17 – Accounting Systems	Aptitude Software
IFRS 17 – Data Management and Reporting	Oracle
IFRS 9	SAS
Integrated Trading and Risk Management	Murex
KYC Solutions	Fenergo
LDTI	Wolters Kluwer
Lending Operations – Collateral	Finastra
Lending Operations – Limits	Integro
Lending Operations – LOS	FIS
Liquidity Risk	Oracle
Managed Services – Credit Risk Management	Abrigo
Managed Services – Financial Crime	Nasdaq
Model Risk Management	SAS
Model Risk Quantfication	Prometeia

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Category award	2024 winner
Model Validation	CRISIL
Model Validation – Supporting Tools	Evalueserve
Regulatory Intelligence	Wolters Kluwer
Regulatory Reporting – Banking	Regnology
Regulatory Reporting – Insurance	Oracle
Regulatory Reporting – Markets and Securities	Adenza
Risk and Finance Integration	SAS
Risk as a Service (RaaS)	MSCI
Risk Data Aggregation and Reporting – Banking	Oracle
Risk Data Aggregation and Reporting – Complex Data/Alt-data	ZE
Risk Data Aggregation and Reporting – Markets	ActiveViam
Supervisory Tech (SupTech)	Regnology
Trade-based AML	Kharon
Trade Surveillance	Nasdaq
Treasury Platforms	ION
xVA	Numerix

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Ones to Watch	
Financial Risk and Reporting	
	Acies
	BBA
	CogNext
	ElysianNxT
	Mirai
	Riskfuel
	Solytics Partners
	Vector Risk
Financial Crime Risk Management	
	Diligencia
	Facctum
	Giant Oak
	NominoData
	Sigma360
	WorkFusion
GRC, OpRisk and Regulatory Intelligence	
	Calpana (CRISAM GRC)
	Corlytics
	Protecht
	RiskLogix

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8. Appendix A: Research methodology

Chartis' RiskTech100® report is the most comprehensive study of its kind, and is a core element of our annual research cycle. The rankings in the report reflect our analysts' expert opinions, along with research into market trends, participants, expenditure patterns and best practices. We also validate the analysis through several phases of independent verification (see Table 1).

So that we can continue to assess the market and its key players accurately, we are developing and refining our methodology as the risk technology market evolves. Any changes will be reflected in subsequent reports.

Table 1: RiskTech100® research methodology

• Performed a comprehensive market sweep of leading market participants in 40 risk categories.
• Completed 1,500 surveys and interviews with risk technology buyers and end users.
• Collected data on organizations' expenditure priorities and vendor preferences.
• Collated 400 completed questionnaires, briefing documents and product specifications from risk technology vendors.
• Conducted and attended 200 interviews, product demonstrations and strategy briefings with risk technology vendors.
• Conducted 150 interviews with risk technology buyers to validate our survey findings.
• Conducted more than 50 interviews with independent consultants and system integrators specializing in risk technology.
• Applied RiskTech100® assessment criteria to filter the top 150 vendors.
• Reviewed data with 30 independent consultants and 110 risk technology buyers.
• Interviewed 60 ex-employees of the top 50 risk technology vendors to validate our findings.
• Undertook final data validation with 100 vendors, receiving 80 completed questionnaires and carrying out more than 100 vendor briefings.
• Completed 100+ independent reference checks to validate vendor claims and client satisfaction levels.
• Developed the final top 100 rankings, identified the category winners and finalized the report.

Source: Chartis Research

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9. Appendix B: How to read the RiskTech100® rankings

The RiskTech100® assessment criteria comprise six categories:

- Functionality.
- Core technology.
- Strategy.
- Customer satisfaction.
- Market presence.
- Innovation.

Within each category, we have included a number of sub-categories to encompass the range and scope of current risk technology solutions (see Table 2).

Table 2: RiskTech100® assessment criteria

Functionality	• **Depth of functionality.** The level of sophistication and detailed features in the software product. Aspects assessed include: innovative functionality, practical relevance of features, user-friendliness, flexibility and embedded intellectual property. High scores are given to firms that achieved an appropriate balance between sophistication and user-friendliness. In addition, functionality that links risk to performance is given a positive score. • **Breadth of functionality.** The spectrum of risks covered as part of an enterprise risk management solution. The risk spectrum under consideration includes treasury risk management, trading risk, market risk, credit risk, operational risk, energy risk, business/strategic risk, actuarial risk, asset-liability risk, financial crime and compliance. Functionality within and integration between front-office (customer-facing) and middle-/back-office (compliance, supervisory and governance) risk management systems are also considered. High scores are given to firms achieving (or approaching) integrated risk management – breaking the silos between different risk management functions.
Core technology	Chartis evaluates a vendor's overall technology stack by benchmarking it against latest best practice. Key considerations this year have been the use of cloud and Big Data technologies, as well as the agility and openness of the overall technology architecture. • **Data management.** The ability of enterprise risk management systems to interact with other systems and handle large volumes of data. Data quality is often cited as a critical success factor, and ease of data access, data integration, data storage and data movement capabilities are all important factors. • **Risk analytics.** The computational power of the core system, the ability to analyze large amounts of data in a timely manner (e.g., real-time analytics) and the ability to improve analytical performance are all important factors. • **Reporting and visualization.** The ability to surface risk information in a timely manner. The quality and flexibility of visualization tools, and their ease of use, are important for all risk and compliance management systems.

Source: Chartis Research

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Table 2: RiskTech100® assessment criteria (continued)

Strategy	• **Vision and leadership**. Market understanding, a scalable business model, product strategy, technology strategy and go-to-market strategy are critical success factors. Both organic and inorganic growth strategies are considered, as well as strategic alliances and partnerships. • **Ability to execute**. The size and quality of the sales force, the sales distribution channels, the global footprint, partnerships, differentiated messaging and positioning are all important factors. Specific consideration is given to the quality of implementation and support functions, post-sales support and training. • **Financial performance**. Revenue growth, profitability, sustainability, financial backing and the percentage of recurring revenues. The ratio of license to consulting revenues is key to business scalability.
Customer satisfaction	• **Value for money**. The price to functionality ratio, and the total cost of ownership versus license price. • **After-sales service and support**. Important factors include the ease of software implementation, the level of support and the quality of training. • **Product updates**. Important considerations for end users include how often vendors issue updates and how well they keep pace with best practice and regulatory changes.
Market presence	• **Market penetration**. The number of customers in chosen markets and the rate of growth relative to sector growth rate. • **Market potential**. Brand awareness, reputation, thought leadership and the vendor's ability to use its current market position to expand horizontally (with new offerings) or vertically (into new sectors). • **Momentum**. Performance in the past 12 months, including financial performance, new product releases, quantity and quality of contract wins and market expansion moves.
Innovation	• **New product development**. New ideas, functionality and technologies to improve risk management for target customers. Chartis assesses new product development not in absolute terms, but in relation to a vendor's closest competitors. • **Exploitation**. Developing new products is only the first step in generating success. Speed to market, positioning of new products and translation to incremental revenues are critical success factors. • **New business models**. Innovation is not limited to the product dimension. Some risk technology vendors are also actively working toward new business models for generating profitable growth.

Source: Chartis Research

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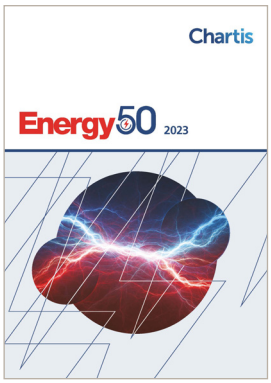
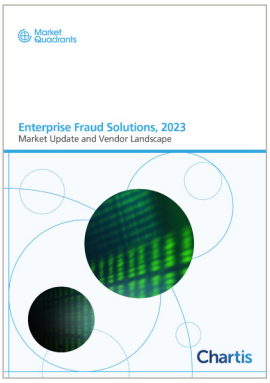
10. Further reading

STORM 2023



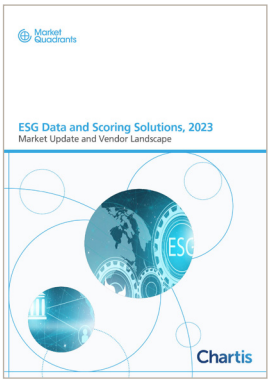
Energy50 2023

ALM Technology Systems, 2023: Market Update and Vendor Landscape



Enterprise Fraud Solutions, 2023: Market Update and Vendor Landscape

Credit Risk Reporting Solutions, 2023: Market and Vendor Landscape



ESG Data and Scoring Solutions, 2023: Market Update and Vendor Landscape

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

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