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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
- Insurance risk
- Regulatory requirements including Basel 2, Basel 3, Dodd-Frank, EMIR and Solvency II

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About Accenture Risk Management

Accenture Risk Management consulting services works with clients to create and implement integrated risk management capabilities designed to gain higher economic returns, improve shareholder value and increase stakeholder confidence. For more information visit www.accenture.com/riskmanagement



With over 77,000 registered members, RiskTech Forum (www.risktech-forum.com) is the leading independent information resource for the global risk technology community.

RiskTech Forum is dedicated to the role of technology as an enabler for risk management. It aims to build the premier network of risk, compliance, and technology professionals and to act as a single hub for high quality research and news relating to risk technology.

RiskTech Forum provides free access to over a thousand research papers, videos and opinions. The content covers multiple industries including banking, capital markets, insurance, and corporates. It also covers multiple risk and technology subjects, including market risk, credit risk, operational risk/GRC, financial crime, regulatory risk, risk analytics, and data management.

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Foreword



Welcome to Chartis's eighth edition of the RiskTech100® report. The RiskTech100® comprises the world's most significant companies in the risk technology sector. This report is acknowledged globally as the most comprehensive and prestigious study of risk technology vendors.

This year we welcome back our research partner for the RiskTech100®, Accenture. Accenture's perceptive analysis of how the risk technology market is evolving appears in chapter four of this report. We also warmly welcome our media partners, RiskTech Forum and S&P Capital IQ.

On the demand side of the market for risk technology, firms continue to increase spending. Most of this growth is fuelled by the changing requirements and regulations within the financial services industry. Chartis forecasts global risk IT expenditure in financial services to exceed \$30bn by 2015. However, other industry sectors such as energy, commodities, telecommunications, and government are also experiencing increased demand due to ongoing enhancements to regulatory and corporate governance standards. For many firms, the key challenge is achieving the right balance between short-term, compliance-driven tactical risk IT projects and the establishment of a long-term strategic enterprise technology architecture for risk and compliance management.

On the supply side, Chartis has noticed an expansion in the use of new technologies, as vendors are employing real-time systems, unstructured data analysis, artificial intelligence, cloud and mobile technologies in order to effectively manage the extraordinary data (Big Data) demands of enterprise risk management. The risk technology vendor landscape is also showing an increased appetite for strategic alliances and mergers or acquisitions, as vendors look to enhance their current product or technology capabilities and establish new channels to expand their sales and marketing reach.

As well as tracking the latest trends and developments in the risk technology marketplace, this report is designed to highlight some of the most dynamic and innovative vendors for key sub-segments and categories (see Category Winners on page 24). I trust that it will prove both valuable and insightful.

Peyman Mestchian
Managing Partner, Chartis

Overview

The RiskTech100® companies are drawn from a broad church of risk technology specialisms, meeting the needs of different business sectors, including banking, capital markets, and insurance, as well as those of non-financial organizations. What they have in common,

however, is that they rank among the top 100 risk technology providers in the world.

The rankings are drawn up based on the following classifications shown in Figure 1:

Figure 1: RiskTech100® research taxonomy



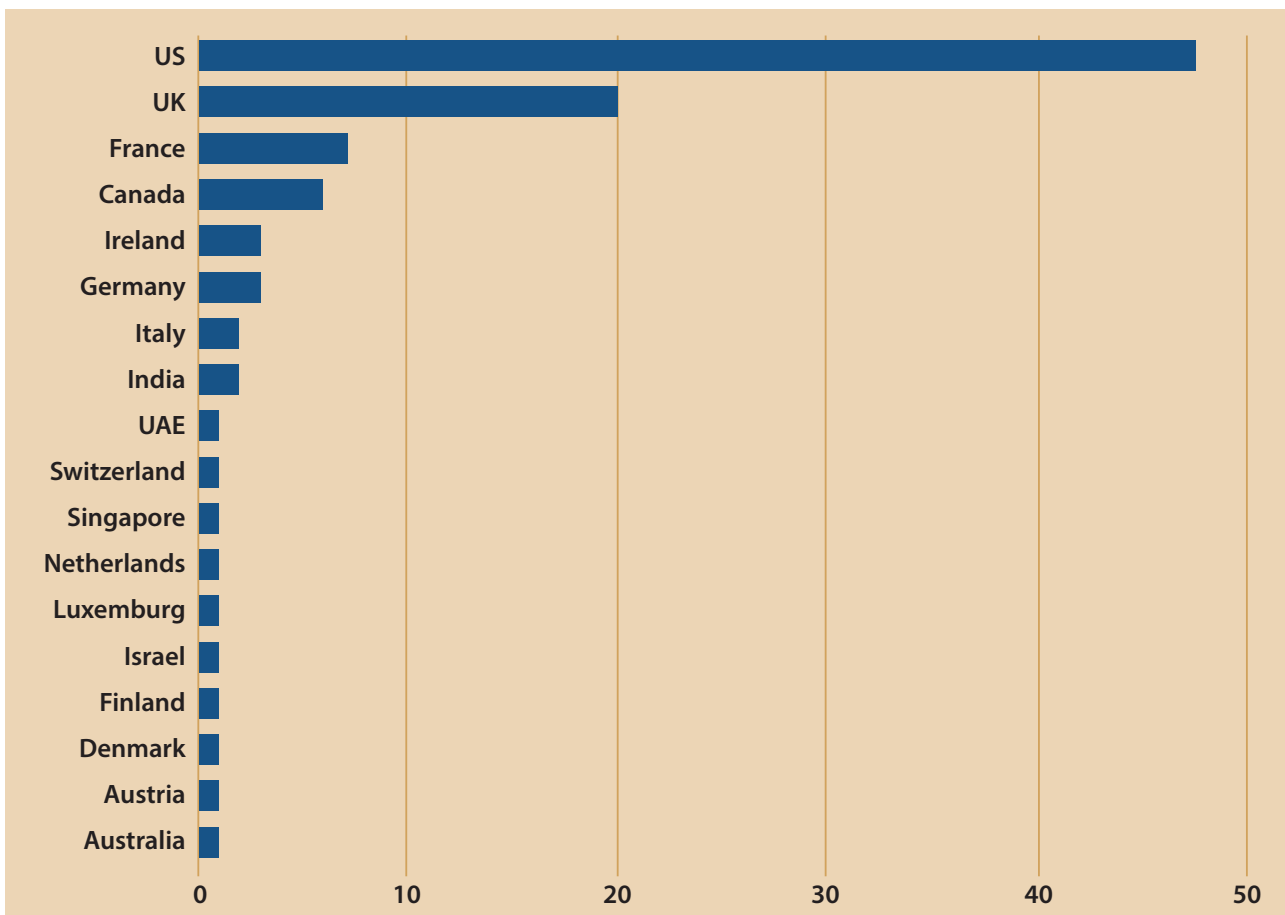
The rankings cover only companies that sell their own risk management software products and solutions. Most RiskTech companies provide professional services and consulting offerings to support the implementation and use of their software solutions. However, pure consulting or professional services firms are excluded from this study.

IBM retains its top position in the RiskTech100® rankings with top scores for functionality, market presence, and innovation. Second-placed SAS was ranked top for its core technology and also scored highly for functionality and innovation. Third was SunGard, posting high scores for market presence and functionality.

Firms on the rise in the rankings include Verafin, up 38 places from 79 to 41, Axiom SL up 24 places from 60 to 36, and ION Trading, up 18 places from 45 to 27. Murex also moves up seven places within the top 20, to 13.

Figure 2, below, shows the geographical location of the RiskTech100® companies. It clearly shows that the rankings are dominated by US-based firms. The UK is the next most common location with 20 companies. Next is France with seven companies, followed by Canada with six.

Figure 2: Geographical distribution of RiskTech100® companies



Key Industry Trends

The demand for risk technology solutions continues to be dominated by the financial services sector. Financial institutions (FIs) continue to tighten their IT budgets. However, while IT expenditure from FIs decreases, their risk IT spending continues to increase, taking a larger share of available funding.

The market for risk technology can be considered to be staggered in terms of maturity: banks and capital markets have traditionally been market leaders in risk technology investment and have the most mature technology solutions. However, other industry sectors such as insurance, energy, commodities, and government are also planning to invest more in risk technology.

Risk IT expenditure in financial services¹

For more than five years, financial institutions have been living with the consequences of the financial crisis. The crisis vaulted risk management and regulatory compliance to the head of firms' priorities and their importance has only grown as the post-crisis environment has coalesced.

To adapt to this new environment, the expansion of the role of risk technology has been vital. Financial institutions have spent heavily to satisfy regulators and to strengthen their defenses. Despite considerable outlay, there is still more to be done. Spending on risk expenditure continues to rise to meet growing, urgent business requirements. Key trends in risk IT expenditure include:

- **Spending on risk IT continues to grow:** In 2014, financial institutions globally will invest US\$28.1bn in risk IT; rising 13% by 2015 to US\$31.8bn.
- **Risk governance and integration are the top investment priority:** Between 2014 and 2015, spending on risk governance and integration will increase 17% from US\$10.9bn to US\$12.7bn, representing the leading investment priority for financial institutions. Financial crime risk management is also a key destination for IT spending, with expenditure forecast to grow by 13% from 2014 to 2015.
- **North American institutions are increasing spending fastest:** Between 2014 and 2015, firms in North America will increase their expenditure on risk IT by 16%. Those in Europe will increase spending by 12% and those in APAC by 10%.
- **Tier 3 firms are investing the most in risk IT, but rate of growth is highest in Tier 1 institutions:** In 2015, Tier 3 firms will spend US\$13.2bn on risk IT, compared with US\$10.1bn among Tier 2 firms, and US\$8.4bn at Tier 1 firms. Growth in spending, however, is highest among Tier 1 firms. Between 2014 and 2015, they will increase spending by 24%, compared with 9% for Tier 2 and 10% for Tier 3 firms.
- **Risk data management is the fastest-growing area of spending by technology type:** Between 2014 and 2015, financial institutions will increase spending on risk data management by 17% from US\$7.5bn to US\$8.9bn. In absolute terms, however, spending on risk analytics will remain considerably higher. Between 2014 and 2015, spending on risk analytics will grow by 12% from US\$10.7bn to US\$12bn.
- **Firms spend most on internal expenditure, but external spending is growing:** Firms continue to spend most on internal technology projects, which will rise 18% to US\$15.4bn from 2014 to 2015. However, firms are also looking for external assistance in developing their risk technology capabilities. Spending on external software will increase between 2014 and 2015 by 8% to US\$8bn and spending on external services will increase by 11% over the same time to US\$5.9bn.
- **Run the bank vs. change the bank:** A common thread across these trends is that financial institutions are trying to balance short-term needs, such as essential daily operations and meeting regulatory deadlines, with long-term objectives, such as enterprise-wide risk management and risk and finance integration. Financial institutions want to implement technology projects that will help them to meet short-term necessities (such as regulatory reporting), while helping them to move towards more integrated and enterprise-wide systems and to improve long-term performance.

Basel 3

The significance of Basel 3 cannot be overestimated. It will considerably increase the capital cushion banks must hold, impose major short-term costs on banks, and change the way banks manage themselves.

Basel 3 requires financial institutions to perform more calculations and submit more data to regulators than ever before, while coming under greater pressure to increase their capital, liquid assets, and collateral. The regulatory workload threatens to consume an ever-greater proportion of resources and prevent functions such as risk and finance from pursuing business goals.

To adapt to the pressure on resources and the impact of new regulations, financial institutions will therefore need to make a number of changes to improve their performance:

- Improve capital management
- Integrate risk and finance
- Integrate liquidity and collateral management
- Implement enterprise-wide risk management
- Implement enterprise-wide stress testing.

Investment in technology now will also pay dividends in the long-term by freeing risk and compliance personnel from regulatory duties, allowing them to focus on business goals. This requires data models, flexible and real-time analytics, capital calculation engines, and technology support for risk and finance integration, liquidity risk and counterparty credit risk.

Firms should consider what elements of a Basel 3 system they need. Implementing an enterprise system may be useful for some banks that have made little progress so far; others may only need specific components, e.g., a liquidity management system, and will need to determine the benefits of investing in sufficiently advanced functionality and the pros and cons of “buy vs. build”. Systems will need to be flexible enough to integrate with other systems and to adapt to the possibility of alterations to the regulations.

Dodd-Frank

Dodd-Frank provides the future path for financial markets regulation in the US. Global markets are strongly affected by changes to US regulatory policy and Dodd-Frank may become the baseline regulation to watch.

The most important areas of Dodd-Frank include enhanced prudential standards, resolution planning,

and capital surcharges for systemically important banks, restrictions to proprietary trading, protection for consumers, and clearing, reporting, and collateral requirements for trading. Firms must also monitor overlaps or conflicts with other regulatory regimes and updates to Dodd-Frank, as only 40% of the rules have been finalized.

To comply with Dodd-Frank, technology solutions will therefore need to cover a range of risk types and functionalities. Chief among these will be a robust data management solution, which will be needed to support reporting and disclosure requirements, as well as trade submission for derivatives. Firms will also need trade management systems and improved collateral management (including margin calculation) systems to comply with derivatives rules while adapting to the new environment, managing assets effectively, and executing trades in the most efficient way possible. Trade surveillance and monitoring systems will also be necessary to manage conduct risk and comply with consumer protection aspects of Dodd-Frank.

While Dodd-Frank covers similar areas to Basel 3 and other international regulations (e.g., EMIR), firms must be able to meet its distinctive requirements and manage extra-territoriality. Therefore, firms that operate across multiple jurisdictions will need flexible technology systems that allow them to meet, for example, stress testing or capital adequacy requirements for Dodd-Frank and Basel 3 compliance, as well as internal measurements.

Enterprise fraud management

Financial crime has become a growing threat and area of concern for financial institutions due to a confluence of factors:

- The economic climate has proved more conducive to fraudsters and less conducive to financial institutions writing fraud off as the cost of doing business
- Increases in mobile and internet banking have tipped the balance in favor of the fraudsters
- Regulators have begun to incorporate fraud into risk management measures, particularly operational risk, and require banks to protect their customers.

To do this, firms need to take advantage of innovative tools for fraud detection and prevention, including link analysis, predictive modeling, artificial intelligence capabilities, and enterprise solutions that can leverage cross-channel data.

Firms need to make the best use of technology available to support improved anti-fraud strategies.

They need to find vendors that can offer them real-time, advanced analytics systems that can integrate with other key risk and banking systems, such as other financial crime solutions, operational risk management, and CRM systems.

Anti-money laundering (AML)

Over the past 5 years there has been renewed interest in AML solutions and a fresh wave of implementations. This has happened primarily for two reasons:

- Stricter regulation and supervision – A general push to tighten supervision of the financial system and a renewed US-led crackdown on money laundering and terrorist finance have led to the introduction of a new raft of money laundering regulations over the past decade. Supervisors are also more willing to use their powers and impose heavy fines. Supervisors are now demanding to see greater evidence of well-developed AML programs in financial institutions.
- The rise of internet and mobile banking has increased the velocity and volume of transactions – These technologies have made money laundering easier and made the job of AML teams harder.

As a result, firms need to improve their existing AML programs and systems. Facing a stricter regulatory environment and a more difficult task, financial institutions need technology systems that will allow them to deal with a higher volume of transactions more quickly and comply with regulation. In updating their systems, financial institutions are looking to take advantage of new AML innovations, such as more advanced analytics and real-time technologies.

Energy trading

The market for energy trading risk management solutions is highly diverse, which can make it difficult to sum up the market as a whole. The models and frameworks for energy trading risk management have been based on those in financial markets, but the needs of the energy trading risk markets are different. Strategies and technologies are evolving to meet the changing needs and increased complexity of energy markets.

The development of the market has centered on increasing complexity and the demand for more integrated risk management. While energy trading risk management previously emphasized VaR analysis and hedge accounting, credit risk, which is complex and computationally intensive, is becoming more

prominent. Operational risk, including geopolitical risk, should be incorporated into risk measurements. Risk analytics must also be built on a firm data foundation that allows firms to build up a clear view of risks across asset types and sectors. Additionally, systems will need to have real-time data capabilities, particularly for market data feeds, alongside real-time business intelligence.

In addition to the effects of energy-specific regulations, new rules and reporting requirements from the FCA, EMIR, REMIT, and Dodd-Frank on reporting and clearing will also affect the marketplace. This has already begun with the “futuraization of swaps” and the subsequent lower than expected number of swaps dealers and major swap participants.

Valuation, pricing, and risk management in an energy context require robust and flexible technology solutions and require a specific range of functionalities, which are either not common or as prevalent in other markets.

Partnerships, mergers, and acquisitions

In the last twelve months, Chartis has observed and advised on a number of high profile strategic alliances, mergers, and acquisitions in the risk technology marketplace. The key drivers for most of these transactions are:

- Access to new product functionality and/or technology capabilities
- Access to innovative intellectual property (IP) or risk/compliance content
- Access to new channels to market, e.g., new geographical or industry vertical client-bases
- Speed to market

Selected transactions and partnerships from the last twelve months include:

- **ACI Worldwide’s acquisition of Online Resources Corporation:** Online Resources Corporation is a provider of online banking and full service bill pay solutions. The acquisition adds Electronic Bill Presentment and Payment (EBPP) solutions as a strategic part of ACI’s Universal Payments portfolio. It also strengthens ACI’s online banking capabilities via inclusion of a support suite for banks and credit unions.
- **Markit’s partnership with Quartet FS:** Markit is to license Quartet FS’s ActivePivot product within its Markit Analytics platform. The integration will enhance the Markit Analytics business intelligence

(BI) tool via the visualization of stochastic risk calculations, including pre-trade checks, and the aggregation of vectors generated for the Markit Analytics Engine in-memory and in real-time. This will enable end-users to calculate margins for cleared and uncleared products in real-time across multiple central counterparties.

- **Thomson Reuters's acquisition of Pricing Partners:** Pricing Partners is an international software developer and provider of OTC (over-the-counter) derivative pricing analytics and services for financial firms. Thomson Reuters Pricing Service (TRPS) is a solution that provides evaluated prices to support portfolio, fund and single security valuations. Pricing Partners contributes software and content to enhance TRPS pricing abilities for structured notes, interest-rate, equity, credit, commodities, and FX derivatives, as well as hybrid products, adding such services as derivative products valuation, pricing tools, and risk analytics to TRPS.
- **ION Trading's acquisition of Triple Point:** Triple Point is a commodity trading, energy and oil risk management, and logistics company based in New York with offices in the US, India, Brazil, and South Africa. ION Trading will expand its focus beyond the financial services sector, using Triple Point to provide solutions for enterprise commodity management technology.
- **Davis and Henderson's acquisition of Harland Financial Solutions (HFS):** HFS is a Florida-based strategic compliance and core banking technology partner to financial institutions, including commercial banks, thrifts, and credit unions. This will enhance the core technology solution of D+H and enhances support of online and mobile banking, online accounting, commercial lending, and branch automation. In addition, HFS has 5,400 bank and credit union clients, bringing the pro forma client base of D+H to over 6,200 in North America.
- **Marlin Equity Partners' acquisition of Asset Control:** Asset Control is a data management company with offices in the US, Europe, and Asia. The acquisition was undertaken in response to cost and regulation-driven demand for more effective data management in financial solutions, enabling data neutral aggregation for business and liquidity management.
- **Datawatch Corporation's acquisition of Panopticon Software:** Panopticon specializes in real-time data visualization technology. Panopticon's information optimization and real-time visual data discovery represents a BI enhancement to Datawatch's data management for structured, unstructured and semi-structured sources, enabling end-user exploration,

discovery and visualization. In addition, Panopticon contributes expertise in the capital markets, telecommunications, and energy sectors.

- **Experian's acquisition of 41st Parameter:** The acquisition of 41st Parameter, which provides products that use device identification to prevent fraud, increases Experian's presence in the fraud prevention market and complements its existing activities in fraud detection and online authentication. The acquisition also extends Experian's presence into web fraud transaction protection. Experian will attempt to drive adoption rates of 41st Parameter's products through cross-selling to Experian's existing client base, by leveraging Experian's wide geographic footprint, and through the integration of device identification into Experian's existing identity management products.
- **SAP and SAS partnership:** SAP and SAS to create a joint technology and product roadmap to leverage the SAP HANA platform and the SAS analytics capabilities, enabling the usage of real-time data analysis within existing SAS and SAP HANA environments. The SAP HANA in-memory platform will be incorporated into SAS applications, helping to remove data movement, duplication, and reconciliation. It will form a single environment for business applications and advanced analytics, increasing the speed and efficiency of SAS analytics, while consolidating a position in the marketplace as a high-performance data environment. The solution will be sold under a co-sell pilot program with selected joint customers in industries, including financial services, telecommunications, and retail.

Notes

1. Chartis Global Risk IT Expenditure 2014-15 report

The Evolution of Risk Technology

Financial institutions have a complex relationship with technology. They need to constantly remain at the cutting edge of innovation to maintain competitive advantage, yet at the same time, investing in IT can also have unintended consequences and may involve multiple barriers towards benefit realization. Architectures can become unwieldy and overly complex, impeding a firm's ability to implement effective change. The external pressures of the regulatory agenda are the primary driver for current IT expenditure. This leaves far less discretionary funding for investment in new technologies that could create future competitive advantage.

As financial institutions develop their infrastructure, they must carefully manage the trade-offs between the benefits of successful technology innovation and the inherent risks. There is no such thing as a perfect or risk-free technological solution – each comes with its own set of challenges. Technological evolution, much like its biological counterpart, is not a static or predictable process.

In this article, based on analysis by Accenture and Chartis, we assess the role of technology in financial institutions as both a tool for managing risk, and as a source of risk in its own right. We have focused on seven specific technology areas, which have been identified by Accenture and Chartis as having significant current or potential influence on enterprise risk management (ERM):

1. *Mobile technology*, such as tablet computing, mobile communications, hand-held devices, etc.
2. *Cloud computing*, such as the use of virtual servers available over the internet, including but not limited to Software as a Service (SaaS)
3. *Social media*, e.g., social media data and/or analytics
4. *Artificial intelligence*, e.g., natural language processing, neural networks, machine learning
5. *Big Data*, i.e., the use of advanced analytical tools and techniques that process extremely large varieties and quantities of data at high velocity
6. *Real-time and high-performance computing*, e.g., very large-scale simulations using in-memory analytics,

supercomputers, instant messaging, complex-event processing

7. *Open-source software*, including open-source content

Survey demographics

The findings from The Evolution of Risk Technology¹ are based on a combination of survey and interviews with 262 risk, compliance and technology professionals:

- 40% of the surveyed respondents were from North America, 30% were from Europe, 16% were from the Asia Pacific region, and 14% were from the rest of the world.
- 49% of respondents came from firms with revenues of less than \$500m, 40% from firms with revenues between \$500m and \$30bn, and 11% from firms with revenues of more than \$30bn.
- 80% of respondents were from the financial services industry, with a balanced distribution across banking, capital markets, and insurance. Government, regulators, and respondents from the manufacturing and professional services sectors represented most of the non-financial respondents.

Key research findings:

Technology is both a key source of reputational risk and a tool for managing it effectively

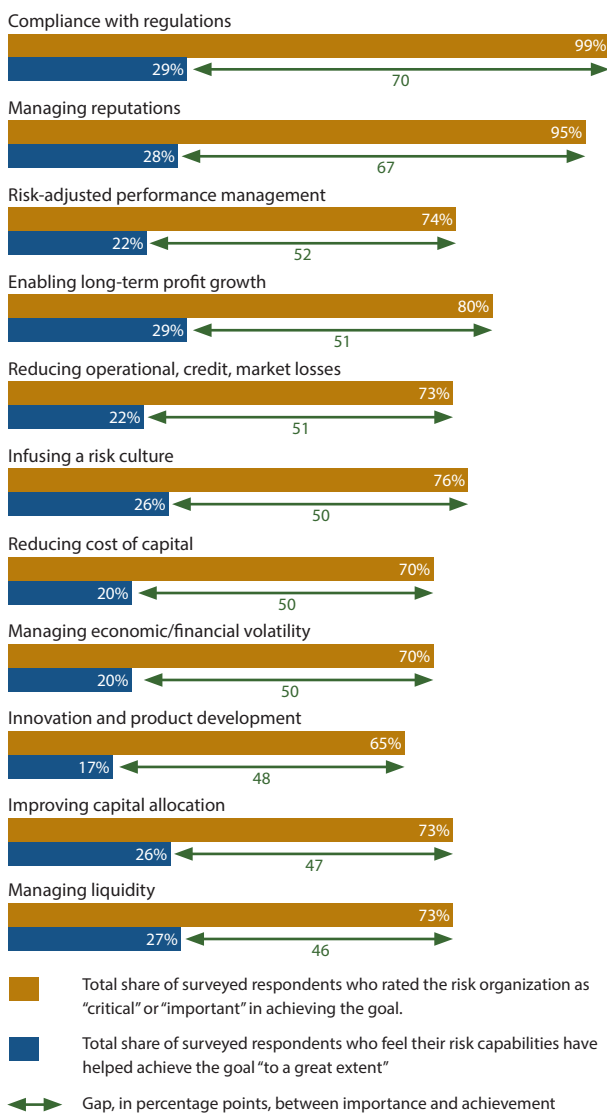
Reputational risk management remains a top priority for the industry. In interviews conducted for this article, it was consistently cited as one of the greatest threats facing financial institutions. Reputational risk is unique because it represents a consequence of failures in other aspects of risk management, which is one reason why firms find it so difficult to manage. In the Accenture 2013 Global Risk Management Study, "Risk management for an era of greater uncertainty", respondents highlighted reputational risk as the risk-related business goal with the second largest gap between the importance of achieving the goal and the availability of risk capabilities to do so (Figure 3). In other words, while the importance of reputational

“Ultimately, our whole business model is based on trust – reputational risk is therefore a higher order risk type and closely linked to trust. We continue to investigate and learn about new methodologies and techniques for reputational risk management. I envisage that in the coming years we will be using a combination of open-source content, social media analytics, and AI tools to monitor and manage reputation risk for our bank.”

– COO of a regional US Bank

Figure 3: Gaps between risk management importance and achievement

How would you rate the importance of your risk organization as a means of achieving the following? vs To what extent have risk capabilities helped your organization achieve the following?

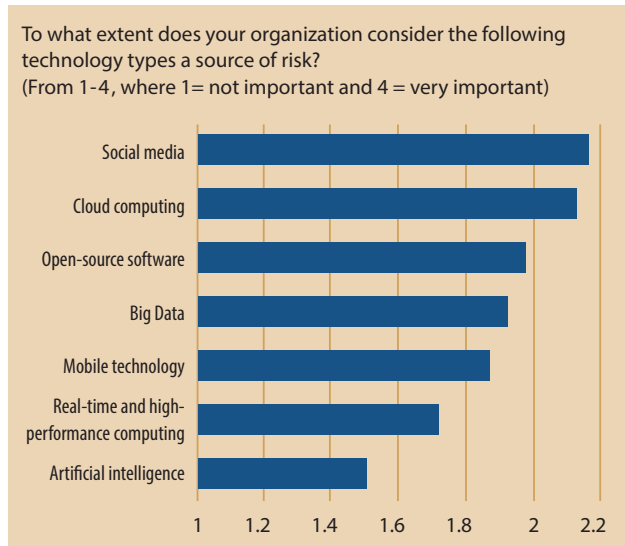


Source: Accenture 2013 Global Risk Management Study.
 Note: Numbers have been rounded.

risk is gaining in recognition and focus, many financial institutions are finding it hard to manage effectively.

The explosion in information technology has been a key contributor to the complexity of managing the reputational risk environment. Among the technology types studied by Accenture and Chartis, social media emerges as the number one potential source of risk, according to respondents (Figure 4). Many firms are concerned about the role that social media can play as a channel for communicating information about loss events and risk management failures to the outside world. In many ways, it represents a “third dimension” of risk for stakeholders. As well as looking at impact and likelihood, companies now need to consider velocity. An incident that may once have taken many weeks to become widely known – or may never have become public at all – can now be shared across major social media networks in a matter of seconds.

Figure 4: Technology types as sources of risk



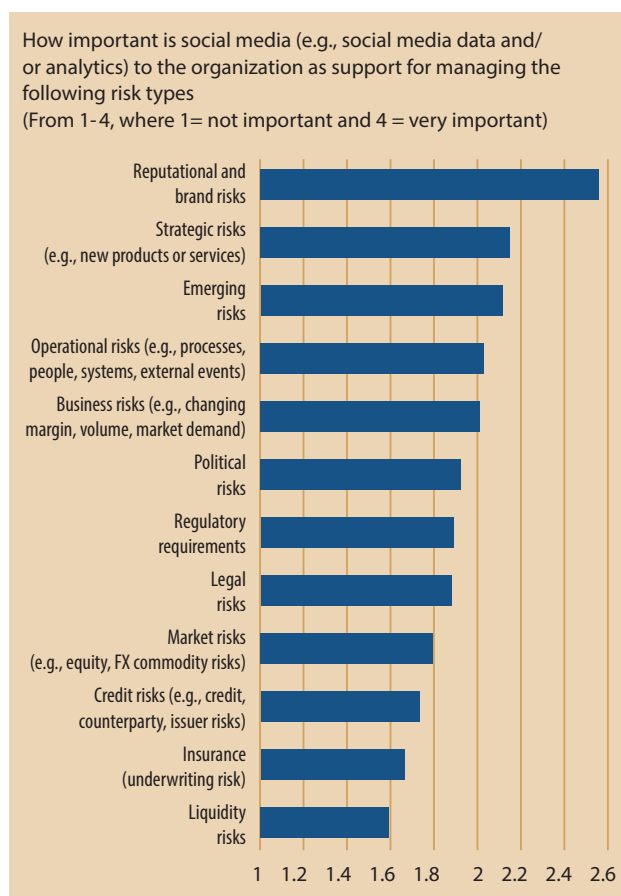
Source: The Evolution of Risk Technology Research

Social media can also be a tool for conducting financial crime. In recent years, there have been numerous social media scams, in which major social media websites have been used to steal identities. Fraudsters have also used spambots to post false information about a company within the social media sphere, which adversely affects the company’s reputation and stock prices. By shorting the company’s shares, the fraudsters are able to profit from the speed with which this false information is shared. At the customer level, social engineering has been utilized by fraudsters (e.g., phishing for personal information).

At the same time, new technologies can be powerful enablers of reputational risk management. Social

media, again, is considered to be particularly powerful in this respect (Figure 5). Some of the firms interviewed as part of the research¹ are planning to use cognitive analysis, computational techniques such as data and text mining, and sentiment studies to help them identify sources of risk. They are also exploring Data as a Service (DaaS), such as social media monitoring, to analyze their social media benefits and risks. This platform-agnostic external data analysis allows for vendors to separate out their data cost and usage from a specific software or platform, which is important for compartmentalized IT budgets. Key vendors in this space include ICBA, Temenos, and Sentiment Metrics.

Figure 5: Social media as an enabler of reputational risk management for given risk types



Source: The Evolution of Risk Technology Research

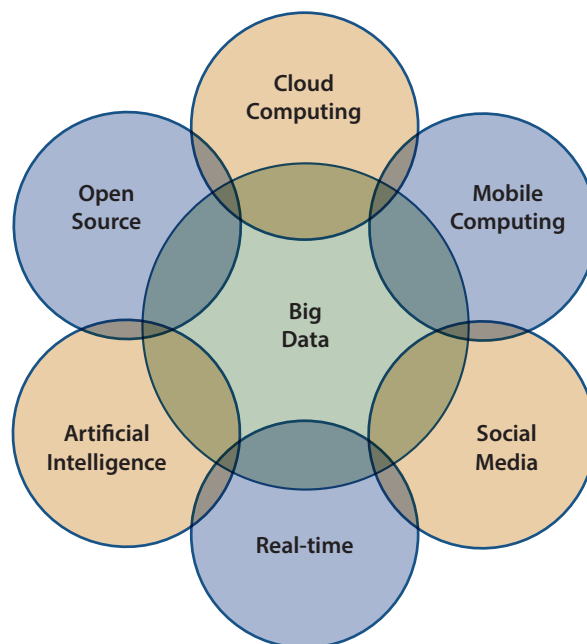
Firms are also using analysis of historical data to determine relevant KPIs/KRIs, breaking these down to a granular level, and implementing early warning systems and controls. Banks and insurers have long used social networking analysis technology within their own datasets to combat fraud, such as insurance claims fraud or 'bust-out' frauds in banking. In future, we envisage that this technology will be extended to include external data found in social media/networking sites. This can be combined with device-ID technology to tackle fraud threats.

This fraud affects three parties: the financial institution; the customer; and the social media company. To make best use of these technologies, financial institutions can collaborate with the social media companies to protect their customers, recognizing social media as a source of risk, a communications medium for reputational risk, and an enabler for risk management.

Interconnectivity in risk technology

Many of the technology types studied in this report are closely connected with one other. Social media is part of cloud computing, which is closely linked to mobile technology. The confluence for these technologies is Big Data, which represents a hub and analysis point for the data produced by these technologies (Figure 6).

Figure 6: Relationships of technology types



Source: The Evolution of Risk Technology Research

This interconnectivity can affect how firms make investments in risk technology. According to the results of the research¹, in some cases there is a strong correlation between investment in one technology and investment in another, whereas in other cases that link is significantly weaker. Table 1 shows the correlations between levels of investment by different technology types.

For example, the research¹ shows that there is a relatively high correlation between investments in social media and mobile technologies among the respondents. This linkage is intuitive as mobile is increasingly the preferred channel for consuming social media.

Table 1: Investment in risk technology – correlation between technology types

	Mobile	Cloud	Social Media	A.I.	Big Data	Real-time	Open-source Software
Mobile technology		Medium	High	Low	Medium	Medium	Low
Cloud computing	Medium		Medium	Low	Medium	Medium	Low
Social media	High	Medium		Medium	Low	Low	Medium
Artificial intelligence	Low	Low	Medium		Medium	Medium	Low
Big Data	Medium	Medium	Low	Medium		High	Medium
Real-time and high-performance computing	Medium	Medium	Low	Medium	High		Medium
Open-source software	Low	Low	Medium	Low	Medium	Medium	

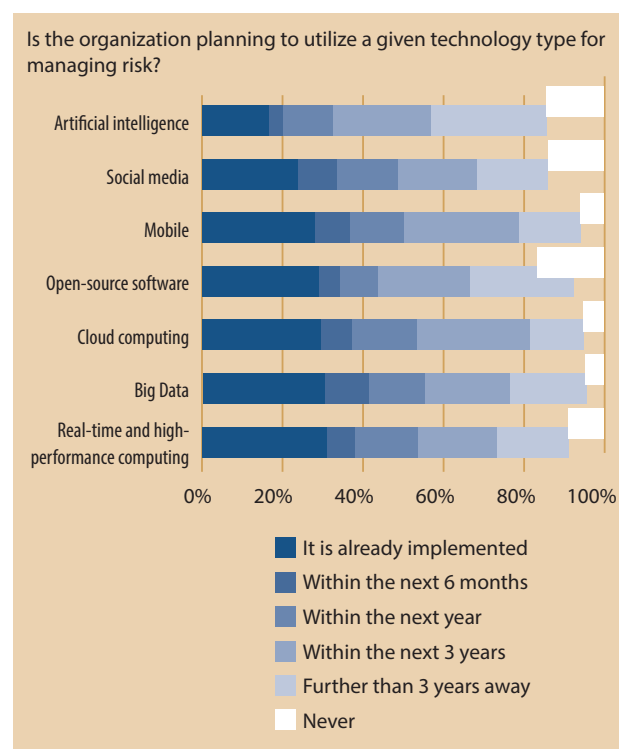
Source: The Evolution of Risk Technology Research

There was also a notably low investment correlation between social media and Big Data and real-time technologies among the respondents. These are key elements of effective social media management: at root, social media comprises large quantities of unstructured data, in real-time. One explanation for this could be that financial institutions trail the retail sector in gaining value from Big Data/social media solutions, as the perceived risks and compliance challenges of these new channels and proliferating customer communications can be a barrier to adoption within the financial services industry.

Firms have invested most in real-time technology and in Big Data, with larger firms proportionally investing more in these technologies

Out of the seven technology types studied by Accenture and Chartis, firms are most likely to have implemented real-time and high-performance computing for managing risk (Figure 7). Financial institutions are using these technologies across areas such as real-time or near-real-time fraud detection (e.g., credit/debit card fraud), real-time credit scoring, real-time transaction monitoring for trade surveillance (e.g., rogue trader detection), and high-frequency trading. While overall levels of adoption are currently low, the majority of firms have some form of implementation plan in place, meaning that there remains a significant opportunity for these technologies to penetrate the risk management marketplace.

Figure 7: Investment pattern among technology types

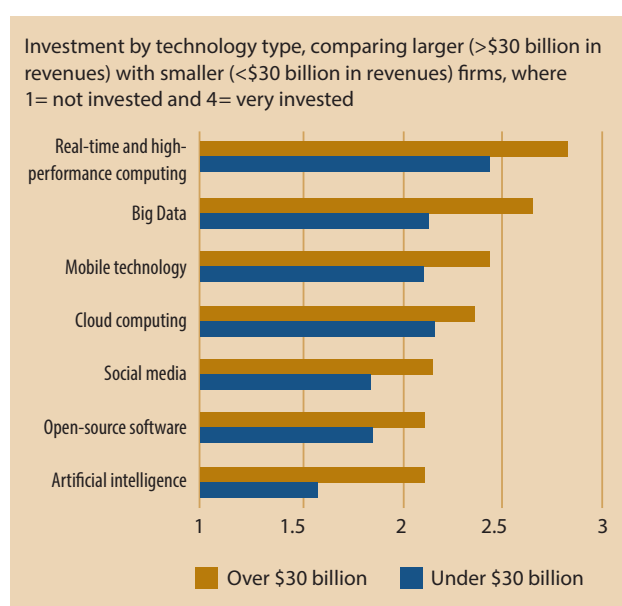


Source: The Evolution of Risk Technology Research

We also found that investment in these technologies is highly correlated with investment in Big Data (Table 1). To parse huge datasets with sufficient speed, firms need to consider investing in high-performance computing, so that models can be updated quickly enough to take advantage of the dynamic nature of the source data. In our view, risk functions increasingly want dashboards that provide information on group-level and end-of-day exposures across the full credit portfolio.

The research¹ found that levels of investment in these technologies vary according to the size of the institution. Although firms with revenues of more than \$30bn have invested proportionally more of their budgets across all technology types than smaller firms have, the gap is largest with Big Data, real-time and high-performance computing, and artificial intelligence (AI) (Figure 8). Follow-up interviews revealed that larger firms are already applying advanced AI tools to fields including fraud detection, credit scoring, and trading risk analytics. The benefits from these initiatives are being used to justify the business case for further investments.

Figure 8: Investment in technology by company size



Source: The Evolution of Risk Technology Research

The study identified that the gap in the level of investment is smaller for other technology types, such as cloud computing and open-source software. Cost is a key factor here, as smaller firms often do not have the resources to invest in costly in-house IT infrastructure and will prioritize solutions, like cloud and open-source software, where the value proposition is more attractive.

Externally hosted or SaaS solutions have become prevalent among smaller and medium-sized financial institutions over the past few years, particularly in capital markets for areas such as market risk analytics and portfolio risk management. These hosted solutions are increasingly used to tackle additional risk and compliance areas such as operational risk, enterprise fraud, counterparty risk, and customer on-boarding.

Within larger firms, our observation is that the move is towards a system of pilot-based innovation, where

“I can access risk information from a dashboard on a tablet computer and drill down in real-time into individual exposures, down to the transaction level. This same dashboard can also be used for monthly discussions with regulators.”

– Chief Risk Officer (CRO) for a top 10 global bank

the costs and benefits of a given technology type can be effectively managed during a “test-run” of the technology within the firm’s infrastructure. Our interviews suggested that smaller firms are more compelled to “take the plunge” when implementing. While potentially high-risk, this method can be much faster to implement, and the early adoption of innovative risk technology can represent a significant competitive advantage for smaller firms.

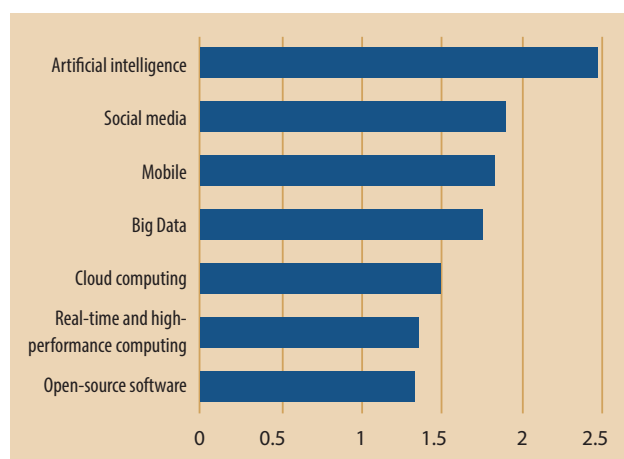
Signal vs. noise

Our research¹ revealed that the analysis of unstructured data can be a key enabler of disciplines such as reputational risk management, systemic risk, credit risk, and operational risk assessment. Most post-loss event analysis reveals early warning indicators hidden in unstructured data (e.g., e-mails, voice recordings). By mining this data proactively and identifying potential risks, firms can take the necessary preventative risk mitigation action. The problem is that financial institutions cannot afford to capture all data from all sources and compute all scenarios. The size of the datasets involved makes it extremely difficult to separate the signal from noise and distinguish between a true positive and a false positive. Equally, retroactive elimination of false positives or data perceived to be meaningless may result in the elimination of information that could prove useful at a later point.

Effective risk management requires focus and the ability to separate the signal from the noise by identifying the right scenarios, in order to prevent them or prepare for them. Technologies such as AI and advanced analytics are playing a key role in enabling this, by helping companies to automate the process and help ensure that they are monitoring the most relevant scenarios and indicators.

Artificial intelligence has the highest rate of future adoption

Figure 9: Rate of adoption (ratio of future implementation to current implementation) for given technology types



Source: The Evolution of Risk Technology Research

The research¹ examined both current adoption of technologies and expected levels of future adoption. By comparing these two metrics, we see not only the maturity of certain technologies, but also the extent to which firms expect to prioritize them.

Out of the seven technology types studied, the response indicated that artificial intelligence (AI) has the highest rate of future adoption. The number of respondents who say they plan to adopt these technologies in the future is more than twice that of those that have already done so (Figure 9).

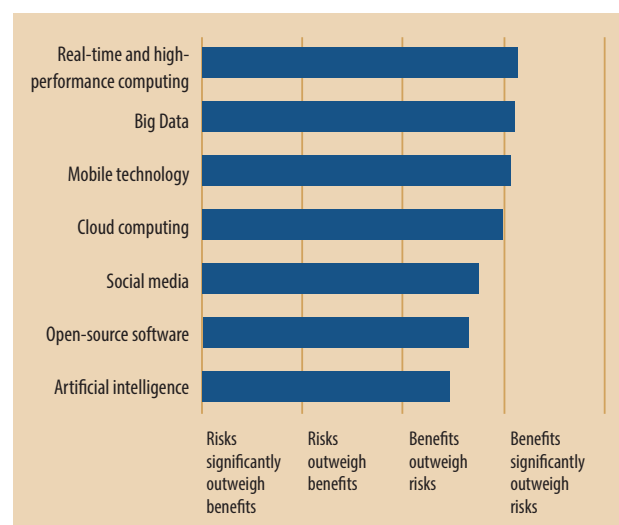
Financial institutions, as well as critical government and infrastructure respondent entities (e.g., defense, air transport, energy and utilities), are prioritizing AI for a number of reasons such as unmanned vehicle management, air traffic control, and energy resource management. Many see it as a key weapon in the fight against financial crime, such as fraud and anti-money laundering. Firms are also applying AI tools and techniques to detect and prevent cyber attacks, which are a key area of concern for respondents. Cyber threats are becoming more sophisticated and fraud detection and security infrastructures need to be able to deal with complex threats within increasingly complex, siloed banking structures. Other risk management applications of AI include the analysis of credit risk by leveraging non-traditional data sources such as social media and the management of investment risk through the use of web-based unstructured sources to develop trading strategies.

The rate of AI adoption reflects the growing automation of the risk function. There is, however, a limit to the role that technology can play in supporting risk management. Although it can play an important role, it cannot replace human judgment and experience. In "How to wage the war for Big Data analytics talent", Accenture noted that there is an increasing demand for analysts and data scientists within financial services. Institutions are looking not only for quantitative analysis, but also for "fact-based insights that can complement [executives'] experience and instincts."

While the benefits outweigh the risks, there is no accord on IT risk

Although all technology types covered by this research¹ can act as sources of risk, as well as helping to manage it, the consensus among respondents is that the benefits outweigh the risks (Figure 10). In particular, Big Data, real-time technology, and mobile technology were seen as having benefits that significantly outweighed their risks.

Figure 10: Risk vs. benefits of technology types

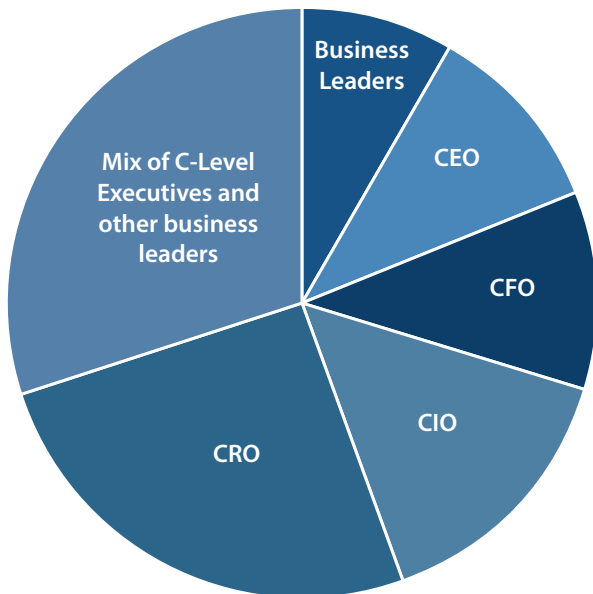


Source: The Evolution of Risk Technology Research

There is, however, little consensus over who in the organization should be responsible for managing IT risks (Figure 11). A large proportion of surveyed firms say that a mix of C-level executives and other business leaders are responsible for managing IT risks in their business, as opposed to a dedicated role such as a Chief Risk Officer (CRO) or Chief Information Officer (CIO). Technology risk is traditionally a subset of operational risk, but as these technologies become increasingly pervasive, they are crossing traditional definitions and boundaries and moving outside the traditional coverage of the risk function.

Figure 11: Responsibility for managing IT risks

Who in your organization would be typically responsible for managing IT risks?



Source: The Evolution of Risk Technology Research

Our follow-up interviews also revealed the growing importance of the Chief Data Officer (CDO) in relation to risk technology. Data availability, consistency, and integration play a pivotal role in risk technology implementation.

Without clear accountability for a particular technology risk type, there is a danger that it will fall through the cracks. It will often be assigned to IT security and compliance departments. These teams can often apply a risk-averse approach, inhibiting further innovations to reduce short-term costs within the firm and blunting the firm's technological edge in the future.

Therefore, while risk technology continues to evolve, appropriate governance and lines of responsibility remain essential to successful ERM.

Final thoughts and recommendations

It is clear from the research¹ that, more than ever before, technology plays a pivotal role in supporting enterprise-wide risk management processes and workflows. Our research has shown that data volume, complexity, and speed can provide opportunities for better risk intelligence and preventative risk mitigation actions. Figure 12 describes the combined views of Accenture and Chartis regarding the evolution of risk technology and the path towards next generation ERM.

This Accenture and Chartis study has also revealed

“We have created a new business unit called the Financial Intelligence Unit. The focus of this unit is to create a multi-disciplinary team of risk and finance practitioners and computer and data scientists, as well as front-line business experts to develop new and innovative technology-based solutions to tackle financial crime, enterprise risk, and reputational risk. We are currently working with [a third party risk technology vendor] to use artificial intelligence tools, including link analysis and machine-learning tools. We are currently in a PoC (proof-of-concept) stage, but we have already identified a number of previously hidden risk exposures. This identification and subsequent prevention have already saved the bank \$25m, ten times the cost of the PoC.”

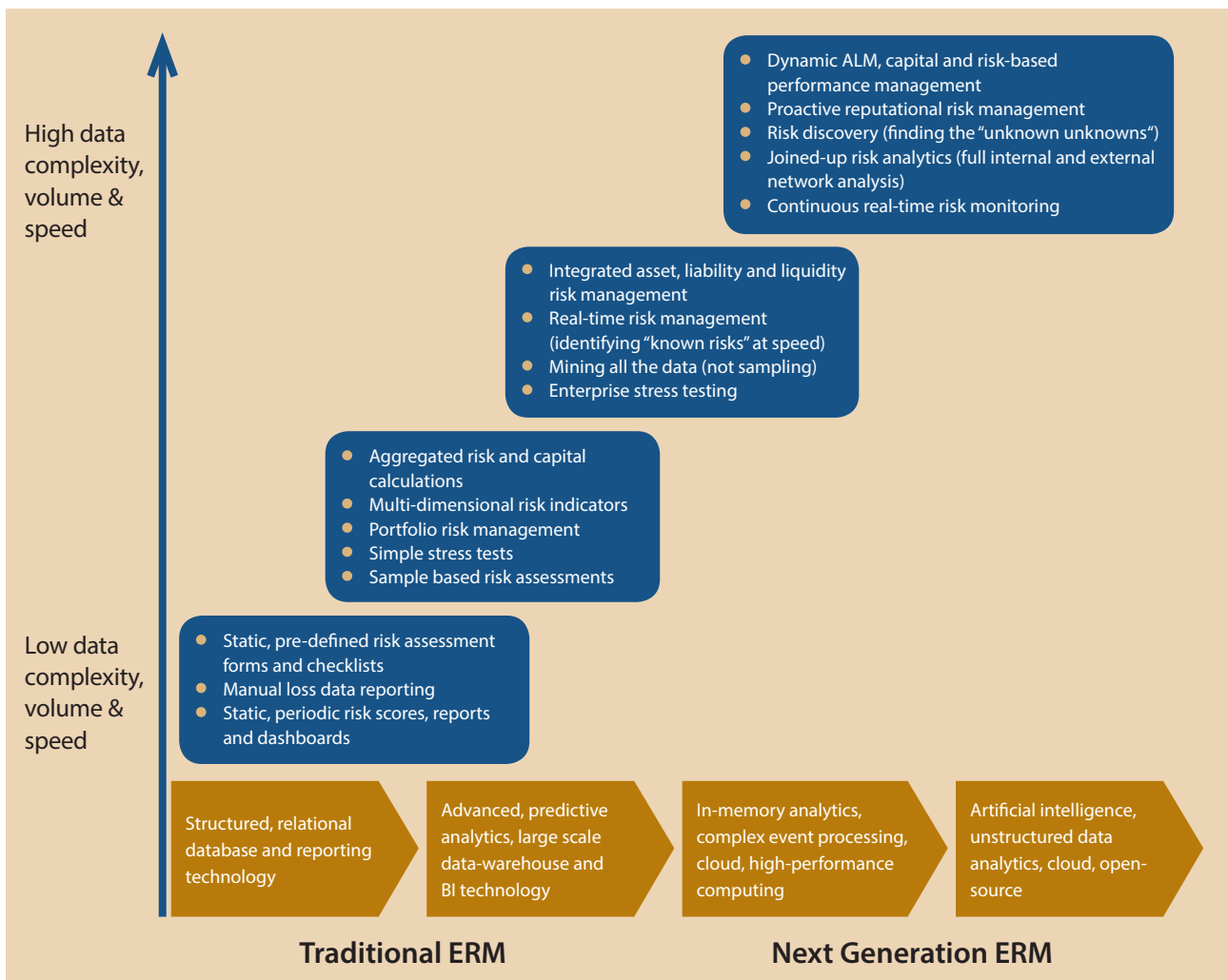
– CRO of Top 20 Global Bank

a number of critical success factors and some best practices relating to risk technology adoption. It is important to take these into account to help ensure the realization of potential benefits and to help in protecting future investment in risk technology.

- **The devil is in the data** – a recurring theme from the interviews we conducted was the importance of data quality, data integration, and overall data governance. Breaking down organizational risk silos is often about breaking down data silos. The move towards Big Data analytics and the increasing use of non-traditional data sources (e.g., social media, text, voice, e-mails) for quantitative risk management can make risk data management more important than ever before. Close alignment of risk management and IT functions is a critical success factor.
- **Balance short-term tactical risk technology investments with long-term strategic risk technology goals** – The on-going need to meet regulatory requirements and deadlines means that firms need to make a series of risk technology decisions over the coming months and years. This is often referred to as “run-the-firm” expenditures, which are usually focused on best-of-breed technology components. Our research¹ has shown that the interconnectivity of different risk technology types means that a purely tactical point-solution approach can result in long-term cost, efficiency, and operational risks. To be successful, firms need to balance the long-term target risk architecture with the short-term tactical needs.

- **Rigorously assess the risks and opportunities of social media** – Firms should act quickly to ensure that they maximize the benefits and minimize the risks associated with social media. This can be achieved via clear policies, procedures and processes for continuous monitoring of social media channels, including relevant KRIs and KPIs. Tools such as data mining, sentiment analysis, and link analysis can help companies identify and assess potential threats as well as highlighting the most effective channels for positive communication and brand protection.
- **Do not underestimate the time and costs of managing “false positives”** – To realize the risk management benefits from Big Data analytics, social media, and artificial intelligence, firms need to take into account the extra time and resource required to separate the signal from the noise. Data quality and optimization of risk models were cited by many of our respondents¹ as critical success factors for managing and reducing false positive rates.
- **Define appropriate lines of responsibility for IT risk** – Management of IT risk requires well-formulated and communicated organizational structure and governance processes. Firms may ensure that there is clear accountability for managing IT risk. The CRO, CIO, and CDO should have clearly defined and articulated lines of responsibility, with appropriate control, audit, validation, and escalation authority.
- **Start small and maintain focus**– A common theme from this Accenture and Chartis research was that successful adoption of risk technology requires pilots, proof-of-concept projects, and controlled roll-outs. This will help to enable internal champions and early adopters to develop the business case for further investment, as well as provide an important feedback loop regarding lessons learned. Successful implementation can require an understanding of how different technology types interact, as well as long-term robust change management plans.

Figure 12: The evolution of risk technology



Source: The Evolution of Risk Technology Research

References

Steve Culp et al, Accenture 2013 Global Risk Management Study, *Risk management for an era of greater uncertainty*, September 2013, Accenture

Narendra Mulani and Nick Millman, *How to wage the war for Big Data analytics talent*, December 2012, Accenture

Notes

1. The Evolution of Risk Technology Research, September to October 2013

About the Accenture contributors



Steve Culp

Steve is the global managing director of Accenture Finance & Risk Services. Based in London, Steve has more than 20 years of global experience in strategy definition, risk management, enterprise performance management, and delivering large-scale finance operations engagements. Prior to his current role, Steve was the global lead for Accenture's Finance & Performance Management consulting services for global banking, insurance, and capital markets institutions. With his extensive risk management and performance management experience and business acumen, Steve guides executives and their teams on the journey to becoming high-performance businesses.



Ian Sharratt

Ian is a managing director – Accenture Finance & Risk Services. He is the Technology lead for this group and is based in London. He is specialized in large scale Finance and Risk transformation projects and has been with Accenture for more than 10 years. Leading high impact transformation engagements across the financial services industry, Ian helps clients perform evolutionary transformations to reduce cost, complexity and drive value through the adoption of enterprise class applications and technologies.

RiskTech100[®] Rankings 2014

Rank 2014	Previous Rank	Company	HQ	Total Score	Functionality	Core Technology	Organizational Strength	Customer Satisfaction	Market Presence	Innovation
1	1	IBM	US	69.5%	82%	75%	66%	56%	69%	69%
2	2	SAS	US	68.0%	80%	77%	62%	59%	65%	65%
3	3	SunGard	US	66.8%	78%	67%	65%	61%	68%	62%
4	6	Wolters Kluwer FS	US	63.7%	67%	62%	66%	64%	64%	59%
5	7	Moody's Analytics	US	63.5%	64%	63%	69%	61%	63%	61%
6	4	Oracle	US	63.3%	73%	75%	65%	50%	55%	62%
7	8	MSCI	US	62.7%	63%	58%	68%	59%	63%	65%
8	5	Misys	UK	62.5%	70%	65%	64%	54%	60%	62%
9	14	OpenLink	US	62.2%	63%	64%	65%	59%	60%	62%
10	10	Fiserv	US	61.8%	64%	60%	64%	63%	62%	58%
11	13	Thomson Reuters	US	61.8%	64%	62%	63%	58%	65%	59%
12	12	NICE Actimize	US	61.7%	63%	61%	64%	54%	64%	64%
13	20	Murex	France	61.5%	63%	63%	62%	60%	61%	60%
14	11	BAE Systems Detica	UK	61.5%	63%	62%	61%	58%	61%	64%
15	9	SAP	Germany	61.5%	63%	71%	62%	54%	61%	58%
16	15	Calypso	US	61.2%	62%	60%	64%	60%	61%	60%
17	25	FICO	US	59.8%	61%	55%	59%	59%	63%	62%
18	17	Markit	UK	59.8%	65%	64%	59%	55%	57%	59%
19	16	NASDAQ OMX Bwise	US	59.0%	65%	56%	60%	53%	60%	60%
20	21	MetricStream	US	58.2%	58%	59%	58%	56%	58%	60%
21	31	Experian	UK	57.8%	55%	50%	62%	65%	62%	53%
22	30	FINCAD	Canada	57.2%	54%	50%	55%	65%	62%	57%
23	19	Imagine	US	57.2%	60%	58%	55%	59%	51%	60%
24	29	Wynyard	UK	57.2%	60%	56%	56%	58%	52%	61%
25	23	QRM	US	57.0%	60%	52%	51%	58%	60%	61%
26	18	Numerix	US	56.3%	48%	48%	59%	65%	58%	60%
27	45	ION Trading	Ireland	55.7%	60%	57%	58%	50%	57%	52%
28	22	Fernbach	Lux	55.5%	59%	59%	52%	56%	49%	58%
29	28	Lombard Risk	UK	55.0%	55%	55%	57%	57%	54%	52%
30	38	Allegro	US	54.7%	54%	55%	56%	54%	55%	54%
31	47	Quantifi	US	54.5%	53%	58%	54%	56%	49%	57%
32	24	FIS	US	54.3%	59%	55%	50%	53%	57%	52%

Rank 2014	Previous Rank	Company	HQ	Total Score	Functionality	Core Technology	Organizational Strength	Customer Satisfaction	Market Presence	Innovation
33	32	ACI Worldwide	US	54.2%	56%	51%	55%	55%	55%	53%
34	27	EMC RSA Archer	US	54.0%	50%	49%	56%	56%	58%	55%
35	—	Reed Elsevier	UK	53.3%	50%	40%	65%	55%	60%	50%
36	60	Axiom SL	US	53.2%	56%	59%	46%	66%	44%	48%
37	34	SS&C	US	52.8%	48%	49%	59%	57%	48%	56%
38	35	EastNets	UAE	52.7%	53%	50%	49%	58%	53%	53%
39	36	Palantir	US	52.5%	50%	55%	48%	53%	49%	60%
40	33	MEGA	France	52.5%	56%	52%	52%	50%	50%	55%
41	79	Verafin	Canada	52.3%	56%	50%	50%	60%	39%	59%
42	37	Intellinx	Israel	52.3%	52%	55%	49%	56%	50%	52%
43	61	FircoSoft	France	51.7%	48%	46%	56%	55%	52%	53%
44	44	RiskVal	US	51.5%	52%	52%	52%	54%	47%	52%
45	40	FinAnalytica	US	51.3%	52%	45%	46%	55%	46%	64%
46	50	Quartet FS	UK	51.2%	40%	55%	48%	60%	45%	59%
47	51	Protiviti	US	51.2%	45%	45%	57%	55%	55%	50%
48	52	Prometeia	Italy	51.2%	60%	49%	48%	55%	40%	55%
49	41	TMX Technology (Razor)	Canada	51.0%	53%	57%	48%	60%	33%	55%
50	39	Jack Henry	US	51.0%	56%	50%	52%	50%	50%	48%
51	43	Conning	US	50.8%	58%	50%	50%	52%	44%	51%
52	42	Trintech	US	50.8%	48%	48%	52%	51%	57%	49%
53	48	DST Global	US	50.3%	47%	47%	52%	52%	52%	52%
54	—	YarcData	US	50.2%	40%	60%	50%	50%	35%	66%
55	55	Simcorp	Denmark	50.2%	46%	47%	53%	50%	50%	55%
56	—	ACL	Canada	49.5%	50%	50%	50%	57%	45%	45%
57	46	Towers Watson	US	49.2%	45%	40%	51%	55%	56%	48%
58	—	Empowered Systems	UK	49.2%	49%	55%	38%	65%	28%	60%
59	49	Brady	UK	49.2%	49%	48%	52%	51%	47%	48%
60	53	BPS Resolver	Canada	48.7%	45%	52%	50%	50%	40%	55%
61	59	Xenomorph	UK	48.5%	47%	53%	40%	55%	37%	59%
62	66	Enablon	France	48.3%	46%	46%	53%	52%	51%	42%
63	54	StatPro	UK	48.2%	45%	45%	51%	58%	42%	48%
64	—	Davis + Henderson	Canada	47.7%	47%	45%	53%	54%	46%	41%
65	57	UBS Delta	UK	47.7%	45%	45%	50%	50%	42%	54%
66	77	eFront	France	47.5%	50%	47%	55%	48%	40%	45%
67	58	AIM Software	Austria	46.3%	35%	53%	50%	50%	45%	45%
68	75	Entrust	US	46.2%	40%	40%	50%	50%	47%	50%
69	63	Savvysoft	US	45.8%	45%	45%	45%	53%	39%	48%

Rank 2014	Previous Rank	Company	HQ	Total Score	Functionality	Core Technology	Organizational Strength	Customer Satisfaction	Market Presence	Innovation
70	92	SuperDerivatives	UK	45.5%	37%	45%	40%	51%	47%	53%
71	64	BlackRock Solutions	US	45.5%	42%	40%	50%	50%	42%	49%
72	83	Sword Group	UK	45.3%	47%	45%	50%	50%	45%	35%
73	56	Cura	Singapore	45.2%	40%	40%	49%	58%	42%	42%
74	70	Polaris Software	India	45.0%	50%	54%	41%	50%	28%	47%
75	80	Linedata	France	44.8%	43%	42%	52%	49%	40%	43%
76	65	Temenos	Switzerland	44.7%	40%	49%	50%	49%	40%	40%
77	—	Tonbeller	Germany	44.7%	45%	45%	45%	45%	43%	45%
78	67	Riskdata	France	44.5%	40%	40%	46%	50%	43%	48%
79	94	SecondFloor	Netherlands	44.3%	40%	50%	45%	51%	30%	50%
80	68	Software AG	Germany	44.3%	44%	41%	46%	50%	45%	40%
81	72	Wilshire	US	43.8%	38%	38%	46%	51%	44%	46%
82	73	SAI Global	Australia	43.7%	41%	41%	47%	50%	45%	38%
83	76	Reval	US	43.7%	44%	42%	46%	46%	40%	44%
84	71	3i Infotech	India	43.7%	48%	44%	40%	46%	40%	44%
85	74	Patsystems	UK	43.5%	36%	39%	47%	52%	38%	49%
86	—	ClusterSeven	UK	43.0%	41%	43%	45%	48%	36%	45%
87	85	QUMAS	Ireland	42.8%	45%	40%	45%	50%	35%	42%
88	—	Armanta	US	42.2%	38%	52%	45%	40%	38%	40%
89	78	Investor Analytics	US	42.0%	40%	39%	37%	52%	39%	45%
90	95	Safe Banking Systems	US	42.0%	35%	43%	42%	52%	34%	46%
91	88	Neural Technologies	UK	41.8%	42%	41%	45%	42%	38%	43%
92	96	Teradata	US	41.8%	20%	50%	46%	55%	38%	42%
93	—	Vadis	Belgium	41.3%	40%	40%	34%	50%	30%	54%
94	82	Infogix	US	41.0%	34%	35%	47%	50%	40%	40%
95	—	Rockall Technologies	Ireland	40.8%	35%	45%	40%	50%	30%	45%
96	86	FactSet	US	40.5%	27%	30%	50%	50%	41%	45%
97	—	MORS Software	Finland	40.5%	43%	45%	40%	40%	30%	45%
98	90	List Group	Italy	40.2%	40%	45%	37%	47%	28%	44%
99	81	Chase Cooper	UK	39.8%	40%	37%	38%	47%	31%	46%
100	93	Microgen	UK	39.5%	25%	40%	42%	50%	40%	40%

Category Winners

Chartis categories:

- Functionality: IBM
- Core Technology: SAS
- Organizational Strength: Moody's Analytics
- Customer Satisfaction: Axiom SL
- Market Presence: IBM
- Innovation: IBM

Vertical:

- Banking: SAS
- Capital Markets – Sell-Side: Murex
- Capital Markets – Buy-Side: Misys
- Insurance: IBM
- Corporations: OpenLink

Geographical sectors:

- North America: FICO
- Central & South America: SAS
- Europe: IBM
- Asia-Pacific: Wynyard
- Middle-East & Africa: EastNets

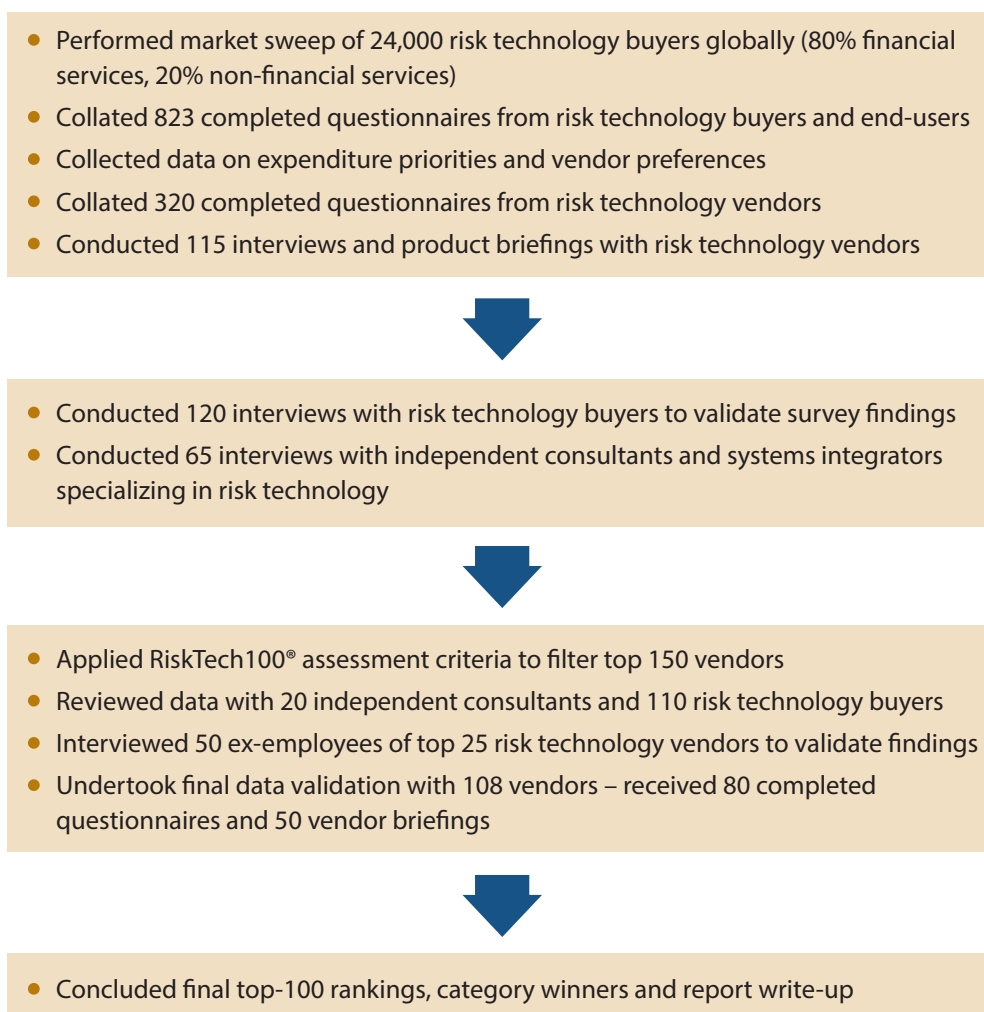
Horizontal:

- Credit Risk: SAS
- Market Risk: IBM
- Liquidity Risk & ALM: QRM
- Energy Trading Risk: OpenLink
- Financial Crime: NICE Actimize
- Operational Risk & GRC: IBM
- Regulatory Reporting: Wolters Kluwer

Appendix A: Research Methodology

The rankings in Chartis's RiskTech100® report reflect our analysts' considered opinions, along with research into market trends, participants, expenditure patterns, and best practices. The data collection for this study started in January 2013 and the analysis has been validated through several phases of independent verification. This study is the most comprehensive of its kind and is a core element of Chartis' annual research cycle.

Figure 13: RiskTech100® research methodology – 2014



Appendix B: How to Read the RiskTech100[®] Rankings

The RiskTech100[®] assessment criteria comprises six equally weighted categories:

- Functionality
- Core technology
- Organizational strength
- Customer satisfaction
- Market presence
- Innovation

Within each category, a number of sub-categories are weighted according to the level of importance that end-users and system integrators attach to these aspects of risk technology provision.

Table 2: RiskTech100[®] assessment criteria

(Sub-category weightings are shown in brackets)

Functionality

- *Depth of functionality* (0.5) – 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 those firms that achieved an appropriate balance between sophistication and user-friendliness. In addition, functionality linking risk to performance is given a positive score.
- *Breadth of functionality* (0.5) – 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 those firms achieving (or approaching) integrated risk management – breaking the silos between different risk management functions.

Core technology

- *Data management* (0.35) – 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* (0.35) – 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* (0.30) – The ability to surface information in a timely manner. The quality and flexibility of reporting tools and ease of use are important for all risk management systems.

Organizational strength

- *Sales execution (0.25)* – The size and quality of sales force, sales distribution channels, global presence, focus on risk management, messaging and positioning are all important factors.
 - *Financial strength /stability (0.25)* – Revenue growth, profitability, sustainability and financial backing. (The ratio of license to consulting revenues is key to business scalability.)
 - *Implementation and support (0.25)* – Important factors include size and quality of implementation team, approach to software implementation, post-sales support and training.
 - *Thought-leadership (0.25)* – Business insight/understanding, new thinking, formulation and execution of best practices, and intellectual rigor are considered important by end-users.
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Customer satisfaction

- *Value for money (0.4)* – Price to functionality ratio, total cost of ownership versus license price.
 - *After sales service and support (0.4)* – Important factors include ease of software implementation, level of support and quality of training.
 - *Product updates (0.2)* – End-users consider frequency of updates, keeping pace with best-practice and regulatory changes to be important.
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Market presence

- *Market penetration (0.4)* – Number of customers in chosen markets, rate of growth relative to sector growth rate.
 - *Market potential (0.3)* – Brand awareness, reputation, and the ability to leverage current market position to expand horizontally (with new offerings) or vertically (into new sectors).
 - *Momentum (0.3)* – Performance over the last 12 months, including financial performance, new product releases, quantity and quality of contract wins and market expansion moves.
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Innovation

- *New product development (0.4)* – 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 the vendor's closest competitors.
 - *Exploitation (0.4)* – 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 (0.2)* – Innovation is not limited to the product dimension. Some risk technology vendors are also actively working toward new business models for generating profitable growth.
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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 global user conference for leading 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

Visit www.chartis-research.com for more information.

Further Reading

- Global Risk IT Expenditure 2014-15
- Credit Risk for Banking Solutions 2013
- Energy Trading Risk Management Systems 2013
- Basel 3 Technology Solutions 2013
- Data Management and BI for Risk in Banking and Capital Markets 2013
- Enterprise Fraud Solutions 2013
- Anti-Money Laundering Solutions 2013
- Operational Risk Management Solutions for Financial Services 2013
- Enterprise GRC Systems 2012

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