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The Digitalization of Sell-Side Risk Management

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Prepared for:

TORSTONE
SIMPLIFYING POST-TRADE

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INTRODUCTION

The world has changed suddenly and significantly, and the field of risk management is once again challenged with the most impactful event the industry has faced since the financial crisis over a decade ago. The novel coronavirus has resulted in mayhem as market volatility and uncertainty surges. This environment has brought the need for digitalization of risk technology front and center to monitor this global event.

Up until this point, much of the pace of change has been driven by an onslaught of stringent regulations aimed at improving transparency, capital adequacy, and practices of sell-side institutions. Against this backdrop, the boundaries of technology are being tested by the need for rigorous calculations as well as data management and consumption. The costs associated with buying or building new tech and hiring additional expertise, and the price tags linked to reporting and compliance, are challenging many institutions at a time when balance sheets continue to shrink and risk is on the rise.

This white paper describes a series of trends in risk management being shaped by the recent wave of volatility, onslaught of regulatory requirements, ever-increasing data, and market structure changes impacting sell-side institutions. Among them, the focus on risk system upgrades and requirements necessary to weather the latest global crisis and remain compliant is key. The use of advanced tech, such as artificial intelligence (AI) and machine learning (ML), is imminent and will influence changes within organizational structures necessary to achieve scale while reducing total cost of ownership (TCO).

METHODOLOGY

This white paper is based on Aite Group interviews with 15 Tier-2 and Tier-3 global banks from August 2018 through February 2020, Aite Group interviews with 19 international data management executives at capital markets firms in Q3 and Q4 2019, and an Aite Group survey of executives from 28 financial institutions worldwide from Q4 2018 to Q2 2019.

MARKET DYNAMICS

The risk management landscape is being shaped by several different factors related to regulatory change across the globe and market structure change. Table A highlights some of the trends affecting the risk management function and their implications for the market.

Table A: The Market

Market trends	Market implications
Advanced analytics such as AI and ML will continue to be tested in the risk management process and will influence the internal structure of banks.	The shift to digitalization will continue to find its way into various parts of banks as technology creates common threads across business areas. In risk, the practical use cases for AI and ML will be slow to develop. However, advanced tech will eventually arm chief risk officers with a better toolbox of analytics and capabilities to tackle ever-increasing amounts of data and complex calculations.
The need to identify synergies across regulations and optimize the use of data in risk management and other business areas will lower TCO in the long run.	Perhaps unsurprisingly, the cost of compliance will only continue to increase for the sell-side as new regulations such as the Fundamental Review of the Trading Book (FRTB) require adequate tech solutions, expertise, and data. Banks will continue to look for ways to minimize costs while maintaining the highest standards of risk management and regulatory compliance.
Hosted deployment will continue to replace on-premises risk system technology as cloud and cloud-native solutions become commonplace.	Hosted solutions have eclipsed on-premises deployments for many consumers of risk system technology. There is a trend for existing on-premises clients to move toward newer, faster tech while new clients use the hosted option from the get-go. This evolution has paved the way for faster deployment of changes and new features as well as quicker run times for risk calculations.
The importance of data management and architecture continues to grow amidst pending regulations and rising data volume and complexity.	Over the past two years, there has been an incredible uptick in data volume driving the need for more AI to help manage it. Ninety percent of today's data has become available during this time. The resulting push by banks for better data management and architecture will enhance several business areas, including risk management.

Source: Aite Group

TECTONIC SHIFTS IN REGULATION AND MARKET STRUCTURE

The new decade brings with it several earth-moving challenges. Among them, the shifting of the London Interbank Offered Rate, or Libor, to alternative market-based benchmarks will prove to be one of the largest fundamental changes in our lifetime. For banks, it's time to get serious about the upcoming FRTB rules. A push toward more common ground between solutions using sensitivities calculations linked to FRTB—such as the Standard Initial Margin Model (SIMM) and initial margin—is forthcoming. Meanwhile, the expansion of various valuation adjustments (XVAs) beyond accounting use will continue to grow, fostered by Basel III regulatory capital requirements as well as the final phases of the uncleared margin rules. The latest surge in volatility resulting from the novel coronavirus has added another test for risk managers.

ADOPTION OF ADVANCED TECHNOLOGY IS IMMINENT

Digitalization was one of the most-used buzzwords of 2019. A simple Google search returns over 27 million results for this word, which, at the highest level, describes the process of converting text and other information into a digital form that can be processed by a computer. AI, which traditionally refers to human-like intelligence being carried out by machines through advanced modern technology, and ML, which sits in the domain of AI and is a cross-disciplinary field that combines statistics and computer science, have underpinned the digitalization process.

Discussions around the adoption of AI and ML tech were regularly included at industry events, in thought leadership papers, and in the financial press as of late. 2020 is set to be the year in which strategies for linking functional areas and finding common ground across business units will begin in earnest for tech-savvy banks. This has already been happening at a handful of Tier-1 institutions over the last few years. J.P. Morgan has been particularly vocal in its efforts to apply AI and ML for a variety of purposes, including intelligent pricing, hedging, anomaly detection, and new analytics.

Experts in the field of risk management have also been experimenting with AI and ML. Although Aite Group expects this to continue, replacing risk models with ML models will likely be years into the future despite the popularity of "all things advanced tech" headlines. A long list of challenges to ML models have been cited by market participants who have spoken with Aite Group. Most often, risk managers point to the "newness", "explainability", and "interpretability" of AI and ML as the greatest hindrance of adoption. Inherently, this makes sense, as firms rely on risk models for managing several types of risk, such as market, credit, and operational risks, as well as regulatory compliance. Fear that ML models are just "black boxes" is a hinderance, particularly as the industry pushes for more transparency. The field will likely turn the corner as more practitioners test these models and develop an understanding of how they work and what their drawbacks are.

The regulatory community also plays a role in the trajectory ML risk models will take. Regulators will need to catch up to these developments from both a technological and skillset standpoint in order to feel comfortable with banks using such models. With swaths of regulations and market

structure changes coming into force in the next few years—including Basel III and the transition from Libor—both regulators and banks will be focused on getting through these challenges before deep-diving into new model techniques and innovation. Aite Group estimates at least five years will pass before mindsets shift to ML models at the regulatory level.

Looking ahead, one can envision applications of AI and ML in the management of market risk. At present, ML is emerging as a relevant method to detect changes in market regimes and anomalies. In areas such as post-trade transaction cost analysis, changes in patterns are beginning to be used to inform a pre-trade process. Consequently, the same information can guide changes in the risk management of trading models as liquidity and other market conditions shift. However, since ML models essentially emerge from data, the volume of data to train the model is called into question, as are the decision drivers that underpin the model's output.

While the future is bright for applications of AI and ML in the risk process, the reality is that use cases will come in drips and drabs. As practitioners use advanced tech in areas it can support, more applications will develop—slowly. Banks that are willing to make the investment and add expertise to develop an advanced tech culture will move ahead of the pack.

SYNCRONIZATION MEANS LOWER COST IN THE LONG RUN

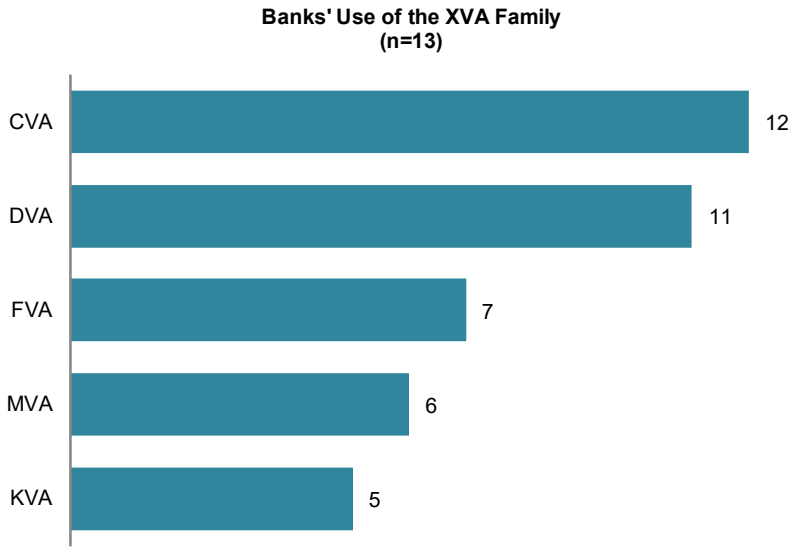
In 2020, the decision to upgrade risk technology will become a necessary evil in light of the many requirements developed by the Basel Committee on Banking Supervision as part of Basel III. Tier-2 and Tier-3 banks are turning to third-party vendors and outsourced solutions providers to enable the calculation of sensitivities for the FRTB Standardized Approach (SA). As a result, risk vendors have invested resources to create solutions capable of calculating sensitivities for the SA since this is where most of the market will be. Fewer solutions focus on the internal models approach (IMA), as its use will likely be concentrated at the Tier-1 level, in which internal systems prevail.

Tier-1 banks have been testing their systems during 2019 and even earlier; however, 2020 is the year lower-tiered banks will get on board as well. In this environment, some banks will choose solutions based on their requirements and existing system architecture that will lower their TCO—even if it means selecting one vendor for the SA, another for the IMA, and perhaps even a third for capital charge reporting. However, savvy banks looking to reduce TCO over the long term are busy identifying operating and other synergies. For instance, the fact that the FRTB SA and standard initial margin model are calculated using similar sensitivities, and the standardized approach for the credit valuation adjustment framework (SA CVA) is based on the same risk sensitivities, offers a common thread along the lines of project implementation, data aggregation, and other achievable synergies.

The trend toward smarter sell-side risk system integration will also be realized by organizational changes within the structure of banks—once siloed functionality and areas of expertise will need to collaborate on a larger scale to optimize the identification of synergies. In the case of the

family of the XVAs, it is evident that banks are looking well beyond the sole use of the credit valuation adjustment (Figure 1).[1]

Figure 1: The Popular XVAs and the Main Use Cases

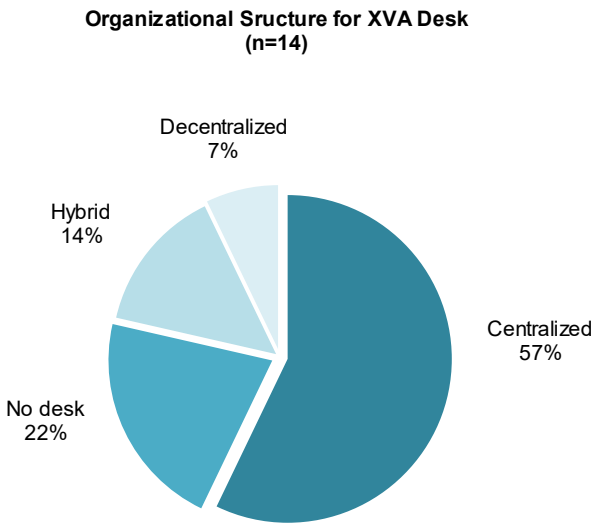


Source: Aite Group's interviews with 15 Tier-2 and Tier-3 bank respondents, August 2018 through February 2019

As a result, internal structures within banks are changing (Figure 2). Half of the firms Aite Group spoke with have deployed a centralized and coordinated desk. The XVA desk requires a combination of diverse skills for pricing, hedging, and model management, and is made up of a mixture of staff. This includes quantitative researchers focused on model calibration and pricing, traders who handle the trading function, and those with technology backgrounds. Some banks may not have "official" XVA desks but still have a team that loosely forms the XVA trading and pricing function. As these banks start to become more sophisticated and want to manage costs in a consistent manner, centralized desks will aid by pooling experts and supporting cohesion between credit, capital, and funding functions.

1. See Aite Group's report *XVA in 2019: Valuation's Generation X*, March 2019.

Figure 2: Common XVA Organizational Structure Across Banks



Source: Aite Group's interviews with 15 Tier-2 and Tier-3 bank respondents, August 2018 through February 2019

THERE IS AN INCREASING APPETITE FOR THE CLOUD

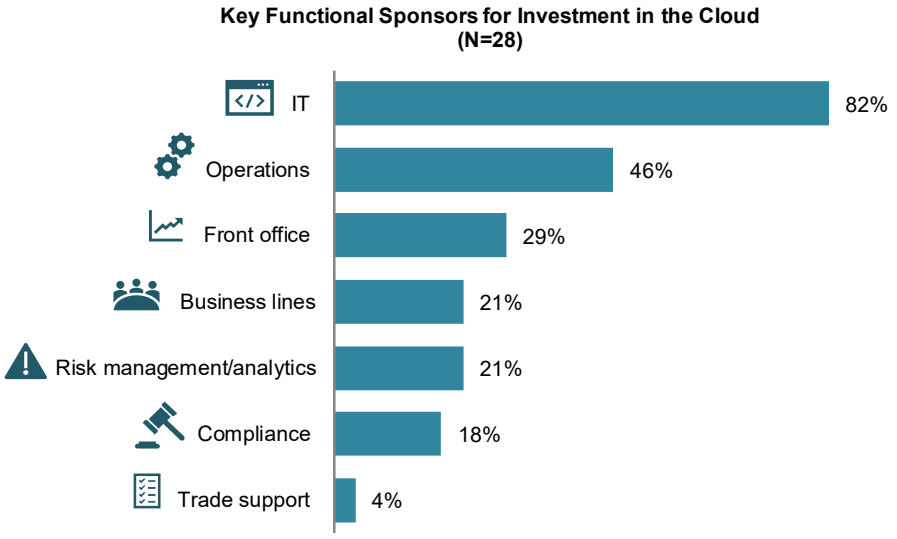
Due to the high computing power requirements for data and analytics required to support FRTB compliance and other risk models, banks are finding hosted solutions more attractive than traditional on-premises risk system deployments. While it may have been difficult to get "the cloud" over the line with clients just a few years ago, hosted solutions have gone mainstream, given their ability to reduce TCO and create efficiencies, such as a faster deployment of changes and elasticity of processing power, which allow bank clients to pay per use for peak run times.

Banks Aite Group interviewed typically choose private cloud deployments rather than public, due to data security concerns. As with any enterprisewide technology choice, the strategic decision to move into a cloud environment involves a lot of functional players from across the firm. Figure 3 describes the functions engaged within respondent firms to a recent Aite Group survey, highlighting the continued importance of IT in the overall decision-making process.[2]

Eighty-two percent of firms still rely on IT to pull the trigger on investment in a cloud. A Tier-1 global bank interviewee notes that the firm's chief information officer and chief risk officer have been at the helm of its cloud strategy and were the key proponents of going the private cloud route rather moving to a public cloud. The other functions of influence within respondent firms include operations at 46% of firms, in which the chief operating officer may have equal pegging or have greater influence than IT on dictating enterprise operating model changes. The engagement of specific functions, such as the front office, risk management, or compliance, reflects the business-line adoption of cloud environments.

2. See Aite Group's report *Cloud Adoption in Capital Markets: A Far From Fluffy Subject*, May 2019.

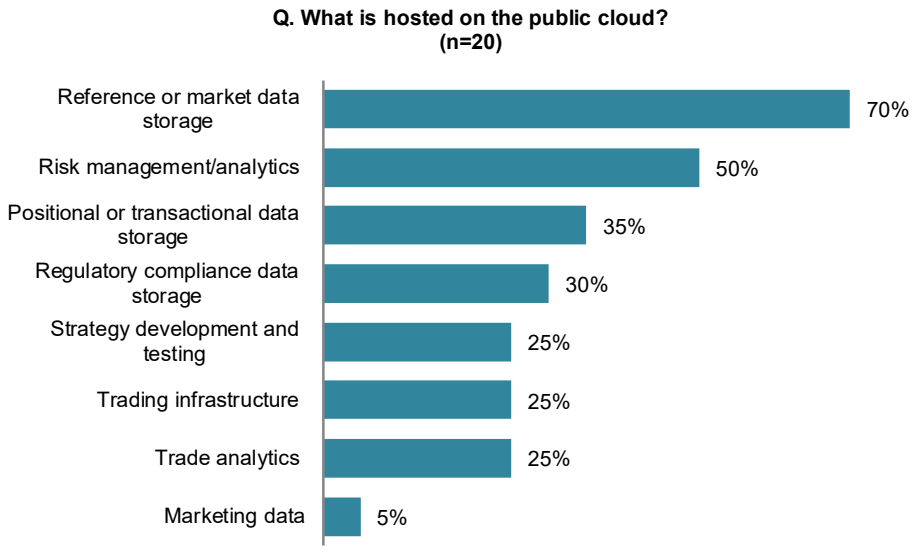
Figure 3: Key Internal Sponsors at Respondent Firms for Cloud Adoption



Source: Aite Group survey of 28 financial institutions, Q4 2018 to Q2 2019

Risk analytics is an area of focus for cloud deployment for half of firms because of the computing-intensive nature of the function and the increasing popularity of cloud bursting arrangements (Figure 4). Cloud bursting is a hybrid cloud setup in which an application runs in a private cloud and bursts into a public cloud when the demand for computing capacity spikes.

Figure 4: Functions and Data Hosted in a Public Cloud Environment



Source: Aite Group survey of 28 financial institutions, Q4 2018 to Q2 2019

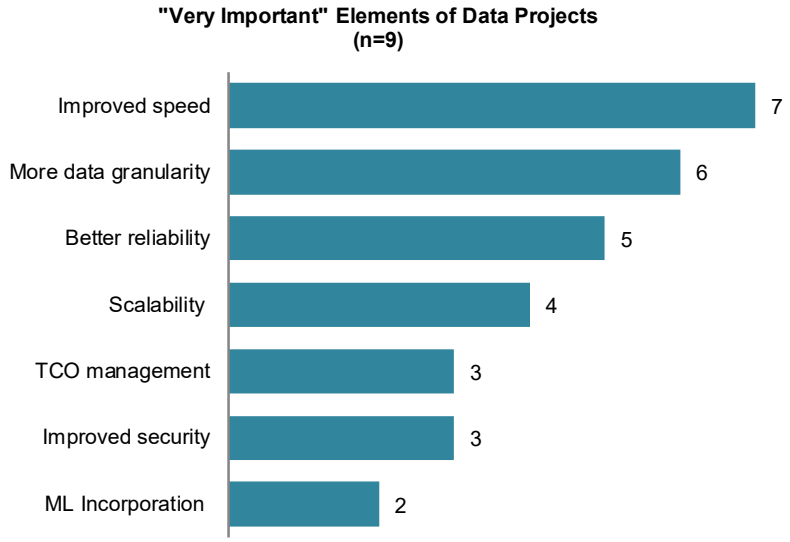
THE IMPORTANCE OF DATA MANAGEMENT AND ARCHITECTURE CONTINUES TO GROW

Data is a topic financial market participants can discuss for hours given the depth, complexity, and uses of information. Over the past two years, there has been an incredible uptick in data volume driving the need for more AI to help manage it. Ninety percent of today's data has become available during this time. To put this statistic in a layman's context, within a single minute, 3.5 million Google searches occur. AI is responsible for delivering search results back to the user against a massive backdrop of possible information. Foot traffic, credit card transactions, social media content, and all other alternative data are collected and fed into machines, enabling users to extract valuable insight like never before.

The demands of risk management across different regions and asset classes has challenged banks' ability to manage data sets. This exercise is particularly taxing given the infancy of advanced tech to aggregate and process swaths of information in a variety of formats and structures. Pending data-intense regulations such as FRTB have further strained resources and have forced firms to invest in data architecture upgrades. The push for real-time analytics adds yet another layer of complexity to the data and risk management story. This climate has resulted in clients placing direct pressure on their counterparties to prove systems are robust and able to cope with often unpredictable market environments.

Banks have responded to these demands by highlighting key challenges. For instance, controlling latency issues and creating efficiencies have become priorities for all business lines at sell-side firms Aite Group interviewed. Improvements in data architecture are expected to improve the speed of calculations, the ability to drill down to a more granular level of detail in the data, and the reliability of information (Figure 5). Interestingly, the incorporation of ML was lower priority in terms of actions taken to improve data quality and processing—a result that emphasizes the newness of this approach.

Figure 5: Sell-Side Data Project Priorities



Source: Aite Group interviews with 19 data management executives at capital markets firms, Q3 and Q4 2019

Business areas that are most impacted by data project priorities tend to be the areas that stand to lose the most by sticking with legacy architectures and processes. According to sell-side market participants Aite Group interviewed, a great deal of data architecture pressure is linked to trading, risk management, regulatory compliance, and transaction processing (Figure 6). Stringent post-crisis reporting and data transparency compliance, which may result in hefty fines for noncompliance, was viewed in equal weight to trading operations by a number of banks—clearly a sign of the times.

Figure 6: Business Areas Most Impacted by Data Architecture

Source: Aite Group interviews with 19 data management executives at capital markets firms, Q3 and Q4 2019

CONCLUSION

Banks:

- The digitalization of risk technology will be a pivotal factor in the monitoring and management of risk during the period of increased volatility and uncertainty caused by the novel coronavirus. System upgrades and advanced technology will better position the sell-side to weather turbulent markets.
- The trend toward smarter sell-side risk system integration will drive changes in the identification of synergies in data and processes, enabling a decrease in TCO in the long run. Banks that are willing to take the time to analyze efficiencies and even change their internal structure to achieve scale will realize greater profitability.
- Banks are beginning to embrace the digitalization of their business areas. Although these are early days, 2020 is the year to embrace AI and ML, and envision where they might create synergies and lower TCO. Getting the right modern risk platform in place will be critical to take advantage of the AI and ML evolution as it develops.
- The push toward better data management and architecture will separate the haves and the have-nots in banking. Firms must prioritize business areas that are most exposed to increased data volume and complexity, such as trading, risk management, and regulatory compliance. Banks that continue to rely on legacy processes and architecture will not be able to keep up with increasingly rigorous risk calculations.
- Finally, hosted deployments will continue to displace on-premises solutions, as the reliance on the cloud for more immediate upgrades will benefit banks that have made the switch. Banks preparing for regulatory challenges linked to risk management and compliance will continue to adopt faster, newer tech and will avoid costly fines for noncompliance in the process.

ABOUT AITE GROUP

Aite Group is a global research and advisory firm delivering comprehensive, actionable advice on business, technology, and regulatory issues and their impact on the financial services industry. With expertise in banking, payments, insurance, wealth management, and the capital markets, we guide financial institutions, technology providers, and consulting firms worldwide. We partner with our clients, revealing their blind spots and delivering insights to make their businesses smarter and stronger. Visit us on the web and connect with us on Twitter and LinkedIn.

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