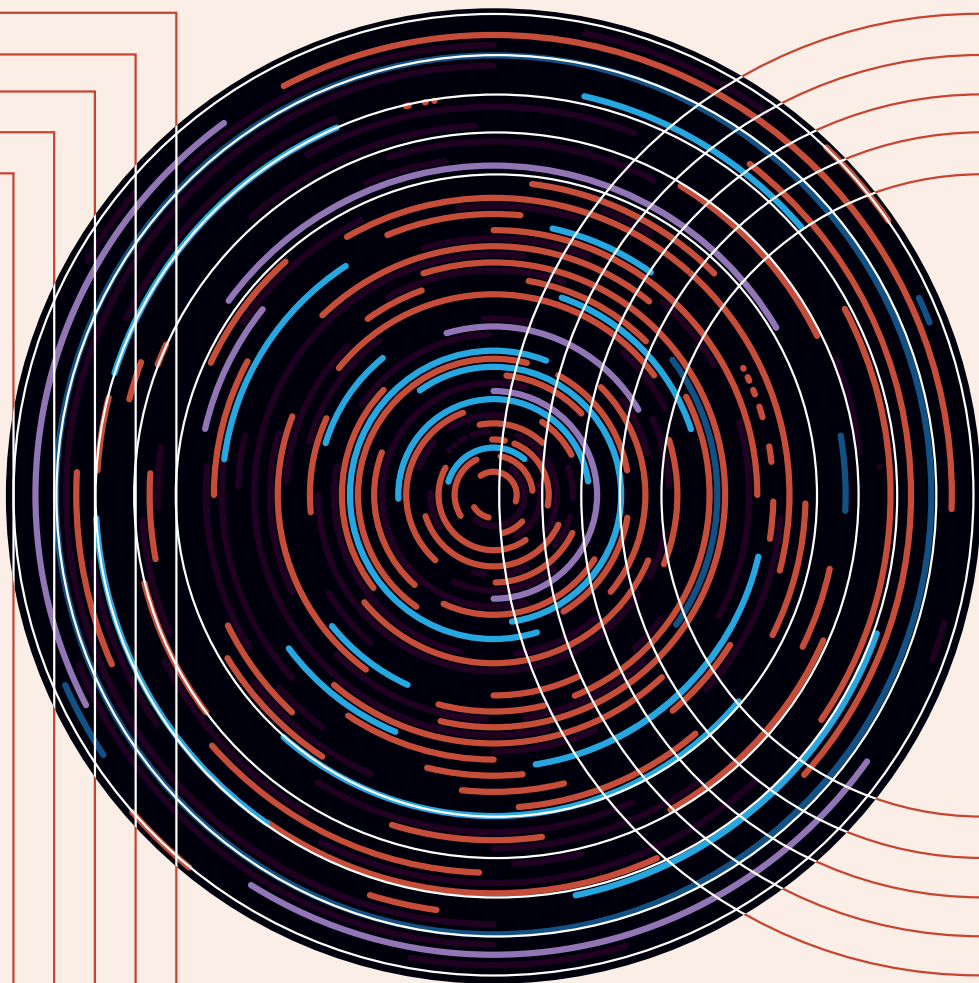




RiskTech
100 2021

**Vendor Analysis:
Broadridge**



Chartis Research is the leading provider of research and analysis on the global market for risk technology. It is part of Infopro Digital, which owns market-leading brands such as Risk and WatersTechnology. Chartis' goal is to support enterprises as they drive business performance through improved risk management, corporate governance and compliance, and to help clients make informed technology and business decisions by providing in-depth analysis and actionable advice on virtually all aspects of risk technology. Areas of expertise include:

- Credit risk.
- Operational risk and governance, risk and compliance (GRC).
- Market risk.
- Asset and liability management (ALM) and liquidity risk.
- Energy and commodity trading risk.
- Financial crime including trader surveillance, anti-fraud and anti-money laundering.
- Cyber risk management.
- Insurance risk.
- Regulatory requirements.

Chartis focuses on risk and compliance technology, which gives 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 implementing and developing risk management systems and programs for Fortune 500 companies and leading consulting houses.

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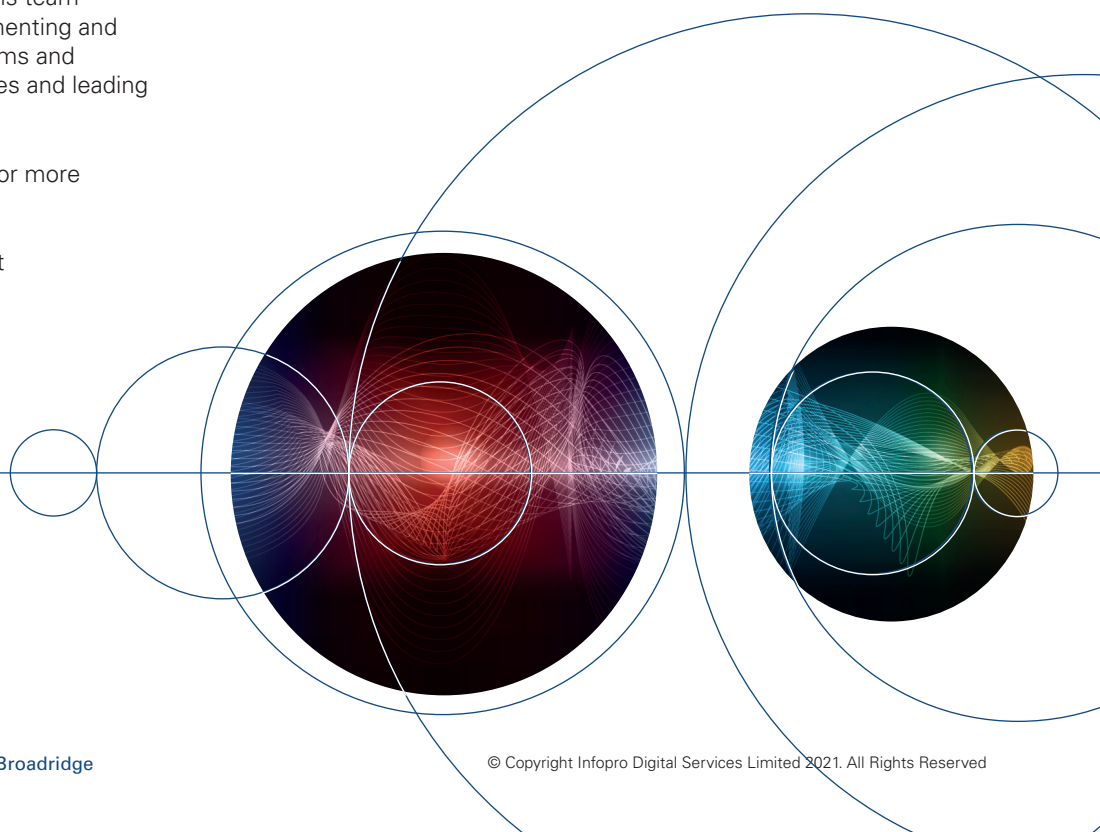


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1. Introduction

This report provides an independent evaluation and description of the ranking given to Broadridge in Chartis' RiskTech100® 2021 report. It contains:

- A vendor profile for Broadridge, with a focus on its fixed-income solution.
- The ranking for Broadridge in each assessment category, with supporting explanation.

Chartis' RiskTech100® report is globally acknowledged as the most comprehensive independent study of the world's major players in risk and compliance technology.

Chartis is the leading provider of research and analysis on the global market for risk technology.

In RiskTech100® 2021, Broadridge was ranked 60 overall.

Broadridge also won the **OpsTech – fixed-income support services** award in the 2021 RiskTech100®.

2. Broadridge: vendor profile

The company

Broadridge Financial Solutions (NYSE: BR), headquartered in New York, provides technology solutions to banks, broker-dealers, asset and wealth managers and public companies, in key areas such as client engagement, risk and operational efficiency.

Broadridge's technology and operations platforms underpin the daily trading of, on average, more than \$10 trillion of equities, fixed income and other securities globally. Broadridge is part of the S&P 500 Index, and employs more than 12,000 associates in 21 countries.

Broadridge won one category award in this year's RiskTech100®:

- **OpsTech – fixed-income support services.** Broadridge's in-depth work in credit risk, and its continuing strength in operational coverage, earned it the award in this particular OpsTech category.

Broadridge's offerings

Broadridge's businesses operate in two segments: Investor Communication Solutions and Global Technology and Operations (GTO; formerly known as Securities Processing Solutions).

The first segment, Investor Communication Solutions, provides solutions that cover bank/broker-dealer investor communications, corporate issuers, advisors and mutual funds and retirement. These solutions largely involve the processing and distribution of proxy materials to investors in equity securities and mutual funds, as well as the facilitation of related vote processing.

GTO is a leading provider of trade processing technology and outsourcing for financial services firms. It comprises a portfolio of solutions serving the capital markets, asset management and wealth segments. These offer a suite of real-time transaction processing services across multiple assets, and automate the securities transaction lifecycle, from front-end productivity tools, data aggregation, performance reporting, and portfolio management, to order capture and execution, trade confirmation, clearing and settlement, account and securities reference data, reconciliations, and accounting.

Broadridge also provides offerings for:

- Proxy voting.
- Market risk (for the trading book as well as the banking book).
- Governance, risk management and compliance (GRC) and model risk management and governance.
- Liquidity risk management.
- Risk data aggregation and reporting.
- Enterprise stress testing.
- Front-office risk management.
- Investment/portfolio risk.
- Fixed-income risk.
- Treasury risk.
- Real-time/trading infrastructure.

RiskTech100® award: success in fixed-income BPO

Broadridge's success in fixed income is driven by a combination of transaction processing and business process outsourcing (BPO). Its fixed-income post-trade processing platform enables real-time straight-through-processing of trades, and is used by over 40 dealers, including 19 of the 24 primary treasury dealers in the US. Broadridge's BPO solution provides services to 46 clients globally, covering more than 39 million accounts, spanning \$1.5 trillion dollars under management and processing over 8 million trades per day. Broadridge offers 30+ complex middle- and back-office processing functions, including advanced robotic process automation (RPA), enterprise risk management and business continuity planning (BCP). In addition, BPO possesses equities, futures, options and other asset classes; between fixed income and equities more than \$16 trillion of trades (notional value) are settled each day.

Broadridge's BPO is supported by more than 1,000 operations subject matter experts (SMEs), seasoned industry practitioners who have

operated in broker-dealers and asset managers, where they have gained vital detail-oriented, real-world operational experience. Broadridge's BPO is located in seven global locations, servicing clients across the capital markets, wealth management and asset management sectors.

BPO handles repo, collateral management, securities lending, asset servicing and full international settlements across instruments. It also provides reconciliations, FX processing, tax services, loan processing, compliance and regulatory services and trade financing operations.

In terms of technology, BPO leverages *Impact*¹, Broadridge's fixed-income solution. *Impact* covers fixed-income performance and risk analytics, as well as full front-to-back transactional processing, from trading through clearing and settlement.

More detail on Broadridge's fixed-income offering is provided in the next section.

¹ *Impact*SM is a service owned and offered by Broadridge Financial Solutions.

3. Focus: Broadridge’s fixed-income solution

Impact

Impact is Broadridge’s core fixed-income software application – a front-, middle- and back-office processing system for fixed-income securities that is heavily focused on US-originated fixed-income instruments. *Impact* handles the complexities of fixed-income treasury, mortgage-backed securities (MBSs), collateralized mortgage obligations (CMOs), municipals, Latin American Sovereigns, etc., as well as all transaction and processing support for front-, middle- and back-office operations, alongside midlife and post-trade activity support capabilities with full audit-trail functionality.

Impact provides fixed-income risk analytics capabilities, using internal and third-party model libraries to enable configurable, specific risk measurements that meet client requirements. *Impact* covers both exotic and vanilla asset

classes, including fixed coupon swaps and bonds, basis swaps, range accruals, inverse floaters, and FX digital floaters. Broadridge’s *Impact* handles to be announced (TBA) allocations, repo processing, sponsored repo, tri-party, real-time trade matching, clearing, risk management and netting of trades and positions. *Impact*’s features and capabilities are summarized in Table 1 and Figure 1.

MBS Expert

MBS Expert (MBSE) is an efficient MBS system for front- and middle-office functions. It is one of the most widely used post-trade MBS systems, and supports large-volume throughput while mitigating operational risk.

MBSE provides functional capabilities that support front-, middle- and back-office operations,

Table 1: Broadridge’s *Impact*: features

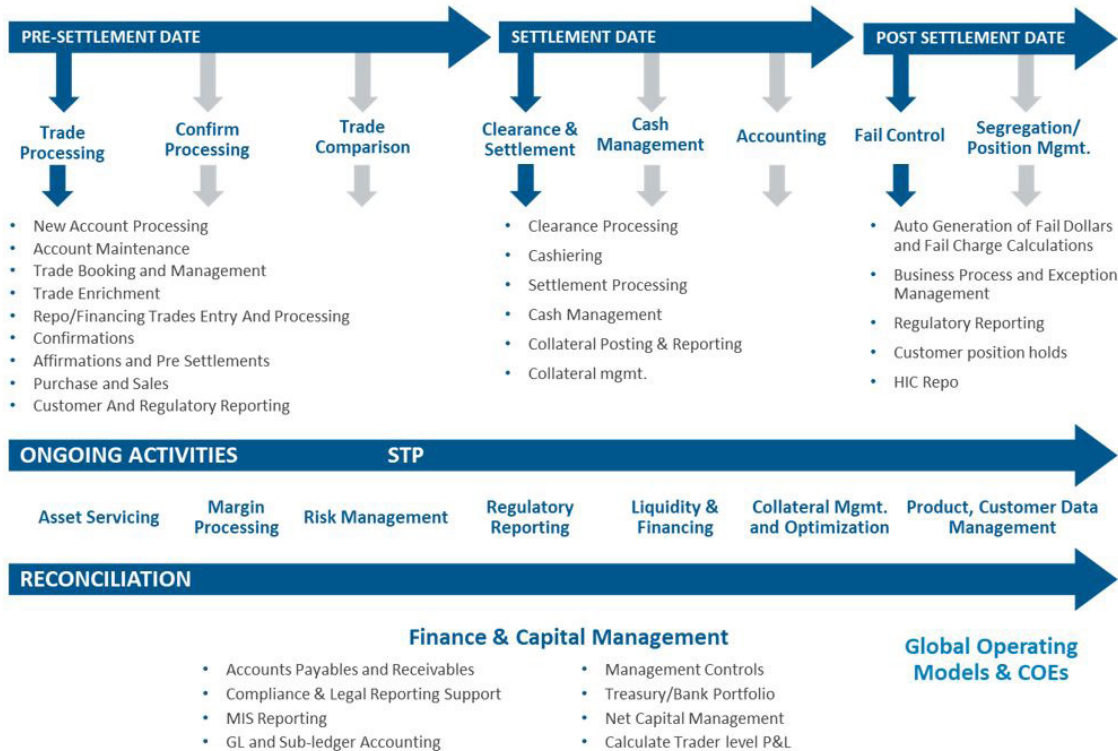
Complete sub-ledger accounting	<ul style="list-style-type: none"> Configurable, multi-currency, multi-entity, AFS/HTM, US GAAP, IAS, FASB 91. Cost lot accounting, auto account reconciliation, trade date/ settlement date FIFO or specified lot match.
Realized P&L, mark to market, accruals (including capitalization of coupon)	<ul style="list-style-type: none"> Flexible accrual rules. Amortization/accretion using straight line, level yield or modified level yield. Cost of carry, including finance interest and charges.
Financing coverage for repos, tri-party, GCFs, pledges, borrows, loans, etc.	<ul style="list-style-type: none"> Allows segregated trading accounts for general collateral, specials and matchbook trading. Flexible position management throughout the entire trading cycle. ECN connectors allowing STP for inter-broker/dealer trades.
Real-time clearance and settlement interfaces	<ul style="list-style-type: none"> Real-time NA interfaces to JPMC, BNYM, FICC, NSCC, DTC, DTC ID, CDS/CDCC, Fed Direct. Real-time international interfaces: Euroclear, Clearstream and many other CSDs; SWIFT, local markets.
Regulatory reporting	<ul style="list-style-type: none"> Full complement of FR 2004 primary dealer reports and Fed compliance. FINRA AEP reporting, etc.

Source: Broadridge

Figure 1: Broadridge's Impact capabilities

Fixed Income Post-Trade Lifecycle Processing

Comprehensive Capabilities Set



Source: Broadridge

which integrate with clients' electronic trading platforms. It also provides MBS functionality such as automatic match of incoming Electronic Pool Notification (EPN) messages to TBAs, buy-and sell-side TBA allocations, pair-offs with Fixed Income Clearing Corporation (FICC)/MBS Division integration, and speed of allocation, and is fully central counterparty (CCP) compliant.

The MBSE EPN function also provides operational and supervisory monitoring tools for inbound and outbound EPN messages (original notification [ON], cancel and correct [CC], and cancel [CX]) in real time. Furthermore, MBSE provides a comprehensive suite of functions for pool allocations, pair-offs and auto allocation, to ensure and optimize 'Good Delivery'.

MBSE has extended analytical capabilities around the details behind TBA transactions. These can provide analytical decisions on the cheapest bond to deliver for a TBA fill, and the optimized allocation of the cheapest to deliver, so that traders can use remaining collateral to sell in the secondary market.

Broadridge's MBSE software as a service (SaaS) platform is used by 30+ firms, including the largest FICC/MBS Division clearing members and asset managers.

MBS Trade Assignment Portal (TAP)

MBS TAP's web portal enables digital communication and assignment of trade (AOT) between mortgage originators, asset managers and broker-dealers, allowing these participants to electronically initiate, review, accept and sign AOT requests across agency generic TBAs, Stipulated (STIP) TBAs and specified pool trades. It utilizes e-signature, automatic match of incoming AOT request to trade inventory, and straight-through processing (STP) creation of assignment trade(s) to reduce manual processes and allow staff to concentrate only on exceptions. TAP is system-agnostic and customizable, and provides round-the-clock support. In addition, assignment letters are archived for up to seven years.

Distributed Ledger Repo (DLR) platform

Broadridge's DLR, underpinned by a secure blockchain, provides a single platform on which bilateral repo transactions can be conducted digitally. Users can receive a major cost advantage because, instead of physically transferring collateral, the underlying security is immobilized, and ownership is maintained through smart-contract functionality that uses a digital representation of collateral.

Intra-company, dealer to dealer and dealer to buy-side bilateral repo transactions can take advantage of immobilized collateral, while smart contracts manage the rights of collateral and ensure 'possession and control' by counterparties. DLR connects to current processing engines to ensure segregation, and to custodian systems to ensure verification of collateral location.

Bilateral repo transactions executed and processed through DLR can benefit from the same reduction of counterparty risk, by being 'tri-party like'. They also take advantage of cost savings through collateral movement.

A look ahead

Broadridge is continuing its 'ABCDs of Innovation' program – AI, blockchain, cloud and digital – giving clients emerging technology solutions to optimize processing and efficiency, increase revenue and mitigate risk. In many cases these pilot solutions are embedded within the BPO offering, and clients can benefit by being on the Broadridge platform. Broadridge DLR, an initial bilateral repo smart-contract offering, is spearheading potential development of the repo marketplace for illiquid asset classes, via the tokenization of assets.

Broadridge acquired ClearStructure in November 2019, incorporating its loan-processing tool Sentry. This is benefiting private equity firms looking to process loans, including commercial and syndicate loans. The BPO team will be responsible for administering the loan throughout its lifecycle, distribution and payment events, and for managing loan books on an ongoing basis.

4. Broadridge: ranking

Table 2 details the rankings for Broadridge for each of Chartis' RiskTech100® assessment categories, with supporting explanations and key highlights from our analysis. (Note that each category is ranked against those of the other 99 vendors in the RiskTech100®.)

Table 2: Rankings for Broadridge by assessment category

Assessment category	Ranking for Broadridge	Explanation
Functionality	53	<p>Depth of functionality. Broadridge's operational technology boasts in-depth functionality: its clearVELOCITY framework supports operations and compliance managers in aggregating and analyzing data and generating reports. One of its key differentiators is its GRC offering. The firm also offers harmonization of internal trade and transaction data, and provides standard connectivity to all major external parties involved in post-trade processes.</p> <p>Breadth of functionality. Broadridge has a wide offering for market risk, credit risk, GRC and OpsTech, covering a broad range of assets for both the trading and banking books within its Risk Master solution. This risk management offering enables firms to assess risk at the trade level or across entire portfolios. In addition, Risk Master, alongside the Portfolio Master platform, enables firms to conduct value-at-risk, scenario, back-testing and sensitivity analyses.</p>
Core technology	74	<p>Data management. An important differentiator for Broadridge is its dashboard targeted at the middle and back office, offering FIs the ability to visualize risk decisions and manage tail risks as part of Risk Master. The solution includes a risk-reporting tool that supports regulatory compliance, and FIs can choose from an extensive list of reports that include all risk measurements plus portfolio mark-to-market and P&L reports.</p> <p>Risk analytics. While Broadridge provides analytics within its operational risk management solutions, the company's key differentiator is risk aggregation. Broadridge's solutions offer fund managers holistic views into their aggregated risk, beyond singular views into individual portfolios or asset classes.</p>
Strategy	39	<p>Vision and leadership. Over the past 12 months Broadridge has published white papers on blockchain, risk management and sponsored repo, reconciliation, benchmarking, performance-based free models and the LIBOR replacement.</p> <p>Ability to execute. Broadridge has undertaken several partnerships and new product enhancements, highlighting its ability to execute on its strategy.</p>
Customer satisfaction	48	<p>After-sales service and support. At the completion of every project, and through day-to-day operational interactions, Broadridge collects, measures and manages client satisfaction in key performance areas. To do this it uses scorecards, annual customer satisfaction surveys, periodic operational reviews, and scheduled client relationship governance meetings.</p> <p>Product updates. Broadridge updated both its Risk Master and Portfolio Master products in 2020.</p>

Assessment category	Ranking for Broadridge	Explanation
Market presence	46	<p>Market penetration. Broadridge has a global presence, with offices in EMEA and Asia-Pacific, alongside its US headquarters.</p> <p>Market potential. As it executes on its strategy Broadridge is broadening its market potential, especially in the areas of regulatory reporting and OpsTech.</p> <p>Momentum. In recent years Broadridge has significantly strengthened its data management and visualization capabilities, as well as its offering for collateral in wholesale management. It has also completed the acquisition of FundsLibrary, a provider of fund documents and data dissemination in the European market.</p>
Innovation	97	Broadridge has maintained a steady focus on product enhancements in its core areas, tending to concentrate on smaller components. This, coupled with its ongoing developments in the middle and back offices, helps to steer its innovation strategy.

Note that each ranking is out of 100
Source: Chartis Research

5. Appendix A: Research methodology

Chartis's 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 validated the analysis through several phases of independent verification (see Table 3).

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

Table 3: RiskTech100® research methodology

<ul style="list-style-type: none"> • Performed a comprehensive market sweep of leading market participants in 40 risk categories.
<ul style="list-style-type: none"> • Completed 1,500 surveys and interviews with risk technology buyers and end users.
<ul style="list-style-type: none"> • Collected data on organizations' expenditure priorities and vendor preferences.
<ul style="list-style-type: none"> • Collated 400 completed questionnaires, briefing documents and product specifications from risk technology vendors.
<ul style="list-style-type: none"> • Conducted and attended 200 interviews, product demonstrations and strategy briefings with risk technology vendors.
<ul style="list-style-type: none"> • Conducted 150 interviews with risk technology buyers to validate our survey findings.
<ul style="list-style-type: none"> • Conducted more than 50 interviews with independent consultants and system integrators specializing in risk technology.
<ul style="list-style-type: none"> • Applied RiskTech100® assessment criteria to filter the top 150 vendors.
<ul style="list-style-type: none"> • Reviewed data with 30 independent consultants and 110 risk technology buyers.
<ul style="list-style-type: none"> • Interviewed 60 ex-employees of the top 50 risk technology vendors to validate our findings.
<ul style="list-style-type: none"> • Undertook final data validation with 100 vendors, receiving 80 completed questionnaires and carrying out more than 100 vendor briefings.
<ul style="list-style-type: none"> • Completed 100+ independent reference checks to validate vendor claims and client satisfaction levels.
<ul style="list-style-type: none"> • Developed the final top 100 rankings, identified the category winners and finalized the report.

Source: Chartis Research

6. 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 4).

Table 4: RiskTech100® assessment criteria

Functionality	<ul style="list-style-type: none"> • 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 those 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 those firms achieving (or approaching) integrated risk management – breaking the silos between different risk management functions.
Core technology	<p>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.</p> <ul style="list-style-type: none"> • 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

Table 4: RiskTech100® assessment criteria (continued)

Strategy	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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

7. How to use research and services from Chartis

In addition to our industry reports, Chartis 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.

Advisory services

Advisory services and tailored research provide a powerful way for Chartis clients to leverage our independent thinking to create and enhance their market positioning in critical areas.

Our offering is grounded in our market-leading research, which focuses on the industry and regulatory issues and drivers, critical risk technologies and leading market practices impacting our sector. We use our deep insight and expertise to provide our clients with targeted market and industry analysis, tailoring content to assess the impact and potential of relevant regulatory and business issues, and highlighting potential solutions and approaches.

Chartis' advisory services include:

Market dynamics

The markets that our clients – vendors, institutions and consultants – address are changing at an ever-increasing pace. Understanding the market dynamics is a critical component of success, and Chartis uses its deep industry and technical knowledge to provide customized analysis of the specific issues and concerns our clients are facing.

Market positioning

In today's highly competitive market, it is no longer enough to simply have a leading product or solution. Buyers must be able to appreciate the differentiating capabilities of your brand and solutions, and understand your ability to help them solve their issues.

Working with our clients, we generate compelling, independent co-branded research, targeting critical business issues. This helps our clients to position their solutions effectively, 'own' key issues, and stand out from the crowd.

Collaborating closely with our clients, we develop pragmatic, resonant thought-leadership papers with immediate industry relevance and impact.

Our offering includes:

- **Co-branded research** on key market topics to provide a unique and compelling point of view that addresses a key industry driver and highlights the relevant issues. Reports can be tailored to varying levels of depth and can be powered by quantitative survey fieldwork, qualitative industry interviews, our deep domain expertise, or a blend of all three.
- **Chairing roundtables and/or facilitating events and workshops**, to support clients in hosting compelling events that put them at the heart of the discussion.
- **Targeted marketing through our sister brands**, leveraging the power of our parent group – Infopro Digital – to reach across leading brands such as Risk.net, WatersTechnology, FX Week and Central Banking.

Competitor analysis

Our unique focus on risk technology gives us unrivalled knowledge of the institutions and vendors in the sector, as well as those looking to enter it. Through our industry experts, Chartis clients can tap our insights to gain a much deeper understanding of their competitors and the strategies they should pursue to better position themselves for success.

Regulatory impact analysis

The analysis and assessment of regulatory change and implementation is one of Chartis' core strengths. We can apply our insights to assess the impact of change on the market – both as it applies to vendors and the institutions they serve, or on a client's specific product and customer base. We can also provide insights to guide product strategy and associated go-to-market activities, which we can execute for internal use to drive our clients' strategy, or as a co-branded positioning paper to raise market awareness and 'noise' around a particular issue.

8. Further reading



RiskTech100® 2021



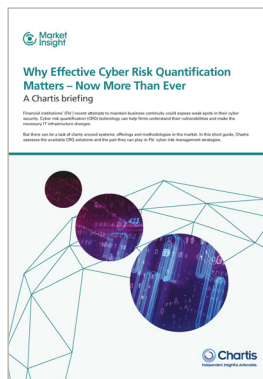
Big Bets 2021



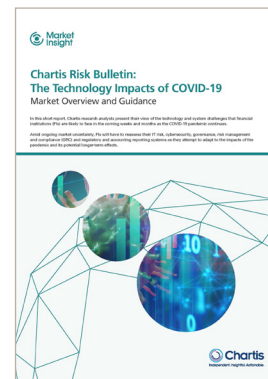
Artificial Intelligence in Financial Services, 2019: Demand-Side Analysis



Enterprise GRC Solutions, 2019: Market Update and Vendor Landscape



Why Effective Cyber Risk Quantification Matters – Now More Than Ever



Chartis Risk Bulletin: The Technology Impacts of COVID-19

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