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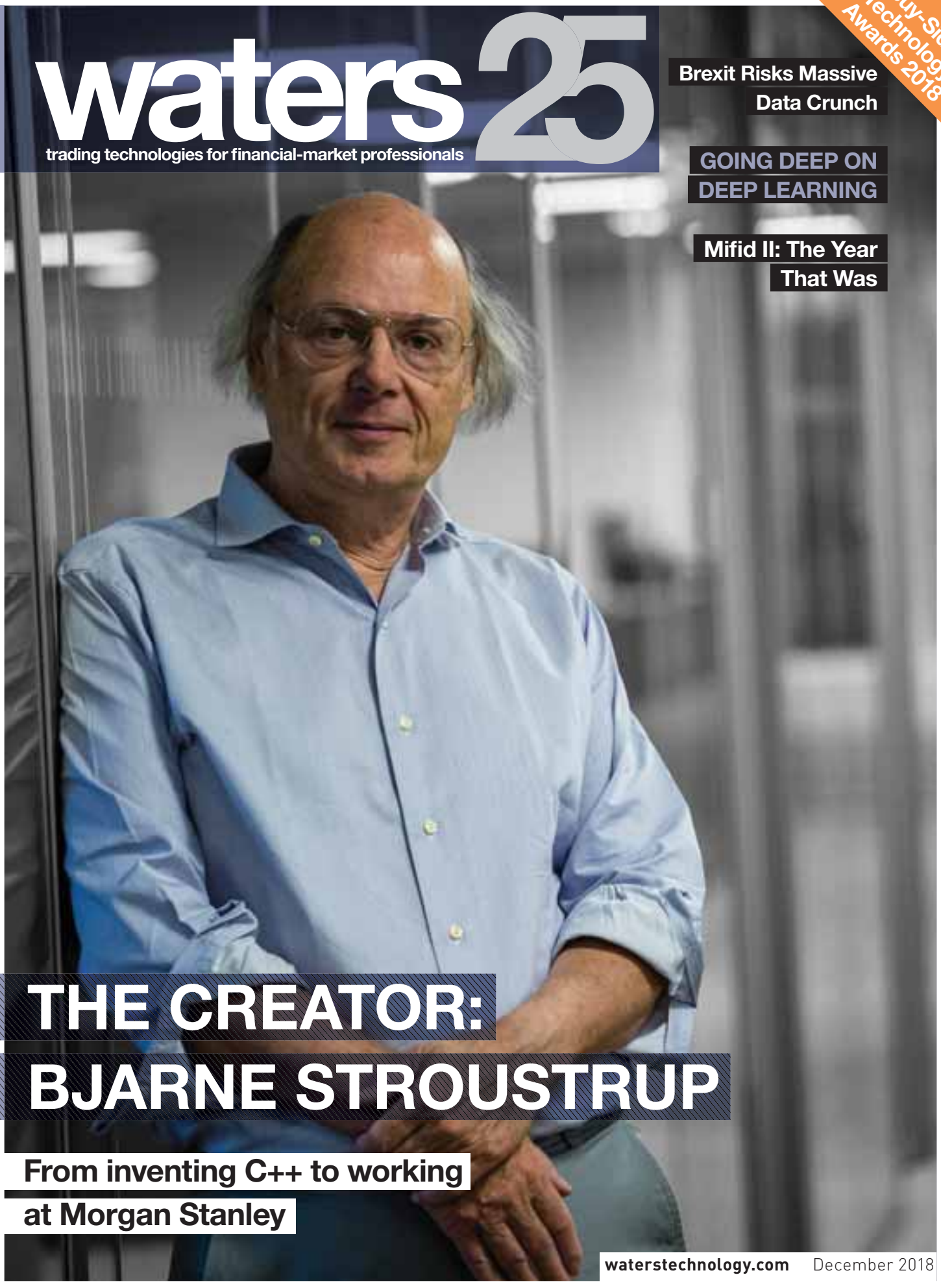
trading technologies for financial-market professionals

Buy-Side Technology Awards 2018

Brexit Risks Massive Data Crunch

GOING DEEP ON DEEP LEARNING

Mifid II: The Year That Was



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Walking Through Fire

If you're reading this column in print, you'll likely be attending our annual, flagship conference, Waters USA. In which case, welcome. Coupled with the American Financial Technology Awards—which, if you're reading this online, you'll be able to peruse soon—we're pretty proud of what our team at *Waters* has put together.

The agenda this year, I believe, reflects many of the changes that have been under way in financial markets for some time. Some of them are for the better—shortly after the subprime crisis, much of the talk in technology was about future-proofing systems for 10, even 15 years down the line, as if such a thing were truly possible. Today, I think, the conversation is more nuanced, particularly as technology has emerged as not just a core part of the trading business, but in many cases, the business itself.

Likewise, in the post-2008 days, there were very few conversations occurring in technology that considered how the industry will move to its next phase of evolution. Rather, it was about reining in technology—just look at the reaction to the Flash Crash and subsequent attempts to corral algorithmic trading, which is now regarded as a staple of the market. Who would have thought the discussions at these conferences would be around how specific technologies could prompt a rethink of the foundation of post-trade, for instance, or how quantum computing is now very much a technology within our grasp?

But, as my predecessor in the editor's chair, Victor Anderson, was always fond of saying, this is ultimately a people business. You can't replace decades of experience with historical data, or the learned intuition of a veteran with an algorithm, no matter how much the people selling these things would like you to believe.

As the industry moves forward, it's important that this experience is retained. I was having a conversation with one such veteran a few weeks ago, who weathered 2008 but found her ultimate nemesis not in asset-backed securities, but in trading technology, which has slowly eaten away at her commissions and business to the point of terminal failure. Her time, she said, was over, and she was considering a move away from the trading floor for the last few years of her career.

It was a stark reminder that, while the move to the screen across asset classes has been good for many, it also comes at a cost. All of the slick interfaces, microservices and neural nets in the world can't compensate, ultimately, for a steady hand at the tiller when things really go south—and while we at *Waters* are, naturally, advocates of the pursuit and advancement of technology, firms should consider the tendency of history to repeat itself, and the need to retain the knowledge and experience of those who have been through the fire before. W

James Rundle
Editor

waterstechnology

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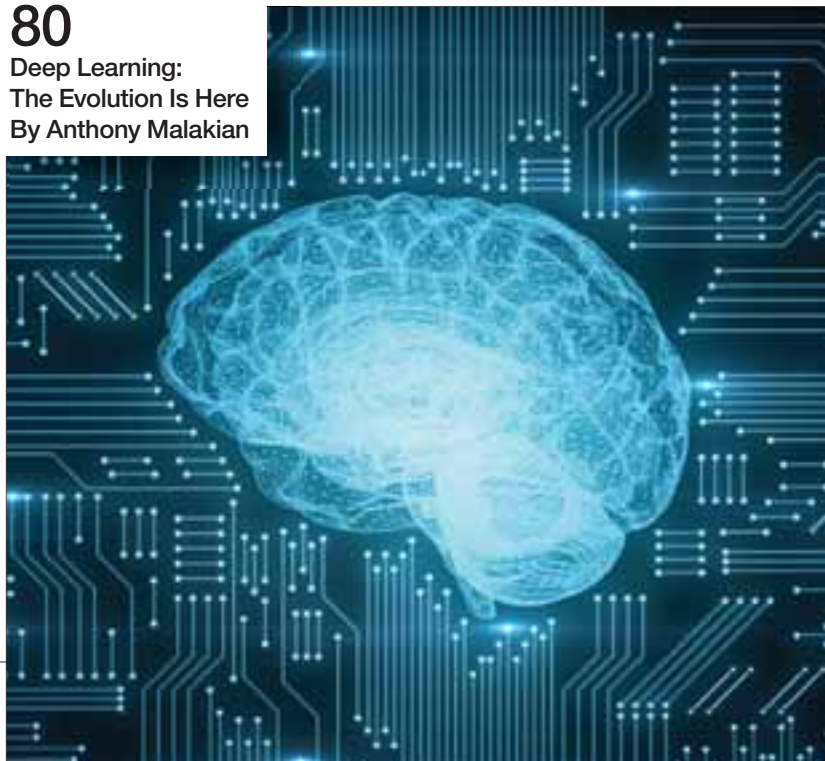


Alt-Data Difficulties Challenge Largest Asset Managers

A new study finds that while large asset managers are investing in big data analytics and alternative data, it's a fraught process. By Anthony Malakian

For many, the next great battleground in asset management will revolve around advanced analytics and alternative data. Asset managers are gearing up for the challenge, but it's by no means a slam dunk, yet.

Earlier this year, UBS Asset Management formed the Quantitative Evidence and Data Science team (QED), which was spun out of the organization's quantitative investment research team to help the asset manager better incorporate alternative datasets and perform advanced analytics using new technologies.

Suvrat Bansal, head of innovation and chief data officer at the asset manager, tells *Waters* that, through creating a dedicated unit that has a laser focus on the alternative data and machine learning spaces, and by combining that with its fundamental data, the firm can better explain the alpha that's being created by a signal. But it's not an easy process and it's one of iteration. Part of the trick, he says, is building an engagement model to avoid sprawl and wasted energy.

"Without that kind of engagement and interpretability, you're going to constantly go through a staggered failure-and-success [process] and that takes time," says Bansal, "Obviously, there are more capabilities constantly evolving in terms of more data and more platforms, but what it comes down to is how you make it real for our portfolio managers and our researchers, and their ability to explain it to the clients, which is the hardest part and has been the hard part on the quant side. Can you take that and apply it equally on the alternative-data and machine-learning side—that's the winning combo."

Suvrat Bansal
UBS Asset Management

By forming QED, UBS AM is further along than most. Indeed, there appears to be no homogenous state as such, when it comes to the buy side's exploration of machine learning and alternative data.

On November 7, data and analytics advisory firm Element22 released a report that benchmarks 20 asset managers in terms of incorporating alternative data and delivering advanced analytics. Those included in the study, which was sponsored by UBS and includes its asset-management arm, are hardly small fry—combined, they have almost $15 trillion under management, representing 20 percent of total global mandates. The inaugural report breaks the institutions into one of four buckets: Two are just starting work in this sector, five are in the middle of their projects and two said they are breaking new ground, while the remainder are just starting their projects.

Predrag Dizdarevic, founding partner of Element22, describes advanced analytics as being able to deploy machine-learning algorithms for alpha generation, classification of client acquisition and retention; for business operations, using natural-language processing (NLP) to feed into the machine-learning platforms; smart robotic process automation for managing the digital workforce, combining machine learning bots with automation bots; and to assist humans to get to the feedback mechanism of the process.

It tends to be a four-year process to get from the starting gun to breaking new ground. Dizdarevic says that even firms in the middle are simply trying new things, whether that be through proofs-of-concept or a production environment for a smaller process.

"Because of that, I'd say there are a lot of misses compared to the hits; however, it's not like they build a whole infrastructure that really doesn't work," he says. "I see more of the efforts fail and some of them succeed, but at some point, those [projects] that succeed open the eyes of everybody to the potential and then the major investment comes."

Those nearing the end of the journey, he says, have a number of elements in common. They have embraced the cloud and big data analytics tools; have the ability to spin up sandboxes; can create specialized environments to test datasets and models; have the ability to use native services within the main cloud providers; and have robust, specialized teams of data scientists and analysts. Those who are most aggressively investing in pursuing advanced analytics and alternative data strategies are investing between two and three percent of annual revenues, according to the report. W

CSDs Consider Entry into Crypto Market

The crypto markets need a body that fulfils the role of depositories adequately, say settlement specialists. By Wei-Shen Wong

A group of central securities depositories (CSDs)—specialist organizations that are typically responsible for holding securities such as shares so they can be easily transferred—are exploring how their roles are translatable to the crypto-asset infrastructure, in a sign that traditional finance's biggest players are considering an entry to the market.

Walter Verbeke, global head of business model and innovation at Euroclear, tells *Waters* that there are certain pieces of financial market infrastructure (FMI) and roles that CSDs as a central body play today, that could be used in the crypto market.

"Tomorrow, those FMI roles will have to be played as well. And some of those pieces of infrastructure and some of those FMI roles will fall more naturally into our remit for what a CSD does. It's very simple. What do we do as a business? Very simply, we provide safety and efficiency and that's what people look for. If you have that, then a traditional investor base—for example, pension funds, and investment managers—will feel confident," he says.

Elements of traditional market structure, such as proper custody agents and settlement specialists, are commonly cited among the key barriers to entry for institutional investors. While some projects have been announced by the largest digital currency exchanges, such as Coinbase, few of the existing custodians and CSDs in equities and other well-established markets have publicly spoken about firm plans to engage.

Part of the reason is due to the idiosyncrasies of the crypto market, which bear some resemblance to commodities in theory, but in practice hold their own concerns. While delivery and storage of physical products such as grain or metals, for instance, require warehousing and supply chains, crypto custody requires a high level of technical sophistication, such as cold storage of wallets and identification keys, and the ability to transfer assets between them. Blockchain technology provides an auditable means to do this on public ledgers, but this is not always regarded as suitable for professional-grade transactions, particularly those that may take place in the dark and cannot be publicly revealed.

Euroclear is one of the 28 CSDs that published a paper through the International Securities Services Association (ISSA) discussing how their roles are applicable to the crypto asset market.

Verbeke adds that there are a number of risks that exist in the market that drove the need to create CSDs some 50 years or so ago. "The market came together and created CSDs to mitigate those risks inherent to the capital market. If you and I buy something from each other, I need to know who you are. That would mean that I have a counterparty risk, a settlement risk, a liquidity risk, legal risk, jurisdictional risk, and so on. It doesn't matter whether it's with securities or fixed income—these risks are inherent to a capital market. That's why the capital markets created an organization to mitigate those risks," he says.

He says crypto assets are just another asset class in that same capital market. "So there will be those same risks again, but of course the way it will present itself will be a bit different. Today we have a centralized database. Tomorrow we will have a distributed ledger," Verbeke says.

There are three things CSDs typically does, he says. They are responsible for safekeeping, safe settlement and to an extent, supporting market liquidity.

These three roles need to be fulfilled in the crypto market, too. Verbeke says the group of CSDs think they have a stronger role to play compared to others. "Why? Because we've been on that line of thinking for the last 50 years and even more. It's not about the technology. We have procedures in place, we have standardizations, and we have people who know what to do whenever something goes wrong. As long as everything goes well, it's fine. But when things go wrong, it's about stability and being safe and efficient," he says.

The crypto asset market needs someone who makes sure the rules are defined, not someone who defines the rules. "That's the tricky thing," Verbeke adds.

"It's all about collaboration," he says referring to the work Euroclear is doing with the other CSDs on this matter. "You come to a much richer solution by working with the custodians," he says. W

For this month's feature on custody in the crypto markets, see page 14.

Brexit's Unintended Consequences Could Include Mifid III

Sweeping changes to Europe's trading rulebook, which came into force in January 2018, may have to be revised again soon after the UK leaves the European Union, according to one key lawmaker.

During a keynote speech at the Fixed Income Leader's Summit in Amsterdam on November 8, Kay Swinburne, a UK Member of the European Parliament (MEP), said that the political environment surrounding Brexit would heavily impact any further revisions of the Markets in Financial Instruments Directive (Mifid II), which she described as "a reality."

Brexit, she said, is "the single biggest driver right now" for continued alterations to Mifid II. Indeed, these changes may be so fundamental that it may result in a third iteration of the rules package. Swinburne, who is also the vice-chair of the influential Committee on Economic and Monetary Affairs in the

European Parliament, was one of the key sponsors of Mifid II. However, she said, key changes are already beginning to take place "behind closed doors" that may redefine Mifid II as the industry knows it.

One example of this is the investment firm review, which has the potential to fundamentally redefine such entities under European law. Other changes could stem from what she described as the "failures" of certain technical standards governing best execution and reporting.

While all EU regulations have a baked-in review clause, in which the performance of the rules is assessed up to five years after enactment and the file can be reopened to make changes—such as the process currently under way with the review of the European Market Infrastructure Regulation—Swinburne expressed concern that politics would have an undue influence on this process when it comes to Mifid II.

"Even though I am a politician, I actually take no pleasure in bringing politics into financial legislation and I firmly believe that a review of any highly technical dossier, anything like Mifid II, should be kept at a distance from serious political influence," she said. "But I am afraid that it is a reflection of the reality that I have seen in Brussels over the last few months. It would be foolish to consider future regulatory change without considering the political drivers that are there right now."

Josephine Gallagher

Tibco Releases Spotfire X Analytics Platform

Data software provider Tibco has released Spotfire X, a business intelligence tool that provides real-time and historical data and analytics for use-cases in trading, portfolio management, back office, compliance, and client services. Mark Palmer, senior vice president and general manager of analytics at Tibco, says Spotfire X was designed to address three trends in market technology: self-service in business intelligence (BI) software, the trend toward the use of artificial intelligence (AI) in BI tools, and the mainstream use of streaming real-time data. To address those trends, Spotfire X integrates natural language processing, AI, and streaming data for predictive modeling and data discovery.

"Spotfire X is the first BI platform to natively support streaming data, which, for the capital markets, makes this the first time that a professional BI tool can be used, for example, on live market data, live order flow, or live customer inquiries," Palmer says. "Furthermore, this live data can be compared to the past, as the data changes."

The solution has a redesigned user interface, augmented analytics for natural language- and AI-driven searches, recorded data flows that can be audited, amended, or authored, and real-time visual analytics on data streams. "Spotfire X instantly adds over 80 streaming data sources to its library of data," says Palmer. "For example, before Spotfire X, there was no way to connect financial market data, trading venue data streams, or FIX data flows directly to a self-service BI tool."

Amelia Axelsen

Startup Genesis Receives $3M in Series A Funding

Four years ago, Stephen Murphy and James Harrison came together to launch Genesis, a software company that uses a microservices framework to build tools for buy- and sell-side firms. Today, the company has clients in Europe and the Americas, and a staff of 30, 26 of whom are developers.

In an effort to build the staff to 42 over the next three months, and enhance its tech capabilities, it has raised $3 million in Series A funding from Illuminate Financial and Tribeca Angels.

Because it uses a microservices architecture, the vendor has been able to expand its product offering fairly quickly, with solutions covering things like wealth management, trade allocation, reconciliation, quote management, transaction-cost analysis, execution management and tools geared toward Mifid II, among other services.

"When building products on top [of a microservices framework] we believe that we can offer our clients not only a buy but a build option, as well. So, it's not buy or build, it's buy and/or build," says Murphy, the company's CEO. "Because it's built on this microservices technology, it's very easy for us to adapt and integrate the technology."

Anthony Malakian

DTCC Moves to Testing Phase for TIW Project

The Depository Trust and Clearing Corp. (DTCC) is moving to the next phase in its project to "re-platform" its credit derivatives processing utility using blockchain technology.

The DTCC began the testing phase of the Trade Information Warehouse (TIW) in November, with 15 participant banks as well as MarkitServ. Once the testing on the new platform, which has been built using distributed-ledger technology, is complete, the DTCC will involve a larger group in a second phase. Testing is expected to end by the first quarter of 2019 with the platform's launch to be scheduled soon after.

The project is a partnership between the DTCC, IBM, Axoni, and blockchain consortium R3. Val Wotton, managing director, product development and strategy, derivatives and collateral management at the DTCC, says the functionality of TIW has been completely recoded. "Since selecting the consortium of IBM, Axoni, and R3, DTCC and its partners have completely recoded the functionality of the TIW, utilizing DLT and the cloud for scalability, optimal performance, flexibility, and to reduce costs," Wotten says. "The testing plan, which includes test cases and test data, was developed with input from our steering committee and includes an independent project management team for coordination and testing expertise."

TIW will automate record-keeping, lifecycle events, and payment management for cleared and bilateral credit derivatives. It provides lifecycle event processing services for around 98 percent of credit derivative transactions around the world. The use of distributed-ledger technology, participants say, will mean that the utility will act as a golden record for credit derivatives settled through CLS.

Test participants will conduct end-to-end structured user acceptance tests, use simulated use cases to test data, and validate system interactions. "We are currently conducting structured user-acceptance testing (UAT) that involves a coordinated effort to test functionality in a controlled environment with the key major participants at the same time," says Wotten. "Participants will not only be able to validate MarkitServ and DTCC's new systems, but also the interaction with existing systems within firms and with other key market infrastructure providers."

The DTCC planned the TIW rollout for early 2018. It was pushed to the end of 2018, then to early 2019. While banks and market participants are the primary targets of the platform's testing, other services, including TradeServ—which will replace DSMatch—are also dependent on TIW and will engage in the testing phase.

Emilia David

Refinitiv Launches Aggregated Bond APA Data

Refinitiv, the spun-off Financial and Risk division of Thomson Reuters, has launched a service that aggregates fixed-income trade data published by Approved Publication Arrangements and multilateral trading facilities under European reporting requirements.

The rules have created an influx of data, which is helpful for firms when fulfilling regulatory requirements, but lacking any way to aggregate this data sufficiently, customers are finding it challenging to get a comprehensive view of the market, says Douglas Munn, head of Elektron Real Time at Refinitiv.

The bond aggregator service addresses this by gathering data from 28 reporting and transactions venues together in one place, Munn says.

"One of the things that customers are very interested in is seeing this data in a time series or tick history," he says. "By bringing all this data together, they can basically see all these trades and use that to fuel not only their transaction-cost analysis and their best-execution services, but also to use it to run back-testing, price discovery, or use it to look into how they want to trade in the market."

Amelia Axelsen

RSRCHXchange Launches ESG Research Stream

Financial research platform provider RSRCHXchange has launched a research section on its RSRCH unbundled platform dedicated to environmental, social, and governance (ESG) initiatives. The platform allows users to view sample research and pitch documents from different research providers—ranging from specialist researchers to banks—and to review and purchase reports linked to ESG insights.

RSRCHXchange co-founder and co-CEO Vicky Sanders says socially conscious investing is driving an increase in demand from asset managers for ESG research and data, but that firms are struggling to find relevant data.

"There's a huge appetite for this research, but there's a big gaping hole in the middle of those that want it and those who produce it," Sanders says. "Due to that high client demand, we spoke to some of the independent firms who do ESG and sustainable research, and onboarded them onto the platform and created a dedicated space within our platform specifically for this research."

RSRCHXchange indexes PDFs of research and reviews content to ensure that the RSRCH search engine can identify all ESG reports for platform users. Sanders says ESG research distribution is the hardest to tag because often the metadata is hidden in niche categories that can amount to more than 200 fields.

Amelia Axelsen

CME, NEX Clear Final Acquisition Hurdles

Clearance from antitrust regulators in the UK paved the way for the Chicago Mercantile Exchange Group's (CME's) acquisition of London-based NEX Group, creating a significant force in global derivatives trading.

The CME undertook a share-and-cash acquisition of NEX, which was formed after interdealer broker Icap sold its voice-broking business to Tullett Prebon in 2016. NEX operates a number of electronic markets in currency and fixed-income trading, as well as a technology arm that includes key post-trade services providers, including Traiana and TriOptima.

On October 12, the US Department of Justice approved the transaction, and on October 31, the UK's Competition and Markets Authority (CMA) said that it had also cleared NEX's acquisition and would not refer it for further investigation.

The tie-up creates a dominant force in certain US markets, particularly the trading of Treasurys. While news of the acquisition first broke in March, the two firms have had to go through a series of antitrust approvals by regulators in both the US and the UK.

UK authorities, in particular, have proved to be challenging when it comes to large-scale financial services mergers and acquisitions—winning antitrust approval from the CMA, for instance, was one of the largest hurdles for the aborted London Stock Exchange–Deutsche Borse merger in 2016.

However, CME and NEX executives have repeatedly said that they were confident of the approvals. On an earnings call with analysts on October 25, John Pietrowicz, CFO of the CME, said the exchange believed that "the transaction will be closed before year-end," and that both firms "feel very good in terms of where we stand with the regulators."

Sources in the UK and US fintech industry had also expressed hesitancy about the chances of the acquisition escaping unscathed. One Treasurys trader at a US bank said it was "by no means a slam dunk" after the acquisition received approval under the US Hart–Scott–Rodino antitrust law. Another executive at a European exchange said that they would have been "surprised" if NEX or CME didn't have to divest anything in order to clear antitrust approvals.

However, executives at both firms have taken steps in recent months to express commitment to the UK, which is set to leave the European Union in March 2019. While NEX has established presences in Europe, particularly in Amsterdam, in anticipation of the withdrawal, both firms have publicly said that London will remain the firm's European headquarters.

Both companies have existing, substantial presences in the City of London, and Michael Spencer, the CEO of NEX Group, has strong links to British politics, having been the treasurer of the ruling Conservative Party from 2006 to 2010.

A Competition and Markets Authority court hearing took place on November 1, formalizing the decision.

Following that meeting, trading in NEX shares was suspended at 4:30 pm on the same day, with the cancellation of NEX shares on the London Stock Exchange following on November 5. The CME issued new shares immediately after, closing the acquisition.

James Rundle

Coleman Debuts Interactions Platform

Coleman Research has launched Coleman Exchange, a cloud-based platform that enables buy-side firms to track their research communications and interactions with partners, industry experts, sell-side analysts, and third-party providers.

Users can plug into a single system on a subscription basis to log and monetize their interactions with other participants during phone calls, conference sessions, meetings, and other events.

The platform records key aspects of the research interactions lifecycle and can be used to publish participants' availability, schedule appointments for consultations, manage subscriptions, and invoice for analysts' services. Coleman Exchange is designed to produce real-time reports based on research consumption and the underlying cost of each interaction, to comply with EU unbundling rules mandated by the revised Markets in Financial Instruments Directive.

Josephine Gallagher

CAT Rollout Smooth, But System Still Needs Work

The first rollout of the Consolidated Audit Trail (CAT) on November 15 was largely smooth, but the system still needs to evolve further to be able to handle the influx of information coming from the industry next year, its builders say.

Thesys CAT, a unit of Thesys Technologies, says it processed over 58 billion equities, options, and market data records. This was strictly limited to self-regulatory organizations, like exchanges, and groups including the Financial Industry Regulatory Authority. The next phase, expected to begin on November 15, 2019, will cover large broker-dealers. Equities will come first, followed by simple options, then more complicated options trades.

Andre Frank, president of Thesys CAT, says work still continues to meet the requirements for staggered industry reporting. "The system will have to continue to evolve in order to be able to properly handle the challenges of the industry member rollout, in particular with the complexities around the phased implementation schedule," Frank says. "That said, Thesys CAT is ready for the challenge and is excited to bring the next phase forward in 2019."

Emilia David

Rimes Debuts New Benchmarks Service

With the advent of the European Union's Benchmarks Regulation (BMR) in January, the UK's Financial Conduct Authority ushered in a stringent regime for the administration, contribution to, and use of benchmarks used in financial instruments and contracts. Data provider Rimes has rolled out a new service designed to help specifically with that.

"For benchmark users such as asset managers, banks and insurance companies, BMR has brought with it uncertainty over which new benchmarks are approved for use in the EU, and around which historic benchmarks will continue to be authorized once the BMR transition period ends on January 1, 2020," says Alessandro Ferrari, chief marketing officer at Rimes.

Under BMR, users can only use benchmarks from authorized or registered benchmark administrators. Fines for non-compliance can run to as much as 10 percent of a firm's annual income. To help users navigate these choppy waters, Rimes is set to launch the next stage of its RegFocus suite of solutions: the BMR Data Feed.

"RegFocus BMR Data Feed gives benchmarks users clarity over which benchmarks are authorized under BMR as the benchmarks landscape continues to evolve," he says. "The service addresses the two major challenges faced by the financial industry with BMR: What specific benchmarks can I use—as the European Securities and Markets Authority (Esma) only provides the names of the administrators—and how do I identify an index when no standard identifier, e.g: an ISIN, has been mandated by the regulation."

Rimes has mapped index reference codes across official symbols, including ISINs, Bloomberg Tickers and Reuters Instrument Codes. The service draws on data from interviews with 350 data providers, including MSCI, FTSE Russell, Bloomberg and the Intercontinental Exchange, as well inputs from Esma and other European regulators, Ferrari says.

"The result is a complete repository of all indices authorized for use in the EU under BMR—including from administrators based in third-country jurisdictions—that is continually updated to reflect changes as they occur," he continues.

Rimes had a soft launch of the product at the company's BMR event in London during November. Ferrari says the event has experienced the fastest registration rate of any Rimes event, ever, due to the confusion that persists in the market around BMR.

The BMR Data Feed is a managed service where the user sends Rimes their daily list of benchmarks they're planning to use and the vendor sends back a feed showing the ones they're approved for. "If no standard identifier has been mandated by the reg, we will research the index further, hence the managed service component," Ferrari says.

Anthony Malakian

Mosaic Smart Data Releases ML-Powered Reporting Feature

Data analytics platform provider Mosaic Smart Data has launched a new feature for its MSX platform that generates fixed-income analytics using machine learning.

The vendor says trade reports will be available to clients faster and can highlight trends or identify anomalies within trades.

Matthew Hodgson, CEO of Mosaic Smart Data, says the new real-time reporting feature addresses a fixed-income pain point. "One of those is that there is no common definition or harmonized format," Hodgson says. "What the platform does is instantly generate a report based on normalized data so all parties can immediately see any discrepancies."

Using natural-language generation, the company can generate trading reports with data coming from both voice and electronic communications. Additional machine learning technology provides explanations for anomalies in the reports. Clients can customize the data read by the platform, and compliance departments can put controls on the data and analytics to make sure only authorized staff access the reports.

Emilia David

BNP Paribas Partners with Itarle Group for TCA

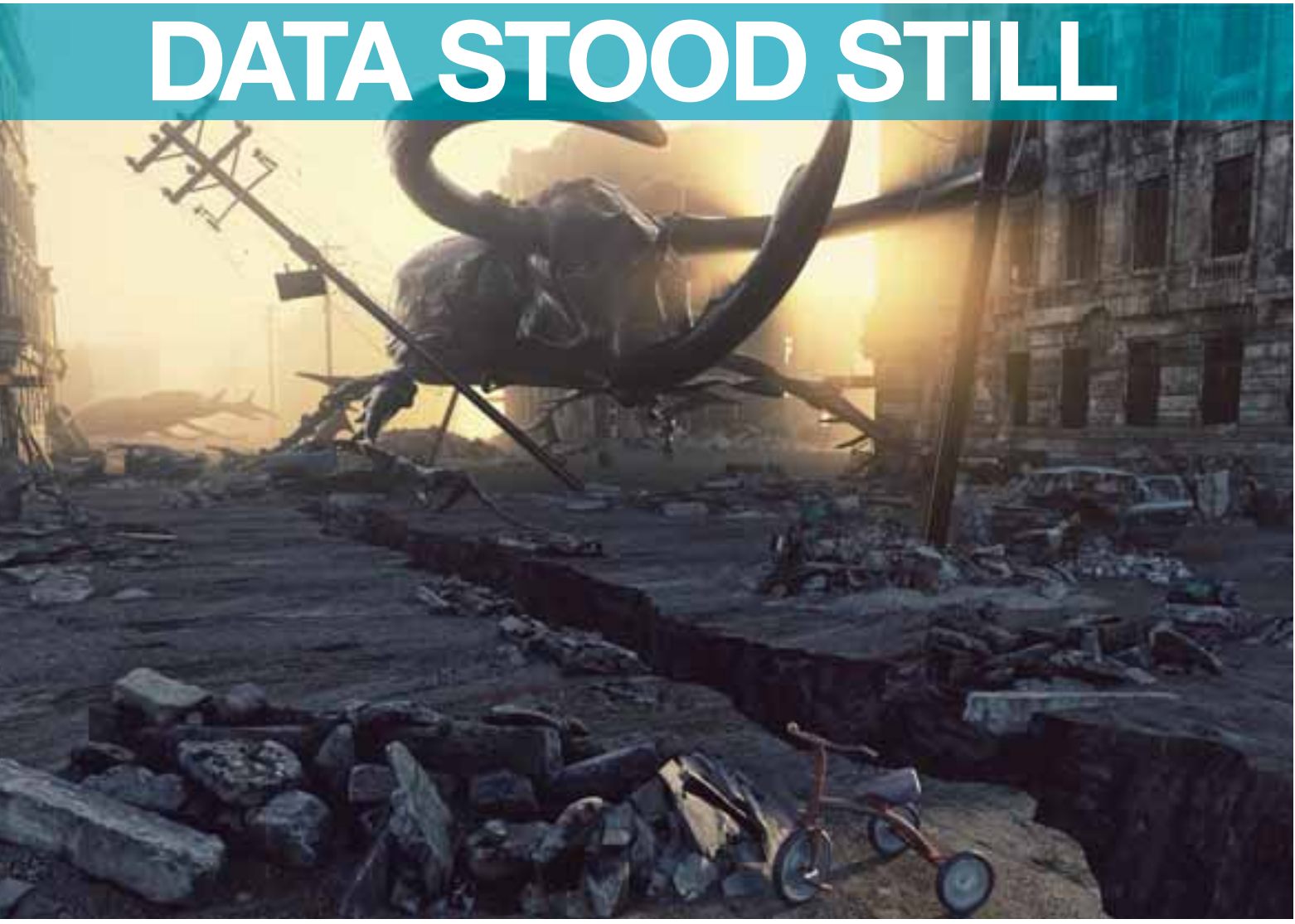
BNP Paribas has partnered with Switzerland-based Itarle Group to give its buy-side clients access to analytics on transaction costs.

"When we looked at all the vendors we could have partnered with, there is a few things that are actually very important to us," says Jason Stipe, global product manager at BNP Paribas. "One, we could provide an independent validation or transaction-cost analysis (TCA) to our clients. That was one of the first critical things for us. The second thing that was important to us was ease of distribution to our clients and Itarle already had that through their Vision platform. The third thing for us, probably the most important thing is, they are already recognized as one of the leading TCA providers in the equity space, and the partnership we did was basically to provide that in derivatives to them."

Access to TCA will be provided through Itarle's Vision platform, which was initially built to monitor the quality of executions that were being carried out on Itarle's algorithmic trading platform.

Hamad Ali

THE DAY THE DATA STOOD STILL



With the UK preparing to leave the EU in March, regulators have a limited amount of time to figure out how to keep the flow of information going between each other post-Brexit—and the window is closing. By James Rundle and Amelia Axelsen, with additional reporting by Josephine Gallagher

The list of issues associated with the UK's planned departure from the European Union (EU) in March 2019 is long, complicated and half-finished. But now, regulators in the financial markets have added another problem—data.

The crux of the matter is this: if Brexit occurs without a deal between the UK and EU in place, what happens to the flow of information between regulators like the Financial Conduct Authority (FCA) and the European Securities and Markets Authority (Esma)? Data sharing between these entities is crucial, not only to the functioning of markets, but also in how it underpins many aspects of sweeping changes to Europe's trading rulebook that have been implemented post-crisis. Regulators are worried that, without a solution, the regulatory gears that govern the market could grind to a halt.

"This technical, regulator-to-regulator coordination is essential to minimize disruption in a no-deal situation," said Andrew Bailey, CEO of the FCA, in an October 25 speech delivered in London. Esma

chair Steven Maijoor made a similar point during his keynote address at the World Federation of Exchanges annual general meeting in Athens, Greece on October 3, saying that a no-deal Brexit "may trigger some significant effects," in European financial markets.

In effect, what two of the most senior regulators on the continent are saying is that they have a matter of months to put a plan into effect to halt a potential catastrophe.

The numbers illustrate just how acute this problem is. The FCA estimates that it sends around 70 percent of its transaction reports to regulators in the EU—not just Esma, but also the national competent authorities (NCAs) that govern each country's internal markets, including the Autorité des Marchés Financiers in France, and Germany's BaFin.

This information is critical to the proper running of key functions in EU regulation, not least of all the revised Markets in Financial Instruments Directive (Mifid II), which came into force on January 3, 2018. Under Mifid II, Esma undertakes a series of calculations to determine which instruments are subject to a range of measures, including the double-volume cap, which restricts trading in equities through dark pools once certain limits are breached, and transparency thresholds for fixed-income instruments, which govern enhanced reporting requirements.

Given its status as the financial capital of Europe, and one of the world's largest financial centers, London's data is crucial to the proper calculation and calibration of these regulatory instruments. Esma estimates that around 40 percent of trading in EU27-issued equities—the name given to the remainder of the bloc minus the UK—currently takes place on UK venues, meaning that without this data, a bifurcation of the market is almost inevitable.

"The Mifid transparency thresholds are calibrated based on EU28 data, and the UK is clearly a very substantial part of that EU market," says a senior British regulator. "So, unless action is taken to avoid it, or avoid this outcome of withdrawal, that withdrawal will lead to EU27 data used in the EU27, and another system based on UK data used in the UK. That would mean, in practice, different thresholds for the same instruments. That's a poor outcome, in my view, for Brussels, for the UK and a for the EU27, and a poor outcome for the market."

Deep Impact

To be clear, this is largely an issue that affects regulators, rather than companies servicing the capital markets. Their plans for Brexit—which have also largely been predicated on the no-deal outcome—are already advanced, with firms such as Bloomberg, Tradeweb and MarketAxess setting up in Amsterdam to service EU27 clients, while banks have variously named Dublin, Frankfurt and Paris, among others, as their future continental homes.

But although the technical aspects of these conversations are confined to the regulators, they will have an impact on market participants. The old adage that the market hates uncertainty, in this instance, is apropos.

> "This technical, regulator-to-regulator coordination is essential to minimize disruption in a no-deal situation."
> **Andrew Bailey, Financial Conduct Authority**

Miranda Morad
MarketAxess Europe and Trax

"There are a lot of rules that are reliant on thresholds and numbers, and we don't know what those numbers will be because we don't know how they will be calculated, because we don't know what data our regulators will have access to on either side of the Channel, so we are building systems that have flexibility within them," says Miranda Morad, general counsel for MarketAxess Europe and Trax. "Obviously, that takes time and cost. We are building very complicated systems that wouldn't have to be so complicated if we knew which way this was going to go."

Indeed, much of what is being discussed in terms of data sharing goes to the very heart of what platform providers do, in light of Mifid II and other such rule packages whose core objectives tend to focus on transparency. Requiring multiple jurisdictional values for rules engines isn't simply a matter of plugging in a regulation, and voila, it works. It's a complex task, involving multiple scenarios—although, Morad says, most are planning for the worst-case, no-deal scenario—that can affect everything from workflow to general functionality.

More to the point, some say, these discussions are serving as a herald of things to come. While the UK will be fully equivalent in everything but name to EU legislation at the point it

leaves the bloc, divergence over time is natural.

"When you think of the effects of Brexit and what they could have on Mifid, I truly think post-Brexit, it will be the EU27 that is most likely to move away in piecemeal fashion from Mifid II to a greater extent than the UK would ever think of," said Kay Swinburne, a UK Member of the European Parliament and the vice chair of the Economic and Monetary Affairs Committee, while delivering a keynote at an industry event held in Amsterdam on November 8.

Stephane Malrait, head of market structure and innovation for financial markets at ING, made a similar point while speaking on a panel at the same event, saying that calibrations for regulatory data would have to change dramatically post-Brexit.

"That is why they may have to change the regulation, to be able to cope with that," he said. "Because even if you have equivalence, you are still outside the EU."

The Last, Best Hope

In many ways, this data issue relates to a consistent problem that has plagued discussions between the UK and the EU, ever since the Article 50 decision to leave was triggered in 2016—the UK wants equivalence determinations to be granted, and the EU will not grant them.

Equivalence, under EU law, is a status conferred on a third-country (non-EU, in European legalese) regulatory system, in which the European Commission recognizes that said regulations and oversight are as strong and rigorous as the EU's own. For the UK, this shouldn't be a problem. The FCA was one of the primary authors of post-crisis financial regulation in Europe, and indeed, has gone further than the bare minimum for compliance in many different areas by gold-plating elements of Mifid II. Yet no equivalence determination has been forthcoming.

Kay Swinburne
European Parliament

This is partly politics. Issues associated with Brexit are, of course, far wider, and often far more pressing than ensuring bond trades are properly reported within a certain number of minutes, as any of the millions of EU citizens living in the UK, and vice

SALIENT POINTS

- In the event of a no-deal Brexit, data sharing between regulators could grind to a halt.
- This will affect an enormous range of processes, many of which have been brought into effect through Mifid II, such as calculating transparency thresholds and dark-trading data.
- Regulators are attempting to solve the issue through agreeing memoranda of understanding between UK authorities and those in the EU27, but these are little more than enhanced cooperation agreements.
- Without further certainty around the conditions of Brexit, and with equivalence determinations off the table prior to March 29, the impact on markets could be tremendous.

versa, can attest. The EU doesn't want to simply give the UK a free pass to remain an associate member of the Single Market, after all.

But there is also a legal issue, in that it is not currently possible, under EU law, for a member state to negotiate an independent treaty or status determination, such as granting equivalence while they are still a member. The EU cannot realistically even enter into talks with any legal certainty, meaning that hopes of an immediate failover from the UK's status as a member state to an equivalent third country the very moment it leaves the EU are unrealistic.

As a result, both Esma and the FCA have pinned their hopes on another tool, the memorandum of understanding (MoU). These are typically conducted on a nation-state level, rather than being the sole preserve of EU institutions, and can allow individual agencies to agree to facilitate agreements over areas such as information sharing and law-enforcement cooperation.

It's a tall order, though. To make this work, the FCA must not only draw up, negotiate, and conclude an MoU with Esma, but with every other regulatory agency it deals with in the EU27. Some countries also have multiple regulators covering markets, or prudential standards, or central banks that assume one aspect of the role while quasi-governmental

Virginie O'Shea
Aite Group

Chris Probert
Capco

bodies assume others. The UK itself, for instance, splits regulatory and enforcement responsibility between the FCA, the Prudential Regulatory Authority, the Bank of England, the Competition and Markets Authority, the City of London and Metropolitan Police and many others.

"There literally needs to be thousands [of MoUs], this is the issue in terms of trying to establish them," says Virginie O'Shea, research director at analyst firm Aite Group. "You'd have to have an MoU with every individual country potentially, which is one of the biggest problems if you look at it from the EU perspective. And it's not exactly like those things, legal documents, get done quickly."

The MoU as a tool, also, lacks a certain degree of weight, in that it is not a legally binding agreement—hence the name.

"It's effectively a stronger gentleman's agreement, a handshake agreement, so it's to be used to show intent that is not legally binding," says Chris Probert, partner and head of the data practice at consultancy Capco. "So, effectively, what Esma is doing is trying to say, 'Look guys, we know what we're trying to achieve here. We know that we're all trying to have financial stability for the benefit of the customer, regulate entities across multiple borders, and not give rise to any fracturing of the political landscape to leave any loopholes for poor behavior to manifest itself.' That's really what the MoU is trying to do, trying to compensate for that lack of a Brexit deal."

Regardless, the FCA and Esma are forging ahead. Sources within both agencies say talks are already under way. In his October 25 speech, Bailey said that the FCA was "ready to go," while Esma said it would coordinate between NCAs and get such agreements in place for March 2019.

Positive notes aside, however, it's hard to see this as anything more than a Band-Aid for a deeper wound. Some experts also say that, while the work toward the MoUs is encouraging, it could be derailed with a moment's notice.

"Bear in mind that this is all being talked about with a no-deal scenario in mind, which I'll grant is a touch more likely now than it was last year, but is not a certainty," says a Brussels-based lobbyist with knowledge of the discussions around this topic at both a UK and EU level. "The issue of data sharing has been going on since the referendum, and it's far broader than just Mifid. Just look at the General Data Protection Regulation (GDPR) and how that will be affected. This is something I imagine should be handled at the highest levels, and the regulators build derivations from that core document, and I shouldn't imagine either Whitehall or Brussels wants every alphabet agency to be conducting thousands of bilateral agreements between one another."

Ultimately, the MoUs aren't even a Hail Mary—they're more an attempt to patch a hole in the boat while deep at sea. Yet, if the UK does continue to look like it will leave the EU on March 29, they are increasingly looking like the only option for embattled regulators who are tasked with keeping markets ticking over amid turbulent political forces.

Either way, the clock is effectively at six minutes to midnight in the countdown to March 30, which could still very much be remembered as the day the data stood still. W

Lock and Key: Custody Is Crypto's Next Battleground

Although institutional interest in cryptocurrency trading has grown, there are aspects of the market that need to evolve further for it to truly reach a tipping point. The development of the custody space, in particular, is crucial to its future. Wei-Shen Wong reports.

Trading in cryptocurrencies has mainly been driven by retail investors, particularly on the hunt for profits from short-term speculative transactions. Meanwhile, greater institutional participation in cryptocurrency trading has been largely kept on the sidelines due to several missing, but extremely important, features.

In order for crypto to become a true asset class, it is "absolutely required" for larger regulated institutions to be involved, says Hu Liang, co-founder and CEO at crypto-trading platform Omniex.

"This means from a systems and infrastructure perspective, scale and regulatory compliance are both necessary. A single point of access to multiple venues, best-execution algo capabilities, complete audit records, and detailed recording are just a few areas where retail needs are different from institutional requirements," he says.

Apart from the elephant in the room—regulation, or rather, the lack thereof—key custodianship is a term that has been creeping up more often. But putting effective custody solutions in place may not be as simple as it is in other asset classes.

Craig Borysowich, a digital platform strategist at consultancy firm Capco, says some of the unique features lacking in crypto trading at

"More professional trading floors that are looking to dabble in crypto asset trading also need a more advanced key custodian that will keep key pairs from being revealed directly to traders and can also enforce trading volume limits on a trader-by-trader basis." **Craig Borysowich, Capco**

present are key custodianship capabilities that help manage and secure public and private key pairs, as well as assist with cold storage of crypto assets that are stored for longer periods of time.

"More professional trading floors that are looking to dabble in crypto asset trading also need a more advanced key custodian that will keep key pairs from being revealed directly to traders and can also enforce trading volume limits on a trader-by-trader basis," he says.

Having key custodianship would insulate the traders from being able to access specific keys, he adds. This could be important to institutions keen on crypto assets, particularly if a disgruntled trader makes off with those keys. "A key custodian platform could protect these keys. And through that custodian, traders only will get exposed on the trading side," Borysowich says.

According to Sebastian Higgs, business development manager at Lendingblock, which provides securities lending for cryptocurrencies and digital assets, the technologies that crypto traders look for fall within two main categories—technology that meets trading desks' execution needs, and technology that meet trading desks' administrative needs.

Of the two, Higgs says the latter is a highly underserved market. A lot of the focus has been put on access to liquidity. "The problem is, if you want to move a large position on an exchange, it will cost you a lot of money. At the moment, this is pertinent to institutional traders—the ability to chip away at their position, rather than in a block," Higgs says.

He says he believes that fragmentation and liquidity are dispersed everywhere. "If you want institutions trading in this space, they can't be exposed for hours and days. In the traditional market, this is something you can leave in a certain way. There are specialists in the traditional market to ensure there is minimal impact on the price," Higgs says.

Key custodianship is a topic that is getting hotter in this space, he says. Keeping "things" at hot storage and moving assets around is fairly easy to do. However, exchanges are getting hacked.

This is an ongoing development. Specialists are still trying to find the balance between having the keys kept at cold storage but also having the capability to respond to market needs within a certain time. "If you're a trader, you need the access to be there," he says.

Sebastian Higgs
Lendingblock

Hu Liang
Omniex

Lendingblock acts as a security trustee, which Higgs says is a concept that exists in the traditional market. "We are a third-party agent and we manage the trade as well. It is enforceable under English law and the trades are completely segregated from our own assets. It's fully safe and segregated. From an operational and legal point of view, even if either party becomes insolvent, there won't be a loss for the other party," he says.

But Tim Enneking, managing director at San Diego fund manager Digital Capital Management, says the key custodianship topic is going into the mechanics of custody. Large institutions are used to trading in a world where the "Holy Trinity" of brokers, exchanges, and custodians exist in an established ecosystem. Currently, the roles are often blended—predominantly at the exchange level.

"Key custodianship is just an implementation of custodianship. That's a mechanic. It's not something conceptual. That's like looking at the grass when you and I are looking at the trees. Until you have the broad outlines of how the business should be done, you can't implement the mechanics," he says.

Custody Is the Key

Having effective custody solutions in place is critical for institutions to enter the market. But Enneking says it is important to understand how custody works in the fiat space first. "When you trade with any broker, the custody is built into the exchange and the brokers. It could be with Merrill Lynch or Goldman Sachs. They will use a custody solution and it's totally transparent to the user," he says.

"There's a custodian that works in the triangle of broker, exchange, and custodian. So there are no concerns because there is a custodian involved. None of that exists in the crypto space," Enneking says.

Until recently, there were no licensed brokers or licensed exchanges, and there are no custodians whatsoever, he adds. Now that is slowly starting to change. But a problem still exists in that the custodians are static, Enneking says.

"What that means is you can get a custodian if you want some bitcoin; you can park it someplace and it doesn't move. But if you want to trade it you have to move it to one of these platforms out of the custodian and yourself. So that Holy Trinity of exchange, broker and custodian doesn't exist at all," he explains.

Archax, a relatively new crypto exchange, is trying to tap into the custody area but is finding that it is no small challenge.

"How do you generate profit and loss, transaction costs—anything that has any part of the puzzle to deal with? And what about the ISO standards and all those regulatory issues? There is lots of work involved to get them," says Andrew Flatt, the firm's CTO.

Although far from a "dynamic" custody solution, there are efforts under way to get there.

Earlier in October, Goldman Sachs added to its stake in digital asset custodian BitGo. BitGo now holds about $2 billion in customer assets across 95 different cryptocurrencies. So far, it is the only regulated custodian for crypto assets, after receiving approval from the South Dakota Division of Banking.

Asset manager Fidelity has also made headlines in this area, with its announcement that it will launch Fidelity Digital Asset Services, a company providing crypto custody and trade execution services for institutional investors. Existing digital currency exchanges, such as Coinbase, are also pushing hard into the institutional space with the launch of custody and prime services.

Andrew Flatt
Archax

Even with these new services coming to market, Flatt says traditional institutional players would want to adopt it within their existing systems. "They've got a traditional execution management system that they already transact in, and now they want to add crypto assets to the traditional front-end so they can see everything in one system. This will support the trader's workflow, he says.

Archax is building its systems up for that, to support infrastructure such as private connectivity networks, he adds. "I don't think institutions care what my trading front-end looks like, but they care about the back-end and what runs under it," Flatt says.

It has partnered with Aquis Technologies to provide it with a suite of exchange operations services and

tools. This includes matching engine and market surveillance technology, which will be aimed at high-frequency traders, he says. "We have seed funding now and realistically, we will start building six months down the line and go live in the third quarter of next year. The first initial test cases are there," he says.

To Prash Puspanathan, founder and CEO at Caleb & Brown, an Australian-based boutique consultancy firm providing cryptocurrency services, the two primary barriers that impede greater institutional investment are a lack of regulatory oversight and trust.

"It is the latter of these factors, trust, where technology can play a huge part in cementing. The lack of a comprehensive, secure and trusted custodial solution for digital assets that allows institutional investors who need to be considerably more risk-averse to be assured that their assets will not disappear off the balance sheet due to security factors out of their control needs to be addressed. And it is being addressed," he says.

This is through the development of innovative solutions for secure custody from multi-signature wallets, to sharded private keys, to analog thumb-printing of hardware wallets, combined with secure vault storage.

"However, it is only when we achieve dependable underwriting of these assets that we will be able to justifiably state that a custodial solution worthy of institutional reputational risk exists," Prash says.

Beyond Custody

Ciáran Hynes, managing partner at Cosimo Ventures, says even though many features are necessary for institutional crypto trading, there is an order in which each feature can and must materialize.

"The first is crypto custody solutions. Without the ability to securely store digital assets on an institutional scale, the space will be restricted to retail speculators—the result of which will limit liquidity, make credit too expensive, and dry up demand for specialist brokerage services," he says.

Prash Puspanathan
Caleb & Brown

Ciáran Hynes
Cosimo Ventures

Once that has been solved, liquidity will improve, and access to credit will improve it further. "Finally, specialist brokerage services—outside of market/limit orders—will take the form of structured products and crypto-based derivatives. This is the natural evolution we envision, and I don't believe we are far away from it, barring any drastic regulatory decisions, which are always a wild card," he adds.

Omniex's Liang says it is difficult, if not impossible, to pinpoint just one single area that can solve the problem of wider adoption among institutional traders. For cryptocurrencies to be truly recognized as a new asset class, custody, platform access, brokerage services, as well as back-office settlement, will all be needed.

"At Omniex, we've taken the approach to create the infrastructure that can connect all these needed areas to create a single, unified crypto ecosystem," he says.

Another important factor that is needed is to have technology that can integrate the exchanges, wallets, and custodians to allow for full reconciliation and audit trails, explains Chris Jenkins, managing director at Caspian, a joint venture between Kenetic Capital and trading technology vendor Tora.

Caspian offers all that, and also provides compliance, risk management and reporting tools to help institutional money feel safer, Jenkins says. "Our compliance system is designed to keep up with the evolving regulatory framework without impacting client workflows, while our portfolio management functionalities include real-time risk and profit-and-loss calculations," Jenkins adds.

New Efforts

It will take time to see how some of these efforts pan out, and there will be more coming to market in the near future. One that could be interesting to watch for is what comes out of discussions between a group of central securities depositories (CSDs).

Euroclear is one of 28 CSDs looking at how their current roles are applicable to the crypto asset market. Walter Verbeke, global head of business model and innovation at Euroclear, says CSDs are responsible for safekeeping, safe settlement and to some extent, market liquidity. These three roles will also need to be fulfilled in the crypto market, he says.

It will take time for this market to develop enough to allow for institution money to participate more widely. Enneking says there are companies that are trying to rebuild the ecosystem that already exists in the traditional investing world.

"It's much easier to build something the second time around. It's crypto imitating fiat. It will happen much faster than how it happened in the fiat space because there is already a model for crypto to refer to," Enneking says. W

SALIENT POINTS

- The "Holy Trinity" of traditional institutional trading does not yet exist in the crypto market, which is one of the reasons it still lacks greater participation.
- Key custodianship is an upcoming area that deals with handling of crypto keys, but is widely underserved at present.
- For cryptocurrencies to be recognized as a true asset class, there needs to be widespread institutional participation.
- Traditional finance players such as central securities depositories (CSDs), are considering how their roles are applicable to the crypto-asset infrastructure.

CODING IN THE TRENCHES

He found fame as the mind behind C++, one of the most popular programming languages ever created. But today, Bjarne Stroustrup is a managing director at Morgan Stanley where he works to create more efficient and secure technology infrastructures. By Emilia David

Bjarne Stroustrup, Morgan Stanley

Ask computer programmers

what their most-used programming language is and you will end up hearing C++, over and over again. The venerable language makes up the backbone of many applications, websites, and programs the world uses today. It's also a programming language that props up bank infrastructure on a global basis—and, luckily enough for the industry, its creator is one of its own. In a manner of speaking.

The man responsible for C++ is Bjarne Stroustrup, currently a managing director for at Morgan Stanley's technology division. Though he is best known for his creation—he frequently travels the world to talk about coding and is still active in the C++ standardization committee—his work at the bank is equally as important.

But, if you ask him what interested him about working for Morgan Stanley, he'll say it's not because of any interest in money or banking. Rather, it was the opportunity work closely with other talented people.

At Morgan Stanley, Stroustrup oversees the data transfer operations of the bank—what he calls the bits and bytes—rather than the securities the bank deals with. He jokes that he's the only managing director at the firm who does not manage a staff, but he does work closely with colleagues.

He deals with how the firm is able to move data from one point to another in a fast, efficient, and secure way. Part of that mission entails finding improvements within Morgan Stanley's whole technology infrastructure, but it is also his responsibility to figure out the infrastructure needs of each group within the bank and determine the best way to get better performance, reliability and security.

"The financial industry has different constraints from many other industries. If I was doing a video game, so what if I miss a frame? You can't even see that one frame is missing. But if I miss one transaction, it would be really bad," he says. "For example, what if that transaction was money being deposited into your account? You have to do it right every time and that puts serious and interesting constraints on how we do things. In the video game industry, I

"I wanted to build things and do useful things. Of course, in high school I had no clue what that meant. One thing education brings you is the breadth of knowledge; you never know what you learned can be useful. "

would also work with transferring data but the constraints of speed and reliability would not be the same."

He adds he's not the guy to go to if there are emergencies around the coding of the bank—rather, if there is an emergency and something has gone wrong, then he's done his job wrong.

Stroustrup, as one of the leaders within the technology division, is also frequently brought into conversations around new technologies that Morgan Stanley might be interested in working with; though he points out it's often just to see how the current stack can work with it rather than give his opinions on the technology itself.

Engineer at Heart

Despite not having an innate interest in the money side of banking, Stroustrup says being curious about many things has been a boon to his career. As a young man, he wanted to study engineering but ended up dealing more with mathematics and computers.

"I wanted to go to an engineering school but it was in Copenhagen and it was too expensive to live there—in Denmark education is free so that wasn't a problem—so I went to my local university and instead of becoming officially an engineer I became a computer scientist and a mathematician," he says. "I wanted to build things and do useful things. Of course, in high school I had no clue what that meant. One thing education brings you is the breadth of knowledge; you never know what you learned can be useful. "

Stroustrup began his education in his home town of Aarhus in Denmark. He studied at Aarhus University's department of computer science where he graduated in 1975 with a cand. scient, the Danish equivalent of a Master of Science, in mathematics and computer science. He then took up his PhD at the University of Cambridge Computing Laboratory.

Once he received his PhD in 1979, Stroustrup and his family moved to New Jersey to work at the Computer Science Research Center of Bell Telephone Laboratories, more popularly known as Bell Labs, in New York. Stroustrup has very fond memories of Bell Labs, calling it one of the best places for practical research into computing at the time. The collaborative small group development setup appealed to him, though he notes the needs of companies were less complicated then compared to today.

It was in Bell Labs that Stroustrup developed C++ in 1979, and more on that, later. But after AT&T bought Bell and then split it into different firms, Stroustrup decided to leave the firm to join the world of academia. He had been with Bell, and its later iteration AT&T Labs-Research, for 23 years until he moved to Texas A&M University in 2002. Even then, his association with the firm continued—despite leaving, he remained an AT&T fellow until 2012.

Academia was where Stroustrup felt he could teach the next generation of engineers and coders. While a distinguished professor of computer science at Texas A&M, he wrote several text books outlining how to teach coding. These days, Stroustrup holds an honorary academic position at Columbia University.

But academia is, by all accounts, a field that not everyone is suited to, particularly inventors and creators. He quickly found that he was always "itching" to be out in the trenches, he says, working on solutions for problems that had tangible results. His passion was in the practice, rather than just the theory.

"In academia, you take a concrete problem, abstract some general topic from it, and then you write a paper

about that. I had trouble with the idea that the paper was the ultimate result," he says. "I like to build things and to see the things I've built actually being used; that's hard to do in academia. I had tried all the things you should do as an academic, and it was getting a bit old."

Enter Morgan Stanley. Stroustrup, who freely describes himself as not exactly being a "natural academic," would go out every year and talk to people in various industries about their problems, and how they solved them. When he visited Morgan Stanley, the bank immediately suggested that he should come and work for them. He said no at first.

However, the bank had impressed him, both in terms of the quality of its answers to his questions and the caliber of its people. But it wasn't just that which ultimately convinced him to sign on.

"One thing that impressed me was that with Hurricane Sandy, Morgan Stanley never stopped trading, which means they have impressive infrastructure and impressive engineers because coping with a major hurricane is seriously difficult," he says.

After that, it was more or less a done deal. He left his academic job in Texas for his role with the bank in 2014, in New York, where he has remained ever since. Yet, in many ways, his career still centers on that period in 1979, when he changed programming—and computer science, more broadly—forever.

The Famous Code

In 1979, he realized that C—a programming language developed by his colleagues at Bell Labs—while revolutionary in its own right, wasn't quite up to scratch for the tasks he had in mind.

His interest in languages, at this point, wasn't exactly new, but his specific focus on C came about because he saw a need for a system that used hardware well, yet added complexity like a distributed system. According to Stroustrup, distributed systems are inherently complicated because they run from one system to another, necessitating a communications infrastructure to ensure performance and reliability.

What he built instead was C++.

"I never got to build that system because my friends and colleagues at Bell Labs and other places found C++ useful. So I got diverted into working with languages and fundamental software libraries; I've been doing that on and off ever since," he says.

Stroustrup says he made C++ as a subset of C, to expand on the language's ability by providing the same flexibility but including higher-level program organization within classes in the code.

The language optimizes hardware power to allow for scaling, both to add more hardware to the system to accommodate new users, and to ensure better performance for those users. It is mostly deployed in video games, data transfer, and operating systems. It is one of the world's most pervasive languages, with millions of C++ developers around the globe, and counting.

Stroustrup approached the language's development as methodically as possible. He looked to other programming languages for some clarity in how he could build his own. As he said subsequently in several lectures, he took ideas on general abstraction that classified objects from other languages and combined them with concepts that hewed closer to the processor instructions. He wanted to make sure that the language he was building was something people could understand clearly but would not cause a fatal crash of the whole system. He also wanted to make sure the language would actually make life easier for those running systems, so he knew he had to get it right.

Due to its ability to scale for user numbers and data volumes, it took off like a rocket. Now, C++ can be found in the back-ends of many popular websites like Google, Facebook, Twitter, and YouTube. Even Bloomberg runs on C++.

Stroustrup is still very much involved in the continuing development of C++. The language was standardized by the International Organization of Standardization (ISO) in 1998. Stroustrup notes updates to C++ used to come infrequently, but with the fast-changing nature of hardware and software, the gap between updates is narrowing.

"C++ is changing so we get a new standard every three years now, instead of every 10, which was standard in the previous millennium. We have to meet these new challenges. Hardware is getting stranger and stranger every year because they just can't get simple computers to run faster, and the architecture is more complicated," he says.

The next standard is expected to come in 2020 with C++20. This will establish new features and supersede how some functions work in the older version of the language.

He adds programming languages need to keep getting better to keep up with the increasing demand on computers, either through speed or resiliency. If the hardware is getting faster, the programs running on it must become faster too.

This applies more than anything else to his day job at Morgan Stanley. Banks have needed to seek hardware improvements as the volume of data processed by the computers has greatly increased just in the past decade. Moving data from point to point becomes an issue of speed and reliability.

Hardware is not the only thing changing. New languages are being created to meet the complicated needs of many industries. Stroustrup notes many of these new languages are interesting, though perhaps tied mainly to certain types of tasks like calculations rather than moving large amounts of data efficiently.

People say C++, like many older languages, may need replacing, but Stroustrup says no other programming language has so far been written that can take its place. He remains a fierce advocate and defender of the language he created.

"A general purpose programming language, such as C++, tends to be less elegant than a specialized language for any particular thing. If you only have to do, say, dense linear algebra then you can write a perfect language for that. But you can't write a language that is perfect for everything and for everybody," he says. "You can have a language that is good enough for a huge range of work—a general-purpose language—but you know it isn't perfect. Some people have trouble with that notion; they think everything can be perfect for them. It can, but only if they never do anything except what they do now and if they don't have to interact with other people. If you want to work with a lot of people and in a lot of different application domains, you have to accept some compromises."

He adds he still likes building things with an engineering mindset and is glad that the engineering world has also embraced C++. The Institute of Engineering and Technology even awarded him with the distinguished Faraday Medal for the creation of C++ in 2017 and he received the Charles Stark Draper Award from the US National Academy of Engineers in 2018.

Shepherding the programming language he created to the future understandably takes up much of Stroustrup's time. He remains committed to working at Morgan Stanley and continues to be interested in the many challenges the finance world throws at him.

While it was mainly the chance to work out how to solve real-life infrastructure issues that brought him to Morgan Stanley, what truly attracted Stroustrup to go back to working was the bank's super-secret weapon: His children and grandchildren live nearby.

In between managing the data flow and transfer at Morgan Stanley and his frequent lectures abroad, Stroustrup tries to find time to pick up his grandchildren and spend time with his family. Family has always been important to him and he frequently brought his children to his many speaking engagements in different countries when they were younger.

He also manages to indulge in some hobbies, like photography. One of the things he tries to take time for is reading—from mysteries to histories, he says his different interests are an extension of his continuing education. These activities have allowed him a different perspective and opened him up to work in industries he didn't think he would ever work in.

Stroustrup is a busy man but he says he'll always be on the search to solve real-world problems because to him, the simple ones have been solved; it's the complicated ones that need tackling. **W**

BST Awards 2018: Regulation Driving the Buy Side

This year's Buy-Side Technology Awards, the 12th annual awards focusing on the third-party technology community serving the global asset management industry, highlighted the extent to which regulation is driving technology and operations across the buy side, as evidenced by Nasdaq's and TriOptima's multiple category successes.

This year's BST Awards, held on November 2 at the May Fair Hotel in London, featured four new categories—best corporate actions platform, best buy-side portfolio analysis tool, best implementation at a buy-side firm (data and operations) and best implementation at a buy-side firm (trading and risk)—and a number of new entrants to the winners' circle, including Tier1CRM, AxeTrading, Style Analytics and Itiviti. Also notable at this year's awards was Rimes Technologies' continued dominance of the best data provider to the buy side category, its 12th successive win.

As usual, the final two categories—the best buy-side product for 2018 and the best overall technology provider for 2018—were announced at the awards lunch and were won by Nasdaq and TriOptima, respectively.

Ex-England and British and Irish Lions rugby international Martin Bayfield handed over the trophies. This year's external judges were Catherine Doherty (Accenture), Clare Vincent-Silk and Paul Miller (both Pentagon Consulting), Sang Lee (Aite Group), Phil Tattersall (EY) and Robin Strong (Cowan), while WatersTechnology's Victor Anderson, Anthony Malakian, James Rundle and Wei-Shen Wong also sat on the panel.

Write-ups by James Rundle (JR), Wei-Shen Wong (WSW), Emilia David (ED), Josephine Gallagher (JG), Hamad Ali (HA) and Victor Anderson (VBA). W

Victor Anderson
Editor-in-Chief

Winners' Circle

Buy-Side Technology Awards 2018

waterstechnology

Buy-Side Technology honored the winners at a luncheon on November 2 in London.

Best Broker-Supplied Tool

Dash Financial Technologies

The win in this category by Dash Financial Technologies marks a double-header for the company in the 2018 Buy-Side Technology Awards, with its other win coming in the algorithmic/direct market access product category (*see page 28*).

That write-up details the somewhat disruptive path the company has taken over the past two years, as well as Sensor Suite, a product which is effectively symbiotic with Dash360, the offering that this year's judging panel voted as the best broker-supplied tool for the buy side. Dash360, first released in early 2016, is a real-time analytics and transparency measurement tool for traders. It ingests order flow information that passes through Dash's pipes and presents it to traders in close-to-real-time, allowing them to view their orders routing through the various exchanges and venues that Dash connects to. "It provides transparency surrounding our clients' experience in terms of what venues they're going to, what prices they're paying at those venues, and what kind of liquidity capture and execution performance they are getting at those venues in live time," explains Glenn Lesko, chief growth officer at Dash Financial Technologies. "They can literally watch themselves trade and access venues."

Delivered via a web interface, any Dash client is able to access Dash360, regardless of whether they are using an execution or order management system sponsored by Dash, Lesko says. Analytical tools are built around the performance visualizations that can feed back into applications such as Sensor Suite, which one Dash official describes as working "hand in glove" with Dash360.

While performance is, perhaps, the most important measure of a portfolio manager's success—from the client perspective, at least—the way in which trades are executed has taken on a new and urgent level of importance in trading firms on both sides of the Street. With the advent of the revised Markets in Financial Instruments Directive (Mifid II) in January 2018, many firms have come under stringent new guidelines that require them to show how they achieved best execution for clients. Tools such as Dash360 are almost tailor-made for this requirement, even for those buy-side firms that aren't necessarily subject to Mifid II, but which might view the Directive as an example of best practice. "The spirit of Mifid II is not just around owning your best-execution policy, but completely understanding top to bottom your best execution process, feeding the data you find back into your process, and constantly optimizing it," Lesko says. "I feel Dash 360 is really helpful in that endeavor."

—JR

> **Delivered via a web interface, any Dash client is able to access Dash360, regardless of whether they are using an execution or order management system sponsored by Dash.**

Best Buy-Side AI Platform or Tool

Nasdaq

Few phrases have the buzzword cachet of artificial intelligence (AI) at present. It is, literally, the talk of the town at any conference. But while interest is high, few areas of trading have made as much use of it as market surveillance. And out of those, few companies are as advanced in their deployment of AI and its subsets as Nasdaq.

In its sell-side endeavors, the exchange operator has put machine learning technology into production on its Nordic exchanges and sold it to a number of other bourses. For the buy side, it has the Nasdaq Buy-side Compliance (NBSC) platform. Detailed fully in the write-up for its market surveillance platform category win for the same technology (*see page 48*), NBSC goes beyond most market-oversight platforms by allowing users to assess the behavioral aspects of trading by portfolio managers, to gain a truer picture of what is genuine activity, such as hedging, and what might be market abuse.

Much of this stems from Nasdaq's 2017 acquisition of Sybenetix, and the incorporation of that company's Compass platform into NBSC—a stated ambition for the acquisition was for Nasdaq to strengthen its push onto buy-side desks. But the beauty of the platform is in how it meshes traditional high-technology tasks, such as analyzing data, with the fluid and previously unmanageable activity of humans.

Using Function Resonance Analysis Methods, the system is able to determine cognitive causality for decision-making by fund managers, which is expressed through heatscoring to identify behaviors that are outside of the norm. For instance, if a particular portfolio manager is consistently beating the market, yet his peers using similar strategies and trading similar instruments are not, it can compare behavioral patterns in the past to determine if potential abuse is taking place. Similar logic can be applied to organizations and accounts to analyze trading behaviors and determine whether a case warrants further investigation.

"We were able to find behaviors that I would call in the gray zone, which, depending on how you set your alerts, you may or may not detect. Now with machine intelligence, that gives you much better coverage," says Valerie Bannert-Thurner, head of risk and surveillance solutions at Nasdaq.

Outside of pure surveillance, Nasdaq's Fair Investor Allocation Reporting module also allows firms to process transaction information for best-execution auditing, and for proving that assets are being allocated fairly and equally. Using machine learning, this can be done far faster than any human analyst could manage and could potentially alert compliance officers to unfair treatment of client accounts before it becomes a problem.

—JR

Taras Chaban, John Hunt, Mark Salter and Martin Bayfield

> Using Function Resonance Analysis Methods, the system is able to determine cognitive causality for decision-making by fund managers, which is expressed through heatscoring to identify behaviors that are outside of the norm.

Best Buy-Side Algorithmic/DMA Product or Service

Dash Financial Technologies

Dash Financial Technologies has had a busy few years. Its current incarnation was formed by the merger of Dash Financial and LiquidPoint, which was undertaken by then-private equity owners GTCR in January 2017, but the firm was brought back under management control through a buyout announced in March 2018. A string of senior hires was then announced throughout the course of the year. It's been a whirlwind by any measure, but one consistent point of focus has been its technology, in particular, Sensor Suite.

One of the original technologies debuted at Dash's founding, Sensor Suite is effectively a smart order-routing algorithm that focuses on optimizing client execution in equity and options markets. It focuses on illustrating two main areas for traders—the first of which is liquidity capture. "The complexity of the markets in both options and equities, as we all know, is the real challenge for clients," says Glenn Lesko, chief growth officer at Dash. "There are as many different pricing models as there are different types of trading venues, and these are literally changing every month. Clients want to know what new order types are available on various exchanges, whether pricing models have changed, which will impact their explicit trading costs, and how we can get the best value for them with regards to liquidity capture compared to the price that they're paying the venues. It's mostly updating what's going on in the markets," he says.

The other primary area of focus for Sensor Suite is around speed and how that relates to performance—or in other words, latency calibration—which is unsurprising, given the pace of modern markets. For this, Lesko says, Sensor Suite provides trade lifetime and post-trade analytics with metrics around visible liquidity, how much liquidity has been captured by the routing algorithm, and how it goes about capturing that liquidity.

Given the nature of the product, it falls somewhat outside the norm of tech development for buy-side technology, in that it's more or less constantly updated, according to Lesko. "The interesting thing about Sensor is that we really update and enhance it every day. It's very configurable and we can make different configurations for different clients and different enhancements on a case-by-case basis. It's honed literally on almost a daily basis by ourselves and our clients who can call us and make changes to the routing."

This, says Lesko, more than anything, has been where the real development work has taken place, in creating a finely tuned machine to execute efficiently in noisy markets.

—JR

One of the original technologies debuted at Dash's founding, Sensor Suite is effectively a smart order-routing algorithm that focuses on optimizing client execution in equity and options markets.

Best Buy-Side Client Reporting Platform

FactSet

FactSet has snatched back the best buy-side client reporting platform title at this year's BST Awards from last year's winner, SimCorp, thanks to its Vermilion Reporting Suite (VRS), Vermilion Software's flagship offering, which it acquired in November 2016 for $67 million. McKay Marschalk, vice president, regional director at FactSet, says many asset managers are faced with challenges around market volatility, the rise of passive investing and a proliferation of technologies and platforms. For example, he says, many struggle to achieve operational scale in their client reporting and marketing teams. "Our clients are being asked to produce increasingly sophisticated and customized reports without significant increases in resources, and they are turning to technologies that empower business users to efficiently and transparently automate processes to improve the overall client service experience," he says.

When starting a new partnership with a client, FactSet initially aims to understand the specific pain points of the client's current reporting process. It then takes a collaborative approach to design a target operating model to ensure it is fit-for-purpose for each client's unique processes, data, and technology ecosystem.

Marschalk says FactSet has seen growth in the use of application programming interfaces (APIs) to acquire data as well as distribute reports to downstream systems like customer relationship management platform and portals. "As the market moves toward a more open framework, our clients have been able to take advantage of FactSet's robust and growing support for web services to create more dynamic processes," he says. "This is in line with our overarching strategy to serve our clients in a holistic solution, while also integrating with proprietary and third-party data and systems."

FactSet is working on making its data and analytical engines more accessible to clients in more ways, to fit their preferred processes and technical architectures. It released version 4.3 of VRS this year, which includes enhancements to tools such as its pitchbook-creation service V:Pitch, and vTemplate, both of which allow clients to save time and reduce errors, as well as increase their efficiency when servicing a growing asset base.

He adds that the Vermilion team and the broader FactSet organization are increasingly tapping into each other's core strengths in order to provide the best possible client experience. "As we service Vermilion users, we strategically leverage FactSet's local market expertise by tapping into a global footprint of over 60 offices spread across six continents," he says. "At the same time, the Vermilion team lends our expertise in applying best-of-breed reporting technology to FactSet colleagues and clients alike."

—WSW

FactSet is working on making its data and analytical engines more accessible to clients in more ways, to fit their preferred processes and technical architectures.

Best Buy-Side Collateral Management Tool

TriOptima

When it comes to the niche corners of financial markets, few are as specialized or arcane as lifecycle events in derivatives trades—particularly collateral and margin management. Yet, equally, few are as important. With its triResolve Margin offering, TriOptima has once again proved its credentials in this complex field, providing a surprisingly elegant tool in a space that is not exactly known for being streamlined.

TriResolve Margin sets itself apart from the get-go. While most collateral management platforms tend to be sprawling, complicated systems that require teams of engineers to manage and maintain local installs, Margin is a web-based service that largely automates previously manual elements of the collateral-management process by using reconciliations data already in its systems. Users set their rules and tolerances and the system automatically works out exceptions, using analytics layered on top of the data processed by its engine to highlight where these occur and—importantly—what is causing them.

NEX Group, TriOptima's parent company, claims that clients can be live in less than a day, but the real efficiency gains of triResolve Margin come from its integration layer. As expected, it works with other triResolve products, being natively integrated with the firm's portfolio reconciliation platform, which enables much of the automation benefits, but it also completely integrates out-of-the-box with AcadiaSoft's MarginSphere platform for collateral confirmations without requiring an additional contract. Like other offerings in the TriOptima stable, such as the pricing and valuations side of the business, which also won its category in this year's Buy-Side Technology Awards (*see page 49*), it is based on a pay-as-you-go model.

The platform has approximately 150 users—nearly 100 of which are buy-side firms—stretching across all types of market participants, from asset managers and servicers through to corporates, regional banks and international financial institutions, at a time when the entire industry is being forced to deal with unprecedented regulatory challenges. Specifically for triResolve Margin, the introduction of margin for uncleared derivatives, which affects the very largest dealers through to buy-side firms, is proving to be a particularly keen challenge for many and has prompted the appreciable uptake of the platform.

The nature of triResolve Margin and the acute regulatory and operational challenges it addresses, especially from a buy-side perspective, is particularly compelling. And being web-based, rather than a locally installed platform, allows TriOptima to incrementally update it at will in response to changing client or regulatory needs, a critical quality at a time when collateral management functions are directly in the asset management and regulatory spotlights.

—JR

Jana Uehlecke, Neil Murphy and Martin Bayfield

> While most collateral management platforms tend to be sprawling, complicated systems that require teams of engineers to manage and maintain local installs, Margin is a web-based service that largely automates previously manual elements of the collateral-management process by using reconciliations data already in its systems.

Best Buy-Side Commodities Trading Platform

Neovest

Orem, Utah-headquartered Neovest takes home the title for the best buy-side commodities trading platform from this year's BST Awards, thanks to its array of commodities trading applications. Its suite of tools are futures commission merchant-neutral and provide single-click execution on worked (care) orders, direct market access and algorithmic trading routes. On top of that, Neovest provides intra-day allocation and clearing reporting to sell-side merchants on behalf of its buy-side clients. This helps support their daily margin requirements.

According to the company, its "secret sauce" has been continuously releasing new tools to streamline the complexities of trading unique to commodities as an asset class. It has signed up 45 new clients since June 2017 and tracks more than 3,100 active logins per day.

In the last year, it released specialized execution and monitoring tools to support trading on the London Metal Exchange (LME), featuring single-click order execution functionality with LME market data and contract-date calendars. Using Neovest, clients can create unique LME order tickets and manage those orders efficiently, and on-demand. "From the LME market data, we incorporate their calendar schedules for one-day, cash, three-month, single, and third-Wednesday contracts in both outrights and calendar spreads," Neovest officials say.

Neovest's LME monitor systematizes metals, contract types, and expiry dates in a structure that updates as expiries and rolls occur. Apart from this, its calendar-spread matrix module provides commodity traders with a view into top-of-book and depth-of-book data to monitor exchange-supported calendar spreads on all exchanges. Neovest has connectivity to 44 futures exchanges and therefore has access to market data from all those exchanges.

"This unique matrix provides spread pricing and depth at each contract intersection for both spread-exchange pricing and outright contract implied pricing. We've again integrated our single-click trade technology in the matrix for calendar spreads and out-rights to lift bids/offers, and launch tickets and depth," the company says.

Meanwhile, the firm's inter-commodity spreading utility incorporates its exchange data. This provides traders with tools to create and price spread trades for arbitrage opportunities across commodities and exchanges. It has integrated brokers' inter-commodity spread algorithms in the module for buy-side clients, which allows them to route legs, a strategy where traders combine multiple options or futures contracts to hedge a position, arbitrage, or profit from a spread. This allows clients to better manage leg risk, the risk of not being able to fulfil a particular leg of a strategy at the price required, as well as price risk.

—WSW

"According to the company, its "secret sauce" has been continuously releasing new tools to streamline the complexities of trading unique to commodities as an asset class.

Best Buy-Side Compliance Product

Indus Valley Partners

There is no shortage of regtech firms these days, so standing out in a highly competitive market is no easy task. However, in recent years, New York-based Indus Valley Partners (IVP) has generated significant momentum in the regulatory space, thanks to its IVP Raptor platform, designed to support hedge funds in managing their global reporting requirements. Thanks to the firm's efforts to extend its regulatory coverage, this year it has scooped the title for the best buy-side compliance product at the Buy-Side Technology Awards, from previous winners Charles River Development and Linedata.

Gurvinder Singh, CEO of Indus Valley Partners, explains that the platform was created using a holistic approach to global regulatory reform where the technology could be developed and adapted depending on the jurisdictional and reporting needs of each client. Each fund is required to input seven basic datasets once and using in-built rules, the platform can then automate answers for multiple filing questions.

"When we designed IVP Raptor, we designed it from the ground up," says Singh. "We made it in such a way that firms load their data once, validate it, check it, and verify it, and then it automatically generates different filings from there."

Using a red, amber, green (RAG) reporting management system, IVP Raptor supports multiple global filings, including Opera, Form PF, Form 13F, Schedule 13 D/G and CPO-PQR, and covers the reporting needs of regulations such as the European Markets in Financial Instruments Regulation, the European Short Selling Regulation, and TIC B requirements. The firm has also built in cross-filing analytics and additional checks into a single, consolidated platform to enable hedge funds to monitor their reporting activities and ensure they comply with the consistently evolving global regulatory landscape. To date, IVP Raptor has been implemented by 50 buy-side firms, with a combined total of $435 billion under management.

In 2014, IVP launched its cloud-based managed service on AWS. The platform has configurable workflows for each user, supports all major browsers, includes email integration, and operates across multiple devices such as tablets and cell phones. Using artificial intelligence, the platform also generates smart analytics to monitor and detect issues relating to data integrity and compliance. Looking forward, IVP is working closely with clients to build out the platform's functionality and broaden its global coverage of filings, including its latest solvency module. "As we bulk up the number of filings and the number of rules, the platform overall gets smarter and gives more value back to our clients," says Singh.

—JG

Martin Bayfield and Tony Premi

> In recent years, New York-based Indus Valley Partners has generated significant momentum in the regulatory space, thanks to its IVP Raptor platform, designed to support hedge funds in managing their global reporting requirements.

Indus Valley Partners

Indus Valley Partners' technology solutions and services are transforming the world of buy-side firms. Addressing needs that span the front, middle and back office, IVP's solutions & services help buy-side firms harness the power of data, improving flexibility, scalability and efficiency so decision-makers can generate insights, reduce risks, gain a competitive edge and find alpha.

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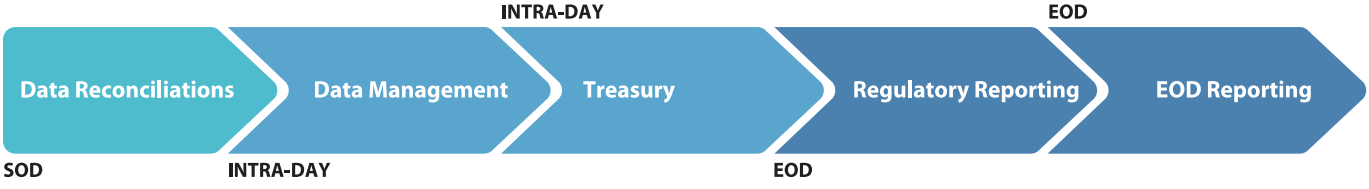

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Best Buy-Side Corporate Actions Platform

SmartStream Technologies

The best corporate actions platform category is one of three new categories added to the 2018 Buy-Side Technology Awards line-up, the other two being the implementation categories on pages 68 and 69. It'll come as little surprise to many corporate actions practitioners that SmartStream Technologies is the first recipient of this award, following its success in the corresponding category at this year's Waters Rankings, *Waters*' only awards program where the winners are determined exclusively by its readers. SmartStream is no stranger to the BST Awards winners' circle having won the best buy-side back-office technology provider category in last year's awards, in addition to wins in the best implementation at a sell-side firm and the best sell-side reconciliation platform categories in the 2017 Sell-Side Technology Awards.

It goes without saying that the corporate actions market is important to the UK-headquartered firm, even though the bulk of its capital markets presence is down to its widely used TLM Reconciliations platform, responsible for delivering so much success for the firm over the years, and its SmartStream Reference Data Utility, winner of the best enterprise data management initiative category at this year's IMD/IRD Awards.

That said, SmartStream has recently thrown much of its considerable weight behind its TLM Corporate Actions platform, an offering that targets both the buy side and the sell side, which represents the heart of the firm's corporate actions strategy. "It's a real-time processing engine that covers the complete event lifecycle from announcement capture to golden-record management, position management, event broadcasting and communication, election management, entitlement-generation and posting," explained Adam Cottingham, product manager of TLM Corporate Actions, earlier this year when speaking to *Waters* in the wake of SmartStream's win in the best corporate actions platform category at the Waters Rankings. "You have a technology that supports all of those processes, but it also involves the processing logic, which is a mixture of industry standards and experience within our client base," he says.

Recently, SmartStream added support for ISO 15022 and 20022 messaging standards, while the firm's next milestone is delivering a new user interface (UI) for the platform that will see the deployment of HTML5 screens for the main UI and portal. This, according to the firm, will leverage the TLM View capabilities of the platform, which have already been rolled out across its TLM Reconciliations platform. SmartStream will also focus on managing the continuous improvement cycle for its model client configuration, whether they are industry changes applied to ISO standards and regulations or best practices defined by its various clients in their given markets.

—VBA

Martin Bayfield and Adam Cottingham

> SmartStream has recently thrown much of its considerable weight behind its TLM Corporate Actions platform, an offering that targets both the buy side and the sell side, which represents the heart of the firm's corporate actions strategy.

Buy-Side Technology Awards 2018
waterstechnology

Cashing in on Corporate Actions

SmartStream Technologies won the best buy-side corporate actions platform category in this year's Buy-Side Technology Awards, mirroring its success in the same category at this year's Waters Rankings in July. Victor Anderson chats to SmartStream's Adam Cottingham about the product responsible for delivering the firm's success in the corporate actions market, details around SmartStream's client engagement model, and current market challenges facing buy-side firms.

Q TLM Corporate Actions has delivered significant recent success for SmartStream. What are its primary attributes and what is driving this success?

Adam Cottingham, product manager of TLM Corporate Actions: TLM Corporate Actions is realizing an accelerated development roadmap after the investments SmartStream has made in expanding the team. The solution already supports the processing of all ISO events through their complete lifecycle, but we are always looking to improve our offering and provide value to our users and the market. Over the last 18 months this has been expanded to include processing of ISO 20022 messages and support for their interoperability with ISO 15022 messages. Proxy voting capabilities have been added to the solution, allowing meeting events to be processed and elected upon within the same platform. Within this year's release we have also expanded the multi-currency and fee-calculation capabilities within the solution.

Q The corporate actions processing market is a mature and highly competitive one. What does SmartStream bring to the table that it believes sets it apart from other market participants?

Cottingham: When TLM Corporate Actions onboards a new client, the main differentiator our customers cite is the quality of our engagement model. This is more than just the rich functionality set within the product. This comprises a Model Client Configuration and the Standardized Integration model that has been developed by our Business Consulting team, who all have multiple years' operational experience within the corporate actions domain. This delivers industry best practice "out of the box" in a solution whose underlying technology is flexible enough to also accommodate each client's proprietary processes. This approach drives down the effort and cost of delivery for a complete corporate actions processing capability to three to nine months, depending on the size of the operation. Now that our track record testifies to this capability, more clients are adopting this approach, which further strengthens the model.

Q What areas of corporate actions processing are buy-side firms struggling with at present, and how does SmartStream address those challenges?

Cottingham: Corporate actions processing challenges are common in the marketplace. Everyone carries event risk for operational failings and this is a key component for investing in improving legacy processes.


Adam Cottingham

I would summarize the key challenges in the following two categories:

Market challenges: increasing volumes of events, event types, and managing their seasonality; attributing regional processing differences; keeping pace with changing regulations that require more data and cost-basis information to meet their reporting requirements; managing tax and currency calculations associated with cross-border holdings; and accommodating inconsistent industry standards from the Securities Market Practice Group within Swift with the associated ISO 15022 and 20022 definitions.

Secondly, processing challenges: reconciling multiple sources of upstream information that are often untimely, incomplete, and are subject to change; managing the communication flow across participants; keeping pace with internal and external deadlines; accurately calculating cash and security entitlements and their tax implications and managing adjustments when information changes; and apportioning different trading requirements for securities lending, collateral and finance trades across a traded and settled balance

Undertaking a corporate actions project has traditionally been resource-intensive and expensive. SmartStream is looking to make that experience redundant with our fair value-based approach and accelerated delivery model. This should mean that clients can realize their goals of automation and control of corporate actions processing in the immediate future with minimal expense.

Q What's in the pipeline for TLM Corporate Actions for the next 12 months? Any new functionality on the horizon?

Cottingham: TLM Corporate Actions' main focus will now be on delivering a new UI for the solution. The user experience will be modernized with HTML5 screens for the main UI and portal. This will leverage the TLM View capabilities of the platform, which have already been rolled out across the Reconciliations product.

We will also focus on managing the continuous improvement cycle for a Model Client Configuration, whether they are industry changes applied to ISO standards and regulations or best practices defined by our clients in their given markets. W

Best Buy-Side CRM Platform

Tier1CRM

The revised Markets in Financial Instruments Directive (Mifid II), which went live in January, has placed greater pressure on asset managers in terms of how they treat research payments. They now have to think more broadly about how to better facilitate as well as justify discussions with companies they invest in, known as corporate access. As a result, there is greater demand for more streamlined event, data and operational workflow solutions.

Relationship management specialist Tier1CRM wins this year's best buy-side customer relationship management (CRM) platform category, displacing last year's winner, Satuit Technologies. Tier1's flagship product—the Tier1ACE suite—is a suite of tools that provides a seamless flow of information across financial institutions' banking and trading desks. It provides both buy-side and sell-side counterparties with secure, anywhere, anytime access to all relevant business information, allowing them to evolve their relationship management capabilities.

In the last 12 months, Tier1CRM expanded its capabilities to address the corporate access challenge, allowing its clients to meet the regulatory parameters under Mifid II. "Since most CRM systems do not have a real-time flow of data to ensure information is available across the firm, buy-side firms must be able to extend their systems and plug-in additional capabilities," says Mark Notten, CEO and co-founder of Tier1CRM. "We've invested the time and resources to ensure our users are equipped to evolve, and we're already seeing the results in clients' improved relationship-building and robust workflow processes."

Tier1CRM's model is constantly being updated to ensure that both buy-side and sell-side users are able collaborate using unique tools and workflows with the connectivity they expect. It is currently finalizing a module that will be added to the Salesforce Financial Services Cloud (Salesforce FSC) platform. It will leverage a number of components offered via the Salesforce FSC and several core features from its product suite to streamline workflows.

Moving into 2019 and beyond, Tier1CRM will focus heavily on artificial intelligence (AI). It will launch Tier1ACE on the Salesforce FSC platform, with more focus on analytics and AI.

As for buy-side products, Notten expects to see more automation in the event management space, which will seamlessly connect the sell side with the asset management industry. Tier1CRM is also looking to gain more exposure in Asia-Pacific and Latin America, where it sees opportunities to help those markets move forward in relationship management. "That being said, we still have plenty of wood to chop in our foothold markets, with a solid pipeline of new European and North American clients onboarding in the coming months," Notten says.

—WSW

Martin Bayfield, Doug Christensen, and Rajiv Aggarwal

> In the last 12 months, Tier1CRM expanded its capabilities to address the corporate access challenge, allowing its clients to meet the regulatory parameters under Mifid II.

Best Buy-Side Cybersecurity Platform

Eze Castle Integration

For many on the buy side, it's time to face the facts: Banks are no longer the most attractive targets for sophisticated cyber criminals—hedge funds and asset managers are.

In particular, the smaller firms, which nonetheless manage billions of dollars in cash and intellectual property, are vulnerable to crafty crooks with a little market know-how. It's a situation that Eze Castle Integration (ECI) has been working hard to change over the years, and the reason why it's won the best buy-side cybersecurity platform category at this year's Buy-Side Technology Awards.

"In addition to facing tough market conditions, hedge funds must assess and address cybersecurity risks in the ever-evolving threat landscape they operate in. This is where Eze Castle Integration come in; we help funds to implement bulletproof layers of security and defence practices. Our clients rest assured knowing that they can rely on us to ensure that they have the technology, policies and employee training in place for complete cybersecurity protection," says Dean Hill, executive director at ECI.

ECI provides such services for alternative investment managers in a number of ways. At a basic level it conducts penetration testing and threat assessments, probing the weaknesses of a firm's defensive walls in order to shore them up against attack. But a large amount of time is also spent on the educational aspect that Hill mentions. This ranges from an institutional level, where ECI will take a firm through a macro strategy when it comes to cybersecurity, but also a personal level, through instructing individuals with respect to how to practice proper cybersecurity at home and harden their personal devices against intrusion.

Where ECI really adds value outside of this, though, is through its active monitoring capabilities. It has partnered with another firm—which Hill declines to name—to provide a security operations center that offers global coverage for monitoring a client firm's infrastructure, meaning that there is always somebody watching for intruders.

Looking ahead, ECI is busy integrating "next-generation" technology at present into its firewalls and other defensive arsenal, but it is also looking ahead into the next wave of emerging tech. Artificial intelligence, for instance, is "at the forefront of everyone's mind," Hill says, in terms of how machine learning can be applied to the security process. The firm is already using it within its own operations center. "As we head into 2019, I think that artificial intelligence will be a big part of the security offering," Hill says.

—JR

Smaller firms, which nonetheless manage billions of dollars in cash and intellectual property, are vulnerable to crafty crooks with a little market know-how. It's a situation that ECI has been working hard to change over the years, and the reason why it's won the best buy-side cybersecurity platform category at this year's Buy-Side Technology Awards.

Best Buy-Side Data Analytics Tool

Trade Informatics

Trade Informatics (TI) takes home this year's best buy-side data analytics tool, thanks to its broker-neutral systematic trading platform, Strategic & Tactical Analytic Research & Trading (Start) and its business intelligence software, Trading Analysis Program (Tap). Allan Goldman, COO at TI, says demand for customized trading strategies from buy-side traders is growing, driven by the need for greater transparency and control of trading processes.

TI's post-trade analytics tool helps buy-side firms align investment and trading strategies as well as seek out improved execution opportunities leveraging the firm's Start platform across brokers' direct market access routes and dark pools. The broker-neutral platform seeks to improve performance, manage costs, and allow control of and transparency into execution strategies to help clients seek alpha, minimize investment costs, and drive operational efficiencies. Through Tap and Start, TI's clients are able to interrogate large volumes of data and identify insights. TI combines trade analysis, trade reporting, systematic trading and centralized workflow management with action-oriented consulting to measure costs, develop trading strategies, monitor results, and improve performance.

Goldman says clients are looking to introduce efficiency, transparency, automation and optimization to front-office desks. "Execution quality beyond basic best-execution compliance requirements is a high priority for buy-side traders and TI is ideally situated to guide them toward this goal," he says.

Using data from clients' portfolio management systems, order management systems and execution management systems, TI combines all actions in the transaction relay from portfolio manager and buy-side trader to broker and venue. It then applies performance attribution and reporting functions to the entire execution process. TI, which has been researching and building AI tools to enhance the Start platform, is training its systems to provide enriched integration of real-time market data signals to support dynamic adjustments to execution trajectory, order horizon, and liquidity sourcing. In the next 12 months, the firm will release Tap4, its proprietary business intelligence and reporting utility that allows its analysts and clients to perform in-depth analysis on their datasets. Tap4 adds new standard benchmarking data points, swelling the total number of data points to 150. "Tap4 also includes Mifid II enhancements, venue-level markout (reversion) analysis and an infrastructure that will facilitate our migration to cloud-based data processing, allowing for unlimited elasticity of computing resources and uptime robustness," Goldman explains.

Meanwhile, TI's Start platform has been rolled out to Europe in a limited release, although Goldman says TI should see broader production rollout in the first half of 2019.

—WSW

Martin Bayfield, Allan Goldstein, Victoria Bryan, and Mark Northwood

> Using data from clients' portfolio management systems, order management systems and execution management systems, TI combines all actions in the transaction relay from portfolio manager and buy-side trader to broker and venue.

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Best Buy-Side IBOR (Investment Book of Record) Platform

SimCorp

Ever since this category was first introduced to the Buy-Side Technology Awards line-up five years ago, Copenhagen-based SimCorp has been the sole winner. Needless to say, to remain at the top of any category in these awards for so long requires a keen awareness of changing technology and regulatory conditions.

According to Mark Baker, SimCorp's IBOR product portfolio manager, the concept of an IBOR is fundamental to how the firm's Dimension platform has been built. "Our IBOR covers multiple asset classes, ranging from simple products such as equities to more complex products like variance swaps," says Baker. "We have also recently expanded that to include alternative investments as well. So within that single system and book of record, we aim to support core position-keeping, which then underpins front-office systems, which we also have available within Dimension, and the middle-office system in risk and analytics. This is quite different to a number of our competitors," he says.

In terms of innovation, SimCorp is looking at the elasticity of use of its services layer, aimed at ensuring that its customers are able to run at an optimal cost within a cloud environment by scaling up and down services on demand. The vendor is also in the early stages of looking at how it can incorporate artificial intelligence into its offerings. "We aim to apply machine learning initially to operational user workflows, whereby we can predict, say, the likelihood of a trade being appropriately confirmed and affirmed," Baker explains. "Then we'll look to implement an application programming interface (API) strategy to either place trades into queues so that they can be reviewed by operational users, or alternatively just automatically push them through. That's putting some business intelligence on top of the analytics, and we're in the early stages of discussions with two to three clients in that area."

In terms of recently introduced regulations like the General Data Protection Regulation and the revised Markets in Financial Instruments Directive (Mifid II), SimCorp has developed specific programs to support its client who fall under their purview. "Obviously the Securities Financing Transaction Regulation is coming up, and so we have an internal program that will facilitate our customers' reporting requirements on securities and financial transactions," he says. "In terms of our delivery, we are looking at a new cloud-based mechanism where we will use an API strategy within the IBOR part of the system to remove the transactions and deliver them to the transactions repository. This is part of our cloud-enablement strategy, and this is just one strand of that."

—HA

Martin Bayfield and Allan Copping

In terms of innovation, SimCorp is looking at the elasticity of use of its services layer, aimed at ensuring that its customers are able to run at an optimal cost within a cloud environment by scaling up and down services on demand.

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Best buy-side IBOR platform
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Best Buy-Side Data Management Provider

IHS Markit

Once again, London-based IHS Markit has won the best buy-side data management provider category at the Buy-Side Technology Awards, its third win in as many years, thanks to its widely-used Enterprise Data Management (EDM) platform.

Spiros Giannaros, managing director and global head of enterprise data management at IHS Markit, says the company consistently advances its technology and content services, factors that have led to the platform's continued growth since it joined the IHS Markit stable from Cadis just over six years ago. "Other platforms solve a specific issue for data, but we want to manage not just reference data or regulatory reporting data—we want to be there for the curation process, to create the data and offer information for investment and risk analytics," Giannaros says.

He adds that preventing the emergence of data silos within user-firms is one of the company's goals, which is why EDM encourages clients to manage the bulk of their data-related functions on the platform. He says the user interface was developed so that insights can be resolved within EDM without users having to resort to separate analytics tools, although those that require advanced analytics can still leverage third-party tools like data lakes. The company is able to manage this by way of its data warehouse offering, which stores historical data that may be called upon for any analytics or regulatory reports and which was recently integrated with the platform. Another key integration it undertook in the past year was with thinkFolio, the firm's order management and portfolio modeling system that won the best buy-side OMS category in last year's awards. This allows clients to generate consistent data flows, according to Giannaros. He points out that integrating more synergistic products to the EDM offering means that clients no longer need to maintain multiple different vendor systems, but rather stick to fewer providers, a trend he sees growing.

Markit EDM has expanded its use of non-financial data, including geospatial datasets, increasingly utilized by clients in the energy and asset management industries. Giannaros says these new datasets have been a key interest for clients, so much so that the firm has even been able to offer the same product to different verticals.

For next year, Giannaros says IHS Markit will continue to grow its managed services platform for EDM, especially as smaller firms need these services to keep up with their competitors. The company also hopes to expand EDM with new capabilities around data, including multi-language support. This will mean further insight into different kinds of data and expanding the reach of the product.

—ED

Martin Bayfield and James Kwan

> Markit EDM has expanded its use of non-financial data, including geospatial datasets, increasingly utilized by clients in the energy and asset management industries.

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Best Buy-side Execution Venue

MarketAxess

In days past, trading technology was stifled by limitations that gave little scope for competitive pricing. Today, electronic trading platforms enable firms to access vast pools of liquidity, connect with various market participants, and benefit from transparent pricing. This value speaks loudly, especially at a time when the industry has witnessed significant regulatory reform, particularly with the introduction of the revised Markets in Financial Instruments Directive (Mifid II), which requires buy-side firms to provide regulators and their clients with evidence that their best execution mandates have been met.

MarketAxess has made significant strides to tackle these issues in the credit markets with its Open Trading electronic all-to-all marketplace, and this year its hard work has paid off as it snatches the best buy-side execution venue title from Liquidnet.

Launched in 2012, MarketAxess has dedicated years to building out the product's functionality and market data capabilities. Today, the platform connects a global community of over 1,400 institutional firms trading credit instruments. MarketAxess has enhanced its workflow capability, providing dealers with more efficient access to Open Trading liquidity pools by allowing them to respond to anonymous pricing inquiries in the same way as disclosed inquiries, whether it is done using the platform's workstation or through its application programming interfaces.

"What we saw was a significant increase in the number of responses we received from dealers, so it was a pretty interesting thing," says Richard Schiffman, head of Open Trading at MarketAxess. "It showed that traders will respond when they are shown an inquiry that's of interest to them, and that knowing who is on the other side [of the trade] is of relatively less importance than what bond they are being asked to price."

From July 2017 to June 2018, Open Trading has saved liquidity takers over $100 million in transaction costs, according to the New York-based firm. It has also seen a jump in its daily volume activity to $1.4 billion, an increase of 54 percent from the same period in 2017.

In March this year, MarketAxess expanded its presence in the Asian credit markets through its partnership with BlackRock. In the coming months, it will continue to develop the platform and its list of trading protocols beyond request-for-quote, including one called Client Axes, in which Schiffman describes as a bulletin board/order book-style for buy-side and sell-side firms to share their interests, where parties can bilaterally engage and trade with each other. "This is the first time that a buy-side firm can advertise their interest out into the market and then trade directly with those other parties who might be interested," he claims.

—JG

Toby West, Martin Bayfield, Christophe Roupie, and Gareth Coltman

> MarketAxess has made significant strides to tackle these issues in the credit markets with its Open Trading electronic all-to-all marketplace, and this year its hard work has paid off.

Best Buy-Side EMS

FlexTrade

FlexTrade clinches this year's best buy-side execution management system (EMS) award due to its flexibility, performance and ability to support bespoke workflows through FlexTrader, its EMS platform. FlexTrader has pre-defined trading strategies and tactics for portfolio and single-security trading. It provides pre-trade, real-time, post-trade and predictive analytics, risk- and cost-optimized portfolio trade scheduling, and smart order routing, among its list of functions.

Andrew Mahoney, head of EMEA sales at FlexTrade, says post-Mifid II, buy-side clients now have a more defined obligation to provide evidence of best execution as well as prove that it is a measurable and continuously evolving process. FlexTrader allows users to capture all events of a trade from start to finish, not just the routing of orders and execution, but also button clicks and other interactions. This provides clients with full evidence of their best execution process, he says.

FlexAlgoWheel, on the other hand, offers clients a platform for the systematic selection of brokers and algorithms. The service is data-driven and creates a quantitative feedback loop to ensure continuous improvement of the trading process. "We also see more buy-side desks trading cross-asset class, so there is a need to ensure a consistent approach to best execution and that a full picture of the trade is available in one system," Mahoney explains. "To cater to these challenges, FlexTrader went live with fixed-income [instruments] at the end of 2017, which rounds off our existing, well-established equities, derivatives and FX coverage," he says.

Next year, FlexTrade—which now has 225 clients—will work on expanding the trading workflows supported by FlexAlgoWheel and will enhance the analytics and intelligence tools on the platform. It has plans to extend its fixed-income product coverage to include more electronic venues and analyze Mifid II-approved publication arrangement data. It will also add additional third-party integrations to ensure clients are able to get the data they need in FlexTrader without having to resort to any manual processes. It already offers integration with financial messaging platform provider Symphony, and research platform RSRCHXchange.

Mahoney says European clients are still largely driven by regulations whereas globally, there is a greater focus on data and processes. "In Europe, we are still very regulatory-driven—more clients are now seeing that post-Mifid II, a cross-asset EMS with a focus on best execution is a requirement. Globally, we see a focus on a data-driven and process-orientated approach to trading, which FlexAlgoWheel is well suited for," he says.

—WSW

Martin Bayfield, Andrew Mahoney, and Valérie De Jong

> Next year, FlexTrade—which now has 225 clients—will work on expanding the trading workflows supported by FlexAlgoWheel and will enhance the analytics and intelligence tools on the platform.

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Best Buy-Side Market Surveillance Tool/Platform

Nasdaq

When it comes to surveillance, the king of the hill on the sell side has, for many years, been Nasdaq. Of late, the US exchange operator has made significant efforts to extend its Smarts platform to the buy side, and this year it returns to the Buy-Side Technology Awards winners' circle thanks to its Buy-side Compliance (NBSC) offering.

While Smarts is a world-class platform in its own right, what has really set Nasdaq apart in recent months has been its incorporation of behavioral models. The roots of NBSC are actually in Compass, the platform formerly offered by London-headquartered artificial intelligence and behavioral science specialists Sybenetix, which Nasdaq acquired in September 2017.

Just over a year since that acquisition, the integration efforts are bearing fruit. NBSC isn't just a standard surveillance platform that checks whether trading patterns of portfolio managers fit the typical definition of layering, spoofing or other forms of market abuse, it also drills down into the individual traits of the trader, identifying when behavior is outside of the norm, and applies advanced analytics to detect the true nature of intent in trading.

All of this couldn't come at a more opportune time for buy-side firms. Having long been largely left alone by regulators, rules including the revised Markets in Financial Instruments Directive (Mifid II) and the Market Abuse Regulation among others, along with enhanced conduct monitoring from government institutions, are placing more scrutiny on asset managers and hedge funds than ever before. Therefore, simply having a process that ticks a box and attests that, yes, this firm tries not to engage in spoofing, layering or wash trades simply doesn't, well, wash. But not anymore. With NBSC, Nasdaq is taking surveillance to the next level.

"We focus on solving problems using new technology instead of the other way," says Valerie Bannert-Thurner, head of risk and surveillance solutions, in Nasdaq's Market Technology business. "But obviously adoption of some of these new capabilities is something we are pushing rapidly from an innovation perspective."

These capabilities are already resulting in the production of suspicious activity reports, Bannert-Thurner says, and are reducing false positives by providing a more "holistic" view of surveillance that doesn't simply rely on pre-programmed alerts. Instead, the AI—for which Nasdaq also won a category in this year's Buy-Side Technology Awards—is paying dividends and putting sophisticated monitoring technology in the hands of buy-side professionals, often for the first time.

—JR

Martin Bayfield, John Hunt, Mark Salter, and Taras Chaban

> While Smarts is a world-class platform in its own right, what has really set Nasdaq apart in recent months has been its incorporation of behavioral models.

Best Buy-Side Pricing/Valuation Service

TriOptima

Pricing and valuations is, by any measure, a mature space. So, when TriOptima decided to enter the market, it knew that it had to do something different to the incumbent providers. In 2016, it launched its triCalculate Valuation business, which, at a high level, offers risk analytics-as-a-service. Initially focused on counterparty credit risk measures, the offering has grown substantially since then, leading it to clinch the win in this highly competitive field for the best buy-side pricing/valuation service in this year's Buy-Side Technology Awards.

For TriOptima and many of its clients, it couldn't have come at a more opportune time. This part of the industry is going through a period of enormous change at present, prompted by regulatory provisions around the calculation of initial margin for uncleared instruments, and the rollout of the Standard Initial Margin Model (Simm) developed by the International Swaps and Derivatives Association (Isda). "That's been one of the biggest pushes for us," says Thomas Griffiths, co-CEO of triCalculate. "The first clients that signed up were phase-two clients under the uncleared margin rules and that gave us the initial boost to really put a lot of effort into building out the service."

The real trick with triReduce Valuation isn't that it works with other systems—which it does—but that it can be coupled with TriOptima's other offerings in collateral management and margin calculation to provide an "end-to-end solution for clients who have these requirements under the new regulation," Griffiths explains. While the service can be taken on a standalone basis, Griffiths says the more services that are taken, the greater the automation benefits, from sending in a trade and conducting analytics on when thresholds are likely to be breached, through to dealing with margin calls and reconciliations at the other end.

In addition, the software is delivered via web interfaces and a private-cloud infrastructure, while onboarding times are rapid—triReduce estimates that new clients can begin receiving valuations for cross-asset over-the-counter portfolios, including exotic instruments, in as little as one to four weeks. The process is fed with market data from NEX Market Data and Thomson Reuters, with the use of that data included in the service fee, itself modeled on a pay-as-you-go basis.

"We see ourselves in a disruptive role," Griffiths says. "Some may say the valuation space is already well-served, but it's also quite outdated in terms of infrastructure. With triCalculate we bring a resource-efficient service while leveraging the trusted brand reputation that TriOptima has amongst our thousands of clients."

—JR

Martin Bayfield, Thomas Griffiths, and Catherine Taylor

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Best Buy-Side Newcomer (Vendor or Product)

AxeTrading

The electronification of fixed-income markets has faced ongoing challenges over the years, particularly as existing fixed-income portfolio management systems (PMS) and order management systems (OMS) were designed for voice-based, broker-centric trading interactions. As buy-side trading desks electronify, these systems need to be redesigned to accommodate the data volumes and processing power associated with automated order entry, and ultimately, execution.

This is where AxeTrading, a London-based fixed-income execution management system (EMS) provider, comes to the fore; it wins this year's best buy-side newcomer (vendor or product) award, thanks to its FI EMS platform that integrates with trading venues, execution protocols, as well as other specialized vendors.

Ivan Mihov, head of buy-side fixed-income EMS at AxeTrading, says buy-side fixed-income market participants have become aware of the need to adopt a full, electronic-trading compatible front-office technology stack to achieve operational efficiencies, improved execution and comply with reporting regulations. "We observed that buy-side market participants are increasingly demanding a highly functional EMS in the most electronified asset classes, as legacy OMSs do not function seamlessly under high-volume, low-latency trading conditions," he says.

AxeTrading provides buy-side fixed-income traders with tools to effectively participate on all-to-all fixed-income trading venues. It will continue developing its buy-side workflows as well as expand on a strategy for providing broader, firm-wide solutions for its customers. This includes extending its connectivity to more than 25 trading venues and data providers. Mihov says the firm has begun implementing a smart order router that will further streamline the low-touch execution workflows and deeper integration with big data specialist firms for transaction cost analysis (TCA) solutions, and dealer performance reports. Mark Watters, chief compliance officer and co-founder of AxeTrading, says the FI EMS can be deployed in-house or in a private cloud. He adds that the firm will remain niche and specialized in one asset class: fixed-income electronic trading.

AxeTrading has made its suite of sell-side tools available to buy-side fixed-income traders. "Buy-side fixed-income traders will be able to utilize full dealer-grade pricing engine technology, enabling them to post liquidity on all-to-all trading venues connecting traditional investors and alternative liquidity providers/seekers," he explains. "We see further applications of our pricing engine in the area of TCA and proving best execution; however, this is a new approach in the industry and adoption will take some time."

AxeTrading recently entered a fixed-income technology partnership with the Stuttgart Exchange, the largest bond trading venue in Germany. It expects to open an office in North America early next year to better-serve its client base there.

—WSW

Dinos Daborn, Ivan Mihov and Martin Bayfield

> AxeTrading provides buy-side fixed-income traders with tools to effectively participate on all-to-all fixed-income trading venues.

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Best Buy-Side OMS

Charles River Development

Taking the crown in the best buy-side OMS category at this year's Buy-Side Technology Awards is Boston-based Charles River Development, which wrested the title from last year's victor, IHS Markit, thanks to its Charles River Investment Management Solution (Charles River IMS), an offering that features an Order and Execution Management System (OEMS) with integrated data, FIX connectivity and trade analytics. Charles River, now part of State Street after this year's $2.6 billion acquisition, last won this category in 2015.

Gavin Lavelle, managing director for EMEA at Charles River, says the biggest driver this year with respect to the firm's OEMS has been regulation, where it has added support primarily around the revised Markets in Financial Instruments Directive (Mifid II). "Mifid II was the biggest thing for us and it was important that we integrated support for it into the system," he says. "We incorporated it into the OEMS and we have a large number of customers interested in the solution."

Lavelle notes that the firm's Mifid II solution has around 40 customers on it so far. New capabilities added to the OEMS also include analytics to simplify investment management processes, allowing clients to create orders for options chains or multi-leg futures and options, and foreign-exchange and money-market trades based on cash-flow forecasts. It also allows them to optimize workflows with order and price alerts, validate compliance, monitor research commission targets, and ensure best execution and trade reporting for Mifid II compliance.

Lavelle explains that buy-side firms are currently demanding more from their existing providers and are looking to rationalize vendor numbers as a way of simplifying their operating environments. Charles River has heeded this call by integrating systems and the functions it supports into the Charles River IMS, which won the category of the same name in the 2016 BST Awards. The platform is designed to automate the investment process between the front and middle offices, allowing clients to manage portfolio management and risk functions within the same application. It also streamlines communication between portfolio managers and traders so that the status of orders can be monitored in real time, while detailed compliance functions can be carried out across the trade lifecycle.

But unquestionably the most far-reaching change to Charles River, arguably since its founding back in 1984, was its acquisition by State Street in July this year. "With the merger with State Street, we can consolidate more of our offerings," Lavelle explains. "We can do more for enterprise front and back offices since we can plug into their products, and I believe we will be uniquely positioned to go to asset managers and run everything that they need."

—ED

Martin Bayfield, Rudolf Kilchherr, and Sue Hillwood

"New capabilities added to the OEMS also include analytics to simplify investment management processes, allowing clients to create orders for options chains or multi-leg futures and options, and foreign-exchange and money-market trades based on cash-flow forecasts.

Best Buy-Side OMS

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Best Buy-Side Performance Measurement and Attribution Product

StatPro

The buy side is driven largely by performance. Each asset manager's livelihood, therefore, depends on its ability to evidence its returns through accurate and sophisticated performance measurement and attribution tools, an ever more important task since the introduction of best execution requirements under the revised Markets and Financial Instruments Directive (Mifid II), which came into force on January 3 this year.

In previous years, this category was dominated by BISAM, now part of FactSet, but this year London-based StatPro takes center stage at the Buy-Side Technology Awards, thanks to its Revolution offering, a cloud-based performance and risk platform. StatPro also won the best buy-side risk management initiative over the last 12 months, thanks to the inclusion of its Risk Driver Decomposition functionality within Revolution (*see page 60*).

StatPro has been hard at work over the course of the last 12 months extending Revolution's functionality, including support for tiered and untiered fee structures, fund look-throughs (including funds, benchmarks and exchange-traded funds), aggregate portfolios, fixed-income attribution, and after-tax returns, mandated by the Securities and Exchange Commission's Investment Company Act of 1940. Ian Thompson, global director of portfolio analytics at StatPro, explains that this year the firm also redesigned Revolution's front-end graphics and incorporated customizable dashboards to enhance the platform's user experience. He adds that one of StatPro's 2018 objectives was to strengthen Revolution's workflow capabilities to enable buy-side clients to manage their performance and attribution data in a more effective, efficient and transparent way.

It is no secret that the provider has spent years developing its cloud-native infrastructure from the ground up, partnering with third-party providers such as Amazon and Microsoft along the way. Being a cloud-based service allows StatPro to scale its business and effectively manage any increases in activity on the platform if and when it arises. "This auto-scalability is the elasticity that allows additional services to be fired up, almost instantly, to enable the processing of any increased volumes according to the agreed service windows," explains Thompson. "For example, if a specific client wants all their portfolios processed within say, one hour, we can set up the software to make sure that all performance calculations will process in that timeframe."

The move to a cloud model has also allowed the firm to roll out software versions of the platform at a steady cadence, providing clients with access to the latest updates on a fortnightly basis.

Looking forward, StatPro will look to further enhance its customized dashboards and extend its support of fixed-income attribution.

—JG

Ian Thompson, Martin Bayfield, Kate Maryniak, Scott Harris, and Justin Wheatley

> StatPro takes center stage at the Buy-Side Technology Awards, thanks to its Revolution offering, a cloud-based performance and risk platform. StatPro also won the best buy-side risk management initiative over the last 12 months, thanks to the inclusion of its Risk Driver Decomposition functionality within Revolution.

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Best Buy-Side Portfolio Analysis Tool

Style Analytics

There are some technology vendors that actively court the press, seeking every bit of help to raise their public profiles, while others choose a different, more media-shy path, relying instead on their clients to do their marketing for them. London-based Style Analytics, winner of this year's best portfolio analysis tool category, falls into the latter category. Until now that is. Style's change in tack, which saw it enter the BST Awards for the first time this year, comes in the wake of the arrival of two key staff members at the firm over the last 18 months: CEO Sebastien Roussotte and global head of marketing, Sylvia Kwok, ex-Vermilion, IHS Markit and SimCorp. Both know a thing or two about marketing and growing fintech firms, the most immediate being the often crucial role that winning awards plays in raising a firm's industry profile. With this win, it goes without saying that Style made a big impression on the judging panel, beating a number of the industry's most celebrated names in its first foray. Not bad for a debut appearance.

In retrospect, the best buy-side portfolio analysis tool category really ought to have been added to the BST Awards line-up earlier than this year, given the increasing need for end-investors and portfolio managers themselves to fully appreciate the variables impacting the investment strategies governing their portfolios. And while Style might not be the most instantly recognizable name across the buy side—it rebranded from Style Research to Style Analytics mid-way through this year—it does boast an impressive client roster of more than 300 investment managers globally, including household names like Wellington Management, Fidelity, Invesco, Schroders, Vanguard, BNY Mellon and Oppenheimer Funds.

According to Roussotte, a buy-side technology veteran with stints at Reuters, Sophis and Misys, the firm provides a cloud-based framework that enables fund managers to determine which factors are impacting the risk and performance of their portfolios. "It is fully cloud-based and it covers three areas of the investment universe: the market in general (macro analysis), peer-group comparison, and factor analysis at the individual portfolio level," he explained during an interview with *Waters* in August this year.

In the music industry, they say that the true test of a band is measured by the critical acclaim of its follow-up album and not its debut. Style will face a similar challenge next year when it locks horns again with the likes of FactSet, Nomura Research Institute and BaseVenture for bragging rights in this category. That it is already a well-established business and is comfortable and successful in its niche, is neither here nor there when it comes to repeating success in these awards, something Style no doubt is well aware of.

—VBA

Martin Bayfield, Sylvia Kwok, and James Rees

With this win, it goes without saying that Style made a big impression on the judging panel, beating a number of the industry's most celebrated names in its first foray. Not bad for a debut appearance.

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Best Buy-Side Reconciliation Platform/Service

Duco

London-based Duco wins the best buy-side reconciliation platform category at this year's Buy-Side Technology Awards, following up its success in the same category last year. Its success has come on the back of its low-touch, self-service reconciliation platform, Duco Cube, offering clients reduced implementation timeframes without the need for heavy IT deployments.

When it comes to reconciliation services, one of the challenges with automation has been that many on the buy side are still reliant on spreadsheets. According to Duco's CEO, Christian Nentwich, what has held back automation is that traditional systems were generally built for specific instruments, like cash and equities. Such systems struggle when it comes to anything that doesn't fit the traditional model, for instance the automation of derivatives such as contracts for difference (CFDs). Since Duco's platform is not specific to any one asset class, it has been particularly successful in weaning buy-side firms off spreadsheets.

Nentwich points out that reconciliation services are normally heavily reliant on technology, which tends to make implementations long-winded, complex and expensive. "With Duco, it is live in 24 hours," he says. "Duco Cube uses machine learning, it learns about the data, it adapts itself to the situation and is used by operations people."

One of the challenges for buy-side firms is that there is a lot of duplication of processes between them and their fund administrators, according to Nentwich. Duco removes the need for its clients to rely on multiple systems. "It is the same reconciliation process repeated in multiple places," says Nentwich. "There are lots of emails flying around, and we are able to bring everybody onto one view and cut some of that down."

Duco is currently investing heavily in research and development and frequently releases upgrades to the platform. This quarter, it is rolling out a set of machine-learning components to its clients; Nentwich sees significant potential around the automation of exception workflows underpinned by machine learning. "That is where we are headed," he says.

In his view, the implementation of Mifid II has been "very positive" for Duco. "In the case of Mifid II, when you have systems that normally match maybe 12 columns, suddenly you're having to match over a 100 and you're having to enrich it with HR information like trader's personal details," he says. "The more complex, the better for us. We invest a lot in handling complexity well, and I would say for us as a business, it has actually brought us a lot of new clients in the last year."

—HA

Martin Bayfield, Mireille Dyrberg, Christian Nentwich, and Chris Peacock

> Since Duco's platform is not specific to any one asset class, it has been particularly successful in weaning buy-side firms off spreadsheets.

Duco: Focusing on Flexibility

London-based data operations specialist Duco has chalked up a number of wins in the last two years across *Waters*' awards, the most recent being the best reconciliations platform provider at this year's BST Awards. Victor Anderson chats to CEO Christian Nentwich about what makes Duco different, what it is focusing on with respect to its buy-side clients, and what's in the pipeline for the next 12 months.

Q Duco won the best buy-side reconciliation platform at this year's Buy-Side Technology Awards, repeating last year's win. To what do you attribute these successes in what is a mature and highly competitive market?

Christian Nentwich, CEO, Duco: The market, while mature, is nevertheless stuck on an old technology model that is highly inefficient and costly. Heavy, legacy point solutions dominate this space, which are good at solving standard cash or custody reconciliation problems, but start to fail as soon as complexity is introduced.

We are on a mission to disrupt this industry for the first time in 20 years. We started Duco because we believe that dealing with data at scale requires intelligent systems, able to adapt to any kind of data. Our goal is to automate more of these types of processes and ultimately use machine learning to provide suggestions on how to improve data quality and reduce risk.

Our innovation agenda is focused on bringing true advances in algorithms, real machine learning, and consumer-level what we call "self-service" to the table. There are no implementation projects. With Duco, end-users can normalize, validate and reconcile any type of data within hours, dramatically reducing cost and risk. There is no other system on the market like it.

Q Duco is more than a one-trick pony, having won both the best data governance solution in this year's IMD/IRD Awards and the best use of the Agile methodology in this year's SST Awards. Can you give *Waters*' readers an overview of the services you offer capital markets firms?

Nentwich: One of the core strengths of Duco is flexibility. We see ourselves as a data operations company, providing fundamental data management capabilities in a data-agnostic way. That means Duco can be used to address a range of critical challenges across data quality, data integrity, reconciliation and system migration. Clients use Duco for a broad range of use-cases from daily margin reconciliations, to consolidation of reference data databases, regulatory data quality assurance and massive system migrations.

Duco's high level of usability empowers the people who know the data best to solve their most critical problems. End-users can normalize data without writing code, fuzzy match data that may not be available in exact form, and detect and eliminate root causes of poor data quality. All this improves agility and speed-to-market, while reducing costs and risk. We must be doing something right because we are now processing over 400 million records of data a day.

Q From a reconciliations perspective, what are Duco's buy-side clients' specific pain points right now?


Christian Nentwich

Nentwich: The biggest buy-side challenges we see are complexity, format and duplication. The move to more complex asset classes, including derivatives and contracts for difference (CFDs), means that these reconciliations almost always end up in Excel. Any legacy system or point solution that might be in place either does not support these assets or it needs a prohibitively costly and time-consuming project to code in. This is not efficient and it certainly does not make the compliance team happy. Second, the diversity and varying quality of formats provided by brokers has resulted in each new data source requiring an IT project to get the data. Again, this is expensive and extremely inefficient. Finally, we see duplication of processes between managers, fund administrators, brokers and custodians. There are people sitting in each firm repeating almost exactly the same process. The good news is that clients using Duco are eliminating these pain points to their competitive advantage.

Q What's on the horizon from Duco's perspective with respect to new product or services?

Nentwich: We are investing heavily in innovation to help companies improve data quality and integrity in a number of areas. First, Duco is the leader in bringing true machine-learning capabilities to this space. We are really excited about harnessing this new capability, making it easier to work with arbitrary datasets and helping users better analyze and make sense of their data. Second, we are focused on helping clients reduce and eliminate needless exception investigation and the cost associated with this. We are doing this by enabling users to relentlessly automate any repetitive process. Third, we are building an ecosystem with like-minded technology firms to support clients as they plan out their future operations to improve data quality and integrity. And finally, we are building out a range of services and solutions to support clients as they continue to streamline operations, reducing cost and risk. W

Best Buy-Side Risk Management Initiative over the Last 12 Months

StatPro

Portfolio data and analytics provider StatPro has snatched the title of the best buy-side risk management initiative over the last 12 months at this year's awards from last year's winner, RiskVal. This is the second time StatPro has bagged this award since 2014, thanks to the new Risk Driver Decomposition (RDD) analysis functionality it launched earlier in the year.

The RDD service helps clients to understand and actively manage their sources of risk. RDD offers deeper risk attribution capabilities through StatPro's reporting engine that delivers analytics in Microsoft Excel, PDF and other report formats, according to the London-based firm.

Damian Handzy, global head of risk at StatPro, says RDD was developed as a result of several interactions with clients asking for more detail behind the contributions to value at risk (VaR) measures. "But unlike typical conditional VaR approaches, which allocate different amounts of risk to sub-portfolios, StatPro's RDD answers fundamental questions about the market sources of risk," Handzy explains. "RDD specifies how much risk comes from, for example, specific tenors of interest rates and credit spreads, and answers questions like 'how much sensitivity do I have to sovereign credit spreads or manufacturing company three-month rates?'"

Handzy adds that the most challenging aspect of analyzing underlying sources of risk is assigning the risk to a linear combination of interpretable driver inputs. "In other words, re-writing the risk equation in the form: risk = driver 1 + driver 2 + driver 3, etc.," he says. This is difficult to do for securities with complicated pricing functions as the drivers are not cleanly separable. StatPro uses a machine-learning algorithm, specifically the Multivariate Adaptive Regression Spline (Mars) technique to address this challenge. Mars isolates the effect of each risk driver individually and simplifies the calculation. "The Mars approach uses a piecewise linear basis function to approximate the pricing function," he says.

Next year, StatPro will include RDD analysis in its flagship platform, Revolution, where clients can configure their own analytics dashboard including RDD. Handzy says this will allow for direct comparisons of performance drivers to risk drivers, which is a critical part of risk budgeting and portfolio allocations. By comparing performance earned with risk consumed, managers can better position their portfolios for profit generation, he adds.

StatPro's risk analysis has several advancements that it will put into production over the course of the next 12 months. These include fixed-income attribution including multi-asset capability; liquidity risk—time to liquidate; fundamental factor models for global, US, European, UK and South African portfolios; and next-generation credit curves across a global spectrum of institutional bond issuers and currencies.

—WSW

Martin Bayfield, Chantal Mantovani, and Justin Wheatley

> This is the second time StatPro has bagged this award since 2014, thanks to the new Risk Driver Decomposition analysis functionality it launched earlier in the year.

Best Buy-Side Risk Management Product

Axioma

Axioma wins this year's best buy-side risk management category, replacing last year's winner, Numerix. The New York-based company last won the award in 2016.

Over the past year, Axioma has continued to seek ways to scale up its services and find new ways to deliver its products to its buy-side and sell-side clients.

One of its most notable updates to its risk suite is its new cloud-based environment, axiomaBlue, which it unveiled in October this year. Ian Lumb, Axioma's global head of risk, says the new cloud-based offering will help clients adjust to the level of service they need. "Being cloud-based has given us the elasticity to address clients' needs," Lumb says. "Instead of forcing companies to conform to a rigid technology stack, we are able to adjust our workflows and solutions to meet their unique requirements. Our new open API (application programming interface) infrastructure, which is part of axiomaBlue, helps us develop that further and to interface with other best-of-breed solutions that will benefit our clients."

AxiomaBlue offers additional analytics through the use of machine-learning models and a marketplace where clients can access a range of third-party services, enabling them to customize their platforms. It is currently offered with Axioma's interface-first risk solution, although more additional functions within the risk management suite will be added shortly.

Many of the new updates to Axioma's suite of risk products will involve multi-asset class data, which, Lumb says, is one of the firm's focuses, given that it has expertise in factor investing. Axioma is also looking to improve and broaden its asset coverage with the possibly of including securitized debt products.

Lumb says the enhancements Axioma has made to its risk management platform have attracted the attention of larger clients. These updates and other enhancements on the horizon are being driven by client demand, according to Lumb, especially now that the asset management industry is experiencing mounting cost and efficiency pressures. "There is a lot of consolidation of asset managers, which has made them think about the legacy infrastructures they have—it's put pressure on them in terms of their budgets as well as efficiency," Lumb says. "Many clients want to have consistent data between the front and middle office to increase efficiency."

Lumb adds that these concerns are why Axioma is looking at means to provide easier links between its many solutions so that downloading data or analytics will ensure consistent information and quick access.

—ED

Martin Bayfield, Ian Lumb, and Sunil Rajan

> Over the past year, Axioma has continued to seek ways to scale up its services and find new ways to deliver its products to its buy-side and sell-side clients.

Best Buy-Side TCA Tool

Tradeweb Markets

Transaction-cost analysis (TCA) has been a core function of the capital markets for years. Today, its significance is greater than ever before, now that the revised Markets in Financial Instruments Directive (Mifid II) has been introduced, requiring buy-side and sell-side firms to transparently evaluate and convey criteria relating to their performance and best execution responsibilities to their clients.

Since the launch of Tradeweb TCA in 2015, Tradeweb has gathered appreciable momentum in this space to address these regulatory challenges head-on, a factor that contributed significantly to it winning the TCA category at this year's BST Awards, following up on its win in the same category last year.

Tradeweb TCA uses in-depth data from sources such as the rates, credit, and derivatives markets and dealer prices to measure and monitor the cost-effectiveness of trading activities. It is used to benchmark clients' trading activities at the point of trades against various data reference points. Mike Thorpe, head of cross-market solutions and relationships at Tradeweb, explains that analysis is then conducted around transaction-cost measurements to evaluate performance based on metrics such as basis points, cash values or the percentage of the bid-offer spread. Each of these metrics are then weighted on a volume, risk or trade basis.

This year, Tradeweb extended its TCA coverage to include US credit markets and swaps, in addition to incorporating AI-Price, a pricing tool powered by artificial intelligence, which leverages data from Trace, Finra's trade reporting and compliance engine. The tool is designed to deliver accurate reference pricing for more than 10,000 US bonds, and is updated every 30 seconds.

Thorpe explains that over the past two to three years, Tradeweb has been actively working with clients to look at the breakdown of TCA measurements such as time of day, trade size and execution type, to improve their trading performance. "It's not just a post-trade compliance tick box—it's actively used by our clients to help analyze how they can improve performance," Thorpe says. "More recently, we are recycling the post-trade TCA experience into a pre-trade target; for instance if clients always typically trade bunds at the midpoint, they can set that as their target for automated execution."

This year, Tradeweb added support for uploading trades onto the Tradeweb platform, allowing clients to compare their performance against their peers. It also launched its Best Execution Monitor application on its InSite portal. Over the next 12 months, Tradeweb intends to grow its TCA coverage, with a focus on derivatives, benchmark swaps and a wide range of bonds.

—JG

Martin Bayfield, Cameron Wallace, and Kerry Gunner

Since the launch Tradeweb TCA in 2015, Tradeweb has gathered appreciable momentum in this space to address these regulatory challenges head-on, a factor that contributed significantly to it winning the TCA category at this year's BST Awards, following up on its win in the same category last year.

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Best Data Provider to the Buy Side

RIMES Technologies

It's difficult to know what to write about RIMES Technologies that hasn't already appeared in the pages of this magazine over the years. After all, *Waters* has published 12 write-ups on the New York-headquartered data provider in this category since the inaugural Buy-Side Technology Awards were held at the Lanesborough in Kinghtsbridge in 2007. Along with BISAM and Cadis, RIMES was one of the unheralded winners that day, but has since established such a stranglehold on this category that its name is now synonymous with the provision of customized datasets and services to the buy side.

Over the years, RIMES—which has grown its client roster to more than 350 firms, including 60 of the industry's 100 largest asset managers in assets under management—has fended off challenges from the likes of Bloomberg, Refinitiv (formerly Thomson Reuters Financial & Risk), QuantHouse and FactSet for bragging rights in this category, but its record remains blemish-free. The RIMES service currently comprises 260 data partners, representing in excess of 1,100 data sources, customizing and delivering data to 40-plus end-systems within a variety of capital makers firms, including portfolio management, performance attribution, risk management, reporting and compliance, as well as in-house databases and enterprise data management systems.

So what is it that makes RIMES different from other providers? "Our clients tell us that it is our passion for data—one client refers to it as an obsession—which is at the heart of our business model," explains Alessandro Ferrari, chief marketing officer at RIMES technologies in New York. "Data management is our bread and butter so we have to get it right all the time. That 'obsession' with data is crucial to the relationship we have with our clients because these days when we meet a prospect, we are often competing with an in-house solution and not third parties, and so it takes a lot of trust from the client to let an external partner take care of all their data," he says.

According to Ferrari, what also sets the firm apart from other providers is that at RIMES the implementation team is present right from the pre-sales stage. There are times when pre-sales teams may promise functionality and implementation timeframes that are unrealistic, which the implementation team will not be able to deliver on. "That scenario often leads to broken promises," he says. "Our implementation and pre-sales teams work together from the outset, so when they go in to a pitch meeting, the client gets told straightaway what they can and cannot deliver, but more importantly, once they sign an agreement, they have a commitment [from the RIMES team] to deliver."

—VBA

Martin Bayfield, Alessandro Ferrari, Neil Kelly, Terri Morgan, and Poly Michaels

> The RIMES service currently comprises 260 data partners, representing in excess of 1,100 data sources, customizing and delivering data to 40-plus end-systems within a variety of capital makers firms, including portfolio management, performance attribution, risk management, reporting and compliance, as well as in-house databases and enterprise data management systems.

Buy-Side Technology Awards 2018
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RIMES: Racking Up the Wins

RIMES Technologies maintained its perfect track record by winning the best data provider category at this year's Buy-Side Technology Awards, its 12th win in succession. Victor Anderson chats to RIMES' Alessandro Ferrari about what separates the firm from other providers in the space, what buy-side firms currently want from RIMES, and what's on the horizon for the New York-based data specialist.

Q RIMES continues to maintain its blemish-free record in the best data provider category in the BST Awards. To what do you attribute this unique record of having won the category every year since the awards began in 2007?

Alessandro Ferrari, chief marketing officer, RIMES Technologies: It's because of the breadth and depth of our managed service, which produces sustainable (and scalable) long-term partnerships with our clients. We feed data from front-office systems through to middle-office and back-office systems across all functions: portfolio management, data management, risk, performance, and now compliance. We're able to tackle all data challenges, including customization and blending, asset allocation support, preview and pro forma data, credit ratings, classifications, price-aligned analytics, security identification and data types. Although benchmark data is our specialist area, we offer all types of data, including alternatives and ESG, commodities, currencies, derivatives, earnings estimates, economic data, pricing, ETF data, mutual funds, fixed income, hedge funds, private equity property, REIT data and ratings. RIMES is truly a one-stop shop for data management.


Alessandro Ferrari

Q What are RIMES' clients' most acute pain points at present? Typically, which aspects of your services are finding the most traction from the buy side right now?

Ferrari: On the data management front, all types of benchmark data management requirements, including alternatives and ESG data, plus growing ETF data requirements. On the regtech front, Market Abuse Regulation (MAR) and European Benchmark Regulation (BMR) compliance are at the top of our clients' agendas.

Q RIMES also won the best implementation category (data & operations) at this year's awards. What do you believe sets the firm apart from other providers in what is undoubtedly one of the most competitive areas servicing the buy side?

Ferrari: Every day, our clients—all 350 of them, including half of the industry's top 100 asset managers by assets under management, and nine out of the top 10 asset servicers—provide us with the best, most current insight into the full breadth of the data challenges experienced by the industry. This combined intelligence helps us to help them.

Q What's on the horizon from RIMES' perspective in terms of new products/offerings?

Ferrari: Following the success of our first BMR solution, RegFocus BMR Control, we're launching a second BMR solution: RegFocus BMR Data Feed. The BMR came into force last January, ushering in a stringent regime for the administration, contribution to and use of benchmarks used in financial instruments and contracts. For benchmark users such as asset managers, banks and insurance companies, BMR has brought with it uncertainty over which new benchmarks are approved for use within the European Union, and around which historic benchmarks will continue to be authorized once the BMR transition period ends on January 1, 2020. Under BMR, benchmark users can only use benchmarks from authorized or registered benchmark administrators. The stakes are high, with fines for non-compliance scaling up to as much as 10 percent of a firm's annual income.

Benchmark users are therefore in urgent need of greater clarity and transparency around the fast-changing benchmark landscape. RegFocus BMR Data Feed provides benchmark users with clarity around which benchmarks are authorized under BMR as the benchmark landscape continues to evolve. The service addresses the two major challenges faced by the financial services industry with respect to complying with the EU Benchmark Regulation: Which specific benchmarks firms can use (as the European Securities and Markets Authority (Esma) only provides the names of the administrators), and how they can identify an index when no standard identifier (e.g. the International Securities Identification Number or ISIN) is available.

We comprehensively map index reference codes across official symbols, including ISINs, Bloomberg Tickers and Reuters Instrument Codes. In addition, the service draws on data from interviews with 350 data partners, including MSCI, FTSE Russell, Bloomberg and ICE, as well inputs from Esma and other European regulators. The result is a complete repository of all indices authorized for use in the EU under BMR—including from administrators based in third-country jurisdictions—that is continually updated to reflect changes as they occur. W

Best Fund Administrator

SEI

Some things, apparently, never change. Take, for example, SEI and its impressive track record in the Buy-Side Technology Awards, specifically the best fund administrator category. Oaks, Pa.-based SEI wrested control of the award from GlobeOp Financial Services—now part of the SS&C Technologies stable—back in 2010, and since then has exerted a stranglehold on a category that over the years has consistently attracted fewer entries than most others in these awards, even though the fund administration market is a mature, lucrative and highly competitive one.

Large numbers of buy-side firms rely on their fund administrators to manage extensive areas of their business, especially manually intensive, costly and often complex back-office functions where they feel they cannot add much in terms of value to their clients. That is SEI's bread and butter, and if you scratch a bit below the surface of the firm, you'll find all sorts of new and innovative technologies and services designed to alleviate much of the grunt work associated with the institutional asset management industry.

SEI, founded 50 years ago and now with close to 4,000 employees worldwide and annual revenues of over $1.5 billion, prides itself on what it describes as its "startup mindset," underlining the significance it places on technology development, nimbleness, time-to-market, client collaboration and responsiveness in terms of addressing the industry's most acute needs. "Our global teams of experts guide our development, so we're offering what we feel are the best solutions in the market, often customized to best fit our clients' unique needs," explains Donal O'Neill, director of client services at SEI. "This year, we focused on better integrating and streamlining our solutions and simplifying processes, while integrating new technologies such as blockchain, machine learning and artificial intelligence (AI). As the entire investment process is becoming more and more digitized, we are conscious that our clients' experiences and their end-clients' experiences should still feel bespoke and personalized."

According to O'Neill, SEI is looking to leverage AI and the various technologies sitting within the AI family, while also focusing on the scalability, resilience and security of its entire fund administration proposition. "Obviously AI is a popular topic, and we think natural-language processing is hot on its heels in terms of what's coming next," he says. "Regardless of the new financial products and innovations being introduced, however, we must not forget that the technological and operational infrastructure we provide our clients is robust, secure and scalable. Data and investor security and regulatory compliance may be boring, but they are also critical aspects of everything we do."

—VBA

Martin Bayfield and Tim Dissen

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View from "The Zenith" in Busan, South Korea

Best Implementation at a Buy-Side Firm (Data & Operations)

RIMES Technologies

RIMES Technologies just can't seem to stop winning categories in the Buy-Side Technology Awards. There was a time when the data management specialist focused exclusively on "its" category: the best data provider to the buy side (*see page 64*), a title it claimed all the way back in 2007 and is yet to relinquish, underlining its stranglehold on the category. This implementation category is one of only two in the BST Awards line-up that scrutinizes the specifics around a product or service implementation at the buy-side firm, and considers the measurable benefits to the client in terms of cost-savings, improved efficiencies and enhanced or extended business opportunities.

RIMES emerged top in this category thanks to its collaboration with a $50 billion global asset manager. The project initially entailed the client undertaking a series of business-transformation programs on the underlying data feeding its investment platforms, opting to work with RIMES for the first stream: the development of a new service model for managing its reference data. Following a successful proof-of-concept, the asset manager went live with the first phase of the project after approximately eight months, where it saw improvements in its data quality and efficiency, and a reduction in its data management costs by a six-figure number.

The client's primary objective was to maintain growth without increasing operational headcount or seeing a rise in associated costs. It identified index and asset data optimization as the starting point for the project, although its existing data processing approach—entailing multiple processes and data onboarding models that had evolved over time, each of which required its own support—made effective data governance difficult to achieve. It therefore developed a new data management and governance approach using the RIMES Managed Data Service.

Key to RIMES' enduring success across the buy side is the extent to which it tailors its services to meet the specific needs of each of its clients, effectively crafting unique services for each of its more than 350 user-firms. "The implementation was not that atypical for RIMES," explains Alessandro Ferrari, chief marketing officer at RIMES Technologies. "We don't have products—we have a service, and it's a managed service, so it's not like your typical outsourcing model. With every client, we go in on a fact-finding exercise where we look to figure out what they are trying to achieve. We also look to identify whether what they are doing now can be replicated more efficiently or whether it needs to be restarted from scratch. The point is that we always go in with an open mind with the goal of developing a long-term partnership with our clients," he says.

—VBA

Martin Bayfield, Alessandro Ferrari, Poly Michaels, and Neil Kelly

> Following a successful proof-of-concept, the asset manager went live with the first phase of the project after approximately eight months, where it saw improvements in its data quality and efficiency, and a reduction in its data management costs by a six-figure number.

Best Implementation at a Buy-Side Firm (Trading & Risk)

FlexTrade

This year's two implementation categories—trading & risk and data & operations—are new to this year's BST Awards line-up, introduced due to the sheer number and quality of entries to the incumbent "best implementation" category—31 entries in total. Last year's category was won by SimCorp for its work in replacing Marathon Asset Management's legacy reporting platform with SimCorp Coric. This year's trading & risk implementation category goes to New York-based FlexTrade for the deployment of FlexOne, its order and execution management system developed for the buy side, at Boston-based hedge fund Quantopian.

At the time of the implementation, FlexOne was new on the market. In business since 1996, FlexTrade is best known for its execution products, underlined by its win in the best buy-side EMS category in this year's awards (*see page 46*). "We always had OMS-like functionality within our EMS, more as a one-off development deliverable to clients," explains Aaron Levine, vice president for OEMS solutions at FlexTrade. Some six years ago, FlexTrade started developing its OMS from the ground up, using Scala and Google's gRPC for API delivery. After laying the foundation and taking on a number of partners, the product was unveiled two years ago. "At FlexTrade, we have always taken a customized approach to working with clients, doing the due diligence to break down their needs, wants and overall workflows," says Levine.

When FlexTrade began working with Quantopian, the big unknown for it was the fund's workflows. That led to the FlexTrade team traveling to Boston and sitting down with Quantopian's principles, development teams and architects to better understand its technology and operational requirements. It also spent a few days running workshops to analyze the fund's workflows. The team then returned to New York and ran development estimates and set timeframes for the implementation. The original deliverables estimate was approximately three months, start to finish.

According to Levine, the most crucial requirement Quantopian had was an open architecture that allowed for straight-through processing. Whereas many traditional clients use point-and-click trading, Quantopian wanted a purely systematic approach. Levine considers peer performance through applied latency to have been a notable driver for the platform, while having a low-latency investment process was also key for Quantopian.

An important aspect of the implementation is Quantopian's ongoing needs after the initial go-live date, according to Levine. "Clients change and adapt over time from a peer business perspective, and that goes hand in hand with our support and implementation model," he says. "So as a client, whether they onboard a new fund or bring on new asset classes, it kicks in and re-circles back to our implementation policies each time."

—HA

Martin Bayfield, Andrew Mahoney, and Valérie De Jong

> This year's trading & risk implementation category goes to New York-based FlexTrade for the deployment of FlexOne, its order and execution management system developed for the buy side, at Boston-based crowd-sourced hedge fund, Quantopian.

Best Integrated Front-Office Platform

SS&C Eze

From a buy-side perspective, the front office has traditionally received the lion's share of technology spend. And for good reason: the front office is where asset managers' returns emanate from, which means the underlying technology is crucial to the overall health of the firm. SS&C Eze (formerly Eze Software) has followed up last year's win in this category by winning again at this year's Buy-Side Technology Awards.

According to Andrew Pheifer, director of product management at SS&C Eze, it is one of the only companies in the industry that integrates an execution management system (EMS) and order management system (OMS) under one roof. "You might be able to take an order in the OMS, and send it to be fixed in the EMS, and then execute that order out of the EMS," he says. "But what you are lacking is bi-directionality in messaging and communication where both systems are synchronized with one another so that if an order change needs to happen, you are not swiveling back to another platform in order for that to happen—you can make that adjustment [once] and it is reflected in both systems."

By building application programming interfaces (APIs) to create the platform and stitch the products together, SS&C Eze has been able to offer a much more streamlined workflow, looking under the hood at the code on both sides to create the optimal architecture, according to Pheifer. "If you have two different vendors doing this, I can tell you that they are certainly not taking the same approach where they are 100 percent transparent with their code," he says. "Typically, with those types of integration, you are going to have a master company and a child company. And even if it is wrong, the master is going to tell the child what to get done. That is never good for long-term 'retainability' of code. Because we are one company, we can all release new functionality on the same date."

There are several hundred buy-side clients currently using both SS&C Eze's EMS and OMS offerings, while those that are taking advantage of the APIs that sit between the systems number more than 50.

In July this year, Eze Software was acquired by investment and financial software provider SS&C Technologies for $1.45 billion. Pheifer sees the new corporate identity as an opportunity to leverage Eze's EMS and OMS work in order to complement other products in SS&C's portfolio. He envisions extending it as a front-office offering for a much larger client base that have their fund administration services run through SS&C.

—HA

Martin Bayfield and Katya Surudina

> By building APIs to create the platform and stitch the products together, SS&C Eze has been able to offer a much more streamlined workflow, looking under the hood at the code on both sides to create the optimal architecture.

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Best Cloud Provider to the Buy Side

Eze Castle Integration

In the competitive world of cloud computing, to stay ahead of the curve requires a deep understanding of changing market dynamics. Eze Castle Integration (ECI), which wins this category in the BST Awards for the fourth consecutive year, clearly has what it takes to be a leader. "We have always had an eye on security and the regulatory requirements with our clients," says Dean Hill, executive director at Eze Castle Integration. "We also have an eye on making sure that we are aware of emerging technologies and platforms."

One of ECI's recent innovations is its Eze Hybrid Cloud, developed after Microsoft approached the firm at the end of 2016 with a request to work with it on becoming an accredited cloud solution partner. ECI went through a program with Microsoft on training accreditation, working on the back-end in terms of datacenters to become a Tier 1 Cloud Solution Provider (CSP). "We are a Microsoft cloud solution provider globally," Hill explains. "This distinction gives us direct access to the Microsoft platform at [the] datacenter level. So we are physically and virtually peered with Microsoft within our datacenters. We are not just a re-seller, we are a true partner."

It was back in 2005 that ECI built and deployed its first cloud-hosted platform for a hedge fund. Back then, cloud technology was still in its infancy and many clients preferred having expensive hardware deployed and managed on their premises. Cloud technology has since evolved and matured, although Hill says concerns around data and cyber-security have increased. When it comes to security, ECI doesn't solely rely on its own in-house expertise. "We are happy to say that we push out specialist security operation center-monitoring of our platform to a specialist third party." Hill explains.

ECI has over 600 clients worldwide. At present it is working on three or four different iterations of its platform, offering varying levels of security and functionality to address specific client needs. "The biggest risk often facing organizations is human error," Hill continues. "One of the biggest loopholes for criminals is targeting an individual or a group and targeting the weakest link when it comes to IT security. A lot of the time that is the human element. To help clients mitigate this risk, we are continually sharing the knowledge, the training and the accreditations to help their employees [to] be risk aware."

—HA

One of ECI's recent innovations is its Eze Hybrid Cloud, developed after Microsoft approached the firm at the end of 2016 with a request to work with it on becoming an accredited cloud solution partner.

Best Low-Latency Trading Network

Itiviti AB

Itiviti is this year's winner of the best low-latency trading network category in the BST Awards, its third win in a row, although its 2016 and 2017 successes were under its former name, Ullink.

Stockholm-based Itiviti merged with Ullink last year, integrating Ullink's Nyfix network with Itiviti's managed FIX offering, which provides access to brokers while at the same time monitors and manages trading flows with dedicated dashboards. The platform also allows clients to analyze executions with the view to helping them develop and implement new trading strategies.

Philippe Carré, global partnerships director at Itiviti, says the network continues to be a stable and robust trading portal offering buy-side firms fail-safe, global connectivity. "Clients demand a robust partner and we offer that kind of stability as we have had no downtime in more than a decade," he says. "We also have an ambitious partner policy to make it easier for our clients to connect and interoperate with other platforms."

Carré adds that Itiviti has one of the largest networks across the capital markets, attracting potential clients looking to connect with other counterparties and trading venues. One of the major upgrades unveiled by Itiviti in the last year was the launch of regional hubs allowing clients to access Itiviti in Asia and Europe. Carré notes that the firm is seeking to maximize the potential for connections from its hubs in Singapore, Tokyo, London, and Paris before it explores the possibility of establishing additional hubs. He adds that future hubs might be located in emerging markets, where capital markets firms have traditionally experienced connectivity challenges. The hubs have already helped expand Itiviti's customer base in Europe and the Asia-Pacific region.

Itiviti is also looking to expand in the area of post-trade services. "We're looking at automating more post-trade services and expanding our footprint in terms of the buy side using this service," Carré says. "We want to make it as close to real time [as possible] to facilitate exceptions [management] so that clients can focus on more complex issues."

Carré adds that Itiviti identified a gap in the market for analytics and data that can be offered via its network. The company already has a post-trade initiative around the use of its online service platform and is working with a third-party to offer transaction-cost analysis (TCA) functionality. Carré says clients have asked Itiviti for help in combining its services to provide access to more trading venues and not just other traders, an important development for the company that it is currently exploring.

—ED

"Stockholm-based Itiviti merged with Ullink last year, integrating Ullink's Nyfix network with Itiviti's managed FIX offering, which provides access to brokers while at the same time monitors and manages trading flows with dedicated dashboards.

Best Outsourcing Provider to the Buy Side

SS&C Advent

Coming off its win in this category last year, SS&C Advent has once again been voted the best outsourcing provider to the buy side in the BST Awards, thanks to its Advent suite of products and services. The past 12 months have delivered significant growth for parent company SS&C Technologies, especially in the wake of its acquisition of Eze Software, which closed in October this year.

Al Castillo, senior director at SS&C Advent, says the Advent platform has found much success in offering flexible options for buy-side firms that may be reluctant to move to the cloud. "One of the things that makes us stand out is our experience, having been around for more than 20 years," he says. "We also take advantage of technology and infrastructure upgrades and our ability to host and cloud-deliver, so we're uniquely positioned in the market. We had some success last year with flexible offerings. Despite more people becoming more comfortable with outsourcing, we are willing to move as fast or as slow as our clients need."

SS&C upgraded its infrastructure over the past year to provide more flexible delivery options and transparency for its clients. Castillo says SS&C released a new status page last year that generates client alerts if there's a problem with the system. The alerts used to be limited to internal monitors, but were extended to clients to keep them up to date. Earlier this year, SS&C also released Advent Lumis, which captures and shares exception events with clients as part of an effort to provide more information around outsourcing workflows. The firm also improved its disaster recovery policies, according to Castillo.

Castillo says the acquisition of Eze Software provides opportunities for new enhancements to the platform, including additional integration with Eze's many buy-side offerings. "With the close of the acquisition, we can host the Eze solution—which we hosted independently before—by 2019," he says. "Clients that use the different platforms will no longer have to move their data through different cloud infrastructures, but rather work with one vendor, so their information is passed and accessed easily."

While there are no planned upgrades to the platform as yet, Castillo notes that work will continue around governance projects to increase transparency to clients, a trend permeating much of the industry. SS&C is also investing in a single portal solution so that clients no longer have to receive multiple reports or log into different sites.

One of the biggest projects SS&C is undertaking, however, is exploring potential solutions to deploy its services via public clouds. Castillo says clients, while still largely hesitant to use public clouds, have nonetheless expressed interest in using these infrastructures.

—ED

Martin Bayfield and Prashant Singh

> SS&C upgraded its infrastructure over the past year to provide more flexible delivery options and transparency for its clients.

Best Portfolio Accounting Platform

SimCorp

Portfolio accounting is a core function that all buy-side firms need to manage efficiently, accurately and transparently, irrespective of their size, location and investment strategies. And now that large numbers of asset managers operate on a global scale, many are feeling the pressure of keeping up to speed with the evolving regulatory landscape and multinational accounting regimes. SimCorp, a familiar name to the investment management community, has dedicated the best part of 50 years to tackling buy-side challenges, putting portfolio accounting at the forefront of its mission. Thanks to the development of its accounting book of record (ABOR) and growing coverage of global accounting rules, the provider has returned to the winners' circle at the Buy-Side Technology Awards, taking home the best portfolio accounting platform award for the second consecutive year.

At the core of SimCorp Dimension's accounting functions lies its ABOR. The platform provides buy-side clients with a consolidated view of position-keeping across traditional and alternative asset classes. Significant features include its broad coverage of regional accounting frameworks, currencies, statutory reporting obligations, and tax requirements. Among those supported include Generally Accepted Accounting Principles (GAAPs), as well as IFRS 9 and IFRS 17.

Paul Ravenscroft, product portfolio manager at SimCorp, explains that regional factors can be used to build and update multiple books of record through a single set of transactions. This cross-border fluency using an integrated platform enables clients to operate on a global scale, minimizing accounting breaks and eliminating data duplication. Dimension further provides a transparent picture of the accounting data at each point in the investment management lifecycle, providing clients with the flexibility to access regional views and drill down to the origins of transactions at any time. "One system, end-to-end, makes it very easy to tie it back," says Ravenscroft. "The most granular level of detail exists in the system, so you can always drill back down to that."

Over the past year, SimCorp has focused on developing its support for multinational firms involved in intercompany trading, where the platform can track the deferral, amortization and currency of the parent company, avoiding additional foreign-exchange costs or added inefficiencies. More recently, SimCorp has developed support for US-GAAP premium amortization for call options and the German Investment Tax Reform Act, which came into force at the start of this year. Looking forward, the firm aims to continue building out its accounting functionality by developing support for the Common Expected Credit Loss model and delivering phase two of its IFRS 9 support.

—JG

Mittal Shah, Martin Bayfield, and Christina Bendall

> SimCorp, a familiar name to the investment management community, has dedicated the best part of 50 years to tackling buy-side challenges, putting portfolio accounting at the forefront of its mission.

Buy-Side Technology Awards 2018
waterstechnology

Best Overall Buy-Side Product, 2018

Nasdaq

The first of two categories decided by the *Waters* journalists, announced on the afternoon of the BST Awards luncheon in London on November 2, where the previous 35 winners were considered as potential recipients, goes to Nasdaq, thanks to its Buy-side Compliance offering. Up to now, the firm's suite of risk and surveillance offerings was headlined by its outstanding Smarts platform, which has dominated the Waters Rankings in recent years. In fact, since 2012 when the market surveillance category was first introduced, there has only ever been one winner: Smarts. But the firm's Buy-side Compliance platform is now also in the limelight, thanks to Nasdaq's September 2017 acquisition of London-based buy-side behavioral analytics specialist, Sybenetix, which resulted in Compass, Sybenetix's buy-side-specific trade surveillance platform, changing hands.

This year's win, however, was far from a one-horse race, as FlexTrade, Eze Castle Integration and Dash Financial Technologies came into consideration as potential recipients by virtue of their double wins, while Duco and AxeTrading were also considered. But it was the Buy-side Compliance platform's topicality and the ingenuity by which it efficiently addresses a number of the buy side's most pressing needs that got it over the line.

It is no secret that the US exchange operator has been eyeing the buy side in recent years, looking for a buy-side-specific surveillance offering to help support firms' internal and external regulatory obligations, rather than extending Smarts to the asset management industry. Nasdaq Buy-side Compliance does just that: It provides traditional asset managers and hedge funds with behavioral profiling algorithms to address the Market Abuse Regulation, which came into effect in July 2016, and Mifid II regulatory requirements. The behavioral analytics model applies algorithms to individual decision making to provide a holistic behavioral analysis of possible instances of market abuse, and to more accurately detect cases of market manipulation. As James Rundle explains in his write-up on page 48, the platform isn't just a standard surveillance offering that checks whether portfolio managers' trading patterns fit the typical definition of layering, spoofing or other forms of market abuse—it also drills down into the individual traders' traits, identifies when behavior is outside of the norm, and applies advanced analytics to detect the true nature of intent in trading. And while the platform's client numbers are currently modest, if Smarts' success is anything to go by, those numbers will have grown appreciably by this time next year.

By winning this category, Nasdaq joins an elite group of past recipients, including Advise Technologies (2012); LCH.Clearnet (2013); Vermilion Software (2014); Algomi (2015); Commcise (2016); and last year's winner, Thasos Group.

—VBA

Mark Salter, John Hunt, Martin Bayfield, and Taras Chaban

> Nasdaq Buy-side Compliance provides traditional asset managers and hedge funds with behavioral profiling algorithms to address the Market Abuse Regulation, which came into effect in July 2016, and Mifid II regulatory requirements.

Nasdaq

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Buy-Side Technology Awards 2018 waterstechnology — Best overall buy-side product, 2018 Nasdaq

Buy-Side Technology Awards 2018 waterstechnology — Best buy-side market surveillance tool/platform Nasdaq

Buy-Side Technology Awards 2018 waterstechnology — Best buy-side AI platform or tool Nasdaq

Best Use of the Agile Methodology

OpenFin

There will come a time when all software development work will be along Agile lines, not only for this industry, but for all industries. As to when we might reach that point is anyone's guess, but it is the future—of that there is little doubt. Gone are the days when the Waterfall methodology sufficed, which, when it came to large numbers of projects, tended to be too long-winded and suffered unnecessarily from scope-creep, missed deadlines and inflated budgets. Now, Agile is the only feasible model for developing and deploying software quickly, efficiently and iteratively for pretty much all capital markets firms and the community of third-party technology vendors serving them.

This is the third year this category has been on offer in the Buy-Side Technology Awards. The first recipient was Pittsburgh-based Confluence in 2016, while last year it was Eze Software, now part of SS&C Technologies, in the winners' circle. This year OpenFin takes home the award, thanks largely to its OpenFin OS, designed to enable Agile development and deployment for capital markets firms and third-party technology vendors who up to now have mostly focused on deploying apps onto end-users' desktops.

The challenge facing large numbers of buy-side firms is that traditionally the bulk of the tools they have developed and deployed for their end-users are either installed directly onto desktops or are run on servers in datacenters, which makes maintenance and upgrades/updates cumbersome, time-consuming and costly. OpenFin OS addresses the problem by allowing developers to build their apps with any HTML5 framework and run them on OpenFin OS as opposed to a web browser. The app looks and feels like a native, installed app, even though it is web-deployed like any other web-based app. This allows buy-side firms and their vendors to instantly deploy and update desktop apps if and when they need to, while bugs found in live apps can be immediately fixed and deployed to end-users. OpenFin OS also enables Agile development when it comes to app interoperability by way of simple APIs, allowing developers to integrate desktop apps with one another, streamlining workflows and unifying the end-user experience.

OpenFin currently uses OpenFin OS to deploy thousands of apps to in excess of 1,500 buy-side and sell-side firms, in addition to a range of capital markets technology firms, a number of whom have won categories in this year's and last year's BST Awards. Clearly, OpenFin is onto something, as evidenced by it phenomenal growth and broad industry adoption since it opened its doors for business in 2010.

—VBA

OpenFin OS also enables Agile development when it comes to app interoperability by way of simple APIs, allowing developers to integrate desktop apps with one another, streamlining workflows and unifying the end-user experience.

Best Overall Buy-Side Technology Provider, 2018

TriOptima

As an organization, TriOptima must be pinching itself. Not only did it win the best buy-side pricing/valuation and collateral management categories, but it also walked away from this year's Buy-Side Technology Awards with the gong for the best overall buy-side technology provider for 2018. Stockholm-based TriOptima, acquired by Icap in 2010 before becoming part of the NEX Group when Tullett Prebon acquired Icap in December 2016, is clearly doing something right.

As has become a tradition at these awards, the final category of the 37 on offer and the second of only two announced on the afternoon of the November 2 awards lunch in London—the other being the product of the year category (*see page 76*)—was that of the technology provider of the year. Last year it was FactSet in the winners' circle, adding its name to the list of past winners that is a veritable who's who of buy-side technology vendors: UBS Delta, Advent Software, Charles River Development, Eze Software, Fidessa, Algorithmics and RIMES Technologies. A quick glance through that list will lay to rest any debate surrounding the ongoing spate of tech firm mergers and acquisitions that shows no sign of running out of steam: UBS Delta is now part of StatPro; Advent was acquired by SS&C Technologies in July 2015, as was Eze Software in October 2018; Charles River became part of State Street (also in October 2018); Fidessa joined the Ion stable in 2018; and IBM snapped up Algorithmics at the back end of 2011. In fact, the only recipient of this award over the past seven years that has not acquired another provider or has not itself been acquired is RIMES Technologies.

Speaking to *Waters* at this year's function, Thomas Griffiths, co-CEO of TriOptima's triCalculate business, explained that one of the most significant industry issues driving buy-side firms to partner with TriOptima are current and future uncleared margin rules for over-the-counter (OTC) derivatives contracts not cleared through central counterparties. "The first buy-side firms came into play for uncleared margin rules in September this year and the next two phases of uncleared margin rules will be in 2019 and 2020," he says.

According to Griffiths, up to 1,000 firms will fall under the regulation's purview, illustrating the scale of the challenge facing the global asset management industry. "We can offer valuations and SIMM sensitivities through triCalculate, we can automate buy-side firms' margin calls through triResolve, and we can provide them with dispute-resolution processes. This whole package and holistic TriOptima solution is something that really resonates with the buy side," he says.

—VBA

Martin Bayfield, Neil Murphy, Catherine Taylor, Thomas Griffiths, Jana Uehlecke, Kofi Karikari, Rajani Sivanesan, and Gemma Bailey

> One of the most significant industry issues driving buy-side firms to partner with TriOptima are current and future uncleared margin rules for OTC derivatives contracts not cleared through central counterparties.

Deep Learning: The Evolution Is Here

Advancements in AI have led to new ways to generate alpha and better serve clients. The next great evolution in the space could come in the form of deep learning. Anthony Malakian speaks with data scientists at banks, asset managers and vendors to see how firms are experimenting with this form of machine learning, and where challenges still exist.

While not quite ubiquitous, examples of deep learning's evolution exist in parts of technologies we now use every day. From Facebook's facial recognition software, to Tesla cars that assist with parallel parking, to Google Translate making Mandarin easy to understand for the unacquainted, to Amazon's Alexa giving advice on the best way to fry a turkey, deep learning—in combination with other forms of artificial intelligence (AI) and mathematics—is seeping into everyday life.

Like a matryoshka doll, deep learning is a subset of machine learning (ML), which itself is a subset of AI, although the terminology for the discipline has been bastardized in recent years. Much like how the word "blockchain" gets used to describe all forms of distributed-ledger technologies even though it is a specific kind of distributed ledger, deep learning and ML are increasingly being used interchangeably. Despite this, an important distinction exists—although all forms of deep learning are essentially ML, not all ML techniques can be classified as deep learning.

Deep learning—which, at its core, is a form of math—uses a computer system that mimics the workings of the human brain, called a neural network. Deep neural networks are

> "In some ways it's truly like magic. We've learned—we've trained an IT system—to learn in much the same way that you and I learn; we learn based on experiences and examples, and that is what we're using to train a system to be able to then make decisions and drive outputs."
> **Kathryn Guarini, IBM Industry Research**

opaque, but they can process massive amounts of data and can essentially learn on their own. Each layer of nodes in a neural network builds on the previous layer. They require massive volumes of data and, when at their best, they can find non-linear correlations and can produce outputs that would take a team of humans months, weeks, or even years to figure out. At their worst, they're subject to bias—even outward, unintentional racism—and are often not worth the trouble and expense when compared with using other forms of ML, such as decision trees, Bayesian networks or support vector machines. There's a lot of experimentation and failure involved in using this still-growing technique.

But improvements are being made, and past what was once purely theoretical in the capital markets, deep learning is starting to find a home in finance—though it's still very early days. Examples exist, though: deep neural networks are being experimented with in areas including risk modeling, market forecasting, customer relationship management, stress testing, surveillance and to tame the wild forest that is the alternative data space.

"In some ways it's truly like magic," says Kathryn Guarini, vice president of IBM Industry Research. "We've learned—we've trained an IT system—to learn in much the same way that you and I learn; we learn based on experiences and examples, and that is what we're using to train a system to be able to then make decisions and drive outputs based on that training information."

Waters spoke with AI experts from banks, asset managers, vendors and academia to find real-world use-cases for deep learning, where there are still roadblocks and to better understand what the field's future evolution might yield. While explainability issues, bias and dataset size will continue to slow the pace of development, it would appear that the dawn of deep learning has arrived in the capital markets—but there are others who believe current approaches are still a bit hit-and-miss.

A Deeper Understanding

Deep neural networks require reams of data in order to produce actionable outputs. One place where it's relatively easy to find a treasure trove of data is in communications.

Credit Suisse, through its global markets equities research team, decided to drill into its communications data—which, for this proof of concept, included over 3 million emails and 500,000 meeting notes, as well as Bloomberg Chat texts and service tickets—to better understand its clients and their desires, says Paras Parekh, head of the predictive analytics team within the global markets technology group at Credit Suisse.

"Usually banks have a voting process where they proactively reach out to the clients and solicit feedback on how they are doing," says Parekh, who also oversees the bank's AI/ML platform. "Based on that, we know how we rank among our peers, but those awards either happen once or maximum twice a year. By mining all the email and communication data, this allows us to, on a near real-time basis, get a sense of what our clients want and desire. This will allow us to serve them better, in terms of better ideas and services."

The bank is developing a platform that accepts email data in its original form as a text input and the backend algorithms generate the mentioned entities, stock and bond tickers, and Credit Suisse products as an output from the larger text. The deep neural networks then generate a summary of the text and provide a sentiment rating.

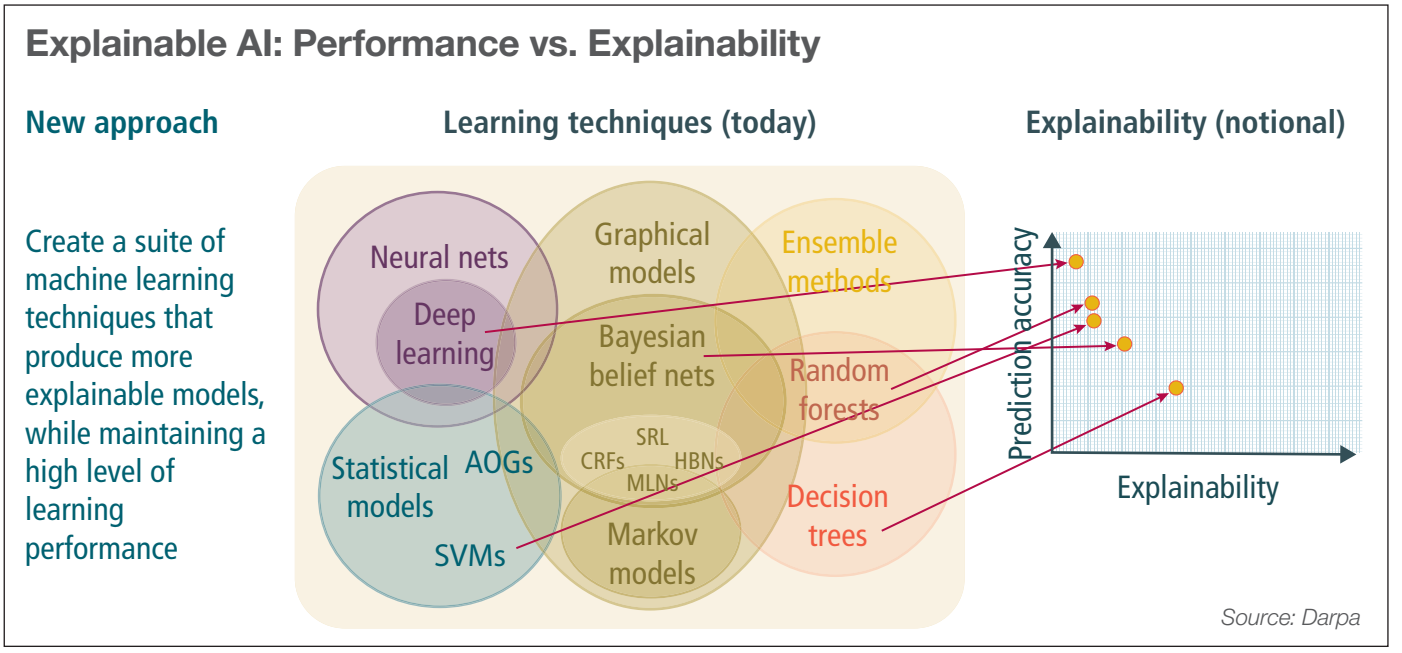
"We tried various models, such as random forest and a few other ones, and we obviously wanted to give deep learning a shot because we had enough data to try it out," he says. "It happens that the deep learning model works fairly well compared to random forest."

Parekh says the end goal is to have a platform—which, like most platforms that use neural nets, relies heavily on natural-language processing (NLP)—that can do four things: provide entity recognition, sentiment analysis, generate cross-sell opportunities, and provide investment ideas.

The project is still in pilot with "a few analysts," says Parekh, with the aim of a wider release for the first quarter of 2019.

"We're still fine-tuning the model. It's giving us enough insight, but there's still some work needed, especially when we're looking to find cross-selling opportunities," he says. "But if

Explainable AI: Performance vs. Explainability



we had to look for investment ideas for stocks that the client may be interested in, that's working quite well. We're also able to do a fair bit of entity recognition and trying to understand all the various entities involved for an individual or within a group at a client level or a macro level."

There's been a fair amount of trial and error as his team has gone down this path. Parekh says that when it comes to sentiment analysis, deep learning works relatively well. He says the sentiment analyzer they developed was trained on financial data, so the accuracy seems to be better than some of the other third-party options available in the market, which are not usually trained specifically on financial data.

The bank also tried to use neural nets to develop an auto-summarization tool for emails and research notes. The idea behind this was that it would take in a large piece of text that contains multiple paragraphs, and it would try and summarize that document into five lines. They used two different models for the experiment. The first was extractive, which would look for the top five, most important sentences from an article. This worked well and the bank is moving forward with the tool, Parekh says.

The second component would try to automatically generate those five sentences—which is not possible with traditional random forests or Bayesian models—but after trying to leverage deep learning for five months, the project stalled.

"Identifying the right use-case is important," he says. "I think we were looking to stretch ourselves farther given that we had some good success on a couple of models before. And it's still effort well spent—we learned quite a bit."

All the Pieces Matter

For most anyone who loves puzzles, Tetris is in the pantheon of greatest video games. And experienced data scientists have the opportunity to apply new technologies to old games.

Norman Niemer, chief data scientist for UBS Asset Management's quantitative evidence and data science team, decided it would be fun to build a deep learning-based robotic agent that could learn how to play Tetris just by "watching" the game being played on a computer screen.

So, for the experiment, there was no human actively teaching the bot how to play; rather, the deep-learning model would learn to play the game just by seeing the pixels on the screen and then it would teach itself the best movements for the Tetris pieces to achieve the best score.

Over the course of a weekend, Niemer combined a mix of Python with Google's open-source library TensorFlow and coded it with deep reinforcement learning formulae.

"In Tetris, normally the blocks just move down in a straight line," he says. "I introduced some randomness in the way the block moves to see how the agent reacts to changes. I also introduced other ways of scoring points, such as by collecting bonus points by moving along the bottom while waiting for the block to fall."

The project was a success, so he decided to try out the bot on trading. Over the course of a weekend, he built another experiment. Unfortunately, for trading, the bot was not effective.

"Even if you introduce some randomness in the game to have the blocks move around randomly—

which is a little bit closer to what a trading environment would be like—it very quickly learned what to do. I was like, 'Wow, this is great! Let me try and use this for trading stocks.' I specifically used it for pairs trading and the machine, basically, wasn't able to learn anything because the data is way too noisy and the so-called rules of the game change all the time," he recalls. "So, after including transaction cost, the agent basically said that the best thing to do was to not do anything."

Niemer's team is encouraged to attend conferences and hackathons to learn about new technologies and experiment with what they learned to help improve the bank's ability to leverage new datasets and data science techniques, so as to improve the investment decision-making process. He says deep learning is probably more useful for systematic investing to help a fundamental analyst understand what the sales of a company will be for the coming quarter or year-end. For discretionary investing, it's still hit and miss.

"For us, it's a matter of what are we trying to do—what does the data look like, and what's the best tool for the job?" he says. "Typically, what the data looks like heavily informs what the best tool for the job is. Deep learning is really good for very large datasets that have stable relationships, which is actually a lot of the time not the case for us. Even for stock prices with longer histories where, in theory, deep learning might be useful, because the relationships change all the time and neural nets aren't always the best at picking that up—especially in a robust way—that is sort of the downside."

The size of the dataset is key in deciding the best tool to use, at least at the start. Then it's a question of how best to visualize the data. So, Niemer says, if it's something like a linear relationship, it's probably best to stick with a linear model.

Norman Niemer
UBS Asset Management

But for something that looks at the behaviors of different investment professionals, a linear model clearly won't work, as the data points are extremely clustered because the human decision-making process functions much more like a decision tree type of model. So, just by looking at the dataset, it can be fairly obvious that deep learning isn't the best choice. It's an iterative process of trial and error, however.

"The jury is still out," Niemer says. "Sometimes it's not even clear if it outperforms a simple linear model, or a tree model. Sometimes it's a little bit better; sometimes it's a little bit worse. I think where a lot of people are right now is that a tool that is a little more complex than a simple linear regression, but not as complex as a deep learning net, is probably good enough for now."

But advancements are being made to improve the viability of deep learning models in finance.

The Great Race

The race for deep learning supremacy has been heating up, with the largest tech companies in the world all looking to carve out their claims. Take IBM for example, which has been aggressively seeking breakthroughs in the time it takes to digest and analyze massive datasets and improve the explainability of deep neural nets.

"If you think about all the ways that you interact with systems today that deal with speech, language and vision, most likely deep learning is the technique—and neural networks—behind them that is powering those kinds of capabilities," says John Smith, manager of AI tech for IBM Research AI at the IBM TJ Watson Research Center. "Where deep learning has really excelled is on understanding of unstructured data, such as text, speech and vision."

It's been a cocktail of advancements that has made deep learning more viable over the last three to five years. The ability to process huge datasets has improved, while the cost of doing so has gone down significantly. Thanks to public cloud providers like IBM, the ability to store huge datasets has also dramatically improved. Furthermore, the amount of data available—often called alternative data in the capital markets to distinguish it from market and reference data—has exploded. And on the academic side, the design of neural nets has become more sophisticated and, as a result, they are becoming more powerful, which makes them more enticing for investment firms to experiment with.

But for all the advancements, if it's not possible to explain how a neural network arrived at its result, it limits what deep learning can be used for.

"This isn't something that's unbridgeable," Smith says. "They are making deep learning models and neural networks more interpretable and more explainable. It's a requirement that we're all aware of, but one in which there's still a lot of progress happening."

His colleague, Guarini, adds that beyond explainability—which she calls "paramount"—there are two other key areas of development that must be improved for wider adoption in finance. She says it's also critical to embed all AI solutions with appropriate ethics and security, and there is still a challenge in training models with an appropriate amount of data.

As noted by Niemer, in order for deep neural networks to work, they need massive datasets. That is another prime area of focus for IBM and others in the space—making deep neural nets effective even in spaces that don't have huge amounts of data.

"The best thing about deep learning is that it's data-driven, especially given the fact that the amount of data is growing," Smith says. "The worst thing about deep learning is that it's data-driven—which means that in the problem spaces where you don't have a lot of data, it could be slower for deep learning to bring value." W

To read the full version of this article—which includes more industry-specific examples of deep learning—visit waterstechnology.com.

Mifid II: Winners and Losers

Nearly one year on from the fundamental changes to Europe's trading rulebook brought about by Mifid II, its overall impact is still unclear. Although experts talk of greater transparency in the markets, it's had its share of issues, some of which are still unresolved. By Hamad Ali

Like the sequel to a blockbuster film, there was a lot of hype before the launch of the revised Markets in Financial Instruments Directive (Mifid II) on January 3. The European regulation had been many years in the making. Its origins stemmed from the 2008 financial crisis to meet the demand for greater transparency and accountability in the markets.

But while the dust has still not settled in respect to the changes brought about by Mifid II, there is already talk about further changes to the regulation through a so-called Mifid 2.2, or, whisper it quietly, even Mifid III.

"I think it is not too outrageous to state that obviously the next revised version of Mifid will probably not be as big as Mifid II," says Christian Voigt, senior regulatory advisor at Fidessa. "Because the number of changes that were in Mifid II was unusually high. There will be fewer, but there will be some changes coming."

This feature will examine some key regulations introduced with Mifid II, and review their performance with the help of market experts.

The Double-Volume Cap

The double-volume cap (DVC) was one of the more controversial measures introduced in Mifid II. Its purpose was to increase trading in the lit markets by placing caps of four and eight percent for individual stocks on trading in dark pools enforced with the help of six-month trading bans on dark venues.

"Unfortunately there is a misconception around trading in the dark that all dark trading is bad by certain individuals, mainly exchanges, and they would like to see liquidity to get back into primary lit markets."

Rebecca Healey, Liquidnet

It was in the middle of March when the first batch of stocks were suspended under the double-volume cap regime. After they were re-introduced in September, dark trading in small trade sizes increased significantly.

According to Fidessa's Voigt, the DVC is a "failure" because it hasn't really changed behavior. He says that due to the way the patterns are right now, all of those stocks that have seen increased trading in the dark are likely to be banned again. "Therefore, we will end up having a see-saw pattern, if you will, where stocks tend to go in and out of the double volume cap. In the end it doesn't really achieve anything other than you are restricted sometimes, and sometimes you are not," he says.

Voigt doesn't mince any words in his critique of the caps. "Living under them for nearly a year, for at least 11 months, I would definitely say that all the concerns about the DVC that were raised before are largely true. It is very cumbersome, it achieves very little, and just makes it very hard to explain to outsiders what is going on," he says.

The DVC was largely seen as a last-minute compromise to ease the passage of Mifid II, but certain questions still remain about its construction. Even regulators cannot answer questions around how, for instance, the thresholds for individual and overall dark trading in a particular name were formulated. Likewise, as Voigt says, there are still extant concerns about the objectives of the DVC, which many argue restrict choice at the expense of little transparency benefits.

"What I mean by that is, it is like the rule has this outset assumption that trading in the dark using small sizes is a bad thing. And that is why it says we are going to ban it if it takes too much. But in reality, it is not necessarily a bad thing because there are apparently a lot of investors who voluntarily choose to trade there. And why do they voluntarily choose to trade there? Because in their view it is the most cost-effective way," he says.

Systematic Internalizers

Systematic internalizers (SIs) first emerged with the original Mifid in 2007. However, they never really took off because of the option of being able to trade in the dark or via broker crossing networks (BCNs). That all changed with the advent of Mifid II, which banned BCNs and energized support for SIs. In the build-up to Mifid II's go-live, dozens of new SIs were being registered every month.

"Unfortunately, there is a misconception around trading in the dark that all dark trading is bad by certain individuals, mainly exchanges, and they would like to see liquidity to get back into primary lit markets," says Rebecca Healey, head of EMEA market structure at Liquidnet. "But the reality is that it really depends on the type of order you are trading, and what your trading objective is, as to whether you should trade on the lit, or it is more advantageous for the end investor to trade in the dark. So what I mean by that is if you are trading on the lit market, and you are looking to trade three weeks' worth of volumes, as soon as you give an indication you may move the price. And that can be quite significant, particularly when you are looking at small- or mid-cap names."

One of the problems has been confusion in the market as to what should be reported as SI activity. Healey says there is a wide disparity across the industry about what should be included in SI liquidity, and what should not. "[There is a] FIX working group that [deals with] the Market Model Typology (MMT), which essentially is the different tags that you can add to individual trades to explain what that trade is," she says. "That has been put together by the industry and we have actually passed it back to the European Securities and Markets Authority (Esma), so they can give us some guidance about what they would like included within the SI calculations, and then we as an industry can implement that across the board to give them the visibility they are looking for."

Christian Voigt
Fidessa

Georg Gross, head of regulatory services at Deutsche Börse, says there is still a way to go until the introduction of the full SI regime. "In effect, Esma has postponed the implementation of the SI regime for over-the-counter derivatives, which will follow in March next year. Although the European Economic Area trade volume data, which allows us to determine whether one of our clients is a systematic internalizer in an instrument or in an

instrument class, will be published by then, the data quality still needs to be improved."

Reporting

With transaction and trade reporting requirements, an important concern has been the quality of the reporting in the data. "This has been one of the Financial Conduct Authority's (FCA's) expressed concerns," says Bobby Johal, director at ACA Compliance. "They highlighted it most recently in their asset management conference in June or July of this year. Transaction reporting is certainly the key area of focus for them. This is a shiny new toy for the regulator as well. For the six months to July, their systems ingested 3.5 billion transaction reports for the market, which is a significant uptick from the year before, for example. They are very keen to use all this data. So that was a degree of a forewarning to the market."

He says it is important that the firms report the data properly, as well as ensure the reporting of the right transactions. However, new platforms put into place, such as Approved Publication Arrangements and Approved Reporting Mechanisms (ARMs) ran into problems from the very first day. *Waters* reported in January that these entities were either malfunctioning and not accepting reports—a problem that went on, in some instances, for months—or had to be shut down entirely, as happened with ARMs in Greece and the UK.

Part of the problem with reporting has also been due to the interpretation of the rules, which can differ significantly from regulator to regulator, depending on which of the EU's 28 member states a market participant is reporting to. Even for established, sophisticated firms, like Deutsche Börse, this can prove challenging.

"We are not only reporting to [German regulator] BaFin, but also to the FCA, and the French regulator," says Deutsche Börse's Gross. "We have 26 different regulators we are reporting into. So I think here the challenge is that although they are all applying the same Esma-defined rules, what we have seen over the last nine or 10 months is that implementing all these rules the same way is sometimes a challenge. All the participants in the market have to recalibrate a bit because of different interpretations of the rules, and therefore we had to align with many regulators and Esma to get a common understanding of what the correct interpretation is. That is a challenge on the transaction reporting side."

It's not all bad news, however. Tom Wieczorek, managing director for product management at UnaVista, the London Stock Exchange's regulatory reporting platform, says that despite issues, Mifid II's reporting requirements have had an effect on market transparency. "We have seen an impact [from Mifid II]," he says. "The biggest is that more and more firms are trading on exchanges or on trading venues because the regulatory burden of doing things over the counter is increasing. We have also seen more firms electing to be SIs, so operating multilateral trading facilities. In this regard, everything has definitely become more transparent under Mifid, because capital markets are moving onto regulated venues."

Because most of their clients are international, Wieczorek says that even though the standards for sending transactions to the individual regulators were all fine, the connectivity, IT infrastructure, and workflow of each varied a lot. "We are connected to around 20 at this point but it did take some time. Each one of these connections requires us to work closely with the regulator to understand how they get the data, how we connect to them, how they acknowledge receipt of that data and so on," he says.

Georg Gross
Deutsche Börse

Tom Wieczorek
UnaVista

Duncan Higgins
ITG

Research Unbundling

One of the cornerstones of controversy under Mifid II was the unbundling of research costs from execution commissions, a transformational shift in how the two have traditionally operated. According to ACA Compliance's Johal, one of the things that drove the change in the research rules was a desire to break up the oligopoly of a small number of very powerful research providers. The goal was to try and diversify the market and get smaller players out there to provide more choice and promote competition. Yet that may not have been achieved.

"That is not necessarily how I understand firms are seeing it," he says. "If anything, they are actually using fewer research providers, not more. There is not a great diversity of research providers. But, then again, we are only 11 months into it. There is still time for more players to emerge. It is still very early. But as far as I understand, that objective definitely hasn't been achieved, and we are not seeing more providers. We are seeing, if anything, a flight to safety," says Johal.

The unbundling rules also raise questions with international implications. "The research point is an obvious example where clients in the US are having to pay for things their clients in the UK may not necessarily have to. There is a question more broadly for you as global firm to consider: Is this fair? Is this fair to all your clients? We are hearing anecdotally that there is a commercial investor-driven desire for some of these initiatives that Mifid II has brought into play, research being the obvious one that we keep coming back to," he says.

Duncan Higgins, head of electronic sales at agency broker ITG, has noticed a change. "We look at trading from our analytics clients in Europe, and the average commission rate that they pay on their trades has

gone down 30 percent," he says. "That was the first quarter of 2017 to the first quarter of 2018. We see a reduction of 30 percent on the average commission rate on a trade. There is evidence right there of the implementation of the requirements of Mifid from an unbundling perspective."

Best Execution

Recently, regulatory technology provider Cappitech conducted a survey of over a 100 European buy- and sell-side compliance decision-makers. The survey looked at the impact of Mifid II on the financial services sector, including plans to tackle regulations like regulatory technical standards (RTS) 27 and RTS 28, which cover best-execution requirements.

The survey found 65 percent of respondents were not monitoring trades systematically according to best-execution criteria, while 60 percent had no plans to use their best-execution reports internally. "Some of the firms did say they perform best-execution analysis, but they do not do it in a systematic fashion," says Ronen Kertis, CEO at Cappitech. "So they would, for instance, take a few trades anecdotally, check those trades and compare them to the market price at the time using Bloomberg or Reuters terminals, but they don't have a systematic system in place to check for best execution."

The industry spent years preparing for Mifid II, but clearly some are still not quite there. There are a number of reasons for this when it comes to best execution. According to Kertis, the requirements are not a simple undertaking if someone wants to build the technology themselves. "The other option is to go and buy a solution from a provider," he says. "Then it is cost, it is integration, it is finding the right provider. These are the things firms are facing."

Bobby Johal
ACA Compliance

Ronen Kertis
Cappitech

While significant efforts are under way at most major firms, and regulators are watching closely, there are rumblings that these rules could change. Speaking at the Fixed-Income Leaders Summit in Amsterdam during October, Kay Swinburne, a UK Member of the European Parliament, lamented the final state of such rules, and suggested they may come in for scrutiny during the Mifid II review.

Brexit

One of the big unknowns in 2019 will be Brexit and how it will impact Mifid II. "We are now looking at Mifid III. I think there is fine-tuning on both sides that will obviously come into play as part of the Brexit negotiations," says Liquidnet's Healey.

She says that ultimately, it is going to depend on how it plays out in terms of whether the UK gets an equivalence agreement, which would allow firms operating under UK law—while distinct from EU law, albeit almost identical—from the point of departure to interact under their home regime with EU entities. As an example, she points out that 40 percent of the SI market is based in the UK.

"There are elements of Mifid that will be impacted. The extent to which they will be impacted will ultimately depend on the final deal that we get. It is just important that firms actually look at making sure that they have contingency plans in place, under which they can continue to trade regardless of the outcome," says Healey. Indeed, regulators are currently undertaking extensive efforts to sign memoranda of understanding to facilitate data sharing in the event of a no-deal Brexit (*see page 10*).

Looking ahead, however, it is unlikely that anything will change in the short term. While Mifid II, like any European regulation, has a built-in review clause that kicks in three to five years down the line, the fact that the UK regulatory authorities were principal authors of much of its content—and, indeed, have gone further than the text in many instances of domestic implementation—means those hoping for a swift dismissal of Mifid II may be living in a fantasy world.

"I don't think we are going to see a regulatory big bang, if that is what some may have thought would happen," says ACA Compliance's Johal. "The UK was a very powerful player in devising and pushing forward many of the changes in Mifid II. In fact, many of the changes across many of the European directives have been in operation in principle in the UK for many years before they became European directives. So the UK is a very well-developed, very well-established landscape for financial services."

As this issue went to press, the UK and EU had agreed a draft deal in principle, but no certainty of its ratification was evident, which included equivalence determinations for the UK during a transition period while it leaves the EU. W

SALIENT POINTS

- There is a worry with the introduction of the double-volume cap (DVC) that stocks are shifting in and out of bans, without real change in trading behavior. The DVC has been one of the most controversial elements of Mifid II.
- While different regulators are applying the same Esma rules for transactional reporting, uniformly implementing them can be a challenge.
- There is wide disagreement in the industry about what constitutes systematic internalizer (SI) liquidity. There is a need for Esma to provide clear guidance on what would be included within SI calculations.
- The UK was an instrumental force in devising and pushing forward many of the changes in Mifid II. Its departure from the European Union next year could have wide-ranging implications, including potentially a Mifid III.

Tokenization:

The Flip Side of the Coin

With the Royal Mint project officially being placed into cold storage, arguably one of the most high-profile examples of tokenization, the questions on everyone's minds point to the value of digitizing traditional assets and whether the market is ready to embrace this technology. If tokenization is the future of trading, why are these projects taking so long to take flight?
By Josephine Gallagher

When news broke in late October that the Royal Mint would be shelving its digital gold project, blaming "market conditions" in a statement for the decision, it was treated as a major blow to the digital space and showcased the reluctance of EU governments to engage with this largely unregulated territory. Until now, the adoption of tokenized assets has largely been driven by the fintech community, with Wall Street keeping a watchful eye on its activity from a distance, and some showing more reluctance than others.

"It is was designed to remove central control and apply to an industry that is obsessed with central control, for a good reason," says a managing director at a global investment bank, who asked not to be named.

Distributed-ledger technology (DLT) in itself has seen significant institutional interest with multiple consortia of heavyweight investment firms developing private networks for sharing transactional data. In some cases, other digital instruments, such as cryptocurrencies and derivatives, have spurred more interest on a wider scale across the industry, one recent example being the launch of Fidelity Digital Assets services for bitcoin and ethereum.

> "The question becomes what actually is the benefit of tokenization or issuing the share of a security of a decentralized network because you can argue that there isn't going to be more liquidity available."
> **Ville Sointu, Nordea**

But now as major firms are directing their attention to crypto as an asset class in itself, some are questioning the value proposition of tokenizing traditional assets in a world where digital representations already exist.

"I think it is interesting to see that there has been a lot of research and techniques and from a mathematical point of view it is very elegant but ultimately the applications seem to be quite elusive yet," adds a second executive from the same investment bank. "I think it might be interesting to ask why that is, beyond cryptocurrencies, which have their own reason for being [in existence]."

The Value of a Token

Tokens are used to create a digital copy of traditional assets that are traded and settled on a blockchain, an immutable, transparent database. The ownership of each asset is built into the technology and is represented as a digital key. Many questions have emerged pertaining to the actual value of tokenization, as some view it as an unnecessary alternative to a system and processes that already exist. A counter argument to this is that the process today isn't fully digitized and is largely inefficient.

"Today we see a digital representation of the securities but the real documents are actually held at a central securities depository, or a custodian, so it is not truly digital yet and there are some inefficiencies in the system due to that," says Anja Bedford, head of blockchain for global transaction banking at Deutsche Bank. (*For more on custody in the digital-asset market, see page 14*).

Whether distributed-ledger technology is designed as open architecture or a private network, tokenization promises a higher level of transparency for all participants. One of the key challenges it claims to tackle is post-trade inefficiencies, through automating the settlement and reconciliations process, and removing intermediaries. Another core selling point marketed by fintech firms is that it will generate liquidity through its decentralized structure and by tokenizing less liquid assets such as art, precious metals or real estate—but this remains to be tested, and some are deeply skeptical of this claim.

"The question becomes what actually is the benefit of tokenization or issuing the share of a security of a decentralized network because you can argue that there isn't going to be more liquidity available," says Ville Sointu, head of emerging technologies at Nordea. "Because it is fully regulated on a local jurisdiction there is very little extra liquidity that you would gain by decentralization."

Tom Jessop
Fidelity Digital Assets

Less-liquid assets have been a major driver in this space, with tokenization projects making headlines this year including the Royal Mint Gold project, the Global Markets Exchange Group's partnership with USAVE in July to create a digital gold exchange, and Muirfield Investment Partners' announcement in May that it will offer real estate tokens using AlphaPoint's asset-backed token framework and blockchain technology. Thomas Zaccagnino, founder of Muirfield Investment Partners, explains that the firm is developing what he calls a new private equity structure where investors can have full or fractional ownership of real estate or a real estate investment funds. The tokens will also be accessible to global investors, as permitted by Regulation D and Regulation S from the US Securities and Exchange Commission.

"Value is achieved by investors having to access unique products that they otherwise wouldn't have had and to also have access in a liquid way," says Zaccagnino. "So it's taking these illiquid assets such as real estate or real estate investment funds and making them more liquid through a global secondary market. And the fraction ownership helps to democratize some of these products that are more geared towards the uber-wealthy."

Beyond the hype, there have been some recognizable steps taken by fintech providers and global exchanges to shift the mood in favor of tokenized products. Japan has demonstrated a progressive approach to the technology in recent months by being one of the first to put a loose regulatory framework in place, and on November 11, the Singapore Exchange and the Monetary Authority of Singapore stated that

they had developed two prototypes for delivery-versus-payment settlement of tokenized assets across various blockchain platforms.

This announcement demonstrates a significant gesture of support from the Japanese government for tokenization, with other jurisdictions such as Gibraltar taking a similar approach to the underlying technology by implementing the Distributed Ledger Technology Regulatory Framework authorized by the local regulator.

Now although some movement has been made to announce these projects and kick-start the production process, it seems that firms are still faced with multiple challenges before they can attempt to test the value of this technology.

"If the promises are fulfilled the upside is huge," says the managing director at the global investment bank. "But the promises have been outstanding for quite a while now."

The Roadblocks

"There are two primary pieces that give large institutions pause, and a lot of our team comes from that background and know the inner workings," says Igor Telyatnikov, co-founder and chief revenue officer at AlphaPoint. "Number one, business and financial institutions are fine taking business risks but they are not fine taking regulatory risks"

The Crypto Asset Task Force, put together by members from the UK's Treasury, the Financial Conduct Authority and the Bank of England, issued a final report in October on its stance on crypto assets. It stated that although crypto assets play a small role in the overall share of the UK market, they have the potential to impact market stability through risks such as financial crime and market manipulation. The taskforce outlined that following its consultation in early 2019, it will provide "guidance clarifying how certain crypto assets already fall within existing regulatory perimeters." Additionally, the report concluded that "exchange tokens present new challenges to traditional forms of financial regulation" and the taskforce would "consider carefully how regulation could meaningfully and effectively address the risks posed by exchange tokens."

Nordea's Sointu explains that, given the rise in activity in this space so far, EU and Nordic regulators are already beginning to understand some of the risks involved. Security token offerings (STOs), a mechanism for raising money for blockchain projects using stricter rules and requirements than an initial coin offering, have also caused regulators to sit up and take notice. Official regulation for STOs is on the horizon and may come out in 2019.

"If you look at the STO setup, the regulators are starting to understand a couple of things, in that they need to regulate the application and the users rather than the technology," explains Sointu. "So the token offerings, if they were regulated, there is exactly the same requirement as for any security offerings that apply for the token offering, so each and every stakeholder in the value chain needs to be identified. So there have to be full know-you-customer (KYC) and anti-money laundering (AML) sanction screenings in place."

Additionally, he adds that regulation would also mean that both exchanges and token offerings would need to be licensed by the local regulator, and each firm issuing

these products would be required to execute a high level of due diligence to comply. For some, regulation may be too slow to catch up with the pace of the technology and waiting would do little to inform regulators of future risks.

"We are seeing a lot of different activities and I do think it would be wrong to say let's wait for the regulation," says Deutsche Bank's Bedford. "Because regulators only regulate activities, but not the technology itself, and the regulations itself are based on the existing availability of technologies. We are not there yet to say this is how the future looks, this is how the risk of the future looks."

Tokenization projects are faced with multiple other technical and practical roadblocks to overcome. As the concept of trading or settling tokens is embedded in an open architecture, it can only work by adding multiple ledgers to the network. This can be a difficult sell when trying to convince highly regulated institutions to sign up to a system that is based on trust and uses majority voting to settle transactions.

"The problem is if I own a house or a bond or anything and I am going to agree to tokenize it, I am de-facto agreeing to have an open architecture where potentially a majority could vote against me owning it," says the executive at the global investment bank.

To tackle these risks, many firms are implementing higher security measures and carrying out screening procedures, such as KYC and AML at entry points for each participant given access to the blockchain network. AlphaPoint's Telyatnikov explains that the biggest concern surrounding security pertains to the custody and ownership of the token. The risk of cyberattacks and lost keys has become one of the leading causes of hesitation among heavyweight buy-side and sell-side firms.

Valerio Roncone
SIX

"The risk of having the private keys of a wallet hacked and stolen, or having those funds stolen and unrecoverable, is not a situation that financial institutions will really accept—that custody risk, that security breach," says Telyatnikov. "And rather than just losing end-user data, which also has serious consequences, but actually losing financial assets and instruments, is a huge roadblock."

This year, a number of global institutions have announced their bid to provide custody services and offerings for cryptocurrencies and assets, to help mitigate some of the risks involved. Among those included are Japanese investment bank Nomura, SIX and Fidelity Digital Assets. The Swiss Stock Exchange, a subsidiary of SIX, is set to launch a trading, settlement and custody infrastructure based on DLT for digital assets and tokens, with the first set of services set to be rolled out in mid-2019.

"We decided to actively go into the market—what we believe is a very unregulated Wild West setup—and bring some order into that space because we believe that this is an additional segment that is important for financial institutions," says Valerio Roncone, head of product management and development, securities and exchanges, at SIX.

SALIENT POINTS

- The uptake of digital tokens has spurred interest across the industry but some are left questioning the value of tokenization as alternative to today's digital technology.
- Less-liquid assets such as art, precious metals and real estate have shown to be key drivers in issuing tokenized products.
- The increasing appetite for digital products and the uptake of STOs have made regulators sit up and take notice, with regulatory clarity expected in 2019.
- Key players have announced the launch of custodial services in recent months, with 2019 set to look like an interesting year for the digital space.

Hold Tight

According to most of the sources contacted for this article, 2019 is expected to bring a new set of changes to the digital space and see the entrance of many more heavyweight firms. A number of projects covering pre- and post-trade services that are currently being built are also expected to go live next year. Most of those spoken to for this story also say there is some application of digital assets, blockchain or tokenization that will become an important part of the market structure in the future.

"I do think that in some shape or form this is the future but it also depends on how much it will impact and make the market more efficient and it depends on how the regulation will change and also what kind of technologies will be employed," says Deutsche Bank's Bedford.

One concern is that this space may be developing too quickly, which could leave the technology open to bad actors and market manipulation. The introduction of a decentralized structure for some use-cases would ultimately remove some regulated processes and open firms up to a new risk profile, and unchartered territory. The wider consensus is that although the space is developing at a significant rate, business decisions should always be driven by customer needs over the latest trending technology.

"If I were to say there was a challenge, I would say that this whole space is moving so quickly," says Tom Jessop, president at Fidelity Digital Assets. "So even in the nine months that we started trying to pull these pieces together into a business, the whole institutional view has changed and accelerated and I think that it is at a point in time where we are trying to make sure that what we are building is in sync with what customers want and because it is such as new field, what customers want is constantly evolving." W

Anthony Malakian

Choose Your Path

Anthony speaks with a young programmer to see what got him into programming, and to perhaps learn some lessons that other parents of young children can instill in their kids.

You are a guard working at a prison located deep in the desert. No signs of civilization are in sight. You hear a gunshot coming from the control room and the power goes out. You're scared, but armed to the teeth. What do you do: run away, enter the control room or find backup?

This is the opening sequence of one adventure inside a new app called Eternal Story. Available via Apple's App Store, the choose-your-own-adventure game was developed by Aidan Thomson, who is in the seventh grade and was first introduced to programming by his father, Seth Thomson, chief information officer for DRW.

Using the Unity engine and C# programming language, Aidan wrote out and coded a set of sub-stories for genres pertaining to action/adventure, historical fiction, fantasy, horror and realistic fiction. Each decision—say, to run or fight—leads to a new scenario that requires the user to make more decisions, which could lead to glorious victory or an untimely demise. While on its face it seems simple enough, there was a lot of writing, coding and trial-and-error involved in the process. "I started about a year-and-a-half ago," says Aidan. "When I was younger I thought that making an app and having it on the App Store would be so cool. I knew a bunch about Unity and I saw that you could make an app with it, so I decided to make a text-based game because Unity is known for its UI."

Full of youthful modesty, Aidan says the story ideas and writing came "kind of easy" for him as he read a lot of adventure stories. Along the way he also had help from his friend Harper Jamison, who wrote the action/adventure game Zombies. For his next act, Aidan hopes to enlist more of his friends to help with the time-consuming process of writing.

Aidan's first foray into coding came through Scratch, a visual language and online community that offers tutoring support. He would also play the video game Minecraft with his dad, who found a course that showed Aidan how to build his own Minecraft modifications. As for Eternal Story, he's continuously updating it and fixing bugs, the bane of every programmer's existence. He's also working to improve his toolkit by taking a course in Unreal, a game engine developed by Epic Games, with C++.

> While Aidan is not yet into his teenage years, he's already well on his own path when it comes to programming and robotics.

"I really like the logic and the math of coding," Aidan says. "You can create this huge sequence and it's an equation and you press play and it all works perfectly. It's so complicated but you understand every little bit about it."

While Aidan is not yet into his teenage years, he's already well on his own path when it comes to programming and robotics. Even though there aren't any programming-specific classes at his school, he's taking online classes through Udemy.com, extra credit classes at Northwestern University and is a member of the First Lego League, which each season offers a challenge to be competed on by kids ages nine to 16, depending on where they live. Through it, they build their own robots and program them to complete different challenges, and Aidan is one of the main programmers on his team, of which his dad is a coach.

This year's challenge is "Into Orbit," which involves the teams doing research on the impacts of long-term space travel. And it's not just the kids who are learning. Even the elder Thomson is learning things he's been able to take with him back to DRW.

"I've learned how to better guide people through watching where he needed to work on his own, and where I could inject myself and it would be helpful," says Seth. "At first I was very involved when he started with Scratch. I went through the first chapter of the book with him, and then he went on his own. After that, I've been less involved and checking in periodically or when he asks me for help, but also to encourage him to seek help on his own and find resources so he can learn to stand on his own. All of that has helped me in coaching some of my employees."

On the cover of the December issue of *Waters* is the inventor of the ubiquitous C++ programming language, Bjarne Stroustrup. While Aidan Thomson has a long way to go before creating something as widely used as what Stroustrup invented, that process has to start somewhere. Aidan's Eternal Story is only just beginning. W

Should aspiring coders start with apps?
For more information and readers' feedback please join the discussion at **waterstechnology.com**

Singing to the Tune of Data

Just as consumption of music has quickly changed, the way market data is consumed is changing too. Wei-Shen Wong wonders about the future of market data models, and how pricing models need to change.

What's in your data playlist?
For more information and readers' feedback please join the discussion at **waterstechnology.com**

At this year's Asia Pacific Financial Information Conference, held in Hong Kong recently, James Watson, global head of sales for interdealer broker Tradition, gave an interesting presentation, discussing key takeaways the market data industry can learn from the music world.

The music industry has changed dramatically since the 1990s. I remember, quite vividly, when I got my first cassette tape (it was the Backstreet Boys, if you must know). I had a couple more after that album, and then CDs started becoming more popular.

And just like that, I've amassed a collection of various CDs, covering various genres and artists, from classical albums like Mozart and Beethoven, to operatic pop like Josh Groban, to the musical testaments to my angsty teen years.

Those CDs are now sitting in a box in a storage room. I also no longer have a radio that plays CDs. How do I listen to music now? "Hey Google, play Christmas Favorites" and in response, I'll hear her (or rather, it) reply "Sure, playing Christmas Favorites on Spotify."

How am I paying for Spotify? Actually, I don't have to. I could listen to my flavor of the month on Spotify for free, as long as I can tolerate the advertisements in between.

This doesn't mean that physical sales of music are dead. In fact, vinyl records are coming back, and it is now hip to have a vinyl player (again) and to buy vinyl records, for which many touring bands can say a big thank you to hipsters.

Similar to the changes that have taken place in the music industry, consumption of market data is also evolving. This is something that has been discussed before. Market data executives are trying to think how their consumption of data is changing, and how that affects what they pay for it.

> **Consuming data on an as-needed basis could mean clients end up paying more than what they used to.**

Watson acknowledged that change driven by technology is happening across all industries, and the financial services industry is not unaffected. "Clients want and should be given more control in how they consume data. This means that clients also have to accept the data has value and pay the fair rate," he said.

Tradition's market data and information services division, TraditionDATA, provides real-time, intraday and end-of-day data from global over-the-counter markets. Additionally, users can access historical data, research and market commentary. Its data packages are customizable according to the user's needs.

Let's think about it from a sales and consumption perspective. For example, just doing a quick check on iTunes, say I want to buy Jason Mraz's new album, that works out to be HK$73 ($9.33) for a full album of 10 songs. Now say I only want to buy a few songs from the album. They are HK$8 ($1.02) each. If I ended up buying all 10 songs, maybe not all at once, I would be spending HK$80 ($10.20), costing more than what I would have paid if I had just gotten the full album to begin with.

Likewise, although not necessarily the case, consuming data on an as-needed basis could mean clients end up paying more than what they used to. But this could also result in a more curated data package, or in music terms, a playlist that I really want.

To this point, Watson said vendors have a big part to play in this, and are one of the major delivery mechanisms for distribution of data. Everyone needs to work together in adopting these concepts, he added.

As consumption of market data continues to evolve, with clients being more picky in what they would like in a data package, and how exactly they intend to use it, vendors, too, will have to think about how to adapt to this, to be able to give their clients more options. W

Human Capital

Former Bloomberg, Bank Data Exec Iwanaga Joins Global Financial Data

San Juan Capistrano, Calif.-based historical and economic data provider Global Financial Data has hired Kevin Iwanaga as executive managing director, responsible for advising and executing on strategic direction, with the aim of doubling company revenues within two years. In his new role, Iwanaga will perform business development, strategic marketing, and product strategy functions to raise the vendor's profile among financial and academic professionals, and will be responsible for identifying and entering new markets, developing strategic partnerships, and for scaling the company to achieve its revenue targets.

Before joining GFD, Iwanaga was a senior data management consultant deployed at MUFG, prior to which he was a real-time data and technology solutions specialist at Bloomberg, and managing director of market and financial data and trading solutions at Intercontinental Exchange in New York. Before that he held a range of roles across Asia, including director and regional head of market data strategy at Citigroup, head of securities trading solutions at BT, vice president of business development and consulting services at PTS Consulting, regional vice president and head of market data management and trading technology at Lehman Brothers, regional vice president and head of market data management and exchange connectivity at Goldman Sachs, and senior market data manager at UBS.

Kevin Iwanaga

At GFD, he reports jointly to CEO and chief economist Bryan Taylor, and COO Michelle Kangas.

Dash Hires AES Co-Founder for Equities Business

Dash Financial has announced the latest in a string of senior hires, this time adding the co-founder of Credit Suisse's advanced execution services (AES) unit as its head of equity product.

James Doherty joined the firm in September, after several years as a managing partner at a proprietary trading firm specializing in artificial intelligence, and as a self-employed consultant, according to his LinkedIn.

Before that, he spent nearly 20 years at Credit Suisse, working across IT, fixed income and equities proprietary trading. He co-founded AES in 2001, and by the time he left the firm—which he originally started at in 1994 as an analyst before leaving for a short stint at Daiwa Securities in 1996.

Doherty is the latest in a series of senior appointments at Dash, which itself was the subject of a management buyout earlier this year from private-equity owners GTCR. In April, it hired Jamie Bogen from Bloomberg Tradebook to head up its execution services arm, while Glenn Lesko, the former CEO of the same agency broker, joined as chief growth officer. Stino Milito, one of the firm's original employees, came back on board as co-chief operating officer in July, rejoining the firm from ED&F Man Capital Markets.

James Doherty

JPMorgan Expanding Credit Tech Team

JPMorgan has initiated a global recruitment drive to bolster the development and delivery of technologies for its credit-trading business.

Despite citing weaknesses in its credit trading performance due to margin compression and tighter financing spreads in its third quarter earnings report, the bank is looking to build out its credit-trading technology teams in multiple locations such as London, New York, Hong Kong, Mumbai, Bangalore, Delaware, Buenos Aires, Chicago, and Herzliya in Israel. With over 300 technologists to date, the credit technology team is aiming to diversify its workforce by sourcing individuals from a global talent pool over the coming months and grow its team by a total of 15 percent.

JPMorgan's credit trading technology division will install completely new teams in Chicago and Herzliya. Chicago will become a recruiting ground for electronic trading specialists and DevOps engineers, aimed at developing out its electronic trading and execution capabilities. The bank will also establish a group of Python specialists in Israel, to grow and develop its global data engineering team, responsible for managing key data sets for electronic trading and data analytics use cases.

Chris Adams, CTO of credit trading technology at JPMorgan explained that the recent initiative looks to strengthen the bank's technology workforce by recruiting experts from newer regions, beyond the likely Silicon Valley or fintech hot spots.

The bank has made a strategic push to grow its technology talent in all parts of the firm. This year, it made senior-level hires at its New York headquarters, with Ranjit Samra and Myron Wieneke both joining as managing directors in March. For JPMorgan's class of 2018 starting in June, the bank said in that it is veering away from recruiting graduates with backgrounds in finance across Asia-Pacific and is instead targeting more candidates for technology roles with experience in computers, science subjects, and mathematics.

LSE Taps Ex-Goldman Exec Dunlap as CDO

The London Stock Exchange Group has hired Tom Dunlap as CDO for its information services division, a new role responsible for leading and developing global data strategy for the business, which comprises proprietary exchange data from the LSE and Borsa Italiana, and index data from FTSE Russell. Dunlap's role will include engaging with clients, integrating recent and future acquisitions, and working with other LSE Group divisions to drive future growth.

Dunlap most recently served as an independent senior consultant at Raymond James and financial technology vendor Lingotek, prior to which he spent 18 years at Goldman Sachs in various roles, including managing director and global head of enterprise data strategy. Before that, he served as a consultant at corporate actions data and technology provider Xcitek, and spent nine years at Citigroup in various roles, including head of portfolio accounting and reporting, and head of data maintenance and control.

Tom Dunlap

Based in LSE's Fort Mill, SC, office, Dunlap reports jointly to group COO and CIO Chris Corrado, and Mark Makepeace, CEO of FTSE Russell and group director of information services.

Buttigieg to Help Esma Shape Data Policy

The European Securities and Markets Authority's (Esma's) board of supervisors has appointed Christopher Buttigieg, director of the securities and markets supervision unit at the Malta Financial Services Authority (MFSA), as chair of its data standing committee.

The committee is an expert group responsible for the development of data policies. Members are selected from Esma staff and the national competent authorities for securities markets regulation in member states.

The board appointed three other committee chairs: Carmine Di Noia, commissioner of the Commissione Nazionale per le Società e la Borsa in Italy, will chair the committee for economic and markets analysis; Martin Moloney, head of markets policy at the Central Bank of Ireland, will chair the investment management standing committee; and Merel van Vroonhoven, chair of the Autoriteit Financiële Markten in the Netherlands, will chair the investor protection and intermediaries committee.

All of the new chairs are effective immediately and will serve two-year terms ending in October 2020, with the exception of Di Noia, whose term ends in September 2019.

Fenergo Re-enlists Fintech Sales Vet D'Souza for New Division

Fenergo has hired Steve D'Souza as global divisional head of private banking and wealth management, a new division created to expand the vendor's coverage of financial institutions. He was previously a sales consultant at compliant instant messaging provider Novastone, prior to which he was head of business development at financial planning application provider Envizage, and was founder and managing director of sales and marketing consultancy Sales Kinetics.

AlphaPoint Taps Rathi for Trading, Exchanges Business

Kapil Rathi

New York-based blockchain technology provider AlphaPoint has hired Kapil Rathi, former head of equity options at Cboe Global Markets, as global head of trading markets, in charge of the vendor's business serving digital asset exchanges and trading firms. In the newly created role, Rathi will also be responsible for expanding the range of cryptocurrency-related assets supported by AlphaPoint's technology, and for helping to make those assets more liquid and accessible to a wider audience of investors.

Rathi joined Cboe via its acquisition of Bats Global Markets, where he was senior vice president of the exchange's options business strategy. Before that, he was head of product management at the International Securities Exchange, prior to which he was a senior business analyst at the New York Stock Exchange.


Steve D'Souza

Before that, he was managing director at Cloud Point Consulting, and sales and marketing director at JHC, and also served as a business development executive at Fenergo. Prior to that, he was general manager for Northern Europe at Odyssey Financial Technologies, sales director at Prospero, head of financial services sales at Impact Plus, retail financial services sales manager at TCA Consulting, a financial services sales executive at Parity Solutions, and held various roles at Unisys. Based in London, D'Souza reports to Fenergo CEO Marc Murphy.

Collibra Collars Burk, Sohtz to Drive Growth

Data management and governance software vendor Collibra has hired Jeff Burk as senior vice president of engineering, and Fleur Sohtz as chief marketing officer, as part of an executive recruitment drive to support ongoing growth.

In the newly created position of senior vice president of engineering, Burk will be responsible for incorporating innovative technologies into Collibra's products. He was previously vice president of engineering and operations at cloud integration and data management provider Dell Boomi, prior to which he was CTO of medical training simulation provider Education Management Solutions, and was vice president of product at cloud-based content compliance tools vendor NextDocs Corp.

Sohtz will be responsible for marketing, communications, and brand strategy. She joins the vendor from governance, risk and compliance service provider Cordium, where she was also CMO, and held the same role at blockchain technology vendor Chain, prior to which she was managing director and head of marketing at Markit, was head of marketing and communications for Thomson Reuters' Enterprise division, and was senior manager of marketing and communications at BT Radianz.

Both report to Collibra co-founder and CEO Felix Van de Maele.

CloudMargin Appoints Daniel Schwartz as CIO

Collateral and margin management products provider CloudMargin has appointed Daniel Schwartz as its first chief information officer.

Schwartz, who will be based in CloudMargin's New York office, will be responsible for the roadmap and implementation of the platform's product design and operations. He will also work with the product, technology, and client operations teams. He will report to CEO Steve Husk.

Prior to CloudMargin, Schwartz was a managing director for NatWest Markets, helping to lead its North American infrastructure services


Fleur Sohtz


Steve Wilcockson

transformation. Some of his projects included initiatives around Dodd–Frank compliance, particularly around swap execution facilities and automated fixed-income trading. He also held technology roles at Citi and JPMorgan, and founded his own consulting firm, FST Consulting, which provided advice on financial services and technology.

Wilcockson Leaves MathWorks for Geospatial Insight

Alternative data analyst Geospatial Insight has hired Steve Wilcockson to boost its financial modelling solutions for the finance sector. Wilcockson is responsible for the London-based company's GeoFinance market and will drive client-facing activities for its finance segment products, as well as heading product management for RetailWatch, a consumer sentiment analysis dataset. Geospatial Insight derives its research from the analysis of satellite, aerial and drone imagery.

Previously, he was a manager at engineering software company MathWorks, where he worked for more than two decades with model builders including quants, quant developers, economists, actuaries, algorithmic traders, portfolio managers and risk managers. In a release, Wilcockson says he is a "passionate exponent" of "the notion that quantitative finance models and data analytics can better account for and incorporate geographical contingency," adding that he will work with the Geospatial team to incorporate "geospatial imagery within the rapidly emerging alternative data universe for financial services."

Wilcockson holds masters degrees in geography from the University of Cambridge and the University of British Columbia. W

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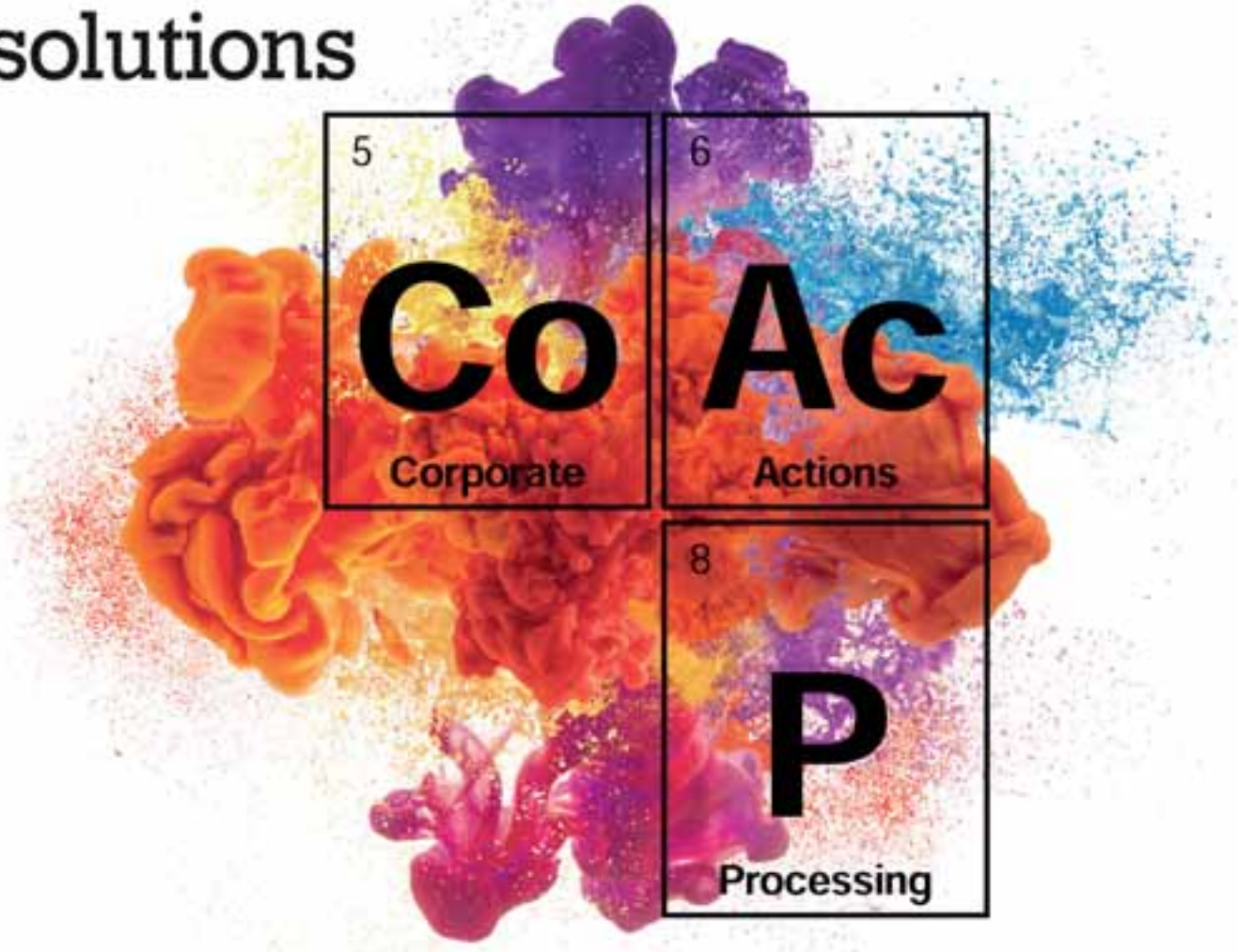

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