waters
trading technologies for financial-market professionals

Blockchain for Syndicated Loans?

FOCUS ON THE CAT

OTFs vs. SEFs

TAKING A HACK

JPMorgan's Anthony Johnson seeks diversity to fight cyber crime

SUPERMICRO®

Lightning Fast

All Flash NVMe

SERVER SOLUTIONS

BigTwin™
2U/4 DP Nodes, 6 NVMe/SAS3/SATA3 per Node

1U 10 NVMe Ultra
SYS-1028U-TN10RT+

2U 48 NVMe Simply Double
SSG-2028R-NR48N

2U 24 NVMe Ultra
SYS-2028U-TN24R4T+

2U 40/20 Dual Port NVMe
SSG-2028R-DN2R40L
SSG-2028R-DNR20L

7U 42 NVMe
Datacenter Blade®

- **Supports Intel® Xeon® processor E5-2600 v4/v3 product families**
- **Over 60 SKUs Enabled**
- **Optimized Hot-Swap NVMe Designs**
- **Highest Quality**
- **The Leader in NVMe Server Development**

intel XEON inside™

nvm EXPRESS

We Power the Cloud

TITANIUM

SUPERMICRO X10 SERVER PLATFORMS

Intel Inside®. Powerful Productivity Outside.

Learn More at www.supermicro.com

03_Q3_SM_USP_121416_MasterFile_AllFlashNVMe_Pg2

Editor-in-Chief Victor Anderson
victor.anderson@incisivemedia.com
tel: +44 (0) 20 7316 9090
US Editor Anthony Malakian
anthony.malakian@incisivemedia.com
Deputy Editor, Sell Side Dan DeFrancesco
dan.defrancesco@incisivemedia.com
Deputy Editor, Buy Side John Brazier
john.brazier@incisivemedia.com
European Staff Writer Aggelos Andreou
aggelos.andreou@incisivemedia.com
US Staff Writer Emilia David
emilia.david@incisivemedia.com
Asia Staff Reporter Wei-Shen Wong
wei-shen.wong@incisivemedia.com
Head of Editorial Operations Elina Patler
elina.patler@incisivemedia.com

Contributor
Max Bowie, Editor, Inside Market Data

Commercial Director Colin Minnihan
tel: +1 646 755 7253 colin.minnihan@incisivemedia.com
Commercial Manager Phil Ansley
tel: +44 (0)20 7316 9643 phil.ansley@incisivemedia.com
Business Development Manager Tom Riley
tel: +44 (0)20 7316 9780 tom.riley@incisivemedia.com
Business Development Manager Michael Balzano
tel: +1 646 755 7255 michael.balzano@incisivemedia.com

Marketing Manager Louise Sheppey
tel: +44 (0)20 7316 9476 louise.sheppey@incisivemedia.com
Design Lisa Ling

Corporate and Single Subscriptions
UK: Claudio De Oliveira tel +44 (0) 207 316 9271
US: Barbara Faiman tel +1 646 736 1852
info@waterstechnology.com

Publisher Katie Palisoul
katie.palisoul@incisivemedia.com
Group Publishing Director Lee Hartt
lee.hartt@incisivemedia.com
Managing Director Celine Infeld
celine.infeld@incisivemedia.com
Chief Executive Tim Weller

Incisive Media Head Office
Haymarket House
28–29 Haymarket
London SW1Y 4RX
tel: +44 (0)20 7316 9000
fax: +44 (0)20 7930 2238

Incisive Media US
55 Broad Street, 22nd Floor
New York, NY 10004
tel: +1 646 736 1888

Incisive Media Asia
14th Floor (Unit 1401-3)
Devon House, Taikoo Place
979 King's Road Quarry Bay
Hong Kong
tel: +852 3411 4888

Incisive Media Customer Services
tel: +44(0) 1858 438 800

Waters (ISSN 1068-5863) is published monthly (12 times a year) by Incisive Media. Printed in the UK by Stephens & George Print Group, Dowlais, Merthyr Tydfil, Wales.

Master and Servant

There is little doubt that artificial intelligence (AI) will play a major role in the financial services industry going forward. In fact, there are precious few industries that will not be touched in one form or another by what many believe will turn out to be one of the most revolutionary technologies in history. Perhaps in years to come, possibly far sooner than we might anticipate, the AI era will come to be seen as something of a watershed technology, rivaling those of the internet and the printing press.

As Emilia David explains in her column on page 36, AI has the capacity to simultaneously thrill and frighten, to emancipate and also enslave. Our industry has been dabbling in rudimentary versions of the technology for some time. Trade execution and market-monitoring algorithms and advanced analytics applications that can ingest and interrogate vast data volumes and assist analysts and portfolio managers in making better informed decisions based on trends they identify, are part of this paradigm.

But true AI constitutes so much more than basic programs that possess a limited capacity to learn and elicit behavior that we might consider human-like, and by so doing pass the all-important Turing test, the benchmark against which all AI behavior is measured. We are talking about entities that have the capacity to develop their own consciousness, which by extention implies emotions, moods and complex personalities, much in the same way that Google's Deep Mind AI has shown glimpses of what might be construed as "annoyance" when it realizes it is likely to lose a game it is playing by adopting learned, aggressive tactics independent of its memory. That's pretty sobering stuff, reminiscent of *Ex Machina*, which, when I started watching it, I assumed would be a "five-minute movie," where I give a movie just five minutes to hook me, and if it doesn't, I move on. Well, hook me it did with its brilliant handling of the common sci-fi theme of AI entities yearning for "freedom" and ultimately turning on their creator to achieve it. That I identified (and dare I say it, empathized?) with Ava, the main android protagonist, is slightly disturbing, although I have no doubt that in a few short years, people will embark on similar, real-life relationships with AI, much in the same way as depicted in the movie.

What is clear with recent developments is that right here, right now, we might well be on the cusp of something really special, and that the AI genie is already out the bottle. Yes, AI will have an incalculable impact on the planet—of that there is little doubt. The real question, however, is how long will it be before AI entities make a play to swap their servant role for that of the master? W

Victor Anderson
Editor-in-Chief

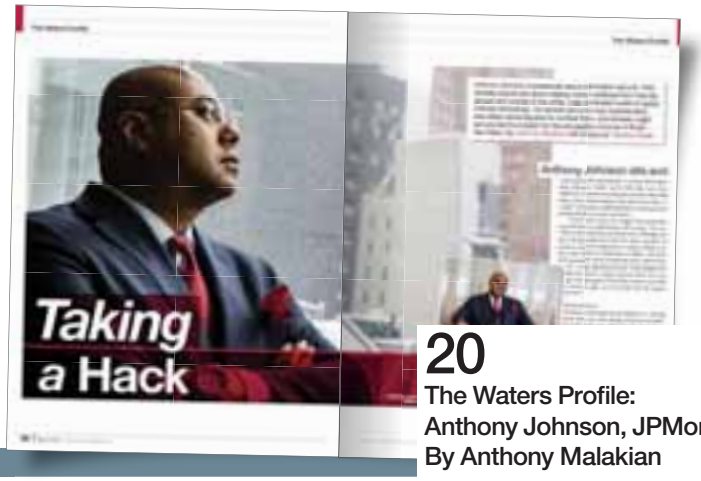
Inside Market Data | Inside Reference Data | Buy-Side Technology | Sell-Side Technology
waterstechnology

Contents

16
Special Requests
By Emilia David

Reginald Browne
Cantor Fitzgerald

12
An Overdue
Revolution
By Steve Marlin



20
The Waters Profile:
Anthony Johnson, JPMorgan
By Anthony Malakian

March 2017

Euronext Details Pan-European Dark Pool

Euronext speaks to *Waters* about its soon-to-be unveiled MTF for block trading that it claims bridges the gap between human trading and electronic execution. By Aggelos Andreou

Euronext is preparing to launch its second dark pool this year, a platform built in collaboration with the US fintech vendor AX Trading, designed to combine high-tough human trading with the low-touch electronic execution.

Danielle Mensah, head of cash markets and deputy head of markets and global sales at Euronext, explains to *Waters* that there is significant institutional demand for executing trades as safely as possible by seeking to limit market impact due to information leakage around large orders.

The new pool, expected to open for business around the middle of this year, proposes a new method of executing orders, which Mensah says will connect human relationships with new technology. The new platform, she says, will still feature high-touch sales traders who provide specialized services, although a significant volume of orders they receive from their clients will be executed by algorithms. "We are bringing together what's happening in high-touch as well as what goes on in low-touch and combining that into a single platform," Mensah explains.

'Proactive' Liquidity

Euronext is branding the new venue as a platform through which participants can seek liquidity in a "proactive" way while minimizing information leakage, a requirement for all dark pools aiming to entice institutional traders looking to move large block orders. "When you try to execute a large order, it is very rare that both sides of the trade are active in the market at the same time," says Mensah. "The real challenge is how to get an execution to take place, which is why institutions so often regard liquidity and challenges to source block liquidity as their number one issue."

Euronext resolved to provide institutional investors with an off-exchange venue that offers not only an order book to facilitate executions but also allows users to signal in a safe, controlled environment to others on the platform that they are ready and willing to execute large blocks. "We will have banks/brokers connected to our platform, and they will either directly interact with institutional investors or put orders into the platform and then send indications of interest (IOIs) out to a list of counterparties, or to the type of counterparties they would like to receive them and define the amount of information they send out," Mensah explains. "At a minimum level, they could mention the symbol, but they could also choose to specify the side and size."

Taking Control

Euronext says it has created an automated service, with fewer "eyes" and with analytics to help ensure safety and trust around the way the venue functions. Users will take full control of their orders on a number of levels. First, according to Mensah, they will be able to choose if and when they send out IOIs, and if they do, they can select how much information they will include—either symbol, side or size, and to whom they send them. "We will then leverage existing IOI networks to distribute them to the right potential counterparties, who then receive the IOIs and can respond to them," she says. "They then send an order into our MTF to execute the trade."

Significantly, there will also be safeguards around the way the platform will execute orders. "Reporting will be provided to clients via our analytics framework to help them understand execution performance," says Mensah. "They will have ways to work on how they optimize the way they interact with the liquidity and with different counterparties."

A European Platform

The new MTF is a European-centered platform, as it will offer European equities, while direct clients will have to be Mifid II-authorized firms. However, according to Mensah, there will also be access from around the world, in line with the regional regulatory permissions and requirements.

The pool currently awaits regulatory approval, which Euronext says is a typical process since the high-level core rules of the upcoming regulation for dark trading are well known and Euronext has already taken these into consideration. Mensah says the new regulatory landscape for dark pools is experiencing a transition from executing small trades in the dark to large block orders. "That's what institutional investors are really looking for," she says. "They are executing large blocks, and for them, it is more efficient to have fewer large trades and not having to go through the process of breaking up their orders into lots of small pieces." W

THE BOTTOM LINE

- Euronext's new dark pool—awaiting regulatory approval—will launch in mid-2017 for Mifid II-authorized firms and, according to the firm, promotes "proactive liquidity" in a controlled trading environment.

Pier 88 Rolls Out LiquidityBook's POEMS

As it launched more funds, Pier 88 Investment Partners knew it needed a more end-to-end trading solution to better manage its growth. The San Francisco-based hedge fund turned to LiquidityBook, with its POEMS offering, to streamline its workflows. By Anthony Malakian

Last year was a mixed bag for the hedge fund industry. While 2016 was the first year of negative flows since the financial crisis, the overall size of the hedge fund industry continued to grow, according to a new white paper produced by Barclays, Turning the Tide: 2017 Global Hedge Fund Industry Outlook and Trends.

One clear trend has been an investor drive toward smaller and emerging hedge fund managers. From the report:

From 2010–2013, HF managers with more than $500mn in AUM garnered almost 90% of the flows to the industry (capturing a greater proportion of flows than they accounted for as a proportion of industry AUM), suggesting the 'big were getting bigger'. Since 2014, however, the situation has reversed, with HF managers with less than $500mn in AUM taking 38% of the inflows, despite accounting for only ~6% of overall industry assets over the period. Digging a little deeper, according to HFR, in 2016 only the <$500mn HFs had positive flows, which could be attributed in part to the recent outperformance by smaller HFs.

So while the hedge fund industry as a whole has had to navigate choppy waters, smaller firms are finding a niche. But it also must be noted that, according to Hedge Fund Research, there were over 700 liquidations through the third quarter of 2016, on pace to be the worst year of closures since the financial crisis took hold in 2008.

Eye Toward the Future

Pier 88 Investment Partners was launched in late 2013 by expats of large shops like Citigroup, Lord Abbett, Brown Brothers Harriman and BNY Mellon. According to its most recently published Form ADV filing, the San Francisco-based multi-strat fund has $177 million under management. It now oversees four funds.

Jackie Fertitta
Pier 88 Investment Partners

Late last year, to help improve its trading functions across those four funds, it migrated to LiquidityBook's cloud-based LBX Buyside POEMS (portfolio, order and execution management system) offering.

When Pier 88 launched, it relied on a combination of Bloomberg's EMSX execution platform or voice orders to route trades to the firm's brokers. It also leveraged its prime broker's solution for profit-and-loss (P&L) monitoring, along with ubiquitous internal spreadsheets to monitor risk limits and reconcile performance.

Jackie Fertitta, Pier 88's chief operating and chief compliance officer, tells *Waters* that those practices worked well when it was just one fund being managed, but now that the firm has grown to four, if it wanted to provide institutional-quality processes for investors, it became imperative to offer a more end-to-end solution to help ensure trade, audit and risk compliance at a cost that is manageable for a growing firm.

"The straight-through processing of trades—from routing orders, to execution, to settlement and record-keeping—with our brokers, fund administrator and multiple custodians eliminates trade errors and omissions imperative to fully understanding portfolio risks at the start of each day," she says. "This is an incredibly valuable feature to any portfolio manager."

A Good Bundle

As with any smaller firm, cost is imperative. Fertitta says a big reason LiquidityBook won out over other vendors the fund looked at was the way it bundles together its fees.

"One of the redeeming factors about LiquidityBook was its all-inclusive monthly fee," she says, declining to name other vendors Pier 88 considered. "Other providers seemed to have additive charges for functionality and the solutions became substantially more expensive when factoring in multiple users, additional custodian feeds, live data and customized pre-trade compliance."

Another selling point was the fact that it is delivered using a software-as-a-service (SaaS) model, via Amazon Web Services (AWS), allowing for the firm's portfolio managers to be untethered from the office.

"As a small firm, our portfolio managers can often be on the road for client meetings or conferences," Fertitta says. "LiquidityBook's web-based access was ideal to help oversee the portfolio remotely."

Fertitta says for the first two funds, it took approximately four weeks to build the connectivity and reports for Pier 88's fund administrator and custodians. But after coordinating testing and configuration requirements were met among the various technology departments, moving the additional funds onto POEMS was much faster—it only took two days to migrate the fourth and final fund onto the system. W

THE BOTTOM LINE

- Thanks to advancements in cloud, smaller firms are using third parties for many trading processes, including portfolio management, and execution and order management. This is good for the industry, which still relies on manual practices and spreadsheets.

IBM Talks CAT Database

Dan DeFrancesco chats with Ron Lefferts of IBM about the technology giant's involvement in the consolidated audit trail.

It will be one of the largest—possibly the largest—financial databases in the world when it is complete, so it seems only fitting that a technology vendor of equal size has a hand in building it. The Consolidated Audit Trail (CAT) will track 58 billion records a day and have a central repository that grows to more than 21 petabytes in its first five years of existence, making it one of the largest financial databases in the world. And while Thesys Technologies, the vendor arm of high-frequency trading firm Tradeworx, has drawn most of the headlines since winning the bid to build the CAT in January, IBM, one of Thesys' partners on the bid, will play a crucial role in getting the CAT's database up and running.

Partner Power

Ron Lefferts, managing partner of the North American financial services sector at IBM Global Business Services, tells *Waters* that IBM's involvement with the CAT dates back to when it was first announced that the platform would be built. IBM was one of 31 firms that initially submitted an intent-to-bid form when the self-regulatory organization (SROs) published a request for proposal (RFP) in February 2013. The vendor was named as one of 10 qualified bids following a round of voting from the SROs in April 2014, but did not make it past the next round of voting, which narrowed the list of bidders down to six.

During that time, Lefferts says many of the bidding firms were considering partnering with other bidders they felt would be able to help them create the most usable and secure solution, leading IBM to team up with Thesys.

> "IBM is providing the cloud infrastructure running on SoftLayer with some other components. We'll run that, manage it, and maintain it. We'll do all the things such as help desk and some other capabilities."
> **Ron Lefferts, IBM**

"We found there to be a great synergy between their core application technology and their approach to security that aligned very well with IBM's approach to security. IBM's cloud and infrastructure and other capabilities made a lot of sense to both parties," Lefferts says.

Lefferts is limited in what he can say publically about what IBM's defined roles and responsibilities will be as part of the CAT bid, as those details are still being worked out. However, Lefferts says IBM is Thesys' only partner from a technology, consulting and implementation services perspective on the bid. Thesys will be in charge of the core applications, analytics and anything around managing the input or access of data.

"IBM is providing the cloud infrastructure running on SoftLayer with some other components. We'll run that, manage it, and maintain it. We'll do all the things such as help desk and some other capabilities," Lefferts says. "From a professional services perspective, we're providing program management, business requirements and analysis and other types of implementation support to get through the build phase, and as a managed service once we're in operating mode over the life of the contract"

Flexible and Secure

Ensuring the CAT is secure is naturally a top concern of not only Thesys and IBM but the entire industry. The database will be a treasure trove of valuable financial information, making it a likely target for hackers. The challenge, and what made Thesys' bid stand out, according to Lefferts, is understanding the CAT's need to be flexible and usable while still remaining secure.

Lefferts says the combination of Thesys' application- and database-level encryption and cryptography with IBM's infrastructure and security management services was a differentiator for the bid.

"We recognize that security and only providing access to those who can actually see and do analysis on that data—a very limited set according to the Securities and Exchange Commission's (SEC's) Rule 613—is a critical requirement. We all know that can't fail," Lefferts says. "We've laid out a program charter that talks about some of the fundamental principles that we need to solve for to keep on top-of-mind for every single one of the members involved in the engagement, and security is clearly top-of-mind. IBM has the largest enterprise security business in the world. Last year we did over $2 billion in security services alone. Part of the overall solution will involve IBM providing part of what that overall security solution is." W

THE BOTTOM LINE

- IBM will be an integral part of the CAT build, specifically from a technology perspective, providing infrastructure and professional services to the bid.

A Scary New World for CISOs

JPMorgan's Anthony Johnson discusses how the cybersecurity industry is evolving and what that means for CISOs and banks in general. By Anthony Malakian

In early January, the Office of the Director of National Intelligence said that Russia, under the orders of its president, Vladimir Putin, engaged in cyber-attacks aimed at influencing the outcome of the 2016 US presidential election. Though there's no evidence that hacking led to voter fraud or irregularities with the Electoral College, it was sufficiently worrisome to lead Arizona senator John McCain, a Republican, to say, "Every American should be alarmed by Russia's attacks on our nation." He said this even as his own party won the presidency, and kept the majority in the House, Senate and governorships.

While it didn't make the same headlines, a couple of weeks before the November US elections, hackers managed to disable a company called Dyn, which monitors and reroutes internet traffic. While the New Hampshire-based company wasn't well known prior to the attack, it affected internet giants like Etsy, Netflix, Reddit, Spotify and Twitter, as well as numerous media outlets. Beyond a simple attack on political parties, this was an assault aimed at the internet's fabric.

Hackers' ability to disrupt organizations and/or obtain information has become alarming. At the same time, the rise of cloud computing and the Internet of Things (IoT) is poised to make people and organizations more vulnerable. Anthony Johnson, managing director and business information security officer for JPMorgan's Corporate and Investment Bank (CIB), says this marks a paradigm shift that firms will have to start to consider.

"When you see some of the denial-of-service attacks that we're seeing today, those aren't just to the company; they can be viewed as a risk to the fabric of the internet," he says. "What happens if someone destroys the fabric of the internet, where the whole objective is not to make money but to make the world burn? It's complete chaos. So as a company, we have to think about all the edge cases. We have to be further along the hype curve, making sure we're staying ahead."

Anthony Johnson
JPMorgan

While cybersecurity has taken on greater importance for firms of all stripes and sizes, most are still concerned with basic blocking and tackling—patching and vulnerability management—and aren't sophisticated enough to have daily threat intelligence reports and hunting teams of white-hat hackers. But as the capabilities of hackers grow, so too must the capabilities of organizations.

But Johnson notes that firms can't overreact; wars won't be won with big movements. The key is progress. "I don't need perfection, I need progress," he says. "If we go two steps, instead of the 10 that we wanted, I'm ok with that because in the long run we'll get there."

Tougher Hackers, Tougher Rules

On March 1, a new rule from the New York State Department of Financial Services (DFS) will require that "banks, insurance companies, and other financial services institutions regulated by DFS to establish and maintain a cybersecurity program designed to protect consumers and ensure the safety and soundness of New York State's financial services industry." It has been described in the media as a rule to make banks vouch for their resiliency to thwart a cyber-attack.

Regulators will continue to focus on cybersecurity in the coming years. As Johnson lays out in this month's cover story—*Taking a Hack*—on page 20, it's vital for chief information security officers (CISOs) to be both educators while also changing the way organizations think about cyber, moving from a stance of simple defense to one of risk tolerance. But he also says that CISOs need to evolve beyond being technologists to understanding the business.

"I would ask every CISO these questions: When was the last time you read a 10-K? Do you actually know how the company makes money? Do you know how much money the company made last quarter? If they can't answer those questions, then what are they really protecting? Are you spending $10 million to protect a $500 wallet? What's the relevancy here?" he asks. "Without those anchor points, you have zero context into the risk tolerance of the firm."

As for understanding the business, Johnson says it's equally important to be able to communicate with the business, rather than just the technology team. "Years ago, I was at a client site talking about strategy components and some very technical risks. I could see that the CIO and the rest of the executive team had no clue what I was talking about. At that point it became apparent that I was not relevant to the conversation," he recalls. "I could have been the smartest cyber guy in the world, but I had no context about their business and I had no direct impact on them." W

THE BOTTOM LINE

- As hackers become more sophisticated, so too must CISOs' and firms' understanding about those threats. This means communicating with the business in a clear way, and understanding how the business makes money.

Future-Proofing Investment Banks

In order to best position themselves in a future of dwindling returns, investment banks must invest in long-term technology advancements and work in tandem with financial technology companies. By Emilia David

As investment banks face lower returns and rising cost pressures, adopting a culture of innovation and digital transformation—as well as developing technologies like robotic process automation (or artificial intelligence), advanced analytics, and smart contracts—are important to future-proofing banks.

According to a report from consultancy EY, *Capital Markets: Building the Investment Bank of the Future*, global investment banks saw a return of 6.3 percent in 2015 compared to 7.8 percent in 2014. New rules like the Fundamental Review of the Trading Book (FRTB), mandates around counterparty credit risk, and new credit-valuation adjustment (CVA) requirements could lead to higher capital requirements, which could cause returns to fall even further.

Roy Choudhury, partner and principal of financial services advisory for EY, tells *Waters* that the environment banks are now in—one where new rules can severely constrain their capital—should provide an impetus to focus on technologies that lessen the bank's reliance on legacy platforms. "Technology is a big part of investment banking but the technology infrastructure is fragmented with new builds tacked on when new regulations come in," he says. "This piecemeal strategy has led to burdensome technology that's not agile. Banks need to remember technology is a competitive advantage."

In an environment of lower returns, firms have to focus on building more sustainable models for IT development.

EY suggests that in the short term, banks should harness technologies like robotic process automation, utilize digital portals to work with clients, and establish utilities and hosted platforms.

THE BOTTOM LINE

- Investment banks must focus on new technologies to be ready to find value and cut costs in an age of dwindling returns.

It is not enough to rely on legacy platforms; banks should look at working directly with vendors for solutions.

Robotic process automation—or artificial intelligence—is expected to cut costs for back-office tasks like reconciliation by as much as 50 to 60 percent. Artificial intelligence can also be used to analyze big data, which can be wielded in areas like the credit evaluation of potential clients.

Digital portals can improve the customer experience, which can enhance client retention and customer engagement, and make the relationship more profitable. And utilities prove valuable because they allow firms to move regulatory needs like know-your-customer and anti-money-laundering (KYC/AML) processes to a common platform. In the long-term, banks should invest in blockchain projects, smart contracts and artificial intelligence, according to EY.

Angus Champion de Crespigny, financial services blockchain and distributed infrastructure strategy leader at EY, notes that blockchain solutions could prove to be a more agile way of transmitting information, which will help to reduce settlement costs for both banks and clients. Blockchain, however, still has to overcome issues concerning resilience, scalability, and security.

Smart contracts are a tool that could work within blockchain and serve as a model for master service agreements or credit support annexes, particularly with derivatives contracts. It streamlines the work that goes into transactions that normally take some time to complete due to their complexity.

The Next Wave

De Crespigny says the vendor industry is changing the way it targets end-users as firms start to recognize the value of disruption. As a result, investment banks may find it increasingly beneficial to partner with financial technology firms, rather than rely on proprietary platforms. "There is a value to uniquely quantify assets that can't be duplicated and offer new financial products," de Crespigny says. "It's interesting to see how financial technology companies will be able to help move value."

Investment bank State Street states much of the same in a new report, *Finance Reimagined: Finding Long-Term Value in a Digital Age,* saying that partnering with technology firms, or even acquiring startups, allows banks to transform models to those that prioritize innovation. Annie Morris, head of data strategy and operations at State Street Global Exchange, writes in the report that an agile "fail fast" approach is crucial to test out new ideas.

"Success in the digital era requires investment institutions to embrace a culture of experimentation," Morris says. "There needs to be a willingness to try new approaches, to tolerate failure, and to adapt quickly to market challenges and client needs."

Like EY, State Street is pushing blockchain and artificial intelligence. Cloud-based platforms are also seen as vital for providing advanced analytics tools, as well as providing a more agile infrastructure to bring new products to market faster. For State Street, the investment bank of the future is also focused on deep-rooted digital innovation and understands the importance of integration, integrity and intelligence of data in order to generate value for customers. W

FactSet Deploys Narrative Science's Natural Language Generation Tool

Financial information services provider FactSet is integrating Narrative Science's natural language generation (NLG) capabilities into its analytics and client-reporting platform.

As a result of the pairing, users will be able to automatically generate portfolio commentary directly within FactSet's platform and alleviate bottlenecks in quarterly and monthly reporting cycles.

Kim Neuwirth, director of product management for Narrative Science, tells *Waters* that many clients in the asset management space use FactSet's portfolio analytics tools to generate performance attribution data that is the same data used by Quill, Narrative Science's Advanced NLG platform, to generate portfolio performance commentary. This integration will allow them to have all the tools they need in one place.

"Enabling customers to automatically generate portfolio commentary directly within FactSet allows investment management firms to exponentially scale their reporting needs and complete their commentary on day one of the quarter," Neuwirth says.

She adds that the solution complies with regulatory mandates as the generated commentary adheres to compliance best practices associated with producing content.

Clients of FactSet will have to sign up to use this new offering, Neuwirth says, while Narrative Science's users will have to work directly with FactSet to establish a contract to use the service.

"For the funds in which the customer has access to FactSet's suite, users can add a 'narrative' module to their document via Quill. On the back-end, this module aggregates the necessary data to support a portfolio commentary report," Neuwirth says. "As of today, the portfolio commentary generation capability within FactSet produces content for equity funds."

Narrative Science's Quill platform specializes in natural language generation, rather than processing. The Chicago-based company focuses on three areas for content generation: institutional portfolio commentary, regulatory compliance, and improving customer engagement. Later this year, in addition to user interface and workflow improvements, Neuwirth says the vendor expects to announce "multiple partnerships" and will launch an Integrated Narratives application programming interface (API) "so business intelligence and analytics companies can seamlessly integrate Advanced NLG into their platforms." W

Northern Trust Releases Blockchain Solution for Private Equity

Northern Trust and its partner IBM announced the first commercial deployment of blockchain for the private equity market as investors seek greater transparency, security, and efficiency. The blockchain—built on the back of the Hyperledger Fabric—will be used by Geneva, Switzerland-based private equity firm Unigestion to manage various fund administration activities. Unigestion has $20 billion in assets under management and is the first client to use the solution.

Arjit Das, senior vice president, applications for fintech solutions and enterprise messaging at Northern Trust, says the private equity space provided an interesting challenge to deploy blockchain solutions to since so much security has to be built in. "Private equity is a unique space and presents a distinct challenge. It's very private so security is important and there are also a lot of document exchanges that cause friction in the space," says Das. "So much of the process was manual and we recognized blockchain can reduce the time it takes to administer the fund."

The solution gives participants the ability to transfer ownership stakes and manage, service, and audit the fund throughout the investment lifecycle through a private permissioned blockchain. It uses IBM's high-security business network.

Das says Northern Trust continues to manage the chain and will be able to give specified access to participants to maintain security.

"Different actors that participate in the chain have different roles in a fund. There will be a partner that administers the fund and then an investor and so on. They all have different access," he says.

Administrative processes around private equity are time-consuming, according to the bank, and lack transparency, which leads to a long, fragmented approach when operating a fund. The blockchain solution also provides access to regulators when required.

Northern Trust's private equity blockchain solution is just one of the use-cases it is looking at to deploy the technology, though it was one of the areas it identified as a good place to start. The bank said it is exploring expanding the blockchain solution into other asset classes and jurisdictions. W

The Technology Impacts of Mifid II (Part 2)

In the first article of this three-part series, Richard Bentley looked at the implications of Mifid II for banks' and brokers' technology stacks to support their electronic order flow, with specific focus on pre-trade workflows. He now turns his focus to order execution, following the decision of where to send orders and the completion of pre-trade risk management and compliance checks.

The execution of orders for "Mifid instruments" is fundamentally changing as a result of Mifid II. Rules like the double volume cap, common tick sizes and the various waivers are driving a shift in market models, away from dark pools and crossing networks and toward new venues that use alternative models like periodic and on-demand auctions, block matching using indication-of-interest (IOI) and request-for-quote (RFQ) workflows, and so on. The introduction of systematic internalizers in 2018 further complicates the liquidity landscape.

These changes will impact trading technologies for a long time to come. While many of the impacts are not presently well understood, there are more immediate consequences of the regulation, which we review below.

Market Gateways

One of the biggest impacts of Mifid II, in terms of workload for market members is on direct market access (DMA) gateways—the software that connects internal trading systems to the venues themselves. Mifid II requires changes to the electronic messages sent and received by participants. These changes include updates to timestamp granularity to support microseconds, new message fields—some that must be computed by the order management system (OMS)—related to transparency and for market operator record-keeping, and complete new workflows for new market models. Brokers will have to map new fields on the order message (e.g., identifiers for individuals involved in the investment decision) to short code forms, but a lack of agreement on a common format means these codes may be different depending on the trading venue, creating a complex data mapping challenge.

> All venues where Mifid instruments are traded will upgrade their application programming interfaces in advance of January 2018, requiring a massive effort to update the DMA gateway software that connects to them.

The result of these changes is that all venues where Mifid instruments are traded will upgrade their application programming interfaces (APIs) in advance of January 2018, requiring a massive effort to update the DMA gateway software that connects to them. In Europe this means more than 50 venues across different asset classes will be revising their APIs this year. As of February 2017, only a handful of those venues had released new specifications, with many yet to even confirm a timetable for doing so. The early-movers have also stated that they will release further revisions to their APIs over the course of this year.

The work to develop, test and recertify DMA gateways to new specifications will be enormous, and heavily weighted to the second half of this year. Brokers offering DMA/low-touch execution across multiple markets are preparing for a very busy third and fourth quarter. Based on our own experience at Ullink, for many participants this will be the driver to investigate outsourcing market connectivity to vendors—especially those providing hosting and managed services—as the costs of maintaining internal market gateways becomes prohibitive.

At-Trade Monitoring and Intervention

Mifid II places new obligations on brokers with respect to real-time monitoring of house and client orders and trades, plus the means to intervene as an emergency measure if issues arise—the so-called "kill switch." Intervention might be necessary in different scenarios, ranging from suspected market manipulation or erroneous trades, directional trading, which builds a significant exposure—possibly due to an out-of-control algo—or operational issues such as a failure in a client trading

system resulting in the client losing visibility and control of its orders.

Larger firms may have several different front-office trading systems across different asset classes, desks or geographies, and gaining a centralized real-time view of activity and exposure, plus the means to intervene, may not be straightforward. In cases of sponsored access, client order flow may bypass broker infrastructure entirely, subject only to broker-supplied pre-trade risk checks. For these reasons, most brokers will connect to venue APIs providing real-time, or "at-trade" drop copies of all orders and trades printed in the firm's name in order to fulfill their monitoring obligations. Many venues also provide, via the same APIs, means to kill individual or groups of orders, or shut down trading sessions entirely, effectively cancelling any orders still working in the market.

Besides connectivity to venue drop-copy interfaces, the stipulation for central monitoring and intervention requires tools capable of processing and visualizing large volumes of order flow in real time. To locate and kill individual or multiple orders among potentially tens of thousands of working orders also requires rich searching, sorting and filtering capabilities. Notification is a further requirement, to detect and alert on unusual patterns of orders that might signal issues which might require trader intervention. These requirements outstrip the capabilities of most order management systems suggesting that new tools will almost certainly be needed.

Reconciliation

In the context of monitoring, Mifid II also stipulates that firms must ensure the accuracy of their trade and position information by reconciling their internal logs with the drop copies provided by trading venues. This provides a second reason why firms must invest to develop the connectivity to venue drop-copy APIs, and introduces the additional requirements to run a reconciliation process.

"Besides connectivity to venue drop-copy interfaces, the stipulation for central monitoring and intervention requires tools capable of processing and visualizing large volumes of order flow in real time.

Richard Bentley
Ullink

The principle behind this requirement is to allow a firm to view its overall levels of risk and exposure independently of internal trading systems. This is a form of "4-eyes" risk management, which is not unique to Mifid II, nor is it limited to the sell-side; buy-side firms must also perform similar reconciliation with information provided by their broker or "direct execution access" (DEA) provider.

While Mifid II does not mandate that this reconciliation process is conducted in real time—stating that it must occur "as soon as is practicable"—it is in firms' interests to detect mismatches as soon as they can. Many firms will look to deploy real-time reconciliation technology with an alerting mechanism to address this requirement to try to prevent erroneous execution reports from being sent to the client, or enable issues to be addressed before trades are reported to the approved reporting mechanism (ARM). With the shortened trade reporting windows under Mifid II, this pushes brokers to reconcile in real time.

Clock Synchronization

Mifid II introduces the notion of "reportable events"—or things that can happen to an order during its lifetime that must be recorded and reported (a subject addressed in the final article in this series). Examples include an order being filled, amended or cancelled—though there is some dispute as to what exactly constitutes a "reportable event." Whatever the eventual definition, central to this is the adoption of consistent timestamps across participants and trading venues during the order lifecycle, and consequent synchronization of clocks used to generate these timestamps with a reliable time source—such as an atomic clock.

The degree of accuracy—or permitted clock skew—varies depending on the participant and style of trading, but can be as low as 100 microseconds. Achieving this level of accuracy in all cases is not trivial, requiring investments at hardware, network and software levels. While some firms will lean heavily on their datacenter and infrastructure providers to enable them to meet this obligation, doing so will come at considerable cost.

In this article we have highlighted the impacts of Mifid II on some of the technologies and systems engaged in the execution of electronic order flow. In the final article of this series we will turn our attention to the post-trade space, focusing on the impacts of Mifid II rules around order record-keeping, trade and transaction reporting, and best execution.

Richard Bentley is chief product officer at Ullink, a Paris-based provider of multi-asset trading technology and infrastructure to the buy side and sell side.

An Overdue REVOLUTION

Steve Marlin outlines how distributed-ledger specialist R3 and a number of its partners are looking to revolutionize the syndicated loans market by "blockchaining" it, and by so doing reducing settlement timeframes, cutting operational risk and freeing up banks' much-needed capital.

Banks and technology firms working with blockchain consortium R3 seem to be taking a leaf out of the Steve Jobs playbook for their latest product rollout, shrouding the research project in secrecy so they can unveil the finished article in a theatrical stage show.

"We are expecting to showcase in mid-March," says Emmanuel Aidoo, head of blockchain technology at Credit Suisse in New York, which is working closely with R3 on the project. "We will show the market everything we've built."

What R3 and some of its members are working on—utilizing technology from vendor Synaps—is a distributed ledger for syndicated loans, a $4.5 trillion industry, but one where transactions are still conducted via fax, and where the majority of trades take longer than a week to settle (*see box: Faxes and Fedwires*). The project could help transform the market, participants hope, dramatically speeding up settlement times and bringing in new players and fresh investment capital.

"There were roughly 25 million faxes floating around Wall Street at quarter end," says Bob Berk, COO for capital markets at US Bank in Minneapolis. "With blockchain, investors would have direct access to systems of record for syndicated loan data. This would yield immediate savings by reducing the manual reviews, data re-entry, faxes and reconciliations that occur during the course of a loan's lifecy-

> "In 2018, we are confident blockchain can take over for a small subset of loans. The existing systems will still be considered primary, but in parallel we will have blockchain."
> **Emmanuel Aidoo, Credit Suisse**

cle, and which ties up a lot of capital banks need to hold against unsettled positions."

Syndicated lending allows banks to share the credit risk of financing large clients, such as multinational corporations and private equity sponsors. These loans offer floating rates, as well as the ability to prepay without incurring penalties, making them popular with borrowers.

The floating rates are also appealing to investors—especially during central bank tightening cycles. According to the Loan Syndications and Trading Association (LSTA), around $650 billion of syndicated loans—consisting almost entirely of non-investment grade debt—are traded annually on the secondary market.

Attractive Features

Many of the features that make syndicated loans attractive to borrowers also make it difficult to settle transactions expeditiously, however. For instance, most loan agreements give the borrower the right to block a sale of the debt, even in the secondary market. The variable rates and prepayment options also mean loans must be continuously repriced as interest rates change and principal is paid down.

As a result, the market is plagued by outmoded technology and workflows, with trade settlement times of as long as 30 days, a perpetual bugbear for fund managers drawn to the asset class, such as '40 Act funds, which raise money from retail investors.

"If you're a '40 Act fund, and the end-investor wants to transfer from one fund to another, by law, that '40 Act fund has two days to complete that transfer," says Aidoo. "Since loans have long settlement times, that can be unattractive to fund managers, because they need to hold extra capital on their balance sheet to guard against redemptions."

Despite efforts to improve settlement times, as of 2015, only 20 percent of par trades were settling within seven days, according to the LSTA, while 45 percent took from eight to 20 days, 16 percent took from 21 to 30 days and 19 percent took more than 30 days. "Loans are unique in that they settle over-the-counter, from desk-to-desk," says Bram Smith, executive director at the LSTA in New York. "That doesn't lend itself easily to technological solutions."

The variable rates on offer also create an incentive for some buyers and sellers to deliberately delay settlement when interest rate changes are imminent. "Because of their variable rate nature, many shops freeze settlement for a day or two, any time there's an interest rate roll," says an industry source. "That could be as often as once a month."

The industry has tried various approaches to curb these practices—including so-called "delayed compensation" provisions in loan contracts, which indemnify buyers against settlement delays longer than seven days—but to no avail. "This is an extremely complex problem, involving elements of legal, operations, behavior and technology," says Smith at the LSTA.

The headaches are magnified by a lack of central utilities such as a clearinghouse to process transactions. Lenders, borrowers and secondary market participants rely on a network of agent banks to collect and process interest and principal payments—often using faxes and Fedwire, the Federal Reserve banks' real-time gross settlement funds transfer system—and handle the ongoing record-keeping and administration associated with syndicated loans.

This is where distributed-ledger solutions come in. On paper, the applicability of the technology to the market's inefficiencies is obvious and the potential benefits enormous. Converting the terms in a standardized loan document—the details of buyers, sellers and critical payments dates, for instance—into code would allow them to be turned into so-called smart contracts, which are tradable on a distributed ledger, where payments are processed in real-time and transactions records are instantly available to all users on the network. "When I first read about blockchain, I thought, 'this would be great for loans,'" says Aidoo at Credit Suisse.

Cutting Delays

Blockchain technology has already inspired a number of projects aimed at cutting settlement delays in the secondary market for syndicated loans. The R3 project is being led by Credit Suisse and US Bank. Other members of the R3 consortium—BBVA, Danske Bank, Royal Bank of Scotland, Scotiabank, Societe Generale, State Street and Wells Fargo—are also involved, along with several major fund managers, including Eaton Vance Management, KKR and Oak Hill Advisers. "Distributed ledgers could cut down on the settlement delays and document processing that goes into loan processing," says Michael Herskovitz, senior vice-president of fixed-income risk operations and technology at Alliance Bernstein in New York, which is among the firms involved in the R3 effort.

Credit Suisse says it developed a proof-of-concept for the technology's potential application to the market, in conjunction with vendors Ipreo—which itself launched a system designed to reduce loan settlement times in September 2015—and Symbiont in the spring of 2016, and began pushing it to other members of the R3 consortium.

At around the same time, US Bank was exploring potential use-cases for distributed-ledger technology in the lifecycle of a syndicated loan transaction—from origination to administration and custodial arrangements for secondary market participants. After sharing its research with other R3 members, US Bank decided to join forces with Credit Suisse on the project.

Few doubt the immense potential for blockchain to bring greater efficiencies to markets with lengthy settlement cycles and other cumbersome post-trade processes. But after years of hype, few projects in flight at either of R3 or Digital Asset Holdings—the other large industry consortium—are close to fruition, and cracks are starting to emerge over which use-cases to prioritize.

Credit Suisse and US Bank, however, insist the R3 effort is producing tangible results. "We're at a point where we think we have demonstrated it can do what it says it can do," says Chris Swanson, vice-president of innovation research and development US Bank. "The protocols work. The code as written performs as we expected it to. The next steps will be continuing to build the technology out."

Credit Suisse's Aidoo says the plan is to unveil the technology this month, and have it implemented by year-end. "In 2018, we are confident blockchain can take over for a small subset of loans. The existing systems will still be considered primary, but in parallel we will have blockchain," he says.

SALIENT POINTS

- Banks are exploring blockchain's potential to reduce settlement times and inefficiencies in the syndicated loan market.
- Banks, institutional investors and technology providers are working with blockchain consortium R3 on a platform they will unveil sometime in March this year.
- Many hope that reduced settlement times will make the asset class more attractive to fund managers and their end-investors.
- Distributed ledgers and smart contracts won't transform the market overnight into a bitcoin-like network, according to dealers; banks will continue to play a central role as agents.

Other Players

R3's effort is not the only one aimed at applying blockchain technology to syndicated loans. Digital Asset Holdings (DAH) and JPMorgan began testing the use of a private distributed ledger to settle bank loans at the end of 2015. It is unclear whether those tests—first reported by the *Financial Times*—have yielded any positive results. Three separate sources tell *Waters*' sibling Risk.net that they believe the project has stalled or has been discontinued. "My understanding is that JPMorgan had other things it wanted to focus on," says a source familiar with the matter. A spokesperson for JPMorgan denied that was the case, but declined to provide a delivery timeframe for the project, while DAH declined to comment.

In the absence of any updates from DAH and JPMorgan, the industry is anticipating the mid-March announcement from R3, although some warn against expecting too much. "Blockchain isn't this magical thing," says Hu Liang, head of the emerging technology center at State Street in San Francisco. "In the short term, we are still going to have an operator and participant model. The real value proposition is that you can use a whole new technology that's somewhat future-proof, rather than 30-year-old technologies, and you have all these components—such as native security, message delivery and distributed-business logic—in blockchain. But you still need to have trust."

State Street is one of several agent banks that facilitate interest and principal repayments for syndicated loans, and provides ongoing record-keeping and administration services for the industry. It has already deployed blockchain technology internally to handle the reconciliation of data between it and its clients, but Liang says this technology might take some time before it is ready for widespread adoption. "I don't think anyone would want to put a mission-critical application on it yet without technologists understanding what the cost is to actually run blockchain in a production environment," he says. "What will happen, which is what we're doing, is building blockchain into some of our internal architecture, that doesn't need to involve the market yet. We're aiming to have that implemented in 2017. But for the industry, it will be a year or two before things start taking shape externally."

Hub and Spoke

Market participants also stress that distributed ledgers will not do away with the need for traditional intermediaries in the syndicated loan markets, such as agent banks. Lee Braine, a member of Barclays' chief technology office, who works on the bank's smart contract effort, says unlike the true peer-to-peer networks that characterize bitcoin, a distributed-ledger system for syndicated loans will look more like a hub-and-spoke model, with an agent bank or a financial market intermediary (FMI) sitting in the middle.

"The idea is that banks' distributed-ledger nodes could start by being hosted centrally by FMIs, but at some later point those nodes could potentially be re-deployed to individual banks to host themselves," he says. "For syndicated loans, the topologies are typically not as centralized."

Although Barclays is not participating in the R3 project, it sees syndicated loans as one of its top 10 use-cases for distributed ledgers, Braine adds.

Whatever form distributed-ledger systems for the syndicated loan market ultimately take, market participants say the technology could help eliminate bottlenecks in the market and spur more investor interest in the asset class. "If the technology is able to make it easier to invest in the asset class, it would be easier for issuers to borrow and for investors to invest," says Herskovitz at Alliance Bernstein. "It could be a means to grow the actual market for syndicated loans." W

This feature first appeared on Risk.net, Risk *magazine's website.*

FAXES AND FEDWIRES

Syndicated loans present a series of market structure complications that don't exist in other asset classes. The ability to trade loans or even check a position is dependent on agent banks, which serve as intermediaries between the lenders involved in each loan syndication. Say, for example, IBM has a $100 million undrawn revolving syndicated loan facility with 10 lenders and wants to draw half of it. The company notifies its agent bank—Credit Suisse, for example—and requests $50 million. At present, Credit Suisse would have to send a notice requesting $5 million from each of the 10 lenders. Once it receives the $50 million from IBM's lenders, Credit Suisse Fedwires the money to IBM, and updates its system.

"Today, it's done by fax," says Emmanuel Aidoo, head of blockchain technology at Credit Suisse. "They receive the instruction electronically in a fax window and rekey it into their system, which has its own operational risk issues. Imagine a system where all these agent systems are linked together in a blockchain. Now we can receive updates on our loan portfolios in real time."

Similar issues arise with loan payments. Suppose, for example, IBM has two loans outstanding and owes $10 million in interest payments on the first and $5 million for the second. IBM may send three payments of $10 million, $4 million and $1 million to cover its obligations. "Typically, you have a lot of activity with a client," says Aidoo. "What if those payments don't add up?"

Blockchain could simplify these processes. "Because of the way we're able to tightly couple the messages of money with the asset, we're able to completely reconcile the current rails, like Fedwire, to attach the correct codes to the payment," Aidoo says.

Joe Salerno, CEO of Synaps, a joint venture of loan settlement software vendor Ipreo and blockchain start-up Symbiont—both part of the R3 project—says: "Instead of taking an incredibly long time to confirm what everyone owns and having to chase erroneous interest payments, we can make that go away by having a logically centralized data store and business logic."

SPECIAL REQUESTS

Request-for-quote trading platforms have, in recent months, shown strong order flow, especially from institutional investors, but are they the answer to sustain the ETF momentum? By Emilia David

Pick up any finance publication and there will be at least a few articles looking at the proliferation of passive investments and exchange-traded funds, or ETFs. As you'd expect, this has led to an evolution in the way these instruments are traded. Request-for-quote (RFQ) platforms—where traders essentially shop around for the best prices rather than rely on an exchange—are growing. These platforms are increasingly being used as part of what's called a multi-protocol approach, which includes voice trading and on-exchange trading. RFQ systems are especially gaining favor among fixed-income traders, who are used to the RFQ format, as they look to ride the ETF wave.

ETFs and exchange-traded products (ETPs), in general, have grown exponentially in recent years, especially among institutional investors. According to research firm ETFGI, as of the end of January 2017, ETFs and ETPs, combined, listed globally reached $3.6 trillion, with $2.6 trillion coming from the US and $598

billion from Europe. The ETF/ETP market has over 6,600 investment vehicles with 12,588 listings from 293 providers listed on 65 exchanges in 53 countries, globally, according to ETFGI.

While popular and growing, liquidity for large orders can hit dry spots when executing on an exchange. For example, in the first quarter of 2016, ETF trading on Bloomberg's ETF RFQ service grew over 200 percent over the first quarter of 2015, according to the company.

In a January whitepaper, *US Institutional ETF Execution: The Rise of RFQ Trading*, electronic fixed-income marketplace provider Tradeweb notes that trading on its RFQ platform nearly doubled in the fourth quarter of 2016 from the previous quarter. Tradeweb's head of US equity derivatives, Adam Gould, tells *Waters* that the growth can be attributed to institutions moving to adopt US ETFs as investment vehicles. "In the first full year of the Tradeweb US ETF offering, clients traded just under $25 billion notional on the platform across nearly 700 US listed ETFs," he says.

Still, while there's movement in the RFQ platform space, there's still room for greater growth, notes Cantor Fitzgerald's Reginald Browne, who has been called the "Godfather" of ETFs after building ETF desks at Newedge, Knight Capital and now Cantor. "As far as institutional adoption of RFQ, it's slow, though it's starting to gain some momentum," says Browne, who is senior managing director of Cantor's ETF group. "Institutional traders know where to find liquidity and they're not all using RFQ platforms."

> "As far as institutional adoption of RFQ, it's slow, though it's starting to gain some momentum. Institutional traders know where to find liquidity and they're not all using RFQ platforms." Reginald Browne, Cantor Fitzgerald

A New Addition

Voice trading is still popular today and not just for ETFs. It is popular especially for securities like treasuries, which operate in a tightened-liquidity environment. Many traders and brokers have established relationships with trusted market-makers and liquidity providers. Sourcing liquidity through voice trading survives, although it does have its downsides, particularly as it is difficult to get competitive offers in a short timeframe, and in most cases, there is no set audit trail for each call.

Nick Hodge, a director for BlackRock's iShares fixed-income ETFs, says the two established protocols to trade ETFs are not going away anytime soon. The RFQ model will simply be another tool used in a trader's toolbox. "People will continue to trade by voice maybe forever; the difference is that RFQ platforms give a timestamp and audit trail for best execution," he says. "Of course, there is always a healthy balance between trading on-exchange, RFQ, and voice because they cater to different situations and institutions."

Most RFQ platforms geared toward ETFs were first introduced in Europe and have expanded into the US. Bloomberg Tradebook, Tradeweb and ITG's RFQ Hub are now in the US, for example, while MTS Markets International—a subsidiary of the London Stock Exchange Group—is rolling out its platform in London in February and is already in use on Borsa Italiana. The bulk of clients using RFQ for ETF platforms are investors looking to work large block trades, rather than having those trades sliced up into child orders on-exchange.

Scott Kurland
ITG

Each platform, of course, is different, but the basic set-up lets traders enter the block size they want. The trade then goes out to market-makers using the platform, who then put out bids to the market, either manually or by auto-quoting a price. The trader then chooses the best offer, which is then logged by the system, thereby providing an audit trail. The trades are anonymous.

Unlike exchange executions, prices for each ETF basket are not displayed for all market participants. Most market-makers refuse to place their liquidity on-screen because, just like poker, they don't want to show their hand. And unlike traditional RFQ methods like voice trading, RFQ platforms don't depend on established relationships.

Gould says platforms like Tradeweb's simplify the process of

Source: Tradeweb

obtaining multiple prices through obtaining real-time bids. As a result, it's more transparent, and significantly, it cuts response times to as little as 10 to 15 seconds, he says.

Many ETF traders who use RFQ platforms say their biggest advantage is their audit trails, which is becoming especially important as rules like Mifid II and proposals coming from the US Securities and Exchange Commission (SEC) are demanding more transparency into the trading of ETFs as these vehicles increase in popularity. With more emphasis on traders' movements in the market, an audit trail allows them to provide proof that they followed best execution mandates.

Additionally, Scott Kurland, managing director and co-head of workflow technologies at ITG, says these platforms also provide a "feedback mechanism" to brokers. "One big issue driving the growth of RFQ platforms is regulations and the need for demonstrable audit trails and best-execution practices," Kurland says. "Having an electronic process where you can store winning and losing quotes that can run metrics shows how often traders deal with certain brokers etcetera, which can then be used to provide feedback to liquidity providers why their bid was not chosen."


Kiran Pingali
Bloomberg

Institutional Growth

Retail interest has helped push the RFQ platform agenda forward, but as Browne notes, adoption on the institutional side has been slower even though it is growing.

However, according to Kiran Pingali, head of ETF development at Bloomberg Tradebook, "Bloomberg feels that RFQ has helped all our institutional clients become more comfortable in the market and to take on larger positions without moving the market."

It is institutional investors who stand to benefit greatly from these outlets, Pingali says, simply because they are more likely to look to trade large blocks of ETFs. Block trading can take place on-exchange, although it tends to take time to complete and orders are normally diced up significantly into child orders so that they can be more easily executed.

ETFs began as an investment product geared toward retail investors, but over the years more institutional money has moved into the space. Bloomberg, Tradeweb and ITG each said that they have seen strong interest coming from the institutional space as these are usually the investors looking to trade larger blocks of ETFs.

According to a new report from Greenwich Associates, *Institutional Investments in ETFs*, commissioned by BlackRock, institutional investors made up around 25 percent of ETF flow in 2016. Of these, 21 percent said ETFs are being used as active assets, up from 19 percent in 2015.

Many institutional investors use ETFs as a means of cash equalization, portfolio rebalancing, and investment-manager transitions. A white paper from Bloomberg Intelligence, *US ETFs 2017 Outlook*, published this month, estimates that about 1 percent of institutional assets are allocated to ETFs. While that seems like a modest number compared with the hype surrounding ETFs, that's 1 percent of a $100 trillion market—and growing.

Fixed-Income Interest

Looking at a subset of the ETF market, fixed-income ETFs have increased markedly since the first one was launched by BlackRock in 2002. BlackRock's Hodge says that because fixed-income traders are more familiar with RFQ platforms, they make the transition to the ETF offering more adeptly. BlackRock saw fixed-income ETFs surge in 2016 and in the first six weeks of 2017 alone, fixed-income ETFs generate $84.5 billion.

Fixed-income traders are used to having to search for liquidity through RFQ processes, either by voice or through an RFQ platform. This familiarity breaks down one of the barriers those new to ETFs might feel—unease about utilizing multiple protocols looking for liquidity and best prices.

"Trading ETFs on-exchange can be bewildering to a bond buyer. It's hard to convince them to use an algorithm to discretely trade a large block order that will take them the whole day," Hodge says. "We saw it here on one of our desks: They used an algorithm and it took them the whole day, but the next day they used an RFQ platform and in 15 seconds they put three dealers in competition with a straight-through process that had this immediacy of risk transfer."

Cantor's Browne, though, points out that the relationship between RFQ platforms and fixed-income ETFs is complicated. "Unlike for individual corporate bonds where finding liquidity is dependent on time and place, ETF liquidity is available throughout the trading day without price discovery, so the RFQ might not be the best method for trading fixed-income ETFs," Browne says. He adds, however, that fixed-income traders are now starting to get a better understanding of how to use RFQs to trade ETFs.

No One Tool

Another reason for the growing support of ETF RFQ platforms is the flexibility they offer. Often, when moving to new asset classes, users have to invest in new platforms or install new software. For many ETF RFQ platform providers, the inertia associated with investors moving into new instruments is removed because it's as simple as adding a new tab on an existing platform. Firms of all stripes are concerned with infrastructure costs—asking them to install new software may turn them off. But because many of the RFQ platforms are already installed in banks—being used to trade other assets—they are integrated with firms' order management systems and investors can use a tab or a related application to start trading ETFs.

David LaValle
State Street

Bloomberg's Pingali adds that RFQ platforms may also begin to cater to smaller liquidity providers. "After the Volcker rule, we felt that the risks banks can take shrunk considerably. This resulted in specialized market-making firms, which have done extremely well," he says. "The platform opens up to a different set of liquidity providers where we feel the true ETF liquidity is hidden."

Proponents of RFQ platforms say that they also improve price discovery. Since RFQ platforms generate prices in real time, they tend to adhere more to live happenings in the market. With voice trading, prices are slightly delayed because of the time it takes to call multiple liquidity providers.

That said, however, it should also be noted that prices generated on RFQ platforms might have fees included in the price. While it's not a given that liquidity providers will immediately tack fees onto their prices, it can be a concern.

No Silver Bullet

RFQ platforms are not silver bullets. While they offer some benefits to institutional investors and those new to the space, the consensus is that there is no one trading protocol to rule them all. At BlackRock, Hodge says his traders use a variety of methods that includes RFQ platforms to get the blocks they need, depending on the size needed. David LaValle, US head of SPDR Capital Markets at State Street, says his firm caters to whatever clients want to use. "Our goal is to ensure a high degree of alignment with clients to enable them to buy and sell with a high degree of confidence and access to liquidity," LaValle says.

Browne from Cantor points out that the more educated ETF traders become, the more their trading methods will increase in sophistication, which involves using a multi-protocol model to reach the best possible liquidity sources.

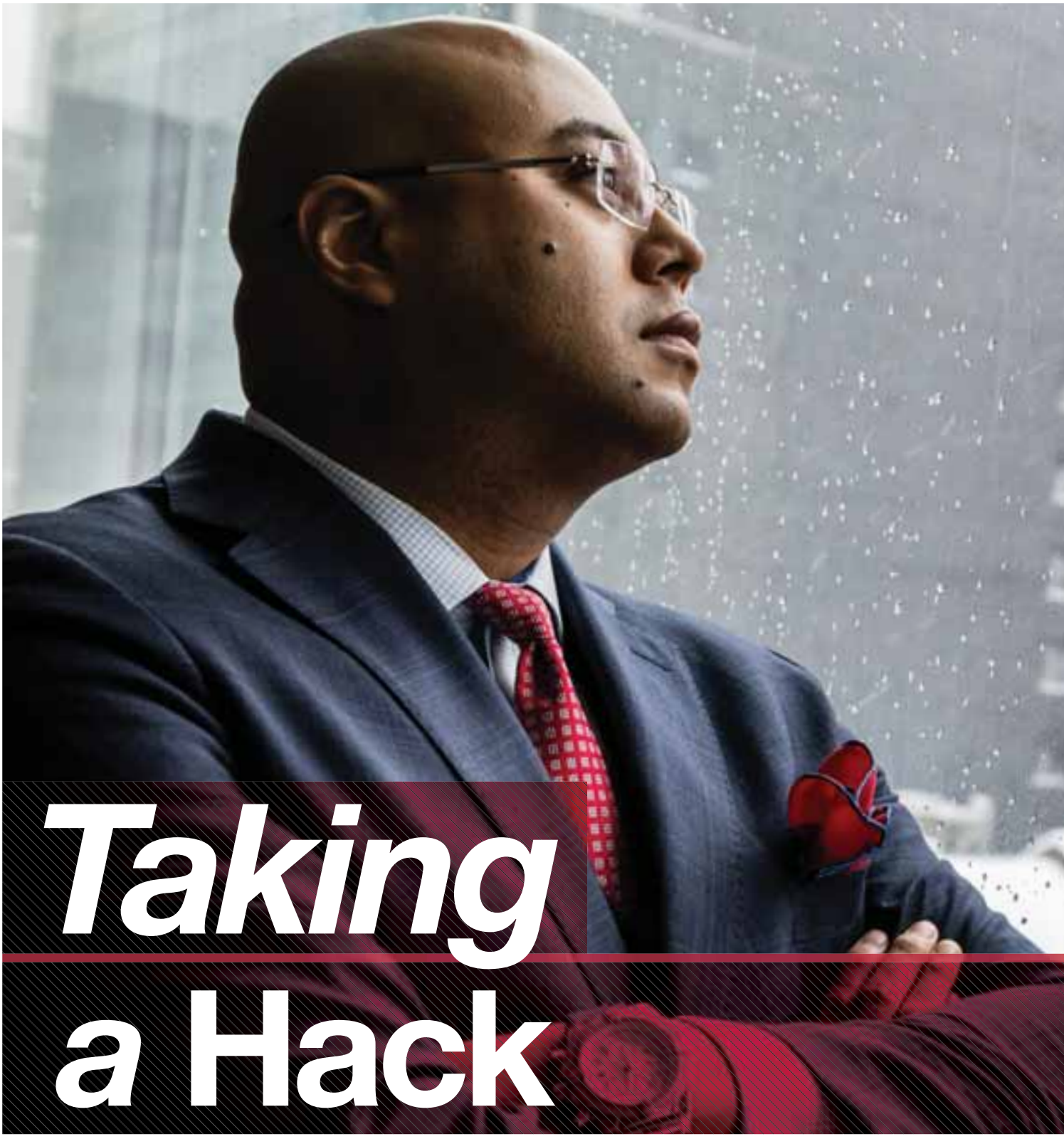
"Saying that RFQ platforms are driving liquidity or driving interest in the market is somewhat off the mark," Browne explains. "To say that it is driving liquidity is not a fair characterization—it's improving transparency to the least informed investor who doesn't understand the composition of the ETF. Once you've exited that education cycle, most people adopt multiple ways of engagement," he says.

Trading desks, of course, study which platforms or trading protocols they will use very carefully. And it seems that despite the potential hurdles RFQ platforms still need to work through, investors are steadily folding them into their toolboxes. RFQ platforms are definitely growing, particularly among institutional investors who are now warming to the idea of trading ETFs and moving away from active management, but it is just one of the possible ways to make a trade and investors are embracing many different avenues to get the volumes they require. W

Adam Gould
Tradeweb

SALIENT POINTS

- RFQ platforms are showing strong trading-volume growth, particularly from institutional investors looking to trade large blocks of ETFs.
- RFQ platforms can be a familiar avenue to trade for fixed-income traders interested in dabbling in ETFs, but it will take more education to fully harness the power of these systems.
- RFQ platforms offer audit trails and can, according to some sources, offer improved price discovery.
- Most desks prefer a multi-protocol approach to take full advantage of the ETF market and are folding RFQ platforms into their toolboxes.



Taking a Hack

Anthony Johnson, JPMorgan

Anthony Johnson is passionate about information security. He's similarly passionate about helping mentor individuals from minority groups and women in the white, male-dominated world of capital markets technology. As hackers become more sophisticated, new ideas will be required to combat them, and diversity might just provide the catalyst for the propagation of some of those new ideas. By Anthony Malakian with photos by Timothy Fadek

Anthony Johnson sits and

contemplates the question for a second: Have there been instances where you've felt that you were held back or passed over because of your color? He takes a beat, acknowledges that there have been "a couple" of instances, although these moments never paralyzed him or made him bitter.

"I don't want to say it's 'crappy' but sometimes you just have to work harder and it sucks," he says. "You need to find those mentors who will help you out. I've been blessed in that I've had a number of mentors who have helped me to figure things out, but I also think it's important to figure out how to be passionate about something and to give back. It's a tough question because when people feel like the deck is stacked against them, you can get into this spiral. The better answer is to find a reason in spite of it: It sucks, but let's figure this out."

Nontraditional

To better understand where Johnson is coming from, there are a few things you have to understand about the man. First, he's the kind of guy who often uses the word "super" to punch up adjectives: that's super cool; I'm super excited. He watches motivational YouTube videos in the morning to get himself hyped up for the day ahead, which can at times drive his wife, Hillary, crazy. Also, he doesn't have the typical background of a technology executive working in finance—or any industry, for that matter.

Anthony was born in Seoul to an African-American father and a Korean mother. His father was in the US Army and spoke Korean when he met his mother. The two were married, had Anthony, and when he was a baby, the family moved to Tacoma, Washington. The couple had another child—a daughter—but when Anthony was four, his father left and Anthony hasn't seen him since.

His mother, Yun, who was from a small village in the Republic of Korea, could only speak broken English. She had to figure out how to make a living in a foreign land without knowing the language. She did so by cobbling together jobs, such as piecing together blinds by hand.

While Johnson credits numerous mentors for his career's arch, his mother taught him determination, willpower and doing whatever it takes to make ends meet.

"For me, my mother was important. She didn't speak English and worked minimum-wage jobs and had that grit, so I was able to tap into that whenever I got frustrated," he says.

The other great influence on him growing up was his grandfather, Tommie Hamilton, the father of Anthony's dad. After his father left, Tommie remained to serve as a father figure. Tommie was a World War II Army veteran. While he has since passed away, he taught Anthony the value of having a strong work ethic and of not taking things for granted.

Johnson loves his job and the daily challenges it poses, but he also wants to mentor others and teach the lessons that Yun, Tommie and others have passed on to him. And now that he's the proud father of a baby girl—Lianna—he also wants to help not just people of color, but also talented women navigate the information security sector.

New Ideas

When you walk into Anthony Johnson's midtown Manhattan office at the JPMorgan building on Madison Avenue, it's hard not to notice that there aren't many chairs in the room. In fact, on this chilly December afternoon, there are, in fact, zero chairs in the room. Yep, he's the kind of guy who prefers to stand at his high-countertop desk when working. That's something else you need to know about Johnson to better understand him—he served in the US Air Force and carries himself with that distinctive military air in that he stands erect, makes constant eye contact and delivers a firm handshake.

"We're starting to see innovation come out of Silicon Valley over the last year or so. But a lot of the stuff we're wrestling with is still firefighting: passwords, firewalls and access certifications. When you get diversity of thought, you look at problems a little bit differently."

Johnson is the managing director and business information security officer for JPMorgan's Corporate and Investment Bank (CIB). He joined the firm one year ago from Fannie Mae, where he was the government-sponsored entity's global chief information security officer (CISO) in Washington, D.C., for two years. Prior to that, he spent two-and-a-half years as GE Capital's Treasury CISO.

Every cyber program fundamentally begins with education that entails trying to get senior leaders to understand vision, direction and make sure everyone is grounded in the same program. But no longer a global head of information security—at JPMorgan, that job belongs to Rohan Amin—Johnson's remit is dealing with the relevant cyber threats specifically for the firm's CIB, which sees trillions of dollars move through the unit on a daily basis.

Johnson is black—so he's obviously very connected to this issue—but he believes that building diversity throughout the industry will be key to handling new threats.

"When people come from different backgrounds, you get completely different perspectives to a problem that needs to be solved," Johnson says. "So within cybersecurity today, we really haven't had a unique idea in maybe 20 years if you really think about it: 20 years ago we were talking about privileged accounts, passwords, knowing where your data is, knowing your systems, patching vulnerabilities and so on, but what is the innovative thinking that we've pushed through? Now, we're starting to see innovation come out of Silicon Valley over the last year or so. But a lot of the stuff we're wrestling with is still firefighting: passwords, firewalls and access certifications. When you get diversity of thought, you look at problems a little bit differently."

Risky Business

Johnson wears a three-piece suit Monday through Thursday, and on Fridays—when many others in the building are wearing jeans—he allows himself the comfort of going sans vest, but still wears the suit. He doesn't care

"In cyber, we keep talking about the return on investment and capital, but why are we thinking like that? We should think of it like fraud—you don't want fraud, but there's a certain amount that has to be written off because you know it's going to happen."

much for eight hours of sleep, because, he reasons, if you can limit yourself to five hours, in nine months you'll have been an extra month more productive than most in the world.

He believes it's important to educate people about the hype curve when it comes to cyber. The first cyber-attack a company takes, the board offers up a blank check; more mature organizations understand that it's not as simple as throwing money at the problem, though cybersecurity comes with its fair share of green. JPMorgan spent over $600 million on cyber last year.

JPMorgan—being one of the biggest targets in finance—is well along the maturity curve. But as an industry, Johnson believes that firms need to move beyond just thinking about cyber as a security issue and view it more as a risk-tolerance issue. "In cyber, we keep talking about the return on investment and capital, but why are we thinking like that?" he asks. "We should think of it like fraud—you don't want fraud, but there's a certain amount that has to be written off because you know it's going to happen. Looking at cybersecurity today, you're not going to stop everything and there's a certain amount that you have to manage through. As a result, it becomes more of a cyber-risk tolerance discussion; that's something that organizations have to migrate to. Just like how you have a fraud-risk tolerance or credit-risk tolerance, you should have a cyber-risk tolerance."

Feeling Vulnerable

Knee-jerk reactions are commonplace in the financial services industry, especially with something that can leave a firm feeling vulnerable and helpless. That's where education plays its role. "Cyber is a little bit different than fraud because it can be fully catastrophic to a company, so you have to prepare for those black-swan cases. But you also have to look at normal cyber events and ask, 'Is this within our tolerance?' The only way to do that is through consistent engagement," Johnson says. "After time, it will become a more normalized discussion. This wasn't on the minds of boards and CEOs five or 10 years ago."

Cybersecurity is part industry standard, part firm-specific. Consider the scenario at Fannie, a firm that was one of the hardest rocked by the global financial crisis, where budgets were essentially frozen in the wake of the crisis. Then, as the threat of a major hack became increasingly worrying, the frim went from a standstill to a period of heavy investment to bolster its defenses.

At JPMorgan, it's been more about simplifying cybersecurity. What that means is reducing silos and footprints, and getting rid of systems and permissions that aren't necessarily going to reduce the likelihood of suffering a major hit. "The model that I used at Fannie Mae for the entire program was: get right, get small and see big. That's how I explained all cybersecurity to everybody," Johnson says. "That's not the exact same model that I'm using here because we're a little bit different, but there are similar aspects. We have to simplify what we're doing."

While education is not a silver bullet to the cybersecurity threats facing banks, there's also not any one piece of technology that will protect a firm. When it comes to cybersecurity, hackers will always be ahead of the curve. "Most people want security to be like a ninja: You don't want to see it or be intrusive, but you want to know you're safe. But we're not there from a technology perspective yet," he says.

A Mover

Johnson has moved around … a lot. He's lived for varying degrees of time in Seoul, Tacoma, Colorado Springs, Virginia, Connecticut, DC, and now New York. Whether from his family, from the military or from colleagues

CISOs AND CYBER THREATS

For more on how JPMorgan's Anthony Johnson views today's cyber threats and how CISOs need to view their job, see page 7.

ANTHONY JOHNSON

FUNDAMENTAL DATA

Name: Anthony Johnson

Age: 35

Hobbies/Interests: Cryptocurrency, sci-fi

Greatest Business Success: "I've overseen a lot of cyber projects and initiatives, but I think what I'm most proud of are the number senior cyber leaders that I've been able to help develop, mature and grow in the industry."

Greatest Business Mistake: "The biggest mistake I've made was associated with a project a long time ago where I didn't understand the business value of a process and system we were trying to secure. Without the context of what we were protecting, I failed to really be a part of the solution beyond a check box. That's when I learned how important it is to understand the business. Be a business leader first then a cyber-security leader."

Most Influential Mentors: "Brett Justice (former Senior NCO in the US Air Force); Grandfather, Tommie Hamilton; YouTube and books (I watch leadership talks, and TED talks on YouTube nearly every day)."

in the information security sector, Johnson's movements have provided him with a well-rounded education that he's now looking to pass on to others.

Education and mentoring are in the same sphere. While at Fannie Mae, he would work closely with DC public schools. He remembers giving a talk to a classroom of 13-year-olds, discussing how he got his start in technology. There was one black teenager in the room who didn't appear to be paying much attention. The boy's teacher walked up to Johnson and said that while it might look like the kid was disinterested, he was in the middle of compiling three programs that would soon be going live in the app store and that the boy could write code in seven different languages.

"I think the problem that we face is that of a pipeline," he says. "People are self-selecting themselves out, for whatever reason. There aren't a lot of role models where you can say, 'That person kind of looks like me.' That's not everywhere, but it's more the exception and not the rule. So that's something that I'm super passionate about and trying to figure out how I can get involved."

Like it or not, hackers are becoming more sophisticated and technology is becoming cheaper, which cuts both ways: It makes Johnson's job that little bit easier, but so too does it allow hackers to more easily assemble the tools of their trade.

Effective cybersecurity programs, therefore, are going to require new ideas. Maybe Johnson will help provide those ideas or maybe they will come from someone he mentors. Maybe they will come from his daughter. "My sister and my mother never really had the types of opportunities their male counterparts had. It's also struck home after having a daughter and thinking about what types of opportunities she would have. She should be able to do whatever she wants, but we don't have that in our ecosystems today," he says. "So I'm passionate about that. There's massive underrepresentation of minorities, in general." W

CAT CONSTRUCTOR

Why Thesys Won, Finra Lost and What Comes Next

On January 17, the self-regulatory organizations announced that Thesys Technologies had won the right to build the Consolidated Audit Trail, putting it in charge of what will be one of the biggest financial technology projects in the history of the industry. Dan DeFrancesco speaks to those familiar with the process about what led to the New York-based vendor's win over the incumbent Finra, and what the industry can expect going forward.

The Consolidated Audit Trail (CAT) has been on a long and arduous road since the concept was first publically discussed by regulators on May 26, 2010. It was on that day that the Securities and Exchange Commission (SEC) held an open meeting to propose a rule requiring the industry to build a massive audit trail for tracking and storing information on every order, cancellation, modification and trade execution for exchange-listed equities and options in the US markets.

The meeting came less than a month after the Flash Crash, which saw the Dow Jones Industrial Average (DJIA) plummet almost 1,000 points in a matter of minutes, before largely recovering those losses before the market close. Regulators' inability to piece together what caused the event in its immediate aftermath caused the SEC to rethink the way it was collecting and storing data, leading then-SEC chairman Mary Schapiro to propose building the CAT.

It would be another two years before the SEC gave the CAT the green light, approving Rule 613 under Regulation National Markets System (Reg NMS) on July 11,

CONSOLIDATED AUDIT TRAIL TIMELINE

The creation of the CAT has been a process over six years in the making. A lot has happened during that time. Here is an abbreviated timeline of some of its most important milestones.

- May 6, 2010 – Flash Crash occurs.
- May 26, 2010 – SEC holds an open meeting proposing a rule to build a Consolidated Audit Trail (CAT).
- July 11, 2012 – SEC adopts Rule 613 under Reg NMS that requires SROs to create an NMS plan to build the CAT.
- Feb. 22, 2013 – SROs announce the creation of the CAT Development Advisory Group (DAG) made up of industry firms to help the SROs create and implement the CAT.
- Feb. 26, 2013 – CAT Request of Proposal (RFP) published.
- March 25, 2013 – SROs name 15 firms that are part of the CAT DAG.
- Feb. 21, 2014 – SEC approves SROs selection plan for how they should review, evaluate and narrow down bids submitted for building the CAT.
- April 24, 2014 – SROs name 10 qualified bids from list of 31 initial bidders.
- May 2, 2014 – SROs add 12 additional members to the CAT DAG.
- June 23, 2014 – SROs start study to analyze implementation cost of the CAT.
- July 1, 2014 – SROs select six shortlisted bids to build the CAT.
- Sept. 30, 2014 – SROs file CAT NMS plan with the SEC.
- Feb. 27, 2015 – SROs file amended and restated CAT NMS plan with the SEC.
- June 17, 2015 – SEC approves Amendment No.1 to selection plan regarding bidders' ability to revise bids prior to the SEC's approval of NMS plan and certain nuances for voting for the plan processor.
- Sept. 24, 2015 – SEC approves Amendment No. 2 to selection plan, allowing an SRO that is a bidding participant to recuse itself from voting in any round to select the plan processor in which it is affiliated with one of the bids being considered.
- Nov. 16, 2015 – SEC reduces shortlisted bids from six to three.
- Jan. 7, 2016 – SROs file amended and restated CAT NMS plan with the SEC.
- April 27, 2016 – SEC publishes NMS plan for the CAT, seeks public comment.
- Nov. 15, 2016 – SEC approves NMS plan.
- Jan. 17, 2017 – SROs select Thesys Technologies as CAT plan processor.

UPCOMING MILESTONES

- March 2017 – Business clock synchronization for SROs and broker-dealers required.
- November 2017 – SROs begin submitting data to the CAT.
- January 2018 – SROs implement enhanced surveillance based on CAT data.
- November 2018 – Large broker-dealers begin submitting data to the CAT.
- November 2019 – Small broker-dealers begin submitting data to the CAT.

2012. The decision then put the onus on self-regulatory organizations (SROs) to submit a National Markets System (NMS) plan to the SEC detailing how to create, implement and maintain the CAT.

The CAT then spent over four years mired in red tape before arguably the most important decision of the entire process was made: selecting a firm to build the massive audit trail.

Thesys Technologies, the vendor arm of high-frequency trading firm Tradeworx—in addition to its partners on the bid: technology giant IBM, law firm Latham & Watkins, and brokerage Rosenblatt Securities—was selected. With the SEC estimating a cost to the industry of $2.4 billion initially and $1.7 billion thereafter annually, Thesys will now be tasked with leading one of the largest financial technology projects the industry has ever seen.

But how did we get here? How did a firm that is not yet 10 years old outlast 30 other bidders, including an organization that has established itself as an integral part of the financial markets and runs a system similar to the CAT, albeit on a much smaller scale? How was the process impacted by taking up the better part of a decade? And what still needs to be done before the CAT is fully functional?

Waters spoke to multiple sources—both directly involved in the CAT process and familiar with how it unfolded—on condition of anonymity about why things panned out the way they did and what the industry can expect going forward.

Overcoming the Incumbent

When the SEC first officially posted its request for proposal (RFP) for the CAT on February 26, 2013, there was one clear favorite: the Financial Industry Regulatory Authority. Finra currently operates the Order Audit Trail System (Oats), a platform many consider to be the CAT's predecessor and one that will likely be decommissioned once the CAT is up and running.

Most in the industry believed Finra was the default choice due to its Oats experience. Even in the days leading up to the final vote, Finra—one of three finalists along with Thesys and FIS, which acquired SunGard in November 2015—seemed to be in the driver's seat, according to a source involved in the process. "I think we were still considering that most people would go with

Finra because it's kind of a conservative choice," the source says. "There were enough exchanges on Finra's side to push it through."

Another source familiar with the process says Finra's advantage over the competition came from the belief that it could get the CAT up and running faster and more easily than other bidders due to the infrastructure it already had in place from running Oats for a number of years. "We were always going under the notion that they had five to six years to modify Oats so that it would have been a seamless transition. The collection process would have been almost seamless for the industry to just continue to use their same gateways and understand connectivity and their interactions. The same personnel would be comfortable to just one day switch over and call it CAT instead of Oats. Ninety percent of what needed to be done from the industry perspective for the broker-dealers or the venues would have been similar," the source says. "Finra was the easy choice. It was theirs to lose, and at the last minute they couldn't satisfy a basic requirement."

Cyber Importance

The requirement in question was that of cybersecurity, according to several sources. It's an area that has grabbed the industry's attention in recent years due to the amount of Personal Identifiable Information (PII) the CAT database will hold, which eventually led the SEC to make modifications to the NMS plan regarding tighter data security requirements before approving it in November 2016.

Finra's issues weren't around the strength of the bid's cybersecurity but instead about what would happen if something went wrong. According to two sources—one involved in the process and one familiar with it—Finra's unwillingness to take on all liability in case of a potential breach of the CAT database was a non-negotiable point for the SROs. "Finra basically said that if things go wrong, or if it's hacked, the liability is going to be shared between the SROs," a source involved in the process says. "We were like, 'Uh, no. No it won't.'"

> "You need to move the computation to where the data is. If you force everybody to download all the data they need to do their analysis and then use their own analytical tools, you're creating 12 copies of the CAT, and you're creating 12 times as big a security problem."
> Mike Beller, Tradeworx

Another source involved in the process says he didn't see Finra's stipulation about sharing liability to be as big of an issue, but admitted that Finra's bid was presented as running the CAT as an industry utility with shared responsibilities among the SROs. "Every organization is concerned about cybersecurity and looking for, depending on your perspective, reducing your exposure for liability. That's standard for anybody," the source says. "There were some nuances in the contract terms that we had discussed with both sides. So others may have latched on to those more than I did. I think it was an area that some felt strongly one way and some felt the other way."

Thesys has long been a vocal proponent of the importance of the CAT's cybersecurity. Mike Beller, Tradeworx CEO and a managing partner at Thesys, has brought up the topic during previous conversations with *Waters*, always citing the firm's choice to include custom analytics and big-data tools directly in the database as a differentiator. "You need to move the computation to where the data is. If you force everybody to download all the data they need to do their analysis and then use their own analytical tools, you're creating 12 copies of the CAT, and you're creating 12 times as big a security problem," said Beller while speaking to *Waters* back in June 2016. "Not because there is anything wrong with the IT capabilities of the SROs—far from it. It's more an issue of, if you could have one database that you could have all your resources focused on, it seems better than having 12 copies and having everybody's security teams beefed up to address that."

One source familiar with the CAT process believes Finra's resistance to taking on more liability in its bid could be tied to the change in leadership the firm had during the process. The retirement of Richard Ketchum as CEO and chairman and appointment of Robert Cook as president and CEO of the firm in the second half of 2016 could have impacted Finra's interest in the CAT bid, according to the source.

In addition to making the initial bid on the CAT, Finra also proposed building the Comprehensive Automated Risk Data System (Cards) under Ketchum. Cards, which was proposed in late 2013, would have collected standardized information regarding account activity and security that could then be run through analytics to identify potential red flags in terms of sales practice misconduct.

The platform was criticized by many in the industry who felt it would be targeted by hackers due to the amount of valuable information it would hold and questioned the need for it when the CAT process was already in full swing. Ketchum announced in May 2015 the project would not proceed until concerns brought up during the comment period were addressed before shutting down the proposal entirely later that year.

The source says Finra's new leader potentially might not have shared the same interest in getting involved in these types of projects. While both men worked for the SEC prior to joining Finra, Ketchum also spent time working on the business side of the industry with stints at NYSE and Nasdaq. Cook, meanwhile, was a partner at a Washington, DC-based law firm focused on the regulation of securities markets and market intermediaries before joining

the SEC and then eventually Finra. "I got to believe Ketchum would have sold his first born to get the CAT. He would have done whatever they needed to get it," the source says. "Cook comes in and he's not business-minded. He's compliance minded, and he probably said this isn't the right place for us to be." Ketchum, who was named to MarketAxess Holdings' board of directors in February effective April 1, declined to comment.

Another source involved in the CAT process says Finra seemed to have a waning interest in the competition down the stretch. "Finra seemed to not be sure whether it wanted to be in the competition or not," the source says. Finra declined to comment on its bid, instead reiterating the statement it made the day it was announced that Thesys had been selected as the plan processor: "Finra appreciates the opportunity to have submitted a highly competitive proposal to become the processor for the Consolidated Audit Trail. Although ultimately we were not selected to be the processor, Finra will work closely with all parties toward a smooth transition to the CAT. Finra remains committed to its robust program of cross-market surveillance and looks forward to enhancing that oversight with the uniform, comprehensive data that the CAT will provide."

Long Process

Finra wasn't the only firm to have experienced a change in leadership while bidding on the CAT. The financial industry is a space full of mergers and acquisitions, departures and arrivals, and the time between the initial RFP and final selection—nearly four years—is a long period for a company to go without any shake-ups. In fact, all three finalists dealt with some dramatic changes during the bidding process.

Manoj Narang, the founder and CEO of Tradeworx and a managing partner at Thesys, departed the firm in January 2015, leaving Beller, who was Tradeworx's CTO and already a managing partner at Thesys, to take over the role of CEO at Tradeworx.

SunGard faced an even bigger transformation. Technology giant FIS announced that it was acquiring the Wayne, Penn.-based vendor in August 2015, with the deal ultimately closing some three months later. A source familiar with the process says changes like these have to be expected when a plan takes this long to unfold.

"In the world of technology, if you're going to take six years to do something, every one of your bidders is going to change. That's why it's incomprehensible why this thing dragged on this long," the source says. "You can't let it go on so long that the companies don't exist anymore or, for whatever reason, change dramatically so that they are unwilling to stand behind what they do."

Midas Touch?

That said, it's not as if the SROs picked a lemon to build the CAT. Nearly every source interviewed for this story spoke highly of Thesys' capabilities in terms of its technology.

"This is a highly technical project and Thesys seemed very keen to take on all of the grizzly elements," a source involved in the process says. "They didn't shy away from that."

Another source points to Thesys' use of the cloud and the potential cost efficiencies that will provide for the industry when it comes to scalability as major benefits influencing the decision.

The challenge for Thesys, according to some sources, is regarding the service aspect of the CAT. While the vendor has no problem building the necessary machines for trade capture, having the required infrastructure in place to efficiently handle an entire industry looking to report into them could be an issue.

"A lot of folks look at this as just a technology solution. It's not just implementing a technology solution—it's basically almost a separate company because you also have to handle all of the administrative aspects of running the CAT, including the billing aspects on behalf of the SROs, the collection side, and also the analysis side in regards to working with the SROs and Finra to make sure that all of the various information that is submitted by the broker-dealers is normalized," a source familiar with the process says. "I have no concern that they can't implement the technical solution, but in putting together and running a whole CAT administration and processor along with dealing with some of these oversight requirements that they are going to have to do for the industry, I think that will be a challenge for them."

Anshul Anand, a vice president at Thesys who led its CAT bid, points to the firm's partners on the bid when addressing those concerns. "While Thesys is leading the CAT processor effort, we're fortunate to have world-class partners in IBM and Latham & Watkins. We'll be drawing on IBM's extensive operational experience from decades of building complex technology and support systems. Latham & Watkins brings a wealth of expertise on the compliance, oversight, and governance side," Anand says. "Thesys CAT will leverage our collective knowledge across technology, operations, compliance and market microstructure."

As an indication of their ability to build platforms for regulators, one source involved in the process points to Thesys' experience running the Market Information Data Analytics System (Midas), which collects and processes data from consolidated tapes and proprietary feeds from exchanges to help the SEC surveille the markets.

However, another source says that's not a like-for-like comparison as the CAT is a far more complex project. "These are data feeds that they now have to create and manage and figure out and manipulate and translate and convert. Then they have got to store them. Then they have got to make them available, spin them out in a way that is compliant under an agency rule—that's a bazillion times more complex than slicing and dicing already-delivered data feeds and providing that to the SEC; it's not even in the same hemisphere," says the source. "That's like playing Legos as a baby as opposed to doing brain surgery. They're on opposite ends of the spectrum."

Not everyone was as supportive of the decision to award the CAT project to the Thesys consortium, though. One source involved in the process questioned whether the SROs were interested in picking the best candidate. "When the result was announced, I heard a few folks say, 'Well, if you had the option to choose your own auditor, would you choose the most capable, or the most incapable?" the source says.

Going Forward

As important as selecting a plan processor was, there is still a long way to go before the CAT is up and running. According to a source involved in the process, the next key hurdle is getting the contract signed between the SROs and Thesys. And while the negotiation process is important, the group can't solely focus on the contract without moving forward with other parts of the plan, according to the source.

Clock synchronization for SROs and broker-dealers is the first upcoming deadline. According to SEC Rule 613's implementation timeline, exchanges and broker-dealers must be within 100 microseconds and 50 milliseconds, respectively, of the time maintained by the National Institute of Standards and Technology (NIST) by March this year.

Reporting to the CAT officially begins in November, with SROs submitting data to the central repository. However, according to a source, that piece is likely to be less complicated as the SROs are already aggregating a lot of their data. The bigger hurdle—and the one more likely to affect the CAT timeline—is the requirement of large broker-dealers to report to the platform, which comes into effect in November 2018. Small broker-dealers must begin reporting the following year. "That is going to be a lot of work, because it is both internal work at the firms and external work, too," the source says. "Whether it's that or the smaller broker-dealers reporting a year later, I think it's that piece in many ways that is going to be the more complicated one."

Necessary?

Perhaps an even more important question that needs answering is whether the entire process is a worthwhile endeavor. One source points out that if getting the CAT up and running is so vital to the markets then why has it taken so long to get this far, and what happens when the technology used by the industry continues to evolve?

"I think that if there really was a need for a CAT, it would have already been solved. Waiting six years just for the selection process shows it's not mission-critical," the source says. "I think it's important that you can track data, but I think that technology is advancing with such speed that once this build is done the market structure might look different where there are other types of technologies being used. What if all the transactions are done on a blockchain? What collection of data should you download, for example? I think that it's a challenge to be a regulator trying to come up with technical solutions, but I'm not convinced I understand the rationale for trying to solve it this way." W

The European SEFs

From January 2018, European capital markets participants will trade derivatives on organized trading facilities, or OTFs, which have been compared by many—including European regulators—to swap execution facilities in the US market. Aggelos Andreou looks at the similarities between the two models and attempts to put the scattered pieces of this puzzle together.

In October 2013, in the wake of the Dodd–Frank Wall Street Reform and Consumer Protection Act, which entered the statute books some three years earlier, the US markets were introduced to swap exchange facilities (SEFs) for the first time. SEFs are swaps trading platforms designed to yield greater levels of pre-trade transparency. The Commodity Futures Trading Commission's (CFTC's) move was a bold one, aimed at firming up the regulatory environment around one of the industry's largest over-the-counter (OTC) markets.

Something similar is about to transpire in Europe, as the European Commission (EC) is primed to introduce Organized Trading Facilities (OTFs), a new type of derivatives trading platform, set to take effect in January 2018 under the Mifid II regulation. When initially introduced, SEFs generated a wave of uncertainty across the US markets, a scenario likely to be mirrored by OTFs, with some even questioning their necessity at all. A key problem is that the relevant legislative text is still on level 1. In EU language, that means the regulators have set the framework within which these platforms will operate, although involved parties will have to wait until level 2 is completed to receive details about how they are required to operate them.

The European Securities and Markets Authority (Esma) told *Waters* that the much-awaited consultation paper would be released no later than June this year. However, the Authority declined to furnish details as to what questions it would address in the paper or shed any light on the final version of the legislation. Patrice Aguesse, head of the market regulation division at the regulatory policy and international affairs directorate of the Autorité des Marchés Financiers (AMF) in Paris, says that OTFs are new entities and will therefore take some time to take shape. In the meantime, regulators understand the industry's demands for a final roadmap. "We have questions ourselves, as well," admits Aguesse. "We are trying to answer them as soon as possible, but that doesn't mean tomorrow."

> "The directive is pretty clear: In the case of multilateral activity carried out on a system, you have to put in place something that looks like a platform for derivatives and also for those that are not submitted to a trading obligation." **Patrice Aguesse, Autorité des Marchés Financiers**

The Genesis

European regulators designed OTFs as a means of helping market participants meet their reporting requirements under Mifid II. The new regulation affects both equities and non-equities, as all trades will offer greater levels of post-trade transparency, even if participants execute transactions in the OTC markets. Aguesse explains that OTFs were created to meet trading obligations around derivatives. "Following the post-crisis G20 roadmap, legislators created trade repositories," he says. "In order to reduce counterparty risk, they imposed central clearing obligations via central counterparty (CCP) clearinghouses. More transparency is needed for investors in the market, and these kinds of platforms will improve pre-trade transparency."

Under the original Mifid regulation, multilateral trading facilities (MTFs) dominated the trading landscape in the European markets. But when drafting the Mifid II framework, the European authorities realized that MTFs were too demanding for products such as derivatives, which traditionally are designed for the industry's largest players. "We created a third kind of platform, which is a happy medium between regulated markets and MTFs and the OTC markets," Aguesse says.

A second reason for introducing OTFs, according to the French regulator, was that Esma also wanted to bring about more transparency on all of the platforms created but not regulated under Mifid I, such as crossing networks. "The directive is pretty clear: In the case of multilateral activity carried out on a system, you have to put in place something that looks like a platform for derivatives and also for those that are not submitted to a trading obligation," he says. "So far we have only had a regulated market on MTFs, and we saw that creating a third platform would be more designed for this type of activity."

Simply put, says Aguesse, OTFs are like the SEFs in the US.

SEFs

Alex McDonald, CEO of the Wholesale Markets Brokers' Association (WMBA), tells *Waters* that the fundamental difference between the two platforms lies in the way they operate. "SEFs are trading venues that operate under the US Commodity Exchange Act and the Dodd–Frank Act, with rules set by the CFTC and the Securities and Exchange Commission (SEC), which is a substantially different legal framework to that in the EU," McDonald explains. He says that certain activities carried out on SEFs could also be carried out on OTFs. "They will practically be very close to SEFs because these types of venues will be operated by the same group of firms and will cater to the same set of clients," McDonald says.

Alex McDonald
Wholesale Markets Brokers' Association

Roger Cogan, head of European public policy at the International Swaps and Derivatives Association (Isda), also notes some similarities: "You have certain SEFs in the US that use discretion to bring together a trade, which is similar to an OTF," he says. "They also have the potential to achieve comparable outcomes." (*See table.*)

However, the undisputable commonality between the two platforms is the role of the interdealer broker, which, similar to SEFs, will probably take the lead in operating OTFs when they come into being. Aguesse says this is yet to be clarified since intermediaries have to meet certain criteria. "It's a bit premature to figure out who is going to operate OTFs," he says.

However, McDonald says the underlying technology and connectivity will be common and will be run by the same operators and

brokers. "All of these would largely be either subsidiaries of exchanges or independent broker-dealers," he says. "There could also be some investment firms that may seek to establish venue functionality as well, although at the moment we are not aware of any of those."

Modest Numbers

Currently, there are about 30 SEF operators in the US, most of which are already registered and offering an MTF platform in Europe. A number of them are planning to operate OTFs when Mifid II comes into effect, but that doesn't mean the rest will follow. That decision will boil down to whether or not their business model includes discretionary trade.

TP Icap is one such firm that runs a SEF in the US and has also decided to apply for an OTF license. David Perkins, Icap's global head of electronic broking, says that he expects the majority of Icap's registered MTF platforms to be operating as OTFs under the Mifid II regime. "OTFs are hybrid venues," he explains.

Mark Croxon
Bloomberg

"They have an element of electronic technology for registry compliance, but they are used in leverage by voice brokers to capture liquidity—they execute in a discretionary way."

Perkins says both SEFs and OTFs share the element of transparency as both have pre- and post-trade obligations, transparent rule books, and fee schedules. Icap's strategy is to find the correct entities and register more than one OTF. "We are currently finalizing our Mifid II venue design to ensure that we develop efficient and compliant workflows," Perkins says.

Conversely, Bloomberg, which operates a SEF in the US and an MTF in Europe, has no plans to launch an OTF. Mark Croxon, head of regulatory and market structure strategy at Bloomberg, says OTF's discretion element is the reason behind the decision. "The regulators introduced OTFs to accommodate the business of interdealer brokers into consideration under Mifid II, as a large part of what they do on the voice side is matching buyers and sellers, exhibiting some degree of discretion," he explains. "That's not Bloomberg's business model. Part of our business is to offer systematic trading services, which one can find in our MTFs."

Fear of Contagion

In 2013, SEFs were launched in the US in what had been a previously unregulated OTC market. As a result, they triggered a lot of uncertainty around the rules of how they should be implemented and operated. SEF operators resorted to legal advice due to a number of operational gray areas, which in turn led to different interpretations of the law.

"What we saw was a split of liquidity between the counterparties with US names and those with non-US names," Perkins recalls. "There were different interpretations by different banks who knew and understood on a matrix who could trade with whom, when on or off the SEFs. It took a long time for the market to settle down."

According to McDonald, there is still something of a state of flux in the US market with respect to the framework determining how SEFs should operate. "There are moves afoot now, particularly in the US under the new administration, to pull back some of the detailed rules that have forced this fragmentation, and put all trading onto SEFs or designated contact markets so that it is more aggregated," he says.

The question of whether OTFs follow the same path as their US counterparts is certainly a consideration for the European industry. "This will most probably not be the case with Mifid II," says Perkins.

Croxon agrees, but estimates that OTFs might experience some issues around the time they're scheduled to go live. "There might be some uncertainty, and some slight fluctuations in volumes as people have to get

SEFs vs. OTFs

	SWAP EXCHANGE FACILITIES	ORGANIZED TRADING FACILITIES
REGULATION	Dodd–Frank Act (2013)	Mifid II (2018)
ASSETS	Derivatives/Bonds	Swaps
MATCHING SYSTEM	Discretionary	Discretionary
RESTRICTIONS	Matched principal trading allowed if client informed	Matched principal trading allowed
	Parallel operation of SIs forbidden	
PURPOSE	Regulate derivatives and meet pre-transparency obligation	Regulate Swaps

used to the processes of interacting with the trading venues," he says. "But after that, once they have the protocols and the processes in place, I don't think the volumes will really change a great deal."

Road to Equivalence

Croxon's view is supported by the argument that at the end of the day, SEFs and OTFs will be deemed equivalent as far as cross-border regulation is concerned. McDonald says this cross-border issue might evolve so that US-based firms could comply with their regulatory obligations under the Dodd–Frank Act by trading in the EU and EU firms can comply with their Mifid II obligations by trading on US venues. "There will be more formal recognition of the cross-border requirements for liquidity to transit and transform," he says. "This deferential requirement will enable wholesale markets to work in a global sense rather than being fragmented across regional lines."

Cogan says that equivalence might prove inevitable in the long run. "Many European market participants were discouraged from transacting with US market participants for fear they would end up under a US nexus," he says. "The equivalence dimension applies to the venues you can choose and use, based on the regional rules you want to abide by."

Questions

For the time being, market participants are eager to get answers to a number of critical questions, given that for many, OTFs will have a material impact on their day-to-day lives. To date, regulators have yet to specify which derivatives will be traded on OTFs, while the wider industry still awaits clarification on the Approved Publication Arrangements (APAs) with which traders should fulfill their OTF reporting obligations. Furthermore, Isda's Cogan has raised a number of issues, saying that while the rules are largely set, the actual understanding of how OTFs will work is anything but simple. "Where do the parameters lie between OTFs and MTFs, and what are the boundaries of discretion?" he says, adding that it is crucial for the derivatives industry to further distinguish the role of OTFs and systemic internalizers. "Those boundaries make a difference in principle to market participants because it determines what the commercial offer is from individual firms and what kind of products they can offer to their counterparties and clients," he says.

> "OTFs are hybrid venues. They have an element of electronic technology for registry compliance, but they are used in leverage by voice brokers to capture liquidity—they execute in a discretionary way." David Perkins, Icap

Agguesse says the regulators added discretionary orders to OTFs to match market practices, but admits that people find it difficult to interpret how that might work. "We already have some definitions of what discretionary is, but it is true that we need more clarification and Esma is currently working on it," he says.

But the concerns don't stop there: Time constraints are causing confusion for participants, especially those planning on operating an OTF. "It's important to ensure that people are working on the same page because if they have a particular interpretation of the OTF and then there's guidance suggesting that they are wrong, that could be very costly," says Cogan.

As for Agguesse and the AMF, it's fair to say that the EU's regulatory wheels are turning slowly. "We are doing our best," Agguesse says. "For some this is not enough, but that's all we can say; we are working hard, but OTFs are just one question among many others from Mifid II." W

SALIENT POINTS

- OTFs will debut along with Mifid II in January 2018, offering special trading venues where derivatives will be subjected to increased levels of pre-and post-trade transparency.
- OTFs have many similarities with SEFs; however, there are differences, especially when it comes to the products traded.
- The challenges posed by SEFs when they were launched in 2013 such as liquidity fragmentation are not of concern to EU market participants, due to the platforms' expected equivalence between EU and US jurisdictions.
- European regulators continue to struggle to firm up the final look and feel of OTFs, raising fears that they might prove to be prohibitively expensive to operate.

John Brazier

Why Can't the Buy Side Get to Grips with Mifid II?

With nine months left to prepare for the arrival of Mifid II in Europe, John asks why the buy-side community is still struggling to get to grips with how the regulation will impact technology infrastructures and applications.

The "man bites dog" aphorism is often the introduction most journalism students receive when it comes to identifying what is and isn't newsworthy; mundane news items that no longer have the power to enthrall will be pushed to the side (dog bites man, in this case) in favor of the sensational (man bites dog). However, that's not to say the less surprising news isn't important. One such example of this is a survey released in February by Northern Trust, which found a significant number of fund managers have yet to adequately prepare their technology stacks before the arrival of Mifid II at the start of next year.

This won't be surprising if you have any knowledge of the buy side, but it is still disheartening to hear that this section of the industry continues to be so woefully unequipped for a regulation that has been coming for so long and should have already been in place by now, had regulators not granted a 12-month reprieve.

Northern Trust's survey, conducted among attendees of the custodian's Annual Depositary and Regulatory Conference in October last year, found that 60 percent of respondent fund managers had not considered utilizing technologies as a response to the new regulatory requirements. The obvious caveat here is that a sample size of 100 fund managers only scratches the surface of the industry and cannot be truly representative of the global buy-side community. However, neither is it an insignificant portion of the market.

Is the buy side ready for Mifid II?
For more information and readers' feedback please join the discussion at **waterstechnology.com/buy-side-technology**

The language used to describe the survey results also offers some insight into the heart of the problem. Northern Trust says that 60 percent of fund managers have "not considered" technology as a solution to some of the challenges Mifid II represents. There has been a raft of new technology offerings and collaborations born out of Mifid II, and, to my mind at least, there's little reason to not be aware of the offerings available to handle whatever part of the regulation is causing headaches for fund managers. Trade reporting systems, algo-testing environments, more analytics systems than should really exist—all of these have been launched, not to mention the compliance-specific systems.

> "Whether regulators are willing to show leniency toward those firms that have not adequately prepared remains to be seen.

Systemic Issues

While it is harsh to judge the state of the buy side's readiness for Mifid II on the results of one survey, this is far from the only example I've found or heard that asset managers don't have their houses in order ahead of January 2018. During various conversations or panel discussions at conferences, I have found that there has been far too much focus placed on the apparent obstacles the regulation presents and the rationale coming from the regulators, rather than on the technology solutions not only to address the issues but to improve on existing processes. Commenting on the survey's results, Northern Trust's head of product and regulatory solutions, Robert Angel, says that while investment managers are now starting to think more strategically about regulatory compliance solutions, it is a long process and for the time being at least, many are simply focused on complying. Angel also asserts that a number of firms are still awaiting further clarification from regulators on aspects of Mifid II, as regulations are likely to evolve or change in the future. This kind of reactive attitude may have been suitable two or three years ago when the guidelines were less substantial, but at this point, it smacks of desperation more than anything else.

I'm not saying that I have all the answers, and there are genuine concerns around cost and operational burdens for asset managers to contend with while simultaneously complying with the incoming regulation. Once it comes into force, however, those issues will become more prominent as trade reporting, research unbundling, clock synchronization, algo testing and reference data, among many other changes, will mean firms have no option but to adapt their technology stacks and business processes.

Whether regulators are willing to show leniency toward those firms that have not adequately prepared remains to be seen, and despite the frequent assertion that Mifid II represents an opportunity rather than a challenge, that window is slowly closing. W

Don't Stop That CAT

Dan explains why the industry should look to get the CAT up and running, and quickly, or risk falling into the same trap as it has in the past.

Will CAT get off the ground?
For more information and readers' feedback please join the discussion
waterstechnology.com/sell-side-technology

Progress—yes, actual progress—was made with the Consolidated Audit Trail (CAT) earlier this year as self-regulatory organizations (SROs) selected Thesys Technologies, the vendor arm of high-frequency trading firm Tradeworx, as the plan processor responsible for building and maintaining the massive audit trail responsible for tracking and storing information on every order, cancellation, modification and execution for exchange-listed equities and options in the US markets. There is no doubt that selecting Thesys, which is partnering with IBM, Latham & Watkins, and Rosenblatt Securities on its bid, is a major step forward in the ultimate goal of getting the CAT up and running. However, now is hardly the time for the SROs and the Securities and Exchange Commission (SEC) to pat themselves on the back for a job well done, as there is still plenty left to do.

Same Mistakes

As I covered in my feature on page 25, getting to this point with the CAT has been no easy task. Financial technology projects don't happen overnight, but the lead-up to building the CAT has been positively glacial. It is a big endeavor, but waiting over four years to simply pick a firm responsible for building the audit trail seems a bit excessive.

It's debatable whether the process was impacted by the delay, but there is no denying the change some bidders faced internally between when the initial bids were submitted and when the final decision was made. The three finalists vying to build the CAT all had significant shifts at the C-level or as a company. Further delays while building and implementing the CAT will only lead to more issues.

Granted, the CAT will run as a separate entity from Thesys, and is therefore protected from any volatility the plan processor might suffer. If, for example, Thesys is acquired and the acquiring firm is not interested in running the CAT, a new group can come in and continue to maintain the audit trail. And while that's fine once the CAT is up and running, that type of transition will be much harder to execute while it's still being built.

It's not just a matter of the makeup of a company changing between now and the launching of the CAT. What about the actual technology? That was a point brought up by one of my sources familiar with the process that I found to be particularly interesting. The source asked what would happen if, for example, transactions were done on the blockchain. There is a good chance that how the markets operate 10 years from now will look significantly different to how they function today. That's not some bold prediction; it's simply playing the odds.

Look at the evolution we've seen in technology over the last 10 years. Is there any reason to believe that trend is slowing down? If anything, it's increasing in speed significantly.

According to almost all the sources I've spoken to, Thesys' technology is outstanding, and I'm sure they've accounted for the fact that the CAT will need to be able to adapt and evolve in the coming years. Thesys' use of the cloud also offers them the ability to be scalable and flexible.

But it's easy to see how continued delays could make things difficult. There could be a situation where the SROs begin reporting data to the CAT on time but the broker-dealers, both large and small, push back on their deadlines and delay the process.

> It's important to get the CAT up and running as soon as possible, as it's much harder to stop something once it has gotten started.

The CAT would then sit in a sort of limbo, collecting only some of the data it needs, while the technology in the space continues to evolve around it. It's one thing to update a system while it's already up and running, but it's a completely different task to have to onboard new clients while simultaneously changing the very system they've just begun to report into.

All of this is in addition to the fact that the new US president is against more regulations in the financial sector—all the more reason why it's important to get the CAT up and running as soon as possible, as it's much harder to stop something once it has gotten started. W

Emilia David

Skynet Is Falling

Artificial intelligence is becoming more sophisticated. And, while she understands the benefits of this evolution, Emilia confesses that every new advancement in AI also scares her.

Confession time: I'm one of those people who gets scared by artificial intelligence (AI). When I learned that Google had successfully taught its AI to create its own AI, my immediate thought was: "The robots … they're coming to kill us." It's overused, but when AIs start creating other AIs, it's impossible not to think about Skynet from the *Terminator* films.

And that is not the only experiment Google has done lately that has given me a Skynet moment. It ran its AI Deep Mind to play a fruit-picking game, and when it started to lose it got aggressive. (To find out more about advances in AI, read Anthony Malakian's thoughts on the Google AI experiments—he's less creeped out by them—and listen to the Waters Wavelength podcast too.)

Yes, reading about artificial intelligence often gives me the heebie-jeebies and it doesn't help that Elon Musk, Stephen Hawking and a bunch of other people a lot smarter than me have predicted that AI could bring about the end of humanity. The knee-jerk reaction of fearing the inevitable destruction of the human race is hard to ignore.

I know on an intellectual level how important it is to push the limits of what technology can create. That's how diseases are cured, inertia to change is overcome, and information is made more accessible. I know that in order for artificial intelligence to really mature, experiments on cognition, adaptation, and reaction are important. These experiments are necessary to seek and push the limits of the technology, creating a powerful AI that we know can take in and churn out information with as little human intervention as possible. But the technology needs to be pushed and developed before capital markets firms can go head-first into putting it to more and more use.

Of course, artificial intelligence is a potential game-changer for our industry. Consultancy EY takes note of the importance of investing in artificial intelligence in the long term. According to one of its reports, *Building the Investment Bank of the Future*, artificial intelligence can be used to credit evaluate clients. More use-cases of the technology, along with machine learning, will be made possible with even greater computing power.

> I know on an intellectual level how important it is to push the limits of what technology can create.

Roy Choudhury, partner and principal at EY's Financial Services Advisory, told me that investing in AI and robotics drives efficiency. "Banks are increasingly looking at tools that differentiate themselves from competitors and optimize costs," Choudhury says. "One of those tools is robotics, which can drive cost efficiencies on analytics."

What Google is doing creates a more robust technology that can consume more data, something which is of interest to many banks. Companies can even use artificial intelligence to parse large, fast-moving, unstructured datasets, providing there are rules placed around it, according to Sandeep Vishnu, partner at Capco's North American Finance, Risk, and Compliance practice. "AI and machine learning are two tools that can be used to look through data, but it needs to run on fuzzy logic so it can be adaptive and evolve," Vishnu says.

Should we fear or embrace AI?
For more information and readers' feedback please join the discussion at **waterstechnology.com/buy-side-technology**

At What Cost?

But still, AI tends to creep me out. I have to keep telling myself not to be scared that some of the AIs built by Google developed "aggressive tendencies," although the fact that they developed "behavior" at all—irrespective of whether it was aggressive or not—is plain scary. Still, it's all for the good of the technology, right? This means that it will be far easier to truly explore use-cases for the financial services world. And more technology to drive efficiency is exactly what banks need.

But if you, like me, are worried about these advancements, AI is not devoid of levity. Check out seebotschat on Twitch or YouTube to watch two Google Homes talk to each other with often hilarious results. The two homes—named Vlad and Estragon, although for some reason they also call themselves Mia—profess love for each other and crack Chuck Norris jokes. These instances assuage some of my feelings about AIs, although it's still difficult not to find their discussion about humanity's frailties and how easy it is to betray us more than a little disturbing. W

Will OTFs End OTC Markets?

Aggelos explains that both the European Commission and the European Securities and Markets Authority have been explicit in their communication when it comes to derivatives trading in general and transparency around OTC products in particular, in the run-up to the introduction of Mifid II in January next year.

Is Mifid II OTC's death knell?
For more information and readers' feedback please join the discussion
waterstechnology.com/sell-side-technology

"No matter their nature, they should be subjected to pre and post-trade transparency," says Patrice Aguesse, head of the market regulation division at the regulatory policy and international affairs directorate of the Autorité des marchés financiers. Aguesse told me that organized trading facilities (OTFs) were created because legislators wanted to offer more clarity on all types of derivatives trading platforms that might have been set up without a strong legal framework, such as broker crossing networks. Regulators understand the concerns of the market, which, says Aguesse, the European Securities and Markets Authority (ESMA) is trying to address as fast as it can.

Market Fear

Many fear that the over-the-counter (OTC) derivatives market will, as a result of OTFs' reporting requirements, be disrupted or even vanish. After all, OTFs were partly introduced as a mechanism to make OTC derivatives reportable products. The feeling among many in the industry is doubt regarding the regulators' transparency efforts. Not all share the same sentiments when it comes to reporting requirements, promoting an efficient and transparent market environment. Several sources expressed reservations as to whether the system for delivering that transparency, which requires an effective instrument identification system, will be fit-for-purpose. That said, there are concerns with International Securities Identification Numbers as a means of identifying instruments for the purpose of delivering transparency. There is still uncertainty as to how or whether it will work, and whether the regulators will be able to develop their systems by Mifid II's January 2018 start date.

Many on the buy side are concerned that this dynamic of moving OTC products to "transparent" venues will result in them getting "caught out" by the transparency rules. Meanwhile, the sell side fears that by fulfilling these requirements, the whole rationale for not disclosing prices on these products will cease to exist.

Mark Croxon, Bloomberg's head of regulatory and market structure strategy, says OTC products will move onto venues, triggering uncertainty in the short term. However, he says the OTC markets won't necessarily vanish. "OTC products are naturally customizable," he says. "I don't think Mifid II will lead to the death of OTC trading because the fundamental reasons why people wish to customize derivatives to meet their risk or investment profiles will remain."

To most, however, OTFs will have a significant impact on the OTC market, even if Mifid II's original purpose was never about changing the structure and the methodologies of the market. The sell side especially will experience wider changes and consequences, which could affect their business. Alex McDonald, CEO of the Wholesale Markets Brokers' Association, says that since the trade reporting requirement for which OTFs were created is accompanied by other mandates, their introduction will have a marked effect on the European trading landscape. "One upshot is that the vastly increased cost of balance sheet and trading inventory will mean that it becomes cheaper for intermediaries to pass transactions straight through to venues than to interpose their own balance sheet," he says. "When you combine these changes with those covering market abuse, benchmarks, short-selling and a series of money laundering regulations, there will be a move to push more trade flow through trading venues than was hitherto the case."

> "Many fear that the OTC derivatives market will, as a result of OTFs' reporting requirements, be disrupted or even vanish.

McDonald sees a potential move from market participants toward the agency trading model. With this, he says, they will directly connect with and combine venue prices and show an aggregated feed to their onward clients. He also says that transparency would make post-trade processes—such as confirmation and affirmation, and clearing and settlement—more efficient. "The use of harmonized trade and product identifiers will also increase transparency and mitigate risk," he says. W

Human Capital

BNP Paribas Securities Services Names Gallagher Head of Americas Region

Global custodian BNP Paribas Securities Services has named Claudine Gallagher as head of the firm's newly created Americas region. Gallagher has served as BNP's head of securities services in North America since 2012.

In May 2016, Gallagher spoke to *Waters* about the firm's goal of moving from the fifth- to fourth-largest custodian in the world. Andrea Cattáneo and Claudia Calderón, who serve as the firm's heads of Brazil and Colombia, respectively, will join the regional executive board and report directly to Gallagher.

Tom Dalglish

"Throughout the past five years, Claudine has been instrumental in building our US capabilities. With her leadership, we will continue to strengthen our presence across the Americas," says José Placido, global head of client development at BNP Paribas Securities Services. "This is our latest step to support clients' ambitions in this high-potential region and make the most of our collective strengths."

HSBC Moves Dalglish to Lead Innovation Labs

HSBC has hired data industry veteran Tom Dalglish as head of technical services for applied innovation. In this role Dalglish will be responsible for the oversight and management of HSBC's applied innovation labs in Hong Kong, China, Israel, the UK and India, as well as managing its engineering teams. In particular, the teams are focusing on driving innovation in cyber security, artificial intelligence, machine learning and blockchain, Dalglish says, adding that the labs are currently focused on projects relating to biometrics, digital identity, optical-character recognition (OCR) and applying machine learning to datasets to gauge customer behavior.

"Applied innovation is about exploring problems that are difficult or impossible to solve within the typical technology and process constraints of large organizations. The goal is to apply new tools and capabilities to these problems and provide a proof-of-value for the successful, or interesting, ones," Dalglish says.

According to Dalglish, one of the major challenges is "taking good business ideas and moving them into production. Innovation without a production go-live isn't very exciting. My role in running the innovation labs is to take the business ideas and prove that they can be done, and then we provide a pathway for going into production within the bank or wider community."

Dalglish currently manages a team of around 10, but says he is always looking for good people. Before taking the role, Dalglish was senior data integration manager at HSBC, prior to which he was global head of transformation at SmartStream. He has also held a variety of reference data strategy roles, including global head of data transformation at iGate Global Solutions; CTO for group data at UBS; director and chief information architect for equities at Bank of America Merrill Lynch; and executive director of investment banking at JPMorgan, following its acquisition of Bear Stearns, where he was managing director.

Based in London, Dalglish reports to Andrew Weir, HSBC chief scientist.

Colt Hires BT Vet Housden in Capital Markets Drive

UK-based network provider Colt has appointed Andrew Housden as vice president of capital markets to lead its go-to-market strategy for capital markets in Europe, Asia and North America. Prior to joining Colt, Housden was vice president of global finance accounts at BT Global Services, where he spent 25 years in various roles, including managing the global sales team for Unified Trading

Claudine Gallagher

Ex-Reuters, Savvis Exec Thomas Joins TradingScreen


Varghese Thomas

TradingScreen, a provider of trading technology and data management solutions, has hired Varghese Thomas as the vendor's chief strategy officer. In his new role, Thomas is responsible for partnerships, strategic initiatives, potential mergers and acquisitions, and partnerships to fill out the vendor's proposition.

Thomas was previously chief business officer at Relationship Science, prior to which he was senior vice president and global head of infrastructure solutions at NYSE Technologies, and spent 11 years in senior roles at network and hosting provider Savvis (now CenturyLink), including global head of financial services. He also spent seven years at Reuters and Bridge Information Systems as vice president of client services.

Based in New York, Thomas reports to TradingScreen CEO Pierre Schroeder.

and Radianz cloud services, and driving business growth with major accounts in the financial services sector. Before joining BT, Housden held sales roles at telecommunications companies Motorola and Mitel.

"Capital markets firms face several significant challenges to remain competitive, in particular the need for a more agile and cost-effective infrastructure, migrating applications to the cloud and ever-changing regulatory requirements," says Housden. "Colt has a firmly established position in serving capital markets firms and is making significant investments to help its customers stay ahead of the market."

Based in London, Housden reports to Colt chief commercial officer Tom Regent, another former BT senior executive, who joined Colt last year.

MarketAxess Taps AXA IM's Roupie to Run European and Asian Operations

Electronic trading platform provider MarketAxess has appointed Christophe Roupie as head of Europe and Asia for MarketAxess and Trax, the vendor's regulatory reporting, post-trade matching and market data subsidiary.

Working alongside MarketAxess COO for Europe and Asia, Scott Eaton, Roupie will be responsible for leading the vendor's expansion in these regions, securing new business and product development.

Prior to joining MarketAxess, Roupie was global head of trading and securities financing at AXA Investment Managers for over a decade and was previously global head of fixed-income trading at Natixis Asset Management.

"Christophe is widely regarded as a leader in the investment management trading community, and has developed strong relationships with dealer trading partners," says Rick McVey, chairman and CEO officer of MarketAxess. "He has led successful initiatives in order management systems, electronic trading, data and straight-through processing, which complement our vision for creating the world's leading credit marketplace.

AxiomSL Appoints Andrew Wood Australia Country Manager

Regulatory reporting and risk management solutions provider AxiomSL has appointed Andrew Wood as its new country manager for Australia, to support its expansion in Asia-Pacific and growing its client base in the country.

Based in Sydney, Wood was most recently a consultant at litigation funding firm IMF Bentham, prior to which he was an associate director and senior project manager for technology and operational risk at Macquarie. Before that he was director and head of the "Change the Bank" project for Deutsche Bank's Asia-Pacific finance group. Prior to joining Deutsche Bank in 2010, Wood served as director and head of projects for global markets at Standard Chartered Bank, preceded by another three-year stint at Macquarie as associate director and senior project manager for group finance. He also held senior financial controller and reporting positions at HSBC, Oracle, JPMorgan and Credit Suisse.

"As global regulators tighten reporting standards and requirements, we have experienced increased interest from financial institutions looking for a platform that is able to tackle cross-jurisdictional reporting requirements across markets in Asia-Pacific," says Olivier Kamoun, Asia-Pacific CEO and chief product officer at AxiomSL. "Australia is one example, with financial institutions facing an expanding array of international and domestic reporting requirements."

Kamoun adds that AxiomSL is currently talking with several major Australian banks on the new reporting requirements from the Australian


Andrew Wood

Prudential Regulation Authority (Apra) that will come into effect in the middle of 2017, and plans to double its business development team to better address its clients' needs in key Asia-Pacific markets.

Remembering Neil DeSena

Neil DeSena, co-managing partner at boutique merchant banking and investment house Sena Hill Partners, passed away recently; he was 52. Freelance journalist Tim Bourgaize Murray—who until recently was a member of the *Waters* editorial staff—got to know DeSena well during their frequent fintech conversations. DeSena's earliest mention in *Waters* came in 1999 when he introduced what would become his most famous technology project. As a managing director with market-maker Spear, Leeds & Kellogg, he discussed the firm's newly engineered REDIbook, a then-nascent trading platform that would be acquired—along with SLK—by Goldman Sachs a year later, and spun off again before ultimately being sold to Thomson Reuters just last September. It has proven one of our industry's most sought-after commodities.

While their relationship was initially phone-based, Tim and Neil did eventually meet. "We crossed paths occasionally at events and the like, and he would check in with some colorful, off-record commentary or a hint for a good story now and then," Tim remembers. "He was always prescient, and told it straight. That's why, today, it's not his many successes or lasting impact on our space, so much as his voice that's still bouncing around in my mind. Ultimately, getting his name or Sena Hill in print wasn't ever really the goal. He just lived and breathed this stuff. For that, as my thoughts are with his family and colleagues today, he is fondly remembered."

Thomson Reuters Taps Malhotra for Toronto Tech Center

Thomson Reuters has hired former Intel exec Shawn Malhotra as vice president of its new Thomson Reuters Toronto Technology Center, responsible for driving the facility's focus on skills such as cognitive computing, visualization, user-experience and cloud development.

Malhotra was most recently director of software engineering at chip manufacturer Intel, and also served as site director for the vendor's Toronto Technology Center. He joined Intel via the vendor's 2015 acquisition of field-programmable gate array (FPGA) manufacturer Altera, where he was software engineering manager. Before joining Altera in 2005, Malhotra was a software engineer at Qualcomm.

"Shawn has a proven track record of delivering results for customers, and his deep roots in the Toronto–Waterloo innovation community will be a valuable asset as Thomson Reuters expands its presence in the region," says Thomson Reuters CTO Stewart Beaumont.


Neil DeSena

Thomson Reuters expects to have 400 technology staff at the Toronto center—located in the Bremner Tower—within the next two years, and to ultimately grow that number to 1,500.

Qineqt Hires Former Dataminr Exec Budnik to Head Delivery, Analytics

Startup data platform provider Qineqt has hired John Budnik as senior data architect, to lead its Delivery Architecture and Data Analytics products. Budnik was previously vice president of professional services and senior software engineer at social media analytics provider Dataminr, where he was also a member of the vendor's original executive team and lead architect of its Dataminr Knowledge Base.

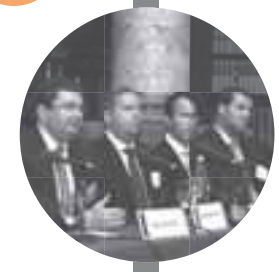
Before joining Dataminr in 2010, he was director of application development at check imaging software vendor Viewpointe, and spent 27 years at IBM in a variety of roles, including software engineer, application engineering manager, and software development manager. At Qineqt, he reports to Parker Ferguson, head of technology, and will focus on overall extraction and delivery architecture.

"Having spent many years as a customer in the financial data space, I know the frustrations of aggregating information for use in data science. I'm thrilled to be a critical part of filling such a real void in the market for investment managers working to become more quantitative," Budnik says. W

European Buy-Side Technology Summit 2017

18 May, The Waldorf Hilton, London

FREE for Buy-side Delegates



Will you be joining us?

WatersTechnology is delighted to announce that registration is now open.

Building on the success of 2016, the **Buy-Side Technology European Summit** will address the latest trading and technology challenges affecting the buy side in an ever changing financial and regulatory landscape.

Join us in May to develop new working relationships and to hear about the latest developments in the buy-side industry.

Topics to be discussed this year:

- Implementing MiFID II
- Advanced data analytics
- Artificial Intelligence and Machine Learning
- Sourcing liquidity
- Improving technology infrastructure
- Cyber Security
- Disruptive Technologies
- Post-trade processing

Visit **buy-sidetechnology.com/eu** for more info and to book. For sponsorship opportunities please contact **Phil Ansley** at **phil.ansley@incisivemedia.com** or call **+44 (0)207 316 9643**

Panel sponsors:

statpro

EzeCastle INTEGRATION

Hosted by:

Inside Market Data | Inside Reference Data | Buy-Side Technology | Sell-Side Technology

waterstechnology

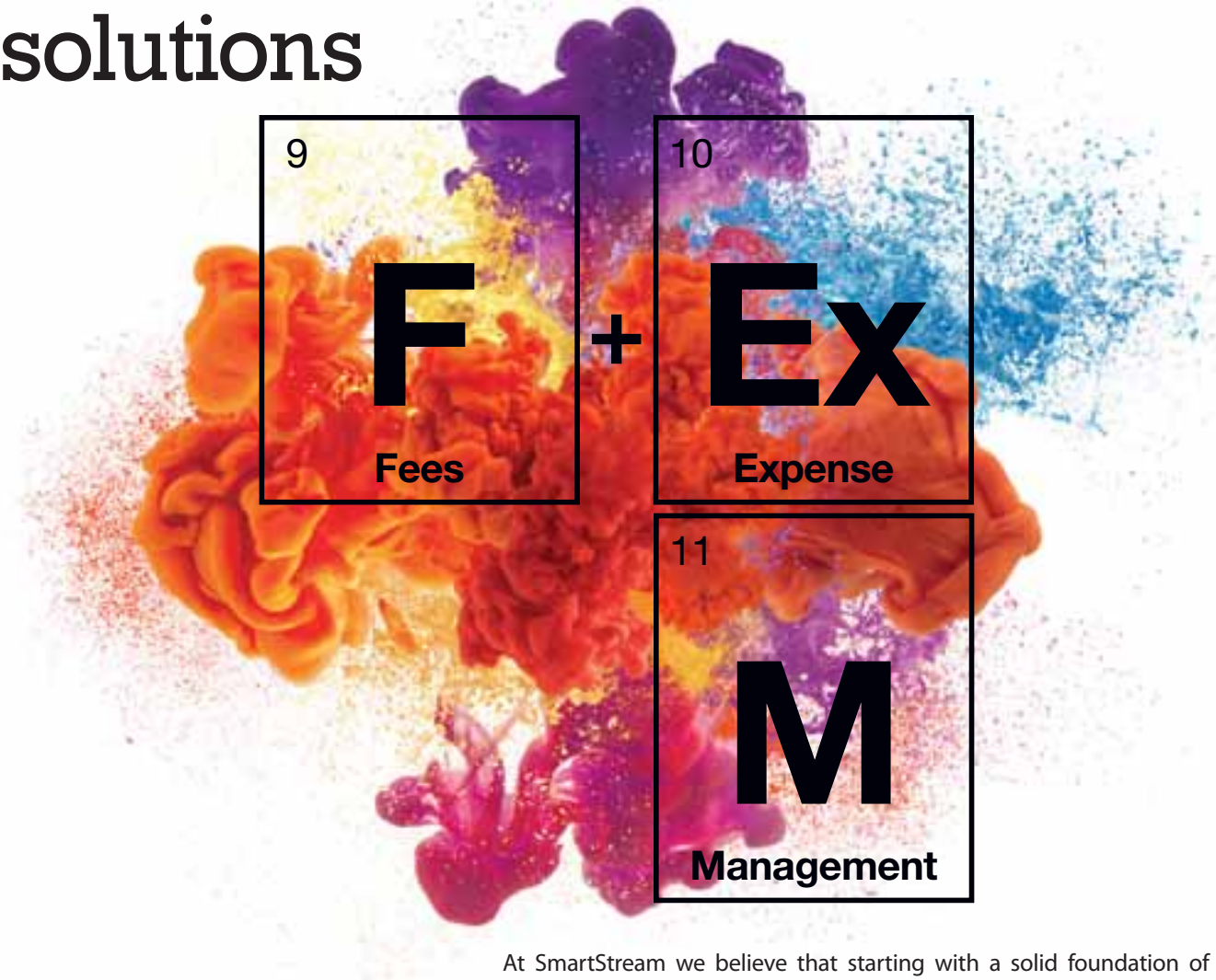
@WatersTech
#BSTEurope

buy-sidetechnology.com/eu

SmartStream

SmartStream-STP

Combining the elements for highly responsive solutions



At SmartStream we believe that starting with a solid foundation of elements is vital when creating new operating models. As a result, it's never been easier for firms to access highly responsive, tailored solutions which can be deployed at speed and with immediate impact.

Our innovative technology delivers fully automated fees and expense management; driven by the need to have greater transparency across all traded asset classes for the processing of payables and receivables, whilst reducing costs through improved accountability.

So, whether you are looking to replace legacy systems, build an internal processing utility, utilise the cloud or outsource your entire operation, partnering with SmartStream is the perfect chemistry.