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# Of Rough Seas and Sailors

For the last four weeks, I've been trying to think about what to write for this column. The words have largely escaped me. But in times of great uncertainty, there are two paths the mind can wander down: one of pessimism and one of optimism. Many will vacillate between the two, but I truly believe it's vital to maintain a positive outlook in times of crisis. This isn't just whistling in the wind: From the Great Wars and the Great Depression, from assassinations and political resignations, from terrorist attacks and the Financial Crisis—society has always bounced back from dark times. We will again.

Words that my dad has often said to me have been on my mind over the last month: "Smooth seas do not make for skillful sailors." He didn't come up with that—it's an African proverb—but it does ring true today. Now, more than ever before, technology will either be the saving grace for capital markets firms, or their lack of investment in technology will be brought to light—and clients will take notice.

I remember back in 2008 at the height of the Financial Crisis, the first jobs to get cut were often the middle- and back-office tech and ops folks. I hope that's not the case today. After all, these are the men and women who have set up those workforces that are able to work remotely to do so. They are carrying on vital tech projects and data integrations. They are the defenders against cyber-attacks. And many of them are still commuting to their offices via public transit so they can ensure their company's systems are running smoothly during a time of heightened stress.

This issue of *WatersTechnology* magazine is going to only be available via PDF and individually on [WatersTechnology.com](http://WatersTechnology.com). We will not produce a magazine for May, June, and July. Quite frankly, even if we did produce a hard-copy magazine, it would be delivered to an empty office. With that said, we are going to be flooding our website with (we hope) useful information about issues resulting from this pandemic; we will look at how firms are working to future-proof their organizations; and we will provide a forum for thought leaders from across the industry. You can find all of our coverage about the coronavirus here: <https://www.waterstechnology.com/topics/coronavirus-covid-19>

Finally, I promise you, our readers who allow us to write these stories, that the editorial team here at *WatersTechnology* will work harder than we ever have to provide you with valuable information. We may stumble from time to time, but we will work tirelessly to be an essential source during these uncertain times. If you think we're missing anything, do not hesitate to reach out to me: email me at [anthony.malakian@infopro-digital.com](mailto:anthony.malakian@infopro-digital.com) or give me a call at 646-490-3973. [wt](http://waterstechnology.com)

**Anthony Malakian**  
Editor-in-Chief

# waterstechnology

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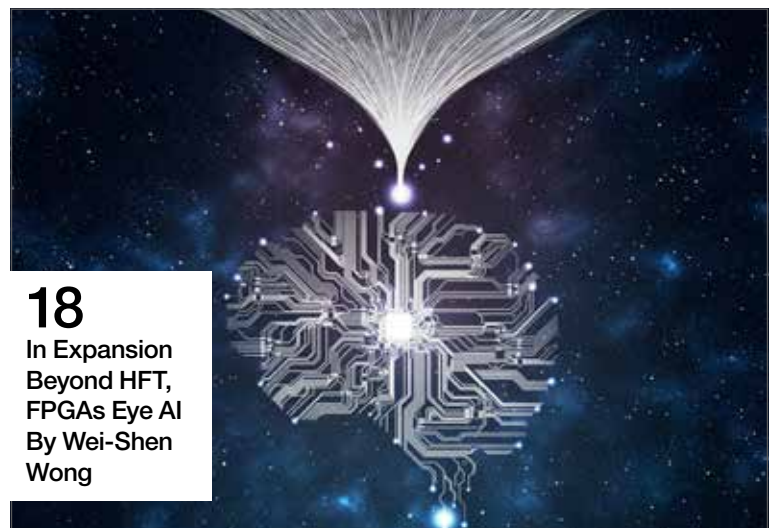
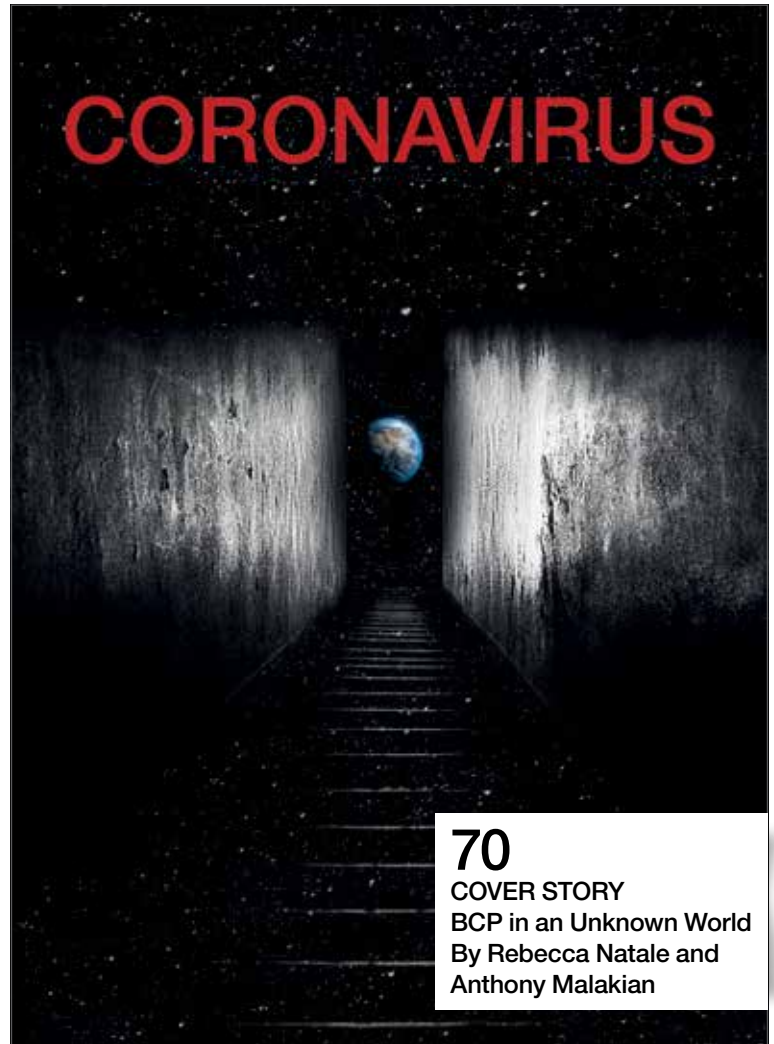
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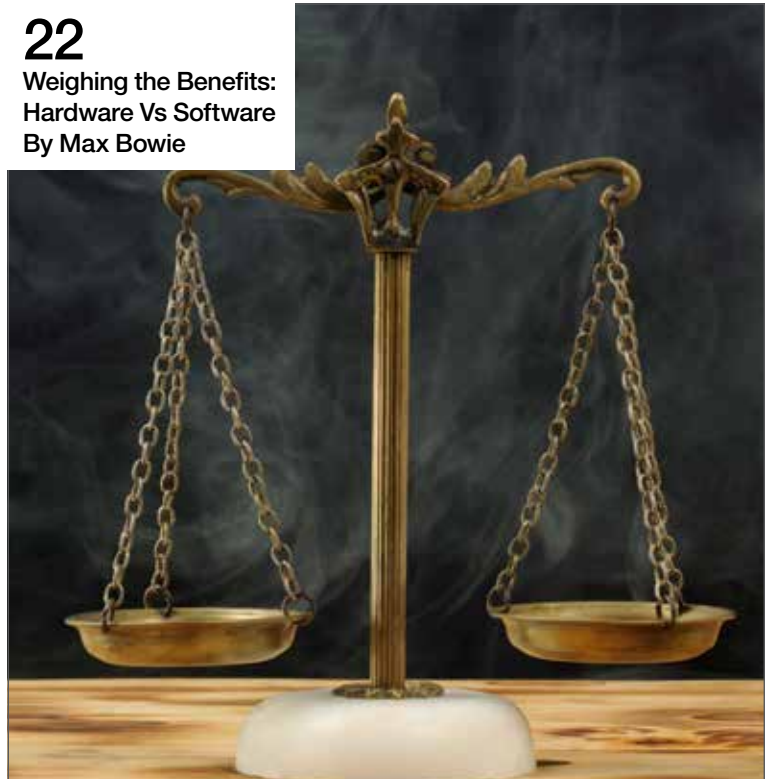
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## Women in Technology & Data Awards 2020

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Weighing the Benefits:  
Hardware Vs Software  
By Max Bowie





# Lazard Asset Management Looks to Reinvent Asset Classifications

The firm is developing themed asset categories for investors by finding new correlations in alternative datasets. By [Josephine Gallagher](#)

**“W**hy do we have asset classes? It seems like a complete waste of time.”

This was a question put to Jai Jacob, managing director and portfolio manager at Lazard Asset Management, by one of the data scientists in his multi-asset investment team.

It was a question that made Jacob scratch his head, wondering the same thing. And now, the asset manager is developing themed asset categories for investors by finding new correlations in alternative datasets or personalizing portfolios to fit their criteria.

Its multi-asset investment team is using techniques like natural language processing (NLP) and network theory to identify new associations between companies, looking at areas such as supply chains or location, or mentions in the same press articles.

Take the US dollar as an example. If an analyst forecast that the US dollar would strengthen, typically, the asset allocation response would be to increase exposure to US small caps, as they would expect to benefit.

But, Jacob says, this is an imperfect mapping exercise. “It’s making two assumptions and bundling them into that one investment decision, whereas if I had an asset class called the ‘US dollar is going to strengthen’, I can rely purely on that investment insight ... and whatever happens to be exposed in a positive way to the US dollar, will find its way into that asset class,” he says.

The idea is that the multi-asset management team can create themed portfolios on demand to more accurately fit the investment decisions of its investors and their changing appetites. This can include readjusting asset



**Jai Jacob**  
Lazard Asset  
Management

allocations due to gaps in exposure or recalibrated risk in parts of a portfolio.

“So, it’s not that we have new asset categories that we’re going to stick with for the next 20 years,” Jacob says. “It’s saying we need the ability to create asset classes on the fly, to be able to better implement investment views.”

However, getting to this point took some time, he admits.

## Lightbulb Moment

At the end of 2018, Lazard AM consolidated its portfolio management team and workflow onto a single multi-asset platform, which became its Dynamic Portfolio Solutions (DPS), bringing together both quantitative and fundamental investing, and data science.

This was the by-product of years of planning and discussions, but it wasn’t until 2014 when Jacob and Paul Moghtader, who headed up the quantitative equity business in Boston at the time, realized the growing importance of data science for developing bespoke portfolios.

“We felt that we needed to start bringing on a different kind of investment professional,” Jacob says. “It was not without its growing pains, but the basic idea was that the concepts that are embedded in income statements and balance sheets, those have been picked over for decades and we needed to figure out how to move beyond that with all the other information that is out there in the world.”

The problem was, they needed specialists. So, they hired a team of data scientists, pulling in talent from various universities and sectors, including health and technology.

But that wasn’t enough. The next

step was to offer these data scientists a career path, and one that validated their importance in the investment management process. As opposed to throwing them in a room with terabytes of credit card data and waiting for the magic to happen, Jacob says.

Instead, they merged the quant team, portfolio managers and data scientists, bringing them under one roof. Jacob says that one of the main reasons the firm did this was to elevate the relevance of data science in the investment process to the same level as other roles.

Today the multi-asset group is made up of 32 people that work across the DPS platform.

“We really rethought the investment talent within the platform and said, rather than putting people in these investment team boxes, let’s try to orient and arrange the talent that we have at our disposal by discipline,” Jacob says.

## Generations Asset Class

Generations is one of the progressive portfolio themes Lazard AM is working on today. The concept looks at trends such as the number of people leaving and entering the workforce, consumption habits, saving patterns, and purchasing power. It also incorporates alternative data from news articles, social media platforms, and other forms.

The effort combines both fundamental and data science skills. “The fundamental insight shows the different consumption patterns and the broad trends, then the data scientists will help map those ideas into specific companies because there isn’t a particular sector or sub-industry that those ideas have to obey,” Jacob says. [WT](#)

# ASX Reviews **CHESS** Replacement Timeline as Coronavirus Bites

The exchange will consult on a new schedule in June, but industry testing of the platform is still on track for July. By [Wei-Shen Wong](#)

**T**he Australian Securities Exchange (ASX) will rethink its CHESS replacement implementation timetable in light of uncertainties created by the coronavirus.

In a statement, the ASX said the new schedule will also allow market participants to focus on day-to-day operations.

In June, the exchange will seek user input on potentially moving the go-live date of the distributed ledger technology (DLT)-backed replacement of CHESS, its equities clearing and settlement platform.

“In light of recent events, ASX is replanning the implementation of the CHESS replacement system,” said Peter Hiom, deputy chief executive officer at the ASX, in a statement. “We are conscious of the importance of providing a new schedule, and the need to get the valuable input of CHESS users. Right now, however, in this environment of heightened volatility and activity levels, the industry needs to focus on day-to-day operations. We will therefore wait until June to consult on the new timetable, when we expect everyone will have more time to consider the replan and better assess the implications of Covid-19. We will then announce the new schedule.”

## Test Environment on Track

However, its target of opening an industry test environment (ITE) is on track for July. The replan will give users additional time to complete their operational readiness activities and to consider the rule changes that accompany the new system.

The ITE will optionally open for developers in July, and then to all

users in October 2020, subject to the June consultation. The ASX has also moved the consultation deadline for Tranche 2 of the new post-trade system rule development timeline from April 3 to the end of May. Tranche 2 covers rule amendments to corporate actions, mFund (the ASX’s managed funds), and real-time gross settlement payment aspects for day-one implementation of the CHESS replacement system’s functionality.

Other key milestones will be decided after the June consultation.

The ASX also said the new plan will increase the time available for back-office software developers to familiarize themselves with key aspects of the new system in a production-like testing environment, and allow them and the exchange to complete software development and testing.

Hiom added that consultation has been thorough during the project, and said the ASX will continue to listen to all its stakeholders. “Our priority is to ensure the orderly and safe completion of this project with the continued close oversight of our regulators,” he said.

He stressed that the exchange remains fully committed to the CHESS replacement. “We continue to progress the project, including system development and testing, supporting back-office software developers, and assisting users in their readiness activities. The investments we are making in the new system and in distributed ledger technology are for the long-term benefit of the financial services industry and the Australian economy,” he said.

The ASX did not respond to further queries.

Dr. Prash Puspanathan, chief



ASX's schedule falls victim to the coronavirus

executive officer of digital currency brokerage Caleb and Brown, says the decision to rethink the CHESS replacement timeline is not surprising.

He said it is ironic that the ASX is delaying its blockchain-based solution, as blockchains are a significant structural improvement on traditional centralized technologies, being more functional during so-called black swan events, such as the coronavirus.

“The fear is that the ASX’s continued delays and uncertainty make it increasingly likely that the CHESS replacement will just be another blockchain buzzword instead of the decentralized future,” Puspanathan says. “That would be disappointing, considering that the current legacy systems the financial ecosystem is based on, and the resultant usage metrics that apply to the end-user, remain hugely outdated when compared to the technological boundaries that the disruptors are pushing.”

## Safety First

An operations and trading manager at a digital asset and brokerage firm based in Australia says the ASX has always been a conservative, yet highly-regarded, organization within the country’s corporate world. Given its historical conservatism and status, it’s unsurprising that it would delay implementing a new system in a difficult time.

“They would likely view anything but a flourishing success as potentially problematic, and given that, they are probably more than ready to do this when the time is right,” he says.

The exchange has been looking for a solution to replace CHESS since 2015. [wt](#)

# Ex-Hedge Fund Data Exec Sets Up Alt Data Advisory Firm

Petrescu is already working with a handful of new and established data providers on product development and strategy for financial markets. By [Max Bowie](#)

Chris Petrescu, a former data strategy executive at ExodusPoint and WorldQuant, has set up a data strategy advisory firm to help data startups target their offerings at financial firms, and to help hedge funds implement strategies around data sourcing and management.

CP Capital's advisory services will cover all aspects of a fund's data consumption—from data sourcing to inventory evaluation, monitoring portfolio managers' usage, and educating individuals about data sourcing and usage—and all data types, except for exchange data and connectivity, though he says he knows experts on exchange data and technology issues who he can call on if needed for a specific project.

However, a key area for the firm will be exploiting the growth of the alternative data market as financial firms seek new sources of alpha and companies collecting data on other industries seek to sell their content into the financial markets.

Petrescu decided to set up the venture after dealing with alternative data providers—and the portfolio managers who consume their data—in his previous roles on the buy side. While on gardening leave after his stint at ExodusPoint, people in his network of contacts contacted him to ask if he could help them with the same challenges.

"I've negotiated thousands of contracts and spoken to thousands of firms over the last five years ... so I understand the challenges faced by data buyers," he says. "Some of the vendors I'm working with are firms I spoke to while at hedge funds, where I helped them to develop and monetize their products."

Petrescu is already working with a



**Chris Petrescu**  
CP Capital

range of startups and established data and service providers. For example, he is partnering with White Rock Data Solutions, the alternative data advisory firm set up by former Goldman Sachs executive and Crux Informatics co-founder Elizabeth Pritchard, and with S4 Market Data, the market data inventory management and cost control consultancy founded by former Franklin Templeton, RBC Capital Markets, ITG, Wellington Management and WestLB data exec Bernardo Santiago.

“Chris ... has been advising us on content strategy and delivery for a while. He has great insight into buy-side data needs, and helps us align product and delivery to those needs.”

**Joe Gits, Social Market Analytics**

In addition, he is working with data vendors such as ETF Global, Social Market Analytics, and Wall Street Horizon—including joining WSH's Innovation Advisory Board—to engage institutional investors and advise on product strategy and development.

## Buy-Side Data Affinity

"Chris ... has been advising us on content strategy and delivery for a while. He has great insight into buy-side data needs, and helps us align product and delivery to those data needs," says Joe Gits, CEO of Social Market Analytics. "One example ... was his suggestion of delivering content one layer down in terms of aggregation—in addition to

our S-Factor feed, deliver an activity feed isolated to specific periods."

One startup that has engaged CP Capital to help it gain a foothold in financial firms is Particle.One, a Santa Clara, Calif.-based provider of an artificial intelligence-based platform for capturing and modeling structured and unstructured data for commodity markets, which closed a \$2.5 million seed funding round in December, and is now in the early stages of testing with alpha clients. The vendor's natural-language processing capabilities can capture sentiment from chat conversations and tag that to companies, contracts and market data. For example, it can use sentiment about the spread of the coronavirus to assess demand for travel, and the impact on airline ticket sales, which in turn impacts crude oil prices.

"We are still in the early stages, and still validating assumptions on how this can be applied in the real world. We've been talking to traders for around 10 months. Chris ... has a great view of the market and a good understanding of the players to provide competitive insight and help shape the product in a way that's compelling to the market," says Tanya Lyubimova, CEO and co-founder of Particle.One. "We think a shift from trading on fundamentals to trading on sentiment may be the next big thing in predicting volatility and price movements in the commodity markets."

CP Capital's initial focus will be on Petrescu's network of contacts, before expanding his external marketing and research activities to identify other companies that may have a dataset of value to financial firms but have not yet marketed their data to the industry. [wt](#)



# MEMX Goes with Nasdaq for Market Surveillance

The Members Exchange plans to be live with the platform by its launch date of July 24, despite market volatility. By [Anthony Malakian](#)

**W**hile the Members Exchange (MEMX) and Nasdaq will look to potentially start competing this summer, that doesn't mean that they can't also partner.

MEMX is in the process of integrating the Nasdaq Market Surveillance platform—which was formerly known as Nasdaq Smarts. Tom Fay, the chief operating officer of MEMX, who joined the startup from Nasdaq last June, tells *WatersTechnology* that the two companies are working on establishing connectivity and that they're waiting for the delivery of the final hardware, which MEMX will host.

"We'll be hosting this ourselves," he says. "So that's another facet of the competition structure: because of that competition, we're not having Nasdaq host it—MEMX is taking on that responsibility. So that's also in our timeline, for them to train us up so operations folks are fluent in that."

MEMX aims to have the popular surveillance platform fully integrated by the time that the exchange launches, which is scheduled for July 24. Fay says that despite the disruption caused by the coronavirus outbreak and subsequent enactment of business continuity plans across the industry, he doesn't anticipate they will have to delay the launch date.

"We've had that discussion on the Nasdaq side; they are staffed and able to function and support us. They are kind of remote anyway—they have a team in Australia and a team in Toronto. So we're working effectively with those folks over that distance. They are fully staffed, so there's no concern there with regard to what's going on," he says.

"We feel pretty comfortable that for

the plan we have in place, we will be able to execute against that successfully."

## Eye Toward the Cloud, Machine Learning

MEMX, the US-based equities market operator that was founded at the start of 2019 by a consortium of financial institutions, will use Nasdaq Market Surveillance for anomaly and market abuse detection, analysis, visualization, and for certain reporting needs. But Fay says that a big reason the exchange selected Nasdaq was because of its embrace of cloud technology and its use of machine learning for surveillance.

"There were a few things that were top of mind when we started looking, and one of the main things was the fact that Nasdaq's solution was built, conceived, and matured through the lens of exchanges," Fay says. "There are many other products out there that were done

“There were a few things that were top of mind when we started looking, and one of the main things was the fact that Nasdaq's solution was built, conceived, and matured through the lens of exchanges.”

**Tom Fay, Members Exchange**

so through the lens of a broker-dealer, but we had some unique needs being an exchange and the fact that Nasdaq uses this solution for its own exchanges, as well as markets around the world, it gave us a good feeling around the stability and fidelity of the solution."

Additionally, as Fay and MEMX CEO Jonathan Kellner noted on the



Nasdaq: "Fully staffed" despite the coronavirus outbreak

*Waters Wavelength* podcast this past January, MEMX set out looking to make the exchange mobile because as they grow, they will need to move offices a couple of times.

"Nasdaq is moving this into the cloud and is also looking to augment the solution with things like machine learning. We can take advantage of that as they roll it out, and it future-proofs us to a certain extent," Fay says. "Longer term, we're building this so that we could lift it and put it into the cloud, or migrate it to the cloud at some point, and Nasdaq is aware of that, as well. So we'll start taking that up as a Day 2 item, and once we get on the cloud, we can scale a whole lot easier there. We can also start taking advantage of some of the stuff that Nasdaq is doing with respect to bringing machine-learning algorithms to bear on that data, as well."

## Friend and Foe

As to the fact that these two exchanges will be competing for order flow once MEMX officially launches—and MEMX's original backers include Bank of America, Charles Schwab, Citadel Securities, E\*Trade, Fidelity Investments, Morgan Stanley, UBS, TD Ameritrade, and Virtu Financial—Nasdaq was largely positive in its comment letter to the US Securities and Exchange Commission.

John Zecca, Nasdaq's chief legal and regulatory officer, did note, though, that "Nasdaq hopes that MEMX, as it strives to save money for its member-owners, will not do so by forgoing the investments in technology, the allocation of resources, and the imposition of safeguards, that are needed to regulate and surveil its market rigorously." *wt*

# OPEN OUTCRY

What the key figures in fintech are saying this month

“



Over time, CPUs have developed to a point where they are more efficient than FPGAs for our workloads—for example, due to faster, more efficient cores, higher core counts, and adjunct technologies such as kernel bypass networking.”

Steve McNeany, CEO Activ Financial

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“It is entirely feasible that someone will discover some key AI/ML techniques that lend themselves perfectly to FPGA acceleration—but I’m not personally aware of any to date. There will, of course, be case studies, but rarely do those case studies compare the FPGA implementation with a software implementation that’s had the same level of engineering attention.



Very often, they are comparing the performance of heavily optimized FPGA implementations with un-optimized software.” Henry Harrison, co-founder and CTO at Garrison

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“Why do we have asset classes? It seems like a complete waste of time.” Data scientist at Lazard Asset Management

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“

“Since the market volatility started, we’ve not had too much conversation with data vendors, as everyone is super busy managing portfolios and communicating with clients.” Portfolio manager at an asset manager



» see page 14 for full feature...

“

“We realized there was going to be a peak in cases outside China and the economic impact was going to be a lot larger than people had thought—and we wanted to understand what European and US corporates were saying.” Andrew Chin, AllianceBernstein chief risk officer



» see page 74 for full feature...

“

“Being able to find and locate green bonds that satisfy that investment mandate requires some work, because there are a small number of green bonds out in the marketplace.”

Chris Concannon, president and COO at MarketAxess

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“

“Nasdaq is moving this into the cloud and is also looking to augment the solution with things like machine learning. We can take advantage of that as they roll it out, and it future-proofs us to a certain extent.” Tom Fay, the chief operating officer of the Members Exchange



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“In light of recent events, ASX is replanning the implementation of the CHES replacement system. We are conscious of the importance of

providing a new schedule, and the need to get the valuable input of CHES users. Right now, however, in this environment of heightened volatility and activity levels, the industry needs to focus on day-to-day operations.” Peter Hiom, deputy chief executive officer at the ASX

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“

“My company is now completely working remotely, and we have not had a lot of challenges having already adopted many cloud apps. But what I’m finding now, our biggest concern is security: With many of our bankers using new networks and devices to do work, our attack surface has increased a lot. And though we planned for remote security, we are still seeing some holes in our strategy, which we are working on. Also, cyber criminals are taking advantage, putting viruses into Covid-19 information sites, phishing government or health care emails, etc.” CTO at a bank



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# NEWSDESK

*WatersTechnology's* roundup of headlines that hit the wire this month from around the industry

## LSEG To Build DLT PoC for Equities Settlement



London Stock Exchange building

The London Stock Exchange Group (LSEG) is planning to build a distributed ledger-based proof of concept for equities settlement, which it expects to have ready for testing in the Financial Conduct Authority's (FCA's) Sandbox later this year.

"We are in the process now [of] preparing to kick-start development," says Dotun Rominiyi, blockchain architect for emerging technologies at the London Stock Exchange Group (LSEG). "Our expectation is that by the end of this year, we will have a PoC in place, and that [we will be] ready to essentially take it into the sandbox and run the live demonstration tests with the FCA and our collaborative partners."

The LSEG began its participation in the sandbox last year in collaboration with Nivaura, a regulated fintech company.

## Market Service Inc. Buys Thasos Group Assets



Greg Skibiski, Thasos Group

All assets belonging to New York-based Thasos Group have been sold off to Market Service, Inc. (MSI). Based in Long Island, NY, MSI also owns AggData, another seller of location data. Thasos' assets will be used under the MSI brand, a

spokesperson for MSI said.

Terms of the deal were not disclosed, but it's understood that the sale price was low compared to Thasos' \$42 million valuation from last year, according to two other sources familiar with the deal.

In September 2019, *Business Insider* reported that then-Thasos CEO and co-founder, Greg Skibiski, had stepped down, and the vendor cut roughly two-thirds of its

staff. Throughout August and the first-half of September 2019, the 40-person staff was reduced to just 12, according to that report.

## EDM Council Report: CEOs, COOs Take Charge



Data is seen more as a business asset

As more financial firms recognize the value of the data held by their organization as a business asset, the way that data is managed—and the role of senior data executives—is evolving, according to the latest Data Management Benchmark

Survey from industry body the EDM Council.

"That [increased participation] reflects that data management projects started by tier-one firms are quickly adopted by the second and third tiers ... and that data governance is not just the provenance of big firms anymore—it's everywhere," says EDMC co-founder and COO Mike Meriton.

One of the key findings of the latest report is that the reporting lines of chief data officers have shifted from firms' technology organizations to the most senior business executives.

## SEC Extends Comment Periods, Citing Covid-19

The Securities and Exchange Commission has granted a one-month extension for financial markets participants to submit comment on any pending rule changes, where comment periods were set to expire in March, including plans for a new model for the consolidated tapes of US equities data.

The Commission acknowledged that operational changes implemented across the industry in response to the spread of the Covid-19 disease may result in delayed submission of some comment letters, and said it will not take final action on a selection of planned rule changes before April 24.

## Refinitiv Takes Stake in ModuleQ for Microsoft Data Integration

Refinitiv has made an undisclosed investment in ModuleQ, a Cupertino, Calif.-based provider of Microsoft Office 365 and Microsoft Teams integration tools, to make Refinitiv data available directly within users workflow tools. ModuleQ's app predicts users' priorities while working in Microsoft Teams, and presents relevant data, news, and analytics in real-time, leveraging Refinitiv Intelligent Tagging and the Refinitiv Knowledge Graph. Potential datasets covered by the agreement include aftermarket research and company profiles.

## SS&C to Buy Data Digitization Specialist Captricity

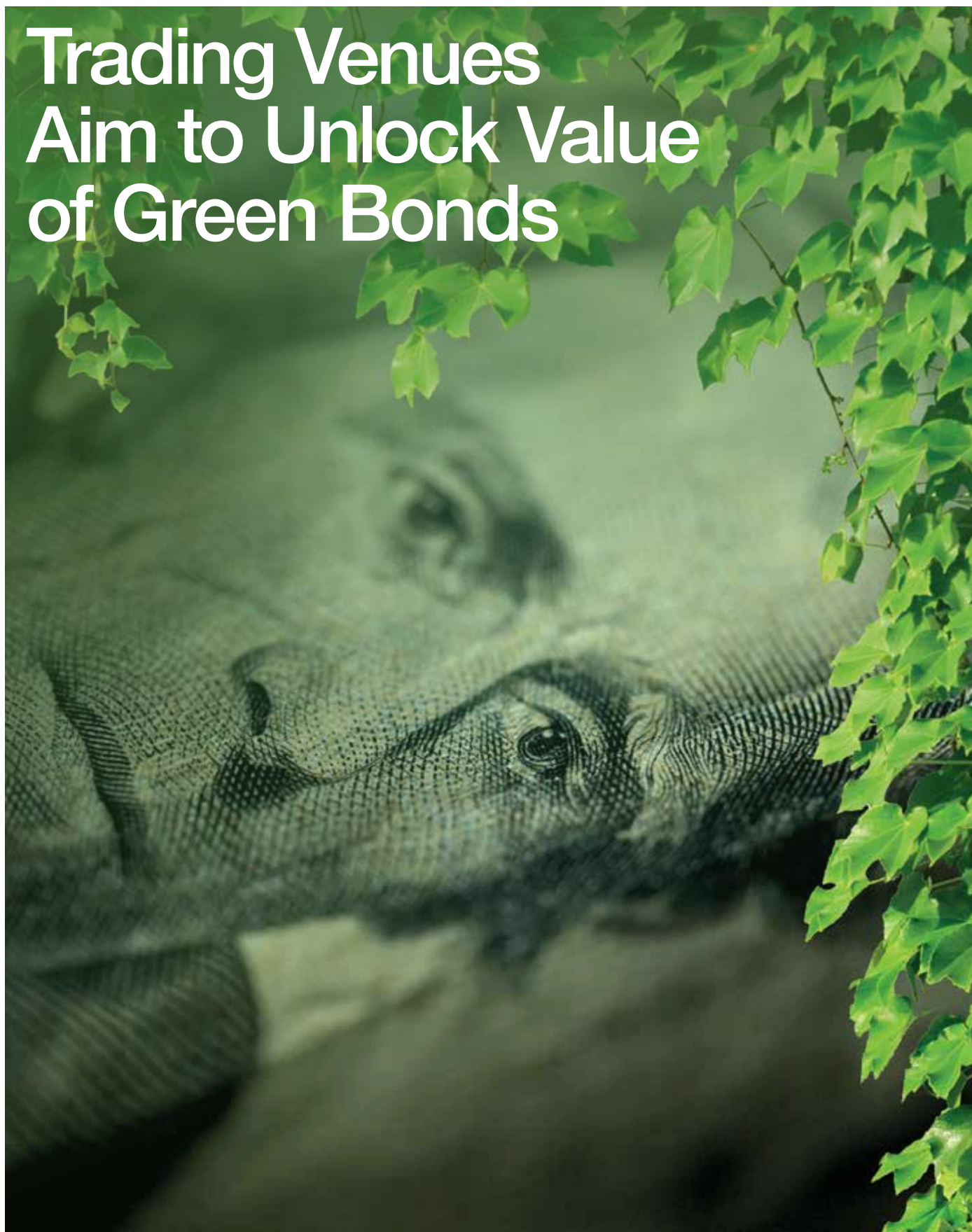
SS&C Technologies is to acquire Captricity, an Oakland, Calif.-based provider of machine-learning solutions for transforming handwritten and printed documents into digital content. Captricity's Vidado technology is used by the financial services, insurance, pharmaceutical, and healthcare industries to automate paper-to-digital data extraction. Full terms of the deal were not disclosed, but SS&C will absorb Captricity's 30 staff, based in Oakland, Boulder, Colo., and New York.

## TRG Screen Adds B-Pipe Notifications to PEAR

TRG Screen has added Bloomberg Enterprise Data notifications relating to Bloomberg's B-Pipe real-time datafeed to the Vendor Notifications segment of TRG's PEAR exchange data license compliance database, enabling PEAR users who are B-Pipe clients to manage Bloomberg notifications centrally alongside those from other vendors, for greater efficiency.



# Trading Venues Aim to Unlock Value of Green Bonds



## Tech providers are looking for ways to increase liquidity in climate bonds, a tiny but fast-growing corner of the fixed-income universe. By Mariella Reason

In 2007, a historic document landed on the desks of leaders around the globe. The Intergovernmental Panel on Climate Change, assembled by the United Nations Environment Programme and the World Meteorological Organization, had published a report providing scientific data showing that it was “very likely” that human action was directly linked to climate change. The impact of industrialization on the climate would have to be addressed, and governments would have to take action to lessen the carbon footprint of humanity.

In November 2008, the World Bank released the first green bond—a fixed income instrument created to raise capital for “green” initiatives. In theory, these bonds would be a vehicle with which investors could fund environmentally sustainable projects without compromising on returns. The bonds would trade in the same way that corporate bonds do, seamlessly integrating into the market.

Except, that’s not exactly what has happened. Companies and governments have issued bonds, but liquidity in this market remains low, as demand for these instruments outstrips supply.

It’s not that no one is issuing green bonds. Apple issued \$2.2 billion of debt in 2019 to raise capital to allow the tech giant to cut carbon emissions from its providers and develop more energy-efficient products. In a report published this year, Moody’s Analytics said it expects issuance of green bonds to climb 24%, from \$323 billion in 2019 to \$400 billion in 2020. The Climate Bond Initiative (CBI), a non-governmental organization (NGO), released a study on the green bond market in 2019 that noted a 51% increase in green bonds in 2018, and a new global record of \$257.7 billion total green bond issuance. On the London Stock Exchange Group’s (LSEG’s) newly launched Sustainable Bond Market (SBM), there are 234 financial instruments that have raised over \$51.9 billion.

While the market in these instruments is growing, it’s still very small. The European Securities Markets Authority (Esma) says in its Trends, Risks and

Vulnerabilities report that liquidity is tighter for public sector green bonds than for conventional bonds in the EU. Those 234 instruments on the SBM look rather insignificant when compared with the 15,000 instruments on LSEG’s whole debt market.

Paul Sinthunont, a senior analyst at Aite Group, says there is over \$100 trillion in debt issuance worldwide and green bonds are estimated to be \$200 billion to \$400 billion of that, which is less than 1% of the total debt market.

At the same time, investors do want to put their money into green bonds. Elena Chimonides, a fixed income product specialist at LSEG, says green bonds are one of the fastest-growing products of interest for clients, market participants, and stakeholders LSEG speaks to.

It’s in this environment that tech and data providers are seeing a need to provide tools to help traders identify and trade green bonds, and increase liquidity in the green bond market. These providers include fixed income electronic trading platforms MTS and MarketAxess, both of which are creating products specifically aimed at aiding green investment initiatives.

### Demand Outstrips Supply

Frank Cerveny, head of global relationship management at MTS, says the modest number of green bonds in comparison to conventional bonds means that the demand for them is largely outweighing supply. “A limited supply of bonds means that the early focus of the green bond market has been on primary issuance,” Cerveny says. “Whether government or corporate issuance, a lack of supply and secondary liquidity necessitates a buy-and-hold strategy.”

As a subsidiary of the LSEG, MTS works closely with the SBM, which the exchange launched in October last year.

Cerveny believes that advancing the trading technology surrounding green bonds will improve liquidity in this market, and thus drive new issuances. “If you can increase the transparency, you can increase liquidity, bring more con-

fidence to the market, tighten bid/offer spreads, and ultimately lower the cost of financing,” he says.

Initiatives like green bonds and investing in companies that have solid practices around environmental, social and governance (ESG) factors have drawn criticism of greenwashing from the public sector, but Oliver Clark, head of product development at MTS, says green bonds are starting to prove they are more than just a marketing pitch. With governments

“A limited supply of bonds means that the early focus of the green bond market has been on primary issuance. Whether government or corporate issuance, a lack of supply and secondary liquidity necessitates a buy-and-hold strategy.”  
Frank Cerveny, MTS

promoting green initiatives, the investment community has followed suit, and Clark says he has seen increased green awareness and interest from his clients.

He says much of the progress in thinking around environmental concerns has been driven, at least recently, by BlackRock’s new emphasis on sustainable investing. The world’s largest asset manager “actually put a line in the sand, effectively driving policy with real money,” Clark says.

BlackRock CEO Larry Fink said earlier this year that the firm would put sustainability at the heart of its investment decisions, and lower exposure to fossil fuel companies. BlackRock did not respond to requests for comment on this article.

In 2018, MTS started flagging bonds as green on BondVision, its multi-dealer-to-client platform for government bonds and credit. Traders can identify green bonds and compare them with those that fail to qualify as green. Investors can see if there is an additional cost or premium required to own or trade the green bonds. Between 2018 and 2019, green bond trading volumes on BondVision



**Paul Sinthunont**  
Aite Group



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“Being able to find and locate green bonds that satisfy that investment mandate requires some work, because there are a small number of green bonds out in the marketplace.”

**Chris Concannon, MarketAxess**





increased 179%, and now there are 426 green bonds listed on the platform.

Cervený and Clark say transparency is the most important aspect of green bond trading. Transparency will unlock liquidity and, consequently, issuance.

“The more prominent or the easier it is to find the green bonds on our platform, the more liquidity and more money will find it,” Clark says.

## Regulation Drives Transparency

Transparency will be driven by the public sector, as standards and regulation will ensure stricter certification of green instruments as actually funding sustainable activities by corporates and governments, and bring more trust to the sustainable bond market. Some of the most comprehensive work in the public sector on sustainable finance generally has been the EC’s Action Plan on financing sustainable growth, which the European Commission laid out in 2018.

As part of the plan, the EC set up a Technical Expert Group (TEG) on sustainable finance. The TEG was responsible for developing recommendations to the EC on a classification system on sustainability, called the EU Taxonomy, and an EU Green Bond standard. The TEG’s final report on the standard was published last year, and its final report on the taxonomy was published in March 2020.

The TEG’s green bonds standards link the use-of-proceeds—how the funds raised from the issuance of the bonds are actually spent—of green bonds to the EU Taxonomy’s standards for what constitutes sustainable activity, and prescribe some standards for allocation and impact reporting. The green bond standard will be voluntary, available to issuers anywhere in the world that wish to align with best practices in the market. The standard will also put in place a registration scheme for external verifiers.

There are other initiatives outside of government, however, to ensure some transparency around green bonds. The CBI runs what it says is the only international certification scheme for these instruments, setting definitions and eligibility criteria for certification. The NGO also has a pre- and post-issuance assurance framework. Similarly, the International Capital Markets Association

(ICMA), a trade association, has voluntary guidelines for the process of green bond issuance, which it published in 2014 and updated in 2018, with the aim of recommending transparency and disclosure in issuance. Major investment banks including JP Morgan, BNP Paribas, Deutsche Bank, and Citi are signatories to the ICMA principles.

CBI founder and CEO Sean Kidney says its certification works by making the ICMA voluntary requirements mandatory: A bond has to meet all of the principles to be qualified as green by CBI. “For the certification to be valid, you must meet all of them: You can’t cherry-pick; you have to meet this independent definition, which is the CBI definition of what is green,” Kidney says.

MTS’ Clark says the green bonds on BondVision have been certified by the CBI.

Rebecca Healey, co-chair of the EMEA regional committee and EMEA regulatory subcommittee at FIX Trading Community, says the EU Taxonomy will bolster the reporting quality of green bonds.

“[The lack of data reported around ESG] is a huge challenge at the moment, because so much of the data available currently is voluntary and it is also subjective,” she says, meaning that every individual company or issuer may have a different definition of what they believe to be a green bond.

Subjectivity, coupled with inconsistent ESG reporting, means that the information available is skewed, Healey adds. “Firms can be at risk of unintentionally greenwashing. Added to which, information is difficult to get ahold of and can be sporadic in how and where it is reported. This is where greater standardization in how data is reported will be extremely helpful for organizations.”

## Lost at Sea

In addition to not having a universal standard for what is green, the bonds that have been qualified, either by CBI or by another means, get lost in the sea of corporate bonds, says Chris Concannon, president and COO of MarketAxess. This hinders a portfolio manager’s ability to fulfill their ESG investment mandates.

While green bonds are a small part of the fixed income market, they are grow-

ing, due in part to the investment strategy developing over major fund complexes, Concannon says.

Concannon, who was previously president and COO of CBOE Global Markets, tells *Waters Technology* that traders and portfolio managers who use the MarketAxess trading technology are getting mandates from their employers that require ESG investment, cutting across equities and fixed income. “Being able to find and locate green bonds that satisfy that investment mandate requires some work, because there are a small number of green bonds out in the marketplace,” he says.

Concannon says MarketAxess recognized that clients were struggling to identify green bonds in the market, not knowing where to look for or how to find them. Clients were also looking for green alternatives that had the same characteristics as non-green bonds. The company’s response has been to launch features like the “Like Bonds” tool, which helps identify those characteristically similar green options. It also added a green bond tab and green bond identifiers to make locating bonds more efficient. Users are able to look at how the bonds are trading, and their liquidity, which Concannon hopes will help portfolio managers as well as traders.

Concannon says MarketAxess has seen huge demand for trading tools within the green bond market, and hopes to continue to respond to customer requests. The company plans to release new products later this year around this market.

As firms like MarketAxess and MTS continue to roll out new features to aid the trading of green bonds, the question of whether the effort is worth the reward still stands. Kidney says CBI predicts the growth of green bonds will keep rising.

And there is evidence that, while debt capital markets have generally placed less emphasis on ESG and sustainable investing than the equities world, fixed income investors are seeing value in specifically green instruments as issuance rises. So even as they are dwarfed by the conventional bond market, perhaps trading tech can unlock the potential of green bonds—especially as the world becomes more concerned about the impact of the real economy on the climate. [wt](#)



**Sean Kidney**  
CBI

# Alt Data Market Could Take Deep Hit Due to Coronavirus

If hedge funds and venture capitalists tighten their spending in 2020—a distinct possibility—it could be the alternative data market taking the brunt of the punishment. By Anthony Malakian and Rebecca Natale

It will take months, if not years, for the ripple effects of the coronavirus pandemic to be felt across the capital markets, but one burgeoning industry that might take a hit sooner than others is the alternative data space.

It's been a couple of years since alternative-data.org has updated its projections, but in 2017 the industry site said the buy side spent \$400 million on alternative data sources and building out the necessary infrastructure to handle these sources of information. It projected by the end of 2020, that number would hit \$1.7 billion. Estimates by consultancies Greenwich Associates and Opimas have shown similar spikes in buy-side spending on alternative data for this year.

Even though the industry has been growing, buy-side firms are also finding that onboarding

new datasets is not a simple plug-and-play endeavor. Last year, analytics advisory firm Element22 released a benchmark survey sponsored by UBS Asset Management. It found that of 59 asset managers, representing more than 20% of global assets under management, 68% were either only in the planning phase or trialing early proofs-of-concept when it came to their alt data programs. While buy-side firms are interested in alternative data, many are still largely finding their footing, and that was before a massively disruptive pandemic.

Market volatility and fears of a looming global recession amid the coronavirus pandemic could lead hedge funds to

tighten their belts, and one obvious area for contraction is the onboarding of new—and costly—alternative datasets.

The CTO of a multi-strat hedge fund with more than \$50 billion under management tells *WatersTechnology* that in the next three to six months, the firm is “unlikely” to onboard an alternative data provider that it has not previously used. The CTO of an emerging markets hedge fund with more than \$10 billion under management said it was not going to add any new alt datasets in the near term.

Meanwhile, the portfolio manager at a fund with over \$25 billion under management says they have signed on a new environmental, social and gov-



ernance (ESG) data provider, and plans to continue adding alternative sources of information in the near future, but notes that the comms front has dried up a bit.

“Since the market volatility started, we’ve not had too much conversation with data vendors, as everyone is super busy managing portfolios and communicating with clients,” they say.

A fourth source—a CTO at a credit fund with more than \$8 billion under management—says they are actually “more likely” to onboard new datasets because of the volatility of the market, specifically around mobile app data.

It’s a mixed bag of responses, but disruption is imminent.

### Cannibals

Even before the coronavirus emerged, buy-side firms were already grappling with tighter margins and higher cost pressures, while at the same time realizing the alt data they use in their investment processes is expensive and doesn’t always prove fruitful. While some buy-side firms will continue to invest in it, others will sit on the sidelines for a while, despite even the best sales tactics, which will shout “alternative data is more important than ever” during these volatile times.

Additionally, venture capital (VC) and private equity (PE) firms might also pull back some of their vital investment dollars in 2020. While many data providers will be able to survive a dry few months,

some contraction in the space seems inevitable.

Chris Metaxas, formerly the chief revenue officer of location data provider Thasos Group—which, after significantly cutting staff last year, was sold this year to AggData’s parent company, Market Service, Inc.—says this is a killer market environment for a space already rife with holes. When coronavirus cases ticked up and up, and as panic started to seize New York City, he thought of all the startups headquartered there—and how at least some of them are likely to go under.

“If I was a private-equity guy, I’m not going to give another dollar to any one of these companies,” he says. “They



**Chris Metaxas**





were already skeptical, but they were believing [the] hype. But now with the demise of everything to a large extent, I don't see anybody positioned in a way that they can say, 'We can help the world—the market—out of this thing with our data.'"

Metaxas doesn't dispute the importance of alt data but says the secretive, cards-close-to-vest hedge fund culture is preventing consumers—those same hedge funds themselves—from getting the most value out of their investments. In other words, what might best answer the "overpromise, underdeliver" accusation many have made against the vendors is another question: How can a data provider offer the right data for a trading algorithm if the fund won't tell the provider how the algorithm works?

Much of alt data on its own doesn't actually tell you much. It needs to be manipulated for client-specific needs, Metaxas says. Until providers are made privy to what those needs are, the best thing they can do to survive is come up with "golden nuggets" of data, though that's easier said than done.

"That's where there's dollars and cents to be made for an alt data com-



**Steve McLaughlin**  
FT Partners

pany," Metaxas says. "And most alt data companies don't have the wherewithal to do that because they don't really know what the customers want because the customers on the buy side are not telling them effectively enough."

He warns today's newcomers to the market: "Enter it with the outlook that they're going to be commoditized and cannibalized, and that their signal is—or should be—only a component of a larger strategy."

### Angel Hunt

In December 2019, alt data startup Particle.One closed a \$2.5 million seed round of funding. Tanya Lyubimova, the vendor's founder and CEO, believes the current markets may be beneficial for alt data providers, noting that in volatile markets, data becomes more important.

"In fact, it's usually the best time to enter the market, as it becomes the perfect sandbox to validate the hypothesis and test the ideas in real time," Lyubimova says. "The first quarter of 2020 seems to be the perfect time to see if this predictive power actually adds value to strategies."



**Tanya Lyubimova**  
Particle.One

But while this challenging market does provide an opportunity for a firm to quickly prove its worth, Lyubimova also acknowledges that it's going to be exceedingly difficult to raise funds in the near future.

"From what I see happening in the VC space, today is probably the toughest time to raise money," she says. "Considering that there are no in-person meetings available—in Silicon Valley or New York—founders [have to] rely purely on the ability to explain their vision via a call or hopefully [video conferencing platform] Zoom. The 'shelter-in-place' unfortunately brings more distraction during regular working hours as kids homeschooling is happening exactly at the same time. You hopefully book a 30-minute call with an investor, but you can never tell what's happening in the background. This means a founder should take two if not three times as many meetings versus before the Covid-19 [outbreak]."

Lyubimova also sees the angel investor space—a valuable source of funds in the past for the alt data community—drying up for the next couple of months.

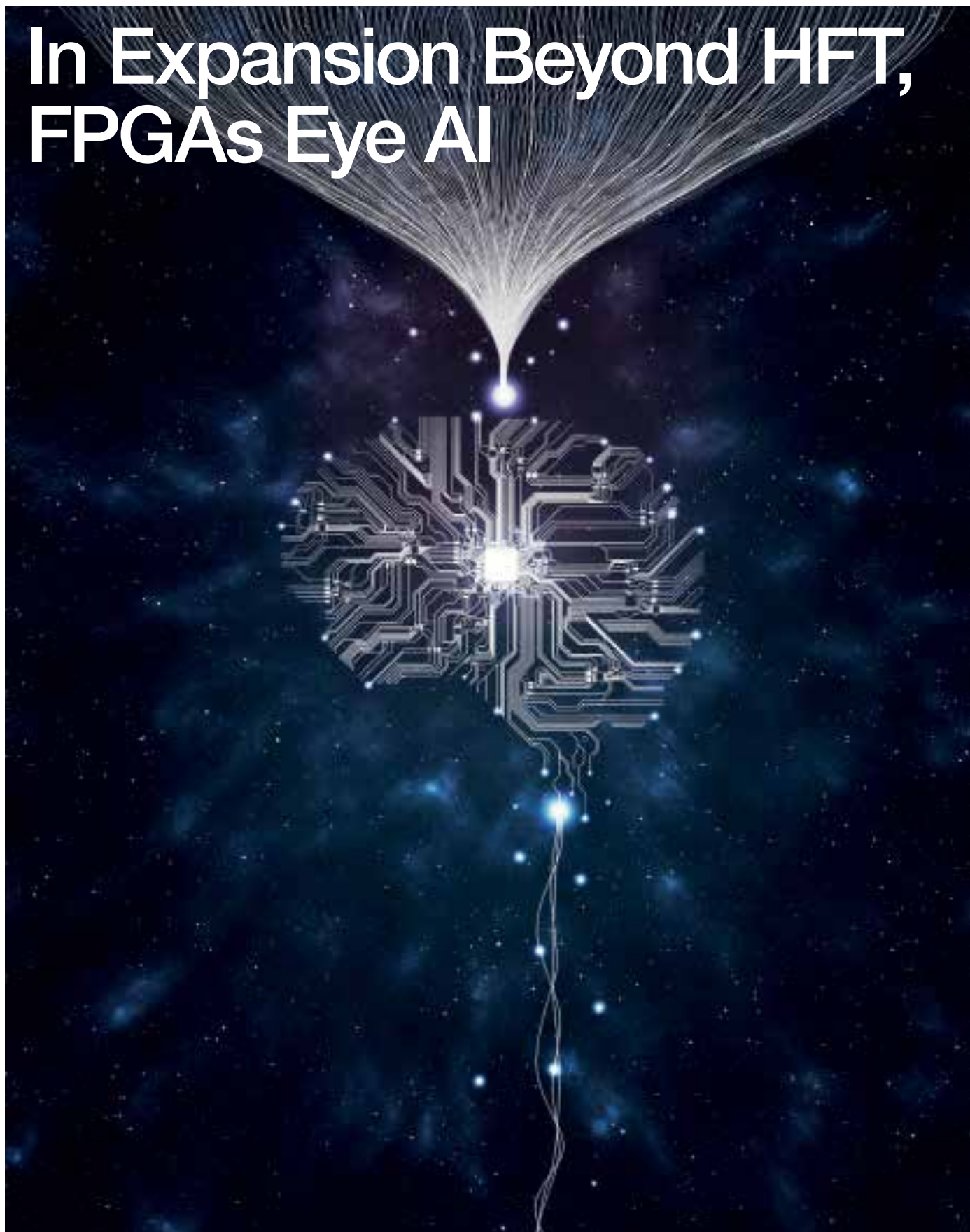
"This also creates another potential problem of not being able to close fast," she says. "Many seed rounds were closed through micro VCs and angels—using SAFE [agreements] or convertible notes—in a matter of weeks with less [due diligence] involved, that pushed institutional VCs to react faster. Now we are in a slow-paced environment."

The major fintech centers—London, New York, and Silicon Valley/San Francisco—have only been disrupted by the coronavirus for a short period so far, so there's still a lot of uncertainty permeating the market, says Steve McLaughlin, founder and CEO of FT Partners, a San Francisco-based investment bank focused solely on the fintech community.

"On one hand, I agree [alt data could be in trouble]. On the other hand, this type of data could be super useful right now," he says.

But McLaughlin also echoes Lyubimova's point: If you can prove your worth in this environment, you're likely to thrive. "There's money for anything at a reasonable price," he says. **wt**

# In Expansion Beyond HFT, FPGAs Eye AI



After a decade of supercharging low-latency applications, **Wei-Shen Wong** explores how FPGAs are pushing into new areas of the capital markets, driven by interest in artificial intelligence and machine learning.

**T**rading firms are notoriously secretive about their use of any technology that they believe delivers an advantage, so gauging actual usage of hardware components such as field-programmable gate array (FPGA) processors can be hard for those outside the firms themselves. But one can gain an idea of demand by looking at recent mergers and acquisitions activity, and the willingness of major chipmakers to invest in these technologies.

Last year saw three significant acquisitions in the space, with two major hardware providers bolstering their FPGA offerings, and one FPGA provider looking to expand its base of services.

In April last year, Intel acquired Omnitek, a Basingstoke, UK-based provider of FPGAs for video systems. The same month, FPGA maker Xilinx acquired Solarflare, which provides ultra low-latency network interface cards. Then in December, Cisco Systems announced that it was acquiring FPGA and hardware switch provider Exablaze. These follow Intel's 2015 purchase of Altera Corp.

Faster, stronger, better—that's how people typically characterize FPGAs. In the capital markets, this piece of hardware found a home in high-frequency trading (HFT) shops, where speed is its main bargaining chip. And as time has progressed, FPGAs have become "table stakes" for banks, asset managers, and vendors trying to supercharge everything from elements of trading and risk management to deep analytics. But while speed is still certainly the hardware's main calling card in the capital markets, FPGAs are becoming more democratized within the financial markets and are also helping when it comes to artificial intelligence (AI) development.

Although FPGAs are already widely adopted—Prasanna Sundararajan, CEO and co-founder of Reniac, a data engine provider that accelerates data-centric applications, calls them the "worst kept secret" in terms of computing performance and cost advantage—there are still

some factors holding them back from achieving greater success, such as certain forms of programmability (which is also a strength), challenges of interoperability with new analytics techniques, and an overall industry drive toward software (*see page 22*).

Nevertheless, market research and strategy consulting firm Global Market Insights expects the market size of FPGAs to grow from \$5 billion recorded in 2018 to \$13 billion by 2026.

"The FPGA industry is moderately competitive owing to the presence of limited strong and leading market leaders worldwide with their broad distribution network. These companies are focusing on R&D activities to develop new FPGA devices with enhanced features and capabilities," said the research firm in a recent report on FPGAs, citing applications such as infotainment systems, speech recognition systems, and machine vision as catalysts for the increasing demand for these devices.

• <https://www.gminsights.com/industry-analysis/field-programmable-gate-array-fpga-market-size>

As FPGAs become easier to access and use, a natural vertical to expand into would be artificial intelligence and, specifically, various forms of machine learning (ML) that require massive datasets for training and analytics. As FPGA providers look to stay relevant in the world of capital markets, they'll have to expand beyond HFT, which is becoming something of a zero-sum game. Machine learning might just be the future.

### Magic Tool for AI?

There's a reason why AI and ML are increasingly butting into the FPGA conversation. Today, AI and ML calculations and workloads generally use central processing units (CPUs) and graphics processing units (GPUs). But due to some of the limitations of these, FPGAs are gaining traction.

Assuming that firms are at the point where they know how to build an ML model, and have the data available to build that model and train it into

a high-quality model with minimal biases, the next challenge is deploying that model.

According to Ludovic Larzul, founder and CEO of Mipsology, a startup focused on acceleration for deep-learning inference, if the deployment of an ML model is internal for small applications, the challenges are small. "However, if the application is for the service of the larger public, then it requires considerable computing power. The challenge is to have a reliable hardware infrastructure that can sustain the loads without failing. FPGAs are better positioned for that task," he says.

Even though GPUs were adopted early on for ML training, they haven't been widely used in industrial or professional applications, whereas deploying ML at scale is extremely important to banks and financial institutions, Larzul says. "Their design is still driven mainly by gamer needs, which are not as sensitive to quality as financial services. Furthermore, GPUs are a very poor fit for the inference/deployment stage of AI," he says.

The inference stage of AI refers to the timeframe during which you can derive insights from the model. According to a report by IBM, the inference phase is the sum of all prior parts—data and training. "If your data was bad or the training was inaccurate, inference will suffer. Without proper inference, all prior efforts are for naught," IBM stated in the report.

Meanwhile, Reniac's Sundararajan says one of the biggest bottlenecks when running AI and ML models is around handling data in a real-time manner. "We have figured out how to collect and store more data than ever, but the issue is with operationalizing the data, particularly as it is being collected," he says. "The key to that operationalization is an extremely fast database, and database software alone has been hitting a ceiling of optimization."



That's where combining FPGAs with software can work to provide the speed and scale required for complex and data-intensive applications like AI and ML. Two of the key advantages of FPGAs are their programmability (which can also, conversely, create challenges) and flexibility: They can be reprogrammed even after the circuit has been designed and implemented, meaning they can be updated to perform a completely different task down the road. Also, FPGAs have additional gates and wiring, which allow them to be flexible.

"Machine learning can use thousands of nodes to execute training on traditional servers and database nodes, but that is really due to CPUs, which communicate in a less efficient manner," Sundararajan says. "FPGAs communicate with one another and other parts of the tech stack at a very fast rate, which provides that speed and scale that AI and ML require. There are other solutions, like adding more traditional hardware to the mix or adding database nodes, but the solution is akin to attempting to support the data of tomorrow with yesterday's datacenter—inefficient, cost-heavy, and complex."

Therefore, he says, if financial institutions can realize that the shape of the datacenter is changing, implementing FPGAs can become a critical competitive

advantage. "The giants and hyperscalers are already taking advantage of this technology, and it truly is the worst kept secret in performance and cost advantages right now. Microsoft, Alibaba, and Amazon all have instances with FPGAs under the covers—and there is no reason a company of any size couldn't benefit from their use," he says.

FPGAs have the flexibility to integrate more features at the hardware level post-installation, and more specifically for AI/ML, they provide parallel compute capability with a large density of memory and high bandwidth, says Mipsology's Larzul.

Sumeet Puri, global head of field technology at Solace, which provides messaging technology, concurs that FPGAs are very good at parallel processing. "In our case, publish, subscribe, message streaming input/output (I/O) is a very parallel problem. So that's how we leverage FPGAs, and that's how we get the performance that they provide. Similarly, whether it's cryptosystems or AI, machine-learning systems, it depends on how you use the FPGA, but they are great for parallelism," he says.

Puri further explains parallel calculations this way: "When you search for something in the Google search engine, say you look for movies [showing]

tonight, or search for the best restaurants. These lookups are completely parallel, and their learning is also parallel. So, Google is trying to learn about me as a person. Okay, I like food, and for further personalization, the machine-learning engines are watching my patterns, and they're saying 'Okay, Sumeet likes food.' So next time, they will suggest more food-related options or anything related to food or cuisine. While in your case, it's learning that you like movies. So that's the machine-learning part, and it's also parallel. Google was able to scale their search because of these capabilities themselves, and so did a few others. And now, with the advent of TensorFlow, with Google's open source, a lot of other trading applications are using some of these capabilities from various cloud providers."

For their programmability and flexibility, FPGAs are being presented as a magic tool for AI and ML workloads. However, according to Henry Harrison, co-founder and CTO of Garrison, a London-based cybersecurity solutions provider that uses FPGAs in an approach called Hardsec, nine out of 10 users are better off focusing on improving their software or finding more efficient algorithms—though he also notes that there are some scenarios where FPGAs

## Case Study: Cisco/Exablaze

Cisco Systems closed out 2019 with its sixth acquisition for the year: Exablaze, an Australian vendor of ultra-low-latency networking equipment specializing in FPGA technology and network switches.

In a blog post, Rob Salvagno, then vice president of corporate development and Cisco investments at Cisco Systems—he recently left to join private equity firm KKR's technology growth equity business after working at Cisco for two decades—said integrating Exablaze's products and technology into Cisco's portfolio will provide its clients the latest FPGA technology, resulting in higher flexibility and the programmability they require.

<https://blogs.cisco.com/news/cisco-corporate-news-december-2019>

"In the case of the high-frequency trading sector, every sliver of time matters. By adding Exablaze's segment-leading ultra-low-latency devices and FPGA-based applications to our portfolio, financial and HFT customers will be better positioned to achieve their business objectives and deliver on their customer value proposition," wrote Salvagno.

<https://media.kkr.com/news-releases/news-release-details/kkr-broadens-technology-investing-talent-appointment-rob>

Exablaze now sits within Cisco's Nexus portfolio of datacenter switches. The two companies will work on next-generation switches and create opportunities to expand the solutions into the AI and ML spaces.

While it's still early days since the acquisition was completed, a head of technology at a network solutions provider believes Cisco's plans for Exablaze go beyond merely boosting its HFT offerings. "Cisco is known globally for building network fabrics. Perhaps in the future, we might see FPGA technology being used to bring that AI or machine learning capability to Cisco's fabrics. But at the end of the day, it's really up to Cisco to decide where they see things going," he says.

Thomas Scheibe, vice president of product management for Cisco's Nexus and ACI product line, says that while it's still too early to talk about potential products the two are working on, the aim is to take what Cisco and Exablaze have and build on that.

Certainly, whatever the two companies build will extend beyond banks and HFTs. Scheibe says there is also a need outside of the financial markets for low-latency and high-precision time-stamping in compute cluster environments—a set of connected computers that work together as one system—used in other industries.

"In the cloud computing space, there's a segment of application needs that require these kinds of high-performance compute, latency-optimized environments. And I do think there's an interesting opportunity to leverage some of these capabilities that exploit us in that space. Again, it's a little bit too early to talk about how we're going to productize it. At least to me, it's a very interesting technology with a lot of different use cases that we can see," he says.

Still, Exablaze primarily builds FPGA-based network devices targeted at a wide range of applications in financial trading, big data analytics, high-performance computing, telecommunications, and datacenters. Its clients include Goldman Sachs, Morgan Stanley, JP Morgan, and Bank of America, among other financial giants.

Scheibe says Exablaze already has a set of good customers, but clearly, there is a much larger market opportunity across the capital markets that it can address. "So I think I've seen that as a clear opportunity, leveraging some of Cisco's presence and availability to help absolutely scale in that core [financial] market," he says.

A natural fit for Exablaze within Cisco could be in the 5G network space, says an analyst covering Exablaze. "With 5G, one of the major technical requirements is what they call ultra-reliable low latency. I think one of the things Exablaze brings, of course, is low latency, and Cisco is a dominant player in the networking space, especially in the enterprise and telecom networking. Exablaze might have something to add there. Suffice to say, I think Cisco's not acquiring Exablaze just for the HFT sector. I'm sure they have bigger plans than just that," the analyst adds.

<https://www.watertechnology.com/technology/4743391/5g-iot-are-you-ready-for-the-data-deluge>



can perform significantly better than CPUs. (See page 22 for more on the cost-benefits of FPGAs versus software.)

“It is entirely feasible that someone will discover some key AI/ML techniques that lend themselves perfectly to FPGA acceleration—but I’m not personally aware of any to date. There will, of course, be case studies, but rarely do those case studies compare the FPGA implementation with a software implementation that’s had the same level of engineering attention. Very often, they are comparing the performance of heavily optimized FPGA implementations with non-optimized software,” Harrison says.

### Other Hardware

On the FPGA-vs.-GPU argument, Jim Handy, a specialist in semiconductors, memory, and solid-state drives at Objective Analysis, a semiconductor market research firm, says that for a few years, GPUs were the preferred way to embody machine-learning or training systems. “Computer architects recently decided that they could do better by converting to FPGAs instead of GPUs. With the Altera acquisition, Intel has the opportunity to win back some of these designs,” he says.

Handy explains that GPUs are designed to solve matrix manipulations for matrices of fixed dimensions, but AI algorithms use varying matrix dimensions. “FPGAs support this flexibility better than GPUs do,” he says.

Back in 2015, Intel bought Altera, an FPGA technology provider, specifically to build next-generation semiconductors. At the time of the acquisition, Intel’s then-CEO, Brian Krzanich, said, “We will apply Moore’s Law to grow today’s FPGA business, and we’ll invent new products and make amazing experiences of the future possible—experiences like autonomous driving and machine learning.”

This February, Intel announced its first next-generation structured ASIC—short for application-specific integrated circuit—named “Diamond Mesa,” aimed at 5G wireless applications. Structured ASIC devices are an intermediary technology between FPGAs and standard-cell ASICs, and allow for faster time-to-market and lower design cost.

Diamond Mesa is designed to complement Intel’s portfolio of processors and FPGAs, to deliver the high performance and low latency required for 5G networks. In a statement, Intel said,

“Structured ASICs like Diamond Mesa provide a minimum-risk optimization path for workloads that do not require the full programmability of FPGAs, targeting double the performance efficiency versus the prior generation, and uniquely position Intel as the only provider delivering a full silicon platform foundation for network infrastructure.”

Early access to Diamond Mesa is now open to some Intel customers, while full production is expected to start in 2022.

### The Future

Xilinx’s acquisition of Solarflare is a different side of the same coin, compared to Cisco and Exablaze. Xilinx is already a major FPGA provider, but Solarflare could help the company expand its machine-learning capabilities.

Xilinx said the acquisition would help it accelerate its “datacenter-first” strategy and transition to a platform company. It will combine its FPGAs, multiprocessor system-on-chip (MPSoC) and adaptive compute acceleration platform (ACAP) solutions with Solarflare’s ultra-low-latency network interface card (NIC) technology and Onload application acceleration software to enable new converged SmartNIC solutions.

Xilinx and Solarflare have been working together on advanced networking technology since Xilinx first became a strategic investor in 2017. Its first joint solution—a single-chip FPGA-based 100G SmartNIC—can process 100 million packets per-second receive and transmit, at less than 75 watts.

But an analyst who covers Xilinx sees the acquisition as a move to strengthen the company’s AI and ML capabilities. “I think there’s a trend toward not just machine learning on a single machine, but fabrics of connected machine-learning components,” he says.

As machine learning takes on greater importance in the capital markets for risk management and investment analytics, speed will also become more important. While the FPGA space is not yet ML-obvious, reading the M&A tea leaves suggests that to meet the future needs of banks and asset managers, this could be the next major battlefield in the hardware wars. [wt](#)

# Weighing the Benefits: Hardware Vs Software





In the pursuit of new ways to eliminate latency from the market data distribution and trading processes, vendors have invested in hardware-acceleration technologies, such as FPGAs. But with commodity chips now giving specialist hardware a run for its money, has that investment been wasted, or does each still have a role to play? By **Max Bowie**

**F**or the past 15 years, trading firms have poured money into the race for zero latency, investing millions in low-latency fiber routes, wireless connectivity, direct exchange datafeeds, and components of trading architectures that promise incremental improvements in processing time. One of these has been the introduction of hardware acceleration for certain parts of a rapid market data workflow, such as field-programmable gate array (FPGA) processors that speed up processing time for repetitive tasks like feed handling and book-building.

When trading firms agonize over microseconds of latency—the delay incurred in moving data from one point to another—finding a new technology that reduces that delay can be a game-changer. Additionally, using a slower technology can be detrimental to the solutions provided to clients, it can impact those clients' ability to trade efficiently, and it can waste development efforts.

In the search for lower latency and greater efficiency, market data and technology provider Activ Financial adopted hardware acceleration in 2007, creating a market data appliance based on FPGAs to complement its existing software platforms. But while fintech vendors invested in FPGAs, the regular microchip manufacturers made giant leaps forward.

"We began to question our use of FPGAs when Intel released its Sandy Bridge processors [in 2011]. It no longer seemed clear whether FPGAs still had a performance edge," says Activ COO Jim Bomer. "We have recently tested our solution on some old Sandy Bridge boxes and found that it outperforms the contemporary FPGA solution as far back as 2012."

As a result, Activ has switched back to a pure software infrastructure—though it will still offer the hardware appliance if customers want it. So now, the question

is, should other fintech vendors follow suit? Their rivals aren't so sure.

### FPGAs: The Latency Penicillin

FPGAs have been used to power some aspects of capital markets technology for almost 15 years—St. Louis, Mo.-based ticker plant and feed handler appliance vendor Exegy was the first to introduce a market data platform based on FPGAs in 2006—and have earned a reputation for being very fast, but tedious and expensive to work with. As a result, we

**“Over time, CPUs have developed to a point where they are more efficient than FPGAs for our workloads—for example, due to faster, more efficient cores, higher core counts, and adjunct technologies such as kernel bypass networking.” Steve McNeany, Activ Financial**

may now be facing an inflection point: Some providers are doubling down on FPGAs for data processing, while others are turning back to pure software solutions, claiming that software and the latest iterations of commodity hardware can deliver sufficient—and in some cases, FPGA-comparable—performance.

Latency-sensitive firms face a constant challenge to decide what technologies will deliver the best results. But the options aren't always clear.

One option for firms seeking clarity is to turn to technology testing and benchmarking body STAC Research. The company runs two benchmarks that measure network input/output (I/O) latency. The first is the STAC-N1 benchmark, which measures data latency using timestamps performed using software. Then there's the STAC-T0 benchmark, a more accurate measurement that determines latency on the wire. It can be applied to software and hardware systems, though to date it has been used to measure latency of FPGA-based systems.

Peter Lankford, founder and director of STAC, says the company is seeing demand to perform tests on both CPU-based and FPGA-based platforms. "There are a lot of firms using FPGAs, but a lot of applications still using CPUs," he says.

In addition, the competing claims made by vendors about their differing strategies can cause confusion. Industry association FISD's World Financial Information Conference last October saw a flurry of announcements on both

sides of the fence from datafeed technology vendors. Feed handler and datafeed provider Vela—with hardware partner Enyx—and Exegy both announced latency gains from new hardware-accelerated services, while Activ Financial unveiled a software-only version of its ticker plant.

Despite different approaches, each believes it will deliver better performance and value for its client base.

For example, by integrating Enyx's nxFeed FPGA network interface card into servers running its software Ticker Plant Appliance, Vela is able to deliver greater capacity using just one server, a server that the vendor ships to clients, who plug into the network ports and write to the API, while Vela manages the box remotely on their behalf—compared to needing two to run the software-only version, which the vendor will continue to offer.

The combination enables Vela to divide tasks between the most appropriate method for each. So, for instance,



**Steve McNeany**  
Activ Financial

line-handling and book-building can be performed using the Enyx FPGA card, while tasks like normalization and downstream distribution are handled using Vela's software.

"So we're leveraging each for what they're best suited to," says Ollie Cadman, chief product officer at Vela in London. "We're very well established in the software space, and haven't used hardware acceleration before. We've done a lot around kernel bypass to improve and contain market data throughput as data rates increased. But there are some instances where hardware delivers the next step in terms of footprint and determinism for the 99.99999th percentile."

Cadman says using hardware and software together in this way allows the vendor to take advantage of the gains made possible by using FPGAs, while retaining the flexibility of software.

"One of our clients' biggest focuses is the operational cost and size of the



**Ollie Cadman**  
Vela

throughput, and to reduce the physical server footprint required to run the ticker plant, or as CEO Steve McNeany puts it, to do more with less.

"Technology requirements change with update rates and user expectations, and we constantly re-evaluate the technical solution," McNeany says. "Over time, CPUs have developed to a point where they are more efficient than FPGAs for our workloads—for example, due to faster, more efficient cores, higher core counts, and adjunct technologies such as kernel bypass networking."

For example, he says, it's easier, faster, and cheaper to deploy a software ticker plant infrastructure in the field, and to make changes to it over time. Additionally, the vendor has been able to exceed its benchmarks measured on FPGAs using commodity servers running the new generation of chips. Beyond the tests with old Sandy Bridge

engineering cost, but we don't think that's our space," Bomer says, adding that the vendor serves a broader base of client types and business requirements than others who specialize only in low latency, and that software gives the vendor more agility to respond to client needs.

In addition, where financial firms perceive a distinct advantage to be gained, they often choose to build solutions in-house rather than buying off the shelf—at least, until the cost of development to achieve those incremental gains outweighs the benefit of the gains. For Bomer, chasing this fleeting demand isn't a wise use of resources. "Why produce a vendor product when people on the leading edge of the low-latency spectrum will 'roll their own'?" he says.

Cynics suggest that Activ's decision to move away from FPGAs may be a result of Exegy suing the vendor for infringement of patents related to FPGA usage. But while unwilling to share specific figures, Activ insists that its decision was motivated purely by performance factors.

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**"In the major developed equities markets and US equity options, I would guess the top market-makers are doing all that using FPGAs, but that the next tier of hedge fund, proprietary trading firms, and dark pool operators are using FPGAs to create a best bid and offer from direct feeds."**

**David Taylor, Exegy**

platform, and we've made investments over the years to optimize that. But we also wanted to build faster and to re-use tools going forward," he says. "And we use multicast so we can publish to unlimited numbers of downstream subscribers and applications with a reasonably low-latency profile, as well as for use in less latency-sensitive applications—so you can use this to power your whole trading stack."

### Ready to 'Ware

Activ Financial, on the other hand, has decided to focus its efforts on a return to an all-software ticker plant stack. Activ's original ticker plant was software-based, built in three tiers—feed handlers, databasing (a last-value cache), and fan-out to APIs. The vendor adopted FPGAs for the databasing tier to address latency and



**David Taylor**  
Exegy

servers, "with more modern Intel devices, we're seeing even bigger performance margins in favor of CPUs, and we are about to start testing with AMD's new Rome processors," Bomer says. "I would have liked to move down this path sooner, but at the time we had a working solution and many other priorities. On the other hand, I'm delighted that it is proving so effective now, as was demonstrated during the recent surge in Options Price Reporting Authority (Opra) traffic."

Activ did actually experiment with porting its feed handler tier to run on FPGAs around 2010.

"We got it running, and saw good results, but it had a very high engineering cost, and feed handlers are the part that changes all the time. There are some use-cases that support that necessary

### The 'Hard' Way

Meanwhile, Exegy is still a strong proponent of hardware for specific functions, though the vendor is blending that approach with software to govern and manage different hardware-based tasks. Its Xero trading platform is an FPGA-based network interface card that can be installed on servers running trading applications, or integrated with the vendor's Exegy Ticker Plant and Exegy Market Data System. Xero was released last year and can execute a trading algorithm in less than a microsecond. David Taylor, Exegy's CTO, says its continued focus on achieving the lowest latencies is a response to the needs of clients as they expand strategies across asset classes.

"What we've seen from conversations with clients, starting maybe 18 months ago, is that they are really focusing on speed, especially now in derivatives and futures markets, such as CME, Eurex, and Intercontinental Exchange, and in Asian markets," Taylor says.

He adds that one of the trends the company is still seeing is that FPGAs in

front-office technology goes through cycles.

"First, it's introduced as an alpha-generator. Then the top firms do it as best practice. Then, in the mature stage, it

recognizes certain market conditions, it can cancel orders, giving the firm time to step back and evaluate how the market is moving, without having its orders picked off.

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**"We can build an order book in 2.1 microseconds. Hardware would be marginally faster, but it only provides meaningful advantage for a very small section of the industry, and that section is shrinking. My opinion is that software will win in a big way within the next four years."**

**Patrick Flannery, MayStreet**

becomes table stakes. For some markets, FPGAs are entering that third stage of being table stakes," he says. "In the major developed equities markets and US equity options, I would guess the top market-makers are doing all that using FPGAs, but that the next tier of hedge fund, proprietary trading firms, and dark pool operators are using FPGAs to create a best bid and offer from direct feeds."

Like Activ, Exegy recognizes that some firms will want to "roll their own" technology where they perceive it gives them an advantage. But Taylor believes some aspects of FPGA ownership are where firms may draw the line.

"We had some clients who recognized that they need this level of performance and were looking to go out and hire FPGA developers to make it happen, but realized that we were the experts. Other clients already had FPGA teams, but didn't want to distract them from other projects," he says. "Part of our secret sauce is where you draw the hardware line: what should happen in FPGAs versus in software, and whether you are hard-coding or making something 'parameterable'—i.e., making it more flexible."

Indeed, Exegy provides a software API for Xero so users can quickly and easily set parameters for what is performed in FPGAs, so that firms concerned about latency can respond to changing market needs. For example, it's not just about speed of execution. Sometimes you need to exit a market just as swiftly.

So the API allows firms to set up a "cancel all" function so that when Xero

"Our intent is that software will always be governing the hardware," Taylor says. "You can be 'pure hardware' for part of a solution, but software at some level will always be a part of every solution."

### Software's Shortfalls

That said, one of the challenges of performing latency-sensitive tasks in software is that whereas hardware robotically performs its assigned task, software is also responsible for performing other processes that can impact specific activities and functions, says Alex Wolcough, director of UK-based capital markets consultancy Greenbirc Group.

"The operating system can occasionally interrupt what you're doing because it needs to do something else—for example, a Java Virtual Machine stops a program every so often to do 'garbage collection.' It only stops for a few nanoseconds, but it means that you're not getting the data at the speed and the consistency that you want," he says. "So one attraction of having something hardware-based is that you are entirely in control of the hardware and it won't be interrupted unless someone literally turns it off."

This challenge has not been lost on software engineers, says Vela's Cadman. "We use C++ primarily because of performance and to avoid the interruptions that you get with other languages, such as Java—though we have a Java API. So in the last software version, we made some adjustments to reduce 'garbage collection' time, because we do still have clients using Java."

Another feature of software solutions— notwithstanding the recent advances by chipmakers—is that once a firm has squeezed all the latency it can out of a process, it can appear that the only way to accelerate these further is hardware acceleration, says a former bank data technology executive who now works at a major hardware manufacturer.

"They say, 'OK, we'll take the hardware approach.' But by the time they've hired and trained people to write hardware solutions, the chip manufacturers have caught up and found ways to get the same performance from chips," the executive says. "We're doing a lot with multi-core channel access. Most multi-core systems have bottlenecks around the amount of memory they can access. But you can architect the circuit boards around where you plug in processes, and design them so they can leverage large amounts of memory."

STAC's Lankford concurs, saying that advances in CPUs have made it possible for software platforms to handle drastically increased volumes of data, but says his tests demonstrate that FPGAs can operate with maximum latency measured in nanoseconds, compared to microseconds for systems that add network I/O and business logic in software.

"Because FPGAs are so customizable and can start working on data as soon as it comes off the wire, they have an inherent advantage," Lankford says. "To get network data into and out of a software application, it first comes into the network interface card (NIC), which transfers it to the memory of the computer. Instructions running on the CPU analyze the data and create outbound data, which is then transferred back to the NIC to be transmitted. So there are several links in the chain. If you could embed your trading logic into the NIC, think how much latency you could save. That's effectively what an FPGA enables."

And in addition to being faster, FPGAs can also get a jump-start on their software counterparts, as FPGAs can start performing tasks on data as soon as the first byte of a data packet arrives, instead of waiting for the whole packet to arrive, he adds.



**Alex Wolcough**  
Greenbirc  
Group





“They say, ‘OK, we’ll take the hardware approach.’ But by the time they’ve hired and trained people to write hardware solutions, the chip manufacturers have caught up and found ways to get the same performance from chips.”

**Former bank data technology executive**

### Hardware’s Hitches

While FPGAs may speed up repetitive processes, it can slow down the ability to get those processes up and running because hard-coding those processes into the hardware is more time-consuming than coding software, Wolcough says. As their names imply, software is flexible; hardware is rigid.

“When you have something repeatable that operates well at low latency, the problem with things being coded into hardware is that it is less flexible,” he says. “So, for example, if an exchange makes a slight change to its protocol, a hardware solution may need its chip updated. So there is quite a high overhead from a maintenance perspective ... because making a change in software configuration is easy, but changing something coded on an FPGA card is more involved.”

The high cost of maintenance is a concern shared by others, including Patrick Flannery, CEO of feed handler technology vendor MayStreet, who agrees, and questions the incremental value of hardware solutions.

“Our perspective is that hardware-based solutions have far too high a cost of ownership and a limited audience, and that their marginal value is very low,” Flannery says, adding that commodity microprocessors are delivering comparable performance within software to current FPGA solutions.

“We can build an order book in 2.1 microseconds. Hardware would be marginally faster, but it only provides meaningful advantage for a very small section of the industry, and that section is shrinking,” he says. “My opinion is that software will win in a big way within the next four years.”



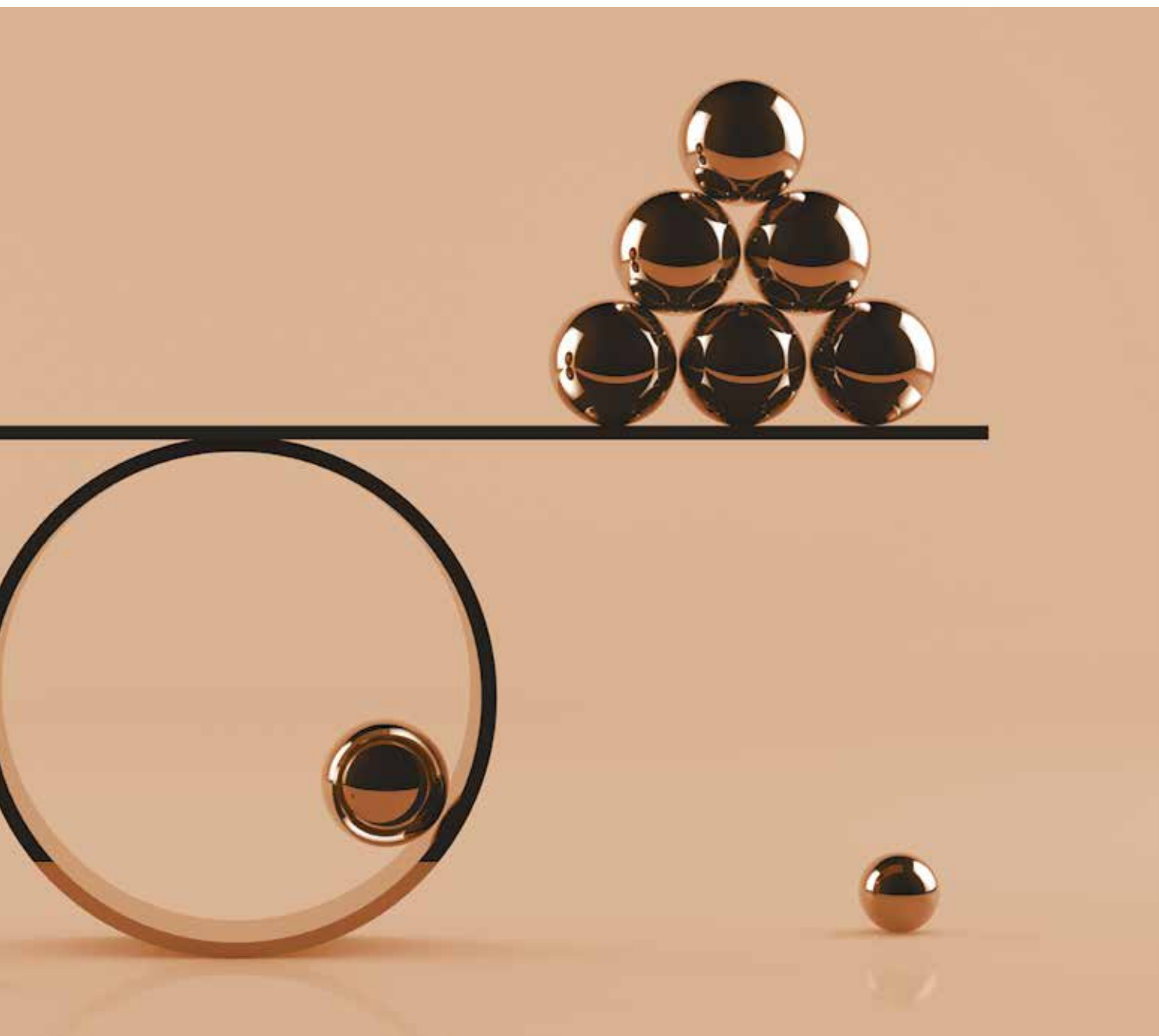
However, FPGA manufacturers are addressing these concerns and making it easier for users to perform more complicated tasks on FPGAs, Lankford says, such as Xilinx and Intel-owned Altera developing libraries that allow users to code logic onto FPGAs using C++.

Another example of inflexibility is determining where the output data from the hardware-based process goes. “If an FPGA wants to take data and send it to an algorithm running on the same or on the next card in a server,

that’s OK. But if you want it to send data to a lot of other applications, you need to have some kind of messaging layer,” which would likely be software, Wolcough adds.

But that’s not the only thing that makes them harder to work with: Monitoring the performance of FPGA-based systems is also harder than pure software platforms.

“If you’re market-making, you can receive data and price orders in hardware, but monitoring that, tuning risk param-



eters, and monitoring P&L—there's no reason to build that in hardware. It's more expensive and time-consuming," says Exegy's Taylor.

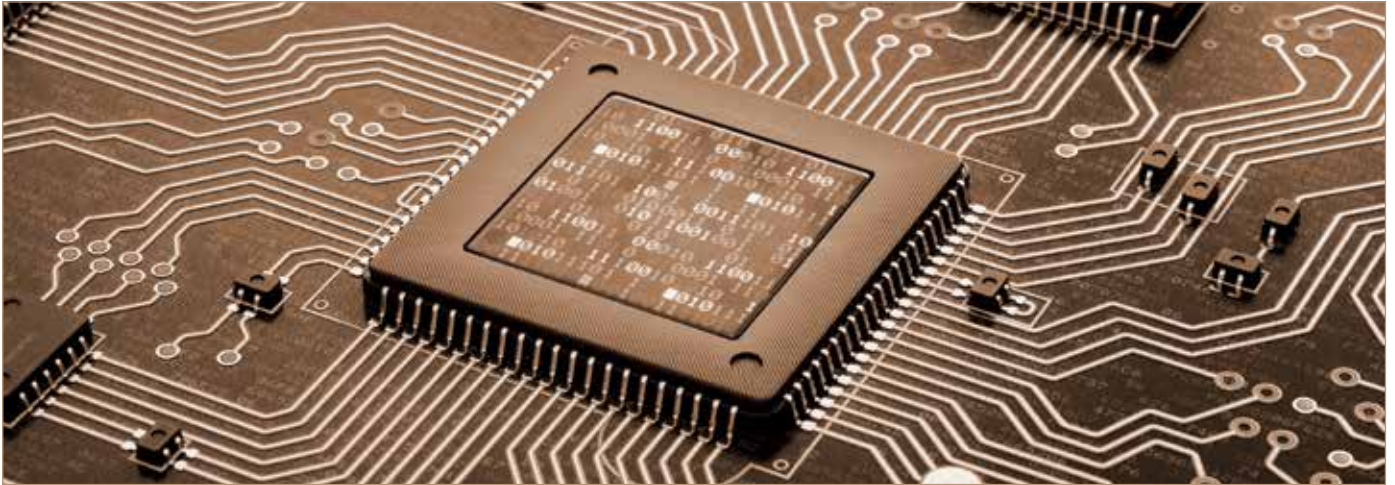
Guy Warren, CEO of systems technology provider ITRS Group, whose Geneos product monitors systems for performance, stability, and uptime, says it can easily support modern configurations of underlying hardware supporting software-based solutions, but that FPGAs present greater challenges.

"Clustered databases, clustered and dynamic containers using Kubernetes, or parallel web servers ... don't create a problem for monitoring, except we need to know how the many—and dynamically changing—parts make up the whole application we are watching. Previously, we got this from configuration given to us through the user interface or configuration management database. With dynamic environments, we have to collect this metadata from Kubernetes, which we can do," Warren says.

However, he says ITRS has not been asked to monitor any FPGA solutions, and "could only do it if the application was reporting the necessary data on an API," adding that FPGAs are "much harder to monitor."

### Seamless = Success

Activ's McNeany says some clients have even expressed relief that the vendor's platform is no longer reliant on FPGAs—though it will continue to offer the hardware-accelerated version.



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“Broadly speaking, super-fast algos tend to be pretty simple, so slower firms can compete by making their algos smarter. But the playing field is constantly shifting, because both the CPU and FPGA ecosystems have been pushing further along their weaker axes. The CPU/software ecosystem has been chipping away at latencies, while the FPGA ecosystem is making it easier to put more smarts into FPGAs. As a result, we can expect to see smart algos getting faster and fast algos getting smarter.”

**Peter Lankford, STAC**

“They just want us to be flexible and responsive ... and there’s a cost factor [to using FPGA-based platforms] as well,” he says.

The former bank data technology executive also highlights cost concerns, noting that—while costing more to deploy—FPGA solutions can save on operational spend by compressing a firm’s hardware footprint, especially when some vendor solutions can require multiple servers just to handle US options markets data. “The FPGA solution may be better, but is there real return on investment in spending that extra money?” he says.

If firms for whom cost is a factor have not already concentrated their efforts on software platforms, the new technique of Extreme Ultraviolet (EUV) Lithography could put an end to any performance debate. Recently highlighted by Goldman Sachs Research as being able to produce more powerful chips at lower cost, EUV prints transistors using shorter wavelengths of light.

Shorter wavelengths allow chipmakers to build chips with smaller components, and pack more compute power into a smaller space. Samsung is already using the process to build its own processors, and Intel and AMD are both also using it to create their next-generation chips.

Not to be outdone, FPGAs are also evolving, Lankford notes, with new generations increasing the amount of memory available. In fact, FPGAs have another inherent advantage: the clock speed of CPUs—measured in gigahertz—was the main driver of processing speed before the introduction of multi-core chips. “FPGAs started at a lower frequency, so they have further left to go,” he says.

In fact, both schools of technology are advancing, each trying to eat into the other’s strengths, driven by the need to increase both speed and intelligence of trading applications. “There is a tension between these, because applying more smarts generally takes more time. It also takes more code, and CPUs have tradi-

tionally been much easier to code than FPGAs,” Lankford says. “Broadly speaking, super-fast algos tend to be pretty simple, so slower firms can compete by making their algos smarter. But the playing field is constantly shifting, because both the CPU and FPGA ecosystems have been pushing further along their weaker axes. The CPU/software ecosystem has been chipping away at latencies, while the FPGA ecosystem is making it easier to put more smarts into FPGAs. As a result, we can expect to see smart algos getting faster and fast algos getting smarter.”

What’s most likely is that the industry will see a convergence of FPGAs and software for specific purposes. “The times are changing,” says Exegy’s Taylor. “Over the past 20 years, the top engineering schools have exposed students to hardware description languages, which are how you write circuits into FPGAs. It remains a fundamentally different discipline from software engineering. So, today, you have to be a good integrated circuit designer.”

But ultimately, clients shouldn’t need to be concerned whether a supplier’s system uses FPGAs or runs in pure software; they just need to know that it works and will deliver the speed, throughput, and capabilities they need. And whatever the underlying technology, it should be delivered as seamlessly as possible.

“Our clients push us towards the things they need to do,” Activ’s Bomer says. “They don’t tell us what technology to use to achieve them.” **WT**



**Peter Lankford**  
STAC



# > Change Creates Opportunity

Anthony Malakian notes that innovation tends to come about through a mix of experience and fresh ideas. This year's Women in Technology and Data award winners embodied that unique concoction.

**T**he majority of this year's Women in Technology and Data award winners have been making their presence felt at their companies for over five years, 10 years, even decades. And, of course, there were those women who have recently joined the capital markets, either fresh out of college or those who have moved over from a completely different industries.

But then there are those who are experienced, having worked for years in the capital markets, but over the last year-and-a-half, they decided to take on a new challenge. While every woman on the subsequent pages deserves a ton of credit for their accomplishments, I was especially struck by this specific category of technologists because they took the leap and clearly stamped their mark quite

quickly. Some of those honorees include Julie Armstrong (ChartIQ), Lauren Dillard (Nasdaq), Ann Neidenbach (LSEG), and Saritha Parchuri (Bank of America).

Innovation involves some chemistry: Combine equal parts experience and youth, and you need a dash of outside perspective that combines new ideas and experience. While the perfect formula for alchemy doesn't exist, there are clearly examples of women who took a risk and made an immediate impact. Change is scary, but sometimes the only way to the next plateau is to leap. [Wt](#)

**Anthony Malakian**  
Editor-in-Chief

## Winners' Circle

Trailblazer (lifetime achievement) award <b>Barb O'Malley, Northern Trust</b>	Page 32	Operational risk management professional of the year <b>Sihem Mouelhi, Elucidate</b>	Page 53
WatersTechnology's woman of the year <b>Ann Neidenbach, London Stock Exchange Group</b>	Page 34	Legal/compliance professional of the year <b>Miranda Morad, MarketAxess</b>	Page 54
Best company for diversity and inclusion (vendor) <b>Datactics</b>	Page 35	Rising star (vendor) <b>Amy Ross, SIX</b>	Page 56
Consultant of the year <b>Selvi Pasumalaithavan, SS&amp;C Advent</b>	Page 36	Rising star (end-user) <b>Charlie Beeson, Man Group</b>	Page 58
Data science professional of the year <b>Anita Patel, Bank of America</b>	Page 37	Startup professional of the year <b>Margaret Hartigan, Marstone</b>	Page 59
Market and credit risk professional of the year <b>Elaine Wong, Moody's Analytics</b>	Page 38	Support professional of the year (vendor) <b>Mardís Heimisdóttir, SS&amp;C Advent</b>	Page 60
Market data professional of the year <b>Amanda Duggan, London Stock Exchange Group</b>	Page 41	Technology innovator of the year (end-user) <b>Saritha Parchuri, Bank of America</b>	Page 61
Reference data professional of the year <b>Louise Green, Bureau van Dijk, a Moody's Analytics Company</b>	Page 42	Technology innovator of the year (vendor) <b>Reeba Mathen, Cloud9 Technologies</b>	Page 62
EDM professional of the year (end-user) <b>Donna Rudnicki, RBC Capital Markets</b>	Page 45	Technology leader of the year (vendor) <b>Ann Neidenbach, London Stock Exchange Group</b>	Page 63
EDM professional of the year (vendor) <b>Mansi Bagga, Oxane Partners</b>	Page 46	Technology leader of the year (end-user) <b>Amie Caban, Guggenheim Partners</b>	Page 64
Exchange professional of the year <b>Lauren Dillard, Nasdaq</b>	Page 47	Vendor partnership or alliance professional of the year <b>Mitra Roknabadi, OpenFin</b>	Page 66
Engineer/programmer of the year <b>Lana Kapulovskaya, JP Morgan Asset Management</b>	Page 48	Vendor professional of the year (business development) <b>Stephanie Sparvero, Bloomberg</b>	Page 67
Gender equality/diversity professional of the year (vendor) <b>Pamela Hutchinson, Bloomberg</b>	Page 50	Vendor professional of the year (data and operations) <b>Julie Armstrong, ChartIQ</b>	Page 68
Gender equality/diversity professional of the year (end-user) <b>Wincie Wong, RBS</b>	Page 52	Vendor professional of the year (trading and risk) <b>Irina Slobodyanyuk, Numerix</b>	Page 69

*Waters honored the winners at a ceremony on March 6 in London.*









## Trailblazer (lifetime achievement)

# Barb O'Malley, Northern Trust

Barb O'Malley, head of client solutions consulting at Northern Trust in Chicago, wins the trailblazer (lifetime achievement) award at this year's Women in Technology and Data Awards, joining past winners, Refinitiv's Debra Walton (2018) and Bank of America's Cathy Bessant (2019). O'Malley is a bona fide veteran of the capital markets, having spent more than three decades in the industry, initially as a techie before transitioning to more business-focused roles within the firm.

"Back in the mid-1990s, we had an aging online presence with an aged repository sitting behind it," she recalls. "I've spent the last 25 years building out and improving our Passport offering, first on the technology side and now on the business side with product development for the next generation of our digital offering. Our online presence is something I've been associated with through various roles for all 36 years of my career here."

Part of O'Malley's day-to-day role entails evaluating what she describes as "the next generation of technologies," of which the firm's API strategy plays a pivotal role, in addition to developing more intuitive online tools for clients. "We are focusing on what we call 'human-centered design' and building applications based on how users want to interact and not on what a technology person thinks is important," she says.

According to O'Malley, Northern Trust has a "robust" Women in Leadership development forum—of which she is one of the facilitators—that invites high-potential vice president-level women to participate in a year-long program that takes them through various modules to develop their skills and help them continue on the leadership path. The firm also has a high staff-retention rate, indicating a happy and settled staff. "Part of it is the culture, part of it is the benefits, and it's also a family-friendly organization," she says. "I also think it's about inviting women to the conversation—that's how you get them to feel valued and empowered."

O'Malley is fortunate, she says, to have had a number of good role models over the years, chief among whom was her retired manager, Pete Magrini, formerly executive vice president of technology, who constantly challenged her. "I was doing well and I was happy in my role, and he suggested that I rip out and overhaul the aging security module of our Passport suite," she says. "He said: 'Hey! You're going to lead this project. Here are two people to help you. Go figure it out.' He pushed me a little out of my comfort zone and it worked out really well for my career."

—VBA



**“** O'Malley is a bona fide veteran of the capital markets, having spent more than three decades in the industry, initially as a techie before transitioning to more business-focused roles within the firm.

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Northern Trust congratulates  
**Barb O'Malley** for her exemplary leadership and  
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## Woman of the year

# Ann Neidenbach, LSEG

Since the mid-1980s, Ann Neidenbach has called the capital markets home. There's the 25 years spent at Nasdaq, where she defined the exchange's roadmap of products and services—a \$250 million business with over 90 global customers. She oversaw the acquisition and implementation of several companies, and was instrumental in the company's European expansion. And of course there are her years spent at the likes of Citi, Lava Trading, BNY Convergenx, and Cowen.

That long road has led her to the London Stock Exchange Group (LSEG), where today she serves as global head of LSEG Technology and chief information officer of the exchange's capital markets group. This year's WatersTechnology Woman of the Year has dedicated her life to technology and has seen firsthand the markets evolve from the trading pits to a universe driven by innovation.

"I haven't worked with a group of business colleagues that doesn't depend on a technology team delivering," she says. "So it's always exciting to be at the table and be part of the solution to grow revenues or to build up new business opportunities."

When she joined LSEG about a year-and-a-half ago, she was initially focused on kick-starting the company's ambitious cloud program, which aims to move 60% of service delivery and corporate computing to the public cloud by 2021. As an example of this cloud push, Turquoise, the European multilateral trading facility majority owned by the LSEG, launched Nylon, a cloud-native platform that brings together Turquoise SwapMatch and Turquoise CFD. The exchange is also moving some of its post-trade processes and information services to the cloud.

"There's a big migration program, but there's also an acceleration of anything new that we feel comfortable we can put in the cloud, we've been building cloud-native," Neidenbach says. "We're very excited about what we're doing."

LSEG Technology is focused on building clearing and trading systems, both internally and for external customers, which includes more than 40 firms around the globe. Services and solutions include everything from traditional broker and exchange technology, to market data, risk management, surveillance, clearing, and settlement products.

To set up the exchange for the future, Neidenbach has led the enhancement of LSEG Technology's solutions to support multiple asset classes and different market structures on a single platform. This resulted in the recent go-live at the Johannesburg Stock Exchange, which implemented equity and foreign exchange derivatives.

Clearly, Neidenbach is not done innovating.

—AM



“When Neidenbach joined LSEG about a year-and-a-half ago, she was initially focused on kick-starting the company's ambitious cloud program, which aims to move 60% of service delivery and corporate computing to the public cloud by 2021.



## Best company for diversity and inclusion (vendor)

# Dataactics

Belfast-based Dataactics, a specialist in data quality and matching, prides itself on the diversity of its workforce. “We consider ourselves to be very inclusive and diverse,” says Stuart Harvey, CEO at Dataactics. “The driver for that is not a particular moral position that we have—we find that it’s practically related to finding good quality people in a demanding market.”

The firm, which has more than doubled the number of women it employs to over 40% by the end of last year, has a number of women in leadership roles, including its project management officer and head of HR. It also has an all-female artificial intelligence (AI) team, led by Dr. Fiona Browne. “We have people at different stages in their career,” Browne explains. “We have a lady who joined us from a placement with a master’s in data analytics. She is at the start of her machine learning career with a background in mathematics. We had another lady who joined us with a PhD from Liverpool University, and she came from an industrial background as well, so she’s got both the software development side and the machine learning side.”

The firm has 13 different nationalities represented within its workforce. One of the steps it has taken to create employee engagement has been organizing international days. This has involved an intern working in HR setting up a Chinese day, while two employees from Lithuania organized a similar event about their country.

Dataactics takes a flexible approach to remote working. For example, Browne—who spends a considerable amount of time commuting from outside Belfast—works from home one day a week. She says it provides her with flexibility in terms of her travel and family.

In addition, the firm has employees working in Milan, as well as a few people based in England. It tries to engender the feel of being part of a team by way of conference calls, meetings and flexible working arrangements. Dataactics also has a voluntary work partnership with a primary school in Belfast. Employees go to the school for one hour each week to do a variety of activities such as one-to-one reading with the students.

—HA

“The firm, which has more than doubled the number of women it employs to over 40% by the end of last year, has a number of women in leadership roles, including its project management officer and head of HR.”

## Consultant of the year

# Selvi Pasumalaithevan, SS&C Advent

Selvi Pasumalaithevan wins the consultant of the year category at this year's Women in Technology and Data Awards. Pasumalaithevan, principal consultant at SS&C Advent, has a lifelong interest in technology, one that she has blended with her interest in finance. Her passion for computers began at the end of high school when, she says, computers were booming.

"That interest in computers made me start in the space, which was primarily focusing on designing the accounting platforms and getting up to speed on the technologies and coming up with solutions," she says. "All of the technologies that I've developed were for asset managers, hedge funds or fund administrators—that's why I blended the technology with the finance industry."

Pasumalaithevan stresses the importance of building bridges between groups of technology users and technology providers. "You cannot just be a technology person because to understand the business, you need to be able to talk to clients and translate what you can do [for them]," she says.

Pasumalaithevan plays many roles at SS&C Advent, from being an implementation manager to project manager, but what is common is that she works closely with clients. She takes note of what their end-users need from their products and their concerns about implementing new platforms in their environments. "In all the roles I play, it's really just about one thing—working with clients and collaborating with them to ensure their success," she says. "When you work with them, you hear about their different needs, so you get to work with different flavors of clients."

For Pasumalaithevan, being able to expose girls at a young age to technology and finance is crucial. As a mother of a 10-year-old daughter, she says young people know how to use technology, but their passion must be harnessed to attract them to the sector. "It's important that we encourage young women and show them women who have accomplished great things in the sector," she says. "We also have to encourage a good work-life balance so they can be more motivated in their work."

—ED



**“**  
Pasumalaithevan, principal consultant at SS&C Advent, has a lifelong interest in technology, one that she has blended with her interest in finance.

## Data science professional of the year

# Anita Patel, Bank of America

Anita Patel has never been afraid of uncharted territory. As a teenager at school in London, there were few guides to help her pursue a career in technology, but now she is a lead data scientist in sales, research and capital markets at Bank of America Securities. And then, having embarked on this career, she pioneered the use of predictive models within that business.

Patel started her career at the bank as a software developer in a different business, where she began to work with predictive models. “I was introduced to the bank’s capital markets business and they were not so used to using technology like machine learning and building out predictive models. So we had a lot of fun exploring this area—it was completely uncharted,” she says.

The model Patel built, the Predictive Intelligence Analytics Machine (PRIAM), won the 2018 American Financial Technology Award for the most cutting-edge initiative. PRIAM is an artificial intelligence system that identifies within seconds the investors most likely to participate in an IPO or block deal, helping to maximize demand for equity capital market transactions. PRIAM has run predictions on equity capital markets transactions totaling more than \$1 billion in aggregate deal volume to date, with 80% accuracy on the top 30 investors in a deal.

With PRIAM, BofA Securities was able to improve the process of finding investors, an undertaking analysts had been doing manually and based on anecdotal analysis for years.

“It would take analysts several weeks. And we could gather all of this data, and apply a model that would generate a list for them. They could still review it before sharing it with clients to ensure they agree with the predictions, but it would simplify the process a lot for them,” Patel says. “Our analysis enabled our bankers to find incremental, ‘high signal’ investors who may not have been initially identified in their analysis as being interested in a particular deal.”

Apart from her work on PRIAM, Patel has also developed time-series forecasting models, such as sales trading shifts, for areas of the bank outside of capital markets. She wants to help women land STEM jobs, so she works with organizations like Stemettes and Code First: Girls, and also participates in recruitment events at her alma mater, Imperial College London. Within Bank of America, she has organized and hosted a data science workshop in collaboration with the Women’s Developers Network, which aimed to teach developers and non-developers how to create predictive models.

—JW



“  
The model Patel built, the Predictive Intelligence Analytics Machine, won the 2018 American Financial Technology Award for the most cutting-edge initiative.



## Market and credit risk professional of the year

# Elaine Wong, Moody's Analytics

Ask Elaine Wong what has had the biggest influence on her career path, and she will tell you it's her curious nature. So it was fortuitous that her path should lead to Moody's Analytics, which she says offers an environment that encourages curiosity and rewards those willing to raise their hand and ask for more responsibility.

Originally from Hong Kong, Wong started out in banking—first as a credit analyst at the Bank of Hawaii, then at Dresdner Kleinwort Wasserstein. “So I know that side of the business. I know the customers, how they analyze credit, and how they perform due diligence. I understand their pain points. ... And Moody's wanted that understanding.”

It was exactly this experience and understanding that two years ago led Wong—then a managing director in the vendor's consulting services division—to tell her superiors that the vendor's existing tools covering spreading, origination, and decision-making support couldn't meet customers' needs. The company took her advice, gathered requirements, created a proof-of-concept, then asked Wong to lead the project—her first product management role.

Here, her curiosity paid off again, having taken an interest through her career in learning not only the lingo used by both business and technology staff, but also the code used by developers.

“Developers aren't impressed that I worked at a bank. But when they see me write SQL code on a whiteboard, they know they can talk to me,” she says.

The resulting solution, CreditLens, provides analytics to help firms make commercial lending decisions, and is built using an API framework to integrate content from elsewhere within Moody's or from other providers. Wong spent the past year adding more tools to CreditLens, notably an artificial intelligence-based capability to automate the spreading process, reducing processing time by 70%, and spreading cost by 60%. This was previously a manual process of collecting information from financial statements or tax forms—“tedious but important so firms understand how much cash they have,” Wong says. Other enhancements include incorporating recent acquisition Bureau van Dijk's entity database of public and private companies, and natural-language processing technologies to extract and standardize data from documents.

Next up, over this year and 2021, Wong will focus on expanding CreditLens to help lenders manage commercial real estate transactions. The vendor is already active in real estate via its 2018 purchase of Reis, and now plans to expand its coverage with more analytics. And yes, she's still curious, and says there's plenty going on at Moody's to keep her that way.

—MB



**Patricia Rozados (left), and Veronica McCartney (right) accept the award on behalf of Elaine Wong**

“Wong spent the past year adding more tools to CreditLens, notably an artificial intelligence-based capability to automate the spreading process, reducing processing time by 70%, and spreading cost by 60%.”

# Winners' Circle: Elaine Wong, Moody's Analytics

## Credit Assessments: The Need for Speed and Efficiency

Elaine Wong, managing director—head of credit assessment and origination at Moody's Analytics, won the market and credit risk professional of the year category in this year's Women in Technology and Data Awards. Victor Anderson speaks to her about the problems Moody's is currently solving for its clients—especially around the need to manage credit assessments faster and more efficiently—the role she played in the development of the firm's CreditLens platform, and the support she has received during her 25-year career in the capital markets.

### **Q** How long have you been in the industry and at Moody's Analytics?

**Elaine Wong, managing director—head of credit assessment and origination, Moody's Analytics:** I've been at Moody's for 13.5 years—this is the longest job I've ever had! I was in banking for a while before I joined Moody's, so at least 25 years in total in the industry.

### **Q** What do you do at Moody's in terms of your "day" job?

**Wong:** I run our credit assessment unit, with architecture, engineering, product, services and operations teams reporting to me. I spend a lot of time thinking about what we need to do next—next quarter, next year and beyond that. Lately there have been more day-to-day activities; right now [in the early days of the COVID-19 outbreak] it is about crisis management and helping our customers to focus on the important tasks.

### **Q** Is CreditLens your baby and was the development of the platform your brainchild?

**Wong:** In terms of the functionality, it has been around for a while. With CreditLens, I said that our objective was to do it better. I'm responsible for guiding my fantastic teams who built it from the ground up, but I never call it my baby. If it were, I would never criticize it, and I never stop asking for more improvement! As I said, I was a banker before joining Moody's Analytics and so I understood what needed to be done. I wanted CreditLens to be a platform and not a band aid piece of software. That initially was a challenge for my architecture team.

### **Q** What are your clients' most acute needs right now? What are you hearing from them in terms of their pain points around credit assessments?

**Wong:** I think that depends on who you ask—people have different objectives. Some people working with credit assessments will say they just need more people. But if you look at it from a bank's perspective, they just want to be faster [in terms of performing credit assessments]. When we look at doing something really fast,

you have to look beyond just hiring 10 more people. That can't be the way.

Lending is fundamental [to our industry] and every crisis we experience becomes a credit and liquidity one when we are not efficient and effective. What we need to do is ensure that the platforms have the fundamentals so that we understand the basics faster and can make decisions faster.

### **Q** During the course of your 25-odd years in the industry, did you benefit by way of a mentor or sponsor who helped shape and advance your career?

**Wong:** There have been a number of people who have helped me, although a single person doesn't stand out. Also, as your career grows, your needs change. I have been lucky in that at various times during my career, I have worked with people who have given me honest feedback and helped me to think about how to navigate [various situations]. There have been a couple of those people within Moody's Analytics, but there were also some in my banking career.

### **Q** What was the best piece of feedback you received?

**Wong:** Someone once advised me to not think small. I'm from the Orient, so I tend to be a bit conservative, but people have always told me that I have great ideas and that I shouldn't be afraid to speak out. I received that advice early in my banking career, but that is also particularly encouraged at Moody's Analytics.

### **Q** Is there anyone at Moody's Analytics who has been especially supportive of you during your career?

**Wong:** Yes, there are two: Steve Tulenko, who is the president of the company, and Keith Berry, who heads the Moody's Analytics Accelerator. They taught me that it's not just about being the smartest person in the room, but how to influence your peers and stakeholders. They have also helped me to think positively. That's really important. [wt](#)



**Elaine Wong**

# Moody's Analytics Supports Women in Technology

We are proud to announce that Elaine Wong has been recognized as Market and Credit Risk Professional of the Year in the 2020 WatersTechnology Women in Technology and Data Awards.



**Elaine Wong**  
Managing Director  
Head of CA&O

**MOODY'S**  
ANALYTICS



## Market data professional of the year

# Amanda Duggan, LSEG

When it comes to market data, the London Stock Exchange Group (LSEG) is best known for producing—and amassing sizeable revenues for—massive volumes of price data to market participants. Perhaps less known is that as its indexes and analytics business lines have grown, the exchange group has found itself becoming a larger consumer of third-party data to support these products, and now captures data from almost 200 suppliers.

So it makes sense that the exchange would also adopt enterprise-wide data management processes more commonly seen at financial firms that consume exchange data. And the person who has led that charge over the past 18 months is LSEG's senior manager of data sourcing and vendor management, Amanda Duggan.

"There has been a push from our side to understand the quality [of data from third parties], and to do our own quality assurance testing to understand that the data is accurate and is being delivered in a timely manner. And we've been able to put in place a lot of best practices to further improve that data integrity and data quality," Duggan says.

These practices start with service-level agreements and vendor scorecards—widely adopted by financial firms for assessing suppliers—which allow the exchange to compare vendor services, ensure suppliers are meeting performance criteria, and to use that data when evaluating providers and negotiating services.

"It's about being transparent around our usage, and having a more integrated, enterprise-wide data strategy ... that ensures data can be used enterprise-wide, not just in siloed divisions," she says.

Duggan has also implemented a three-tier system of classifying vendors—Silver, Gold, and Platinum—based on the level of information they provide about their services and how well they communicate with the exchange about any service issues.

These measures aren't just about managing the cost and reliability of third-party data; when onboarding a new supplier, or refreshing an existing contract, LSEG also assesses factors such as a vendor's information security practices, its code of conduct, whether it is subject to any sanctions, and performs a financial healthcheck on each supplier, to ensure they comply with LSEG's procurement and risk practices.

Duggan's team—spread across London, New York, Fort Mill in South Carolina, and Malaysia—also set up a Data Sourcing Committee that approves all new data before a contract is signed.

This year Duggan plans to create a strategic framework to ensure some of its third-party datafeeds are fit for purpose and align with the exchange's strategy, pursue more enterprise data licenses, and ensure that all suppliers deemed "core" attain the Platinum service tier.

—MB



“Duggan has also implemented a three-tier system of classifying vendors—Silver, Gold, and Platinum—based on the level of information they provide about their services and how well they communicate with the exchange about any service issues.

## Reference data professional of the year

### Louise Green, Bureau van Dijk (a Moody's Analytics company)

When you've spent 30 years at the same company, you must be doing something right. That's how long Louise Green has spent at company information provider Bureau van Dijk, steering its marketing activities, first for the UK market, and now as managing director, with a global remit for its products.

Green joined the vendor as one of its first UK employees. Then, BvD was selling data on CD-ROMs, which she says was "revolutionary" at the time. Now, as part of Moody's Analytics, the vendor's products cover more than 366 million companies (up from 60 million 10 years ago) and 325 million company executives.

Over that 30 year period, Green points to two trends that have contributed to the company's growth: first, technical advances that allow for far greater export and integration of data, and the creation of identifiers that allow users to create company-level views; and second, the globalization of data. Whereas company data used to be domestic by market, the vendor created regional and global datasets to reflect a company's global presence via its supply chain, partners, and customers.

Before BvD, Green worked for a financial analyst, gathering data from official sources on construction companies. "So when I interviewed at BvD, I understood the product because it was what I would have wanted," she says. Her first three years at the vendor were in sales, where she came to understand the importance of working closely with clients—something she says its salespeople still excel at, actively providing feedback to drive product development. "The culture here is that we get excited about the things clients can do with our data," she adds.

During the 2017 purchase of BvD by Moody's Analytics, Green was "privileged" to be part of the team charged with representing BvD in the acquisition and integration and understanding what Moody's brought to the table. For Green personally, this translated to a bigger role, and leading last year's launch of its Compliance Catalyst 2 product, which helps firms strengthen their third-party due diligence and risk assessments, reflecting the evolving market's need for a more scalable compliance platform.

Now, Green is excited about the potential for artificial intelligence (AI) to help evolve BvD's platforms further. "There is always appetite for more data, and higher-quality data. We're constantly striving to reduce false positive results, and AI is going to make a big difference around speeding up the interpretation of data. We're about helping people make better decisions and work more efficiently."

—MB



“Over that 30 year period, Green points to two trends that have contributed to the company's growth: first, technical advances that allow for far greater export and integration of data, and the creation of identifiers that allow users to create company-level views; and second, the globalization of data.”

# Winners' Circle: Louise Green, Bureau van Dijk

## Searching for the Right Answers

Louise Green, managing director for marketing and communications at Bureau van Dijk\*, won the reference data professional category for the second successive year at this year's Women in Technology and Data Awards. She speaks to Victor Anderson about her clients' need for the "right" answers, her achievements during her 30-year career at the firm, and the positive changes she has seen towards women and minority groups during her time in the industry.

**Q** What does your day-to-day role at Bureau van Dijk entail?

**Louise Green, managing director, marketing and communications, Bureau van Dijk:** I lead the marketing and communications at the firm, and part of that includes knowledge management and e-learning.

**Q** You must have seen some changes across the industry during your three decades at the company?

**Green:** Yes, the entire industry has changed—it was in fledgling form when I joined. We were selling data on CD-ROMs. Some people didn't even have CD-ROM drives at the time!

**Q** What are you most proud of that you brought to Bureau van Dijk during your time at the company?

**Green:** I'm proud that I was part of the team involved in the sale/acquisition of Bureau van Dijk to Moody's and the subsequent integration into the Moody's Analytics business. Having joined Bureau van Dijk as a startup, and then seeing it being such a significant acquisition and contribution to Moody's, has been immensely rewarding. There's still so much to learn and achieve and it's a great privilege to have been part of such a successful journey.

**Q** What are the most acute challenges facing your customers right now with respect to your remit? What are you hearing from them?

**Green:** Our Orbis entity database is used for lots of different business challenges, so customers' needs vary. I think a big challenge for our clients is how they can make better decisions, which we support by giving them high-quality data. They are also interested in getting a single-entity view—they want scale of data and unique identifiers. And when they are doing things like onboarding know-your-customer (KYC) and anti-money laundering (AML), they want to reduce the number of false positive results from their screening as much as possible.

**Q** How does Orbis help in that regard?

**Green:** It's a balance: Our customers want to look at the detail and be rigorous in their screening, but the more detail you look for, the more results you get. The reality is that you only want the "right" answers. We plug Orbis into solutions we've created that we call catalysts. We have one called Compliance Catalyst, which

we reworked last year, and we've done a lot of work around trying to reduce false positives. Part of that is improving the accuracy of the algorithms and models [in Compliance Catalyst]. We also employ artificial intelligence and machine learning in those models so they can learn from when false positives crop up, particularly around adverse news associated with companies and people.

**Q** Did you benefit from a mentor or sponsor who helped you with your career development in what is still a male-dominated industry?

**Green:** I've been very fortunate that since becoming part of Moody's—we were acquired in August 2017—I've been involved with the Moody's Senior Women's Leadership Forum. Within that there are lots of mentoring and opportunities to meet senior people in the organization. The forum also offers coaching and face-to-face teaching. Last year, I attended the Women's Leadership Forum, which is part of Harvard Business School's Executive Education Program, which was also inspirational. I'm also involved with a program where senior women help develop high-potential women in the organization, which is an opportunity to keep learning too.

**Q** Have you noticed much of a change across the industry in terms of gender equality and equal opportunities for minority groups?

**Green:** Well, it's great having things like these awards that recognize women in the industry. In the marketing industry, as in the information industry, there are more women [than other parts of the capital markets], although I would still like to see more women in senior roles. But I do think there is increased awareness that women are here, we're at the table, and we want to be part of the senior leadership. I'm pleased to see that there is increased awareness that it's not for women to change to become part of that conversation, but for workplaces to adapt. I'm a big fan of Michelle King's research, which shows that women don't need to be fixed or do things differently—it's the environments that need to change, and both men and women will benefit from these changes. [wt](#)

\* Bureau van Dijk is a subsidiary of Moody's Analytics.



Louise Green



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## EDM professional of the year (end-user)

# Donna Rudnicki, RBC Capital Markets

Donna Rudnicki, chief data officer (CDO) for RBC Capital Markets and winner of the enterprise data management (EDM) professional of the year (end-user) category in this year's Women in Technology and Data Awards, credits her life-long career in technology and data to serendipity—at least a little.

After completing a degree in psychology, she entered into what she calls a one-person IT role for one of the provincial Canadian governments, which paved the way for further tech opportunities, such as teaching computer classes to general audiences at a time when computers hadn't yet been made widely available in classrooms. Rudnicki first made the transition to heading up a data organization when she joined the Canada Pension Plan Investment Board in 2007, prior to joining RBC. Through the years, she says, the most important quality she's learned is resilience.

"It gets very easy to try and be something that you're not—tougher, meaner, more aggressive. It's just very easy not to be yourself or trying to be something else," Rudnicki says.

A newly appointed member to the board of the Salvation Army, a wife and a mother of two boys (the older of the two also works in data, while the younger is studying for a degree in commerce), Rudnicki is also a director and active member of the EDM Council, a global, non-profit dedicated to advancing data management best practices, standards, training and research with more than 200 member firms and more than 10,000 members. In 2019, she helped launch the Canadian Chapter of the EDM Council's Women in Data (WID) group, where she has recruited several female Canadian CDOs to the WID Global Advisory Board.

"Slightly different from technology, if you look at the data space, I would say there are more women—but [they] have historically worked more in data operations roles," Rudnicki says. "And I think it's important to be encouraging the same women who thought of themselves as maybe data analysts to push into data science roles, and to feel like they can move into the more technical side of data."

—RN

“After completing a degree in psychology, Rudnicki entered into what she calls a one-person IT role for one of the provincial Canadian governments, which paved the way for further tech opportunities.”

## EDM professional of the year (vendor)

# Mansi Bagga, Oxane Partners

Mansi Bagga, winner of EDM professional of the year (vendor) category in this year's Women in Technology and Data Awards, has, for the majority of her career, been involved in the alternative investment sector. She joined Oxane Partners in 2015, prior to which she held roles at BlackRock and Evalueserve. Her varied background has given her experience in a range of asset classes, such as structured credit, real estate, loan portfolios, specialty finance and direct lending. "I was basically the end-user of the technology product in the beginning of my career," she says. "That is how I transitioned into having insights into what an end-user might require."

Oxane Partners specializes in technology offerings for the alternative investment industry. In her role as vice president within the firm's Platform Solutions Group, she is involved in general management duties, as well as collaborating with the technology team, including its database architects and software developers.

Among her successes was her role in dealing with a large US-based alternative credit manager with \$100 billion under management. "These are always long-term projects," she says. "They always involve multiple people and stakeholders, in addition to the original sponsors."

Bagga dealt directly with the client in addition to receiving support from her team. "I am at the forefront and I understand my clients' requirements," she says. "I give them advice and I guide them about how they should translate all their scattered things into a single good source of data."

Bagga says her company is highly merit-based and sees herself as a strong advocate of equality and empowerment for women. "I have never felt disadvantaged or singled out just because I am a woman," she says.

Her future plans are to use the knowledge she has gained from her previous projects and implementations to land additional clients, while at the same time ensuring the ongoing satisfaction of current ones.

—HA

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In her role as vice president within the firm's Platform Solutions Group, she is involved in general management duties, as well as collaborating with the technology team, including its database architects and software developers.



## Exchange professional of the year

# Lauren Dillard, Nasdaq

For 17 years, Lauren Dillard worked at the Carlyle Group. It was going to take a unique opportunity to pry her away. Sometimes change presents itself as a new challenge—maybe a new city or a whole different industry or job function. Sometimes it's the opportunity to work alongside someone you greatly respect. Dillard was ready for a new challenge, but it was the chance to once again join forces with Adena Friedman that led her to join Nasdaq in the summer of 2019.

Dillard and Friedman worked together for three years at Carlyle. Friedman, who was CFO at Carlyle, left to rejoin Nasdaq in 2014, first as president and COO, and later taking over as CEO at the start of 2017. Seeing Friedman put her stamp on Nasdaq, Dillard was ready to explore new opportunities with her former coworker, and she joined the exchange as the executive vice president of global information services.

"When [Friedman] came back to Nasdaq, what interested me was her strategic pivot. I fully believe in what she laid out as far as delivering transparency to markets everywhere, and the need for data and analytics across the investment community," Dillard says. "I believe she's the best CEO in the business."

Dillard, the winner of the exchange professional of the year award, believed in that push toward data and analytics, because she saw the need for it while heading Carlyle's investment solutions business.

"It all goes back to that North Star: How do we provide transparency, data, and analytics to serve the capital markets?" she says. "I've got this best-in-class team on some of the historic legacy businesses, and then it's my job to help the business move into new asset classes and support areas."

In June 2019, Nasdaq joined with Microsoft to provide real-time US equity market data to Main Street investors. Through Microsoft, the general public can now access real-time data from Nasdaq Last Sale to inform their research and financial literacy. Additionally, Dillard and her team launched Nasdaq Smart Options, a service that allows for easier access and more transparency to essential options market data, with savings of 80% over the cost of connecting to the full standard Options Price Reporting Authority (OPRA) data feed.

"I usually tell people that it's all about learning and never saying no to an opportunity," she says. "I had a very non-linear career; I'm a nerdy tax professional. But you don't say no to new opportunities and constant learning, so you find what you can bring to the table."

—AM

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## Engineer/programmer of the year

### Lana Kapulovskaya, JP Morgan Asset Management

Lana Kapulovskaya is not one to back down from a challenge. In fact, as the head of business intelligence and advanced analytics at JP Morgan Asset Management, and this year's engineer/programmer of the year, Kapulovskaya says problem-solving is the most attractive part of her job.

"I always loved it. The potential of data and technology fascinates me, and it's exciting to be able to use it and make our sales and marketing people's day-to-day lives better," she says.

Kapulovskaya and her team are responsible for using advanced technology and innovation to shape sales and marketing distribution strategies through data-driven insights and by embedding these analytical processes in the firm's decision-making framework. She prioritizes data challenges as data is a core component of what she and her team do.

"Using emerging technologies and innovative approaches, we processed and organized our data into a clean and effective data model empowering data-driven strategies," she adds.

One of Kapulovskaya's achievements is architecting and building the asset manager's big data platform and core framework. She designed and developed a meta-data-driven approach to build data pipelines, which led to facilitation of real-time data delivery and a 50% reduction in maintenance costs. She also built Single View of a Client—a scalable framework that delivers client data in a single view and adapts easily to various business requirements. The strength of the framework is its ability to answer complex business questions in a matter of minutes instead of weeks or months.

Kapulovskaya led the design and development of the firm's Next Best Product and Next Best Call recommendation engine using artificial intelligence and advanced analytics technologies. Since rolling out in October 2019, the solution earned \$700,000 in incremental sales and is projected to bring in \$1.5 billion in sales this year.

Although she enjoys experimenting with emerging technologies, when it comes to finding a solution for a business problem, she says the key is to focus on the solution that fits users' needs and adds the most value, instead of chasing down the most recent trends.

—WSW

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Kapulovskaya and her team are responsible for using advanced technology and innovation to shape sales and marketing distribution strategies through data-driven insights and by embedding these analytical processes in the firm's decision-making framework.



# Congratulations

We are proud to congratulate our very own Lana Kapulovskaya on being named Engineer/programmer of the year.

Congratulations to all of the 2020 Women in Technology & Data honorees on their well-deserved recognition.

**J.P.Morgan**



## Gender equality/diversity professional of the year (vendor)

# Pamela Hutchinson, Bloomberg

Heads: law firm. Tails: Goldman Sachs. It was a flipped quarter that decided Pamela Hutchinson's fate when she received two competing job offers in 1998. Having finished her law education two years earlier and working as an employment law advisor in the UK, she was well on her way to being a lawyer. But a series of twists and turns in the interim—which began with sitting outside her company's HR office and happening upon an article titled *Managing Diversity and Inclusion: A First for the UK*—culminated in a surprise: Goldman Sachs wanted Hutchinson to help its diversity and inclusion programs, particularly around campus recruiting. She was torn.

"I flipped the coin, and it landed on Goldman. And I thought 'Aw, what the hell? I'll go to Goldman for a couple of years, and if I hate it, I'll go back to being a lawyer,'" she recalls, along with her mother's scolding for leaving her career choice up to a 25-cent piece of metal.

Fast-forward two decades. Today, Hutchinson is Bloomberg LP's global head of diversity and inclusion, taking home the award for the gender equality/diversity professional of the year (vendor) category in WaterTechnology's Women in Technology and Data Awards.

Looking back, she's glad the coin landed as it did. She has been regional head of diversity at a variety of institutions, including Goldman Sachs, Barclays, Deutsche Bank, Northern Trust and Bloomberg, before receiving a promotion (from former New York City mayor Mike Bloomberg, himself) to run the department globally in 2018. At the same time, Hutchinson is a trustee for the Inspiring Leadership Trust, a volunteer organization that promotes and mobilizes selected charities and projects for the benefit of vulnerable women and children around the globe.

Despite having "fallen" into her line of work, she found she was passionate about it early on, Hutchinson says.

"I felt my purpose was to do this work," she says. "I think if the coin had landed on heads, and I had ended up doing the other legal job, I might have been passionate for it for a little while, but the passion would have waned, and then there would have been no purpose."

—RN

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## Gender equality/diversity professional of the year (end-user)

# Wincie Wong, RBS/NatWest

Wincie Wong wins the gender equality/diversity professional of the year (end-user) category at this year's Women in Technology and Data Awards. With over a decade at NatWest (formerly Royal Bank of Scotland), Wong has a history of working across technology, digital and innovation. She is currently responsible for leading the implementation of the Rose Review on behalf of the bank, commissioned by Her Majesty's Treasury. In partnership with the government and other banks, Wong and her team are tasked with delivering on the initiatives of the review that seeks to resolve gender inequality in female entrepreneurship in the UK by working to add 600,000 female entrepreneurs by 2030.

"We found in the research that only one in three entrepreneurship in the UK are led by women and if we were to get women to start, sustain and scale their businesses at the same rate as men, we would add an additional £250 billion (\$306 billion) to the UK economy," Wong says.

Beyond finance, Wong has an impressive track record of pushing for gender equality in technology. She co-founded the NatWest Girls Can Code group to help women in the bank develop coding skills. She also founded the annual Growing Inclusive Leadership in Tech conferences in London and Edinburgh, attended by hundreds of attendees each year. In 2019, Wong and her colleague Burcu Karabork started the NatWest Technically Speaking podcast, which covers a variety of topics and had over 14,000 downloads and listens in its first few months.

While Wong was leading initiatives and attending conferences, she also had the opportunity to meet a variety of women technologists in the industry, which led her to become a founding member of the Tech She Can Charter group, which has grown from 18 to over 140 signatories over the last two years, including names such as PwC, Tesco, Credit Suisse and Rolls Royce. Under her leadership of the Charter group, she also launched the Enrich Education initiative, which helps increase the number of women in tech roles.

—JG

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Wong has a history of working across technology, digital and innovation. She is currently responsible for leading the implementation of the Rose Review on behalf of the bank, commissioned by Her Majesty's Treasury.



## Operational risk management professional of the year

# Sihem Mouelhi, Elucidate

Sihem Mouelhi, COO of Elucidate, a Berlin-based startup founded in 2018 that describes itself as a digital financial crime risk rating agency, wins the operational risk management professional of the year category in this year's Women in Technology and Data Awards. Startups are organizationally different from corporates, and while the threat of existential crisis is often not far away, they also have their benefits, chief among which is the ability for employees to set the tone of the business on multiple levels from the outset. "The benefit of working in a startup is that you get a chance to set the culture of diversity [of the organization] right from the start as opposed to trying to change the culture within an already-established firm," Mouelhi explains. "That means you are more able to do things right and incorporate them into the company's DNA. You can therefore establish a culture where people can express themselves freely, where you can start hiring a diverse workforce from the start, and where conversations about diversity can be had openly. That makes a big difference."

Given that Elucidate is a startup, it is unsurprising that Mouelhi's proudest achievement at the firm is the role she played in developing its minimum viable product, allowing it to go to market with a product as soon as possible. "When I joined, we were still building the product—the Elucidate FinCrime Index (EFI)—more or less from scratch," she explains. "We've gone from an idea to a piece of software to actually selling a product within a year."

Now, she says, her focus is on scaling and building a platform such that it becomes an industry standard.

When it comes to the individuals who played instrumental, influencing roles in her career, Mouelhi lists three—all men, she is quick to point out—two of whom she met during her consulting days, while the other she worked alongside at one of the industry's largest investment banks. "I've had a few [mentors]. Shane Riedel, our CEO, has been very influential, as I started my career working on financial crime with him at Citigroup," she says. "Antony Smyth, a partner at EY who I worked with in the past, taught me a lot about working effectively with clients, while Markus Bender, who I worked with at Capco, was someone I learned a lot from on structured problem solving."

—VBA

“Given that Elucidate is a startup, it is unsurprising that Mouelhi's proudest achievement at the firm is the role she played in developing its minimum viable product, allowing it to go to market with a product as soon as possible.”

## Legal/compliance professional of the year

# Miranda Morad, MarketAxess

For the second year running, Miranda Morad, general counsel at MarketAxess, picked up the award for legal/compliance professional of the year. This is the first time in the history of the Women in Technology and Data Awards that anyone has won a category for a second time.

Morad oversees all regulatory, legal and compliance matters across Europe and Asia for the global electronic bond trading platform and regulatory solutions provider. Since joining the firm in 2013, she has played a key role in establishing Amsterdam as the firm's new European base and worked with the Netherlands Authority for the Financial Markets to gain approval in 2019. She has also been instrumental in preparing the firm for the Securities Financing Transactions Regulation, Central Securities Depositories Regulation, and Capital Requirements Directive regulations.

Morad likes the autonomy of being an in-house lawyer and says she gets to make far more crucial decisions than she would if she were in private practice in the UK. "Knowing what I know now, I wish I had gone straight to being an in-house lawyer—it's much more fun and rewarding," she says.

Morad says the most rewarding project she has worked on over the last year has been making MarketAxess a great place to work. The project has been in the works for two years and this year, Morad and her team gave a presentation to the board highlighting areas where the company could benefit from further insight and investment. "Making MarketAxess a great place to work is equally as valuable as the next big commercial idea," she explains. "It was important because it was recognition that the people and their happiness at work was something worth investing in," she says.

She cites an article from the Harvard Business Review titled *Research: Changing Your Mind Makes You Seem Intelligent*, which talks about the difference between confidence and intelligence in decision-making and the imperative for lawyers to distinguish between the two. "If you're looking for a motivational speaker, you're looking for confidence. But if you're looking for someone to make decisions like a lawyer, you're looking for someone who is intelligent," she says.

The ability to change your mind when presented with new information, without fear of looking stupid, she says, is what makes a great lawyer.

—MR



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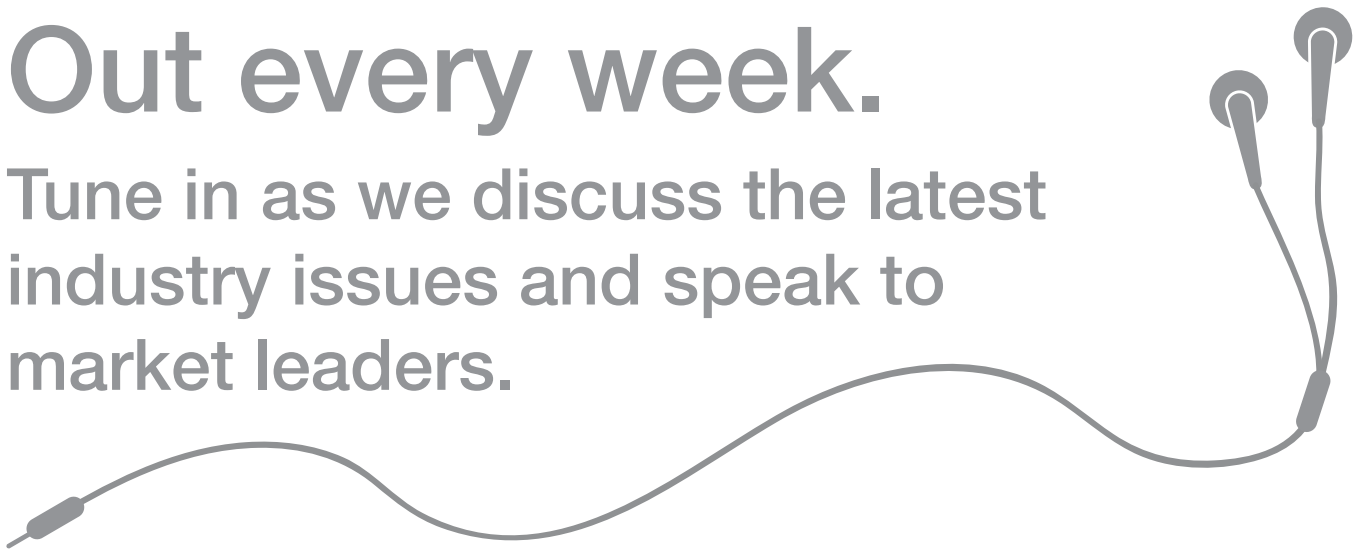
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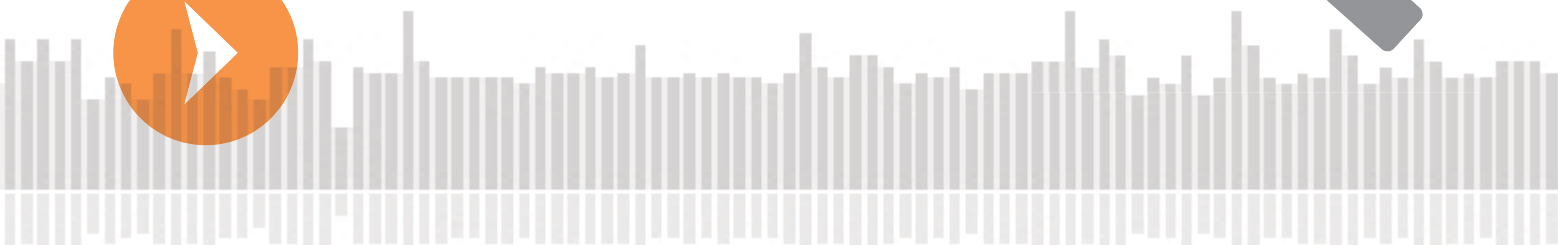
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## Rising star (vendor)

# Amy Ross, SIX

Amy Ross from SIX wins the rising star (vendor) category at this year's Women in Technology and Data Awards. With over eight years at SIX, she has proven herself to be a change agent with an impressive trajectory, having been promoted seven times within the company. Today, as head of international IT services, she is responsible for the firm's legal and risk compliance functions, client services, client and employee satisfaction, and budgeting, globally.

During her time at SIX, Ross has shaped the firm's approach to technology and ways of working. She assessed the types of technologies the firm used and set out on a mission to reduce costs and automate low-touch processes. One example of that strategy is her decommissioning of a little-used conference call service that cost the firm €16,000 (\$17,600) a month, replacing it with Skype. She developed policies, including business continuity plans in the US and spearheaded the firm's decision to outsource the running of its datacenters to third parties, helping to offload the labor involved in managing the hardware internally. In her first year at SIX she reduced IT costs by \$1 million; she attributes much of her success at SIX to her previous 14 years at UBS, where she developed her skills in IT and operations.

"I think it was bringing that fresh set of eyes, that fresh set of skills and coming from such a large conglomerate that does it well in terms of operations, access management and continuity. I had experienced and spearheaded those [initiatives] at UBS, like running the continuity tests, and that experience really mattered a lot," Ross says.

A significant part of her role is nurturing and developing SIX's workforce. As part of that responsibility, she has introduced team-building exercises, promoted collaborative working and offered facilities to upskill employees. She has also taken on the role of mentoring women in IT. On separate occasions, she spent a year-and-a-half working with two women, helping to develop their skills, confidence and leadership qualities. As a result, both women are now managers on her team. "I'm always willing to give time to people and that's a differentiator," Ross says. "I think when leaders get very busy and bogged down with their reporting and management meetings, I always stop and prioritize people, because our people are the assets of our company."

—JG



“During her time at SIX, Ross has shaped the firm's approach to technology and ways of working. She assessed the types of technologies the firm used and set out on a mission to reduce costs and automate low-touch processes.

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## Rising star (end-user)

# Charlie Beeson, Man Group

On the face of it, astrophysics and financial services might not have a lot in common. But when Charlie Beeson went to work at Man Group with an MSc in physics with astronomy, she discovered a number of parallels. “It’s less of a jump than it appears, to be honest. I was running Python scripts to analyze large time-series data about asteroids,” she says. “You swap the asteroids for financial data.”

Beeson had already taught herself Python while completing her master’s at the Harvard–Smithsonian Center for Astrophysics. She was using data for her thesis that came from amateur astronomers all over the world. “One of the challenges I had in analyzing all of this data [was that] it came from so many different sources, which I now equate to our long list of different data vendors that can represent data in different formats and styles,” she says.

Her area of interest involved near-Earth objects, searching for asteroids in images, such as supernovae, taken by astronomers. “At Man Group, I was applying similar statistical techniques that we might use to find and characterize asteroids from within huge datasets” she says.

Beeson, who is staff business manager within the COO office at Man AHL, has been involved in a number of forward-thinking initiatives, including collaborating with the firm’s global head of talent to build a feedback tool that was rolled out across the business last year.

She says the firm conducted a review of similar products in the market and found that they incorporated a lot of HR processes that could be distracting, or did not fit with Man Group’s culture. The firm wanted the tool to facilitate a cultural shift whereby feedback flowed much more freely among all team members. “Everywhere varies in terms of how freely feedback flows, like on a sports team or in professions where someone’s life might be on the line, they will have a culture where information feeds back and forth between people because it has to be like that. But in an office environment, sometimes it’s not the same—feedback happens maybe at a certain one-hour session with your manager or things like that,” she says.

Beeson plans to make available the feedback tool’s source code via GitHub to allow other firms to benefit from it.

—HA



“Beeson, who is staff business manager within the COO office at Man AHL, has been involved in a number of forward-thinking initiatives, including collaborating with the firm’s global head of talent to build a feedback tool that was rolled out across the business last year.”



## Vendor partnership or alliance professional of the year

# Margaret Hartigan, Marstone

Margaret Hartigan, CEO and founder of Marstone Inc., won the category for the vendor partnership or alliance professional of the year at this year's Women in Technology and Data Awards. Marstone partners with banks, asset management and insurance companies to create a digital platform that Hartigan likens to the role of a robo-advisor. The platform allows institutions' clients to design their own investment portfolios. Once data such as appetite for risk, age, investment goals, and amount to invest has been inputted into the system, Marstone's technology enables clients to invest tactically and take investments all the way to execution.

After receiving her BA in English from Brown University, Hartigan decided to follow her father's route and move into the financial services sector, despite coming from a humanities background. "I'm a creative person and if I get the *Financial Times* weekend edition or something like that, I'll wrestle someone for the arts pages before I jump into the business section," she says. However, she has always been interested in finance and started investing from a young age, later taking inspiration from her father to also become a financial advisor at Merrill Lynch. She started at Merrill Lynch in 2002 and stayed with the firm until 2012 when she left to set up Marstone.

A key objective Hartigan has for Marstone is to humanize and demystify finance and investing, she says. "Marstone is a medium where we present big ideas and break them down to where everyone can understand [them]," she says.

Later this year, Marstone plans to roll out a new financial planning tool, which Hartigan says will help users to plot various goals, for example, buying a house, sending a child to college or taking a sabbatical. Marstone will then look at a client's financial situation and recommend an investment portfolio to help meet those long-term goals.

One of her hopes for the financial planning tool is that it helps the younger generation to be smarter with their money, as she recognizes the difficulty of learning about finance when they haven't yet had any real experience handling their own money.

—MR

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## Support professional of the year (vendor)

# Mardís Heimisdóttir, SS&C Advent

Mardís Heimisdóttir is a busy woman. In addition to being director of organizational development and program management at SS&C Advent, she has a new baby at home and is also the winner of the support professional of the year (vendor) category in this year's Women in Technology and Data Awards. Not bad for someone who claims she fell into the financial services industry by accident.

Heimisdóttir started with Advent in Sweden right after she graduated from university with a degree in business administration. She moved to an executive assistant role where she worked with many members of the company's leadership team. From there, she was offered the opportunity to move to New York as an operations manager before being promoted last year. "It's very telling that I've really striven for improvement," Heimisdóttir says. "I know that all of us can continually improve and this applies to organizations, too. I think that attitudes or mindsets have really shaped my career journey and I look for instances where we can do better. I've never been afraid of going to my boss and telling him that I think we can do better or that there is an opportunity to do something. It's me stepping up and identifying those opportunities that have shaped me today."

It isn't just her work that Heimisdóttir sought to improve. Once she moved to New York, she decided to pursue a graduate degree in business administration to broaden her skills.

She says her role at the firm focuses on three things: devising programs to improve efficiency within the company, helping craft organizational strategies, and internal communication to employees. She works closely with the general managers within the company to figure out what internal challenges exist and how to overcome them.

Despite entering the industry by coincidence, Heimisdóttir says she has a deep love for her work.

"Being a woman in technology, it's important to have role models, but not just at the highest levels," she says. "We need to highlight women and show that they can grow and improve. We need to advocate for more diversified teams."

—ED



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Heimisdóttir says her role at the firm focuses on three things: devising programs to improve efficiency within the company, helping craft organizational strategies, and internal communication to employees.

## Technology innovator of the year (end-user)

# Saritha Parchuri, Bank of America

The consolidated audit trail (CAT) regulation has presented data challenges to broker-dealers, which have to invest in new technology and controls. Bank of America is preparing to leverage a data warehouse for the CAT, which already powers reporting under Finra's Order Audit Trail System. The solution has come out of transformation of the bank's equities business, which has been driven by Saritha Parchuri.

Parchuri is the CIO of the bank's Equities Data and Analytics Technology. She has worked to transform this business into a more data- and analytics-driven one, keeping a global team of 100 engineers focused on getting data right. Parchuri's initiative is called DNA, for Data aNd Analytics, and has resulted in a new end-to-end processing architecture for data. DNA already processes over 10 billion messages a day.

DNA began with the build-out of a real-time streaming data backbone based on a data dictionary and unified messaging bus designed to enforce data quality and completed throughout the trade lifecycle. This data contract was adopted across every trading platform in BofA's equities business, ensuring that all the trading desks and their systems speak the same language. This singular view of trading activity enables the aggregation of trade data to provide insight into sales and trading activity across the organization, which was not possible before. And this is what will be leveraged for CAT reporting.

The data dictionary was designed with a wide scope to support multiple use-cases, all while being powered by a single view of data, eliminating discrepancies between reports and reducing the need to reconcile between multiple data sources.

Parchuri's rollout of DNA also simplified the application landscape: Hundreds of proprietary point-to-point data feeds are being untangled into a single, unified feed covering multiple use-cases. Aging middleware is being retired and replaced with a high-performance universal bus adopted by all trading systems, while legacy databases are being consolidated into a single data warehouse. This simplification has resulted in quicker turnaround time for new development, while lowering the total cost of ownership.

Parchuri is now rolling out DNA—which has been awarded two US patents—to other areas of BofA's Markets, including foreign exchange, futures and wealth management. It is being used for reporting under various regulatory regimes in Europe and Asia-Pacific, and for extended uses in surveillance reporting, business alerting and trading analytics.

—JW



“Parchuri's rollout of DNA also simplified the application landscape: Hundreds of proprietary point-to-point data feeds are being untangled into a single, unified feed covering multiple use-cases.”



## Technology innovator of the year (vendor)

# Reeba Mathen, Cloud9 Technologies

As head of product management at Cloud9 Technologies, Reeba Mathen is responsible for the firm's entire product vision. With the strong performance of Cloud9 this past year, it is no wonder that Mathen has won the technology innovator of the year (vendor) category in this year's Women in Technology and Data Awards.

Mathen—the first project manager hired by Cloud9—has always been interested in technology, although even as an undergraduate, she saw the need to have a strong business background and bring these two worlds together. “When you're in school, you end up doing a lot of projects and you learn how you want to architect a system, but it's always difficult to learn the skill to translate what you're trying to build,” Mathen says. “I was not as keen on writing code and architecting systems—I was more keen on saying I need this to work in the first year for a hundred users and in the second year for 10,000 users and this is how it grows. I want to have the tech side and communicate that with the business. I always loved tech, but I knew I wanted to be on the business side.”

Mathen has a double master's in computer science and information systems. She decided to study information systems to help bolster her skills in translating architecture and technology to business people, she says.

In her position at Cloud9, Mathen is responsible for setting the company's product vision. She designs and drives product strategy and communicates that to the rest of the firm, as well as with its customers. She was instrumental in pushing for additional functionality in Cloud9's trader voice platform, including Presence, a feature that alerts traders if and when someone is available for a conversation.

For Mathen, the financial technology world has become more welcoming to women, but it's more important than ever to lean on those who came before. “The landscape of women in technology is definitely changing,” she says. “There are a lot more avenues for women to be part of technical groups and organizations. I think women helping women is a big thing now, so one thing I tell people who want to get into financial technology institutions is to use their network and say yes, I can do the job.”

—ED

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## Technology leader of the year (vendor)

# Ann Neidenbach, LSEG

Ann Neidenbach, global head of technology and CIO, capital markets at the London Stock Exchange Group (LSEG), picked up not one, but two accolades at this year's Women in Technology and Data Awards. She won the technology leader of the year (vendor) and woman of the year categories, which come hot on the heels of her win in the best third-party vendor CEO or CIO category in last year's AFTAs.

"I have a passion for financial markets and the technology that drives them," Neidenbach explains.

With over 20 years' experience in the financial technology sector, that passion has been put into practice over a number of instrumental products and initiatives. Since joining LSEG 18 months ago, she has focused on a number of key initiatives. First, as CIO of shared services, she was able to formulate the LSEG Cloud-First Program, which is working to move 60% of the firm's workload from capital markets, information services, and its post-trade business to the cloud in the next couple of years.

As well as actively working to migrate existing systems to the cloud, Neidenbach's team is also building new cloud-native products and initiatives. "With capital markets, for instance, we launched a new platform on the public cloud called Turquoise Nylon, which supports contracts for difference trade reporting," she says.

Earlier this year, Neidenbach was also appointed CIO for LSEG's capital markets division. In this role, her focus is primarily on resilience and assembling a technology roadmap that will leverage automation and increase the firm's agility and responsiveness to the needs of the market.

Neidenbach gained valuable experience from her roles as CIO at Convergenx, managing director of electronic trading tech at Citi, and senior vice president of global technology at NASDAQ.

As to whether Neidenbach would change anything about her career path, she tells *WatersTechnology*: "Absolutely not." Being a successful woman in the industry, she says, allows her to help other women to move into leadership positions. "It's not about addressing gender parity—it's about creating gender equality," she says.

—MR



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## Technology leader of the year (end-user)

# Amie Caban, Guggenheim Partners

The road to excellence is paved with many challenges. To Amie Caban, some of the challenges she has focused on as CIO at Guggenheim Partners include being more data-driven and using metrics to help with the decision-making process.

Caban, who wins this year's award for technology leader of the year (end-user), is putting the appropriate foundation in place at Guggenheim to drive efficiencies and deliver innovative solutions to the firm's business partners.

In January this year, she stepped up from her previous position as deputy CIO and replaced Jim O'Donnell, Guggenheim's former CIO. Caban is now leading the transformation of Guggenheim's infrastructure and application development environments. This includes the consolidation of legacy applications to modernize the information architecture for the firm.

Caban says the transformation initiative focuses on establishing a modern technology platform to meet business objectives in a scalable and cost-effective way.

"It involves centralizing data stores and standardizing business intelligence and analytics capabilities, implementing next-generation technologies and skillsets, and retiring costly legacy systems. This is a major opportunity as it will provide a more streamlined and scalable platform that will enhance execution time and support continued growth," she says.

Since joining Guggenheim in 2010, Caban has led the firm through several strategic technology programs, including establishing its information security program, where she was responsible for security policy and program management. Part of the program involved implementing an event detection and analytics system, which led to improved visibility, higher-quality alerts, and a 66% reduction in "false-positives," resulting in the ability to initiate a user behavior analytics program and leverage resources more efficiently.

Together with her team of more than 200 technologists, Caban is focused on shifting toward a cloud/hybrid architecture to be pragmatic about getting the most value when running applications and services.

Caban is drawn to understanding new disruptive technologies such as blockchain and artificial intelligence (AI). She notes that the challenge with implementing the latest trends is finding practical use-cases and understanding the implications of emerging technologies and how they best fit into the organization. She is also passionate about the use of AI in the ever-evolving security landscape.

—WSW

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Since joining Guggenheim in 2010, Caban has led the firm through several strategic technology programs, including establishing its information security program, where she was responsible for security policy and program management.

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## Vendor partnership or alliance professional of the year

# Mitra Roknabadi, OpenFin

At the beginning of the last decade, Mitra Roknabadi was not likely to become a highly influential person in the worlds of programming or financial markets technology. But one should also never underestimate drive and self-belief.

Roknabadi, who is fluent in English, German and Farsi, was born in Cologne, Germany, and moved to Los Angeles when she was 13. Today, she's vice president and global head of marketing at OpenFin, which is arguably the leading vendor in the desktop application interoperability space, building an operating system environment that is used by the likes of Barclays, RBC, Citadel, JP Morgan and numerous vendors.

The truth is, she stumbled into OpenFin. In 2002, she started working at fashion giant Chanel. Roknabadi knew, though, that she wanted to be more involved in technology. She tried to convince retailers like Chanel and Lancôme that e-commerce was the future. Along with a friend, she even created a startup around beauty product e-commerce.

After moving to New York a decade ago, she began attending tech meet-ups on the advice of an old friend—Mazy Dar, whom she had known since 2001 and who was in the process of getting OpenFin off the ground and running along with cofounder Chuck Doerr. Roknabadi convinced Dar that she could help with the company's website and build its marketing campaign as the company was ready to really start pulling in clients in 2013.

"OpenFin was completely the opposite end of the spectrum [from Chanel], but when you hear Chuck and Mazy talk about this, I'm convinced that we can take over the desktop," she says.

OpenFin has found its footing because it has created a unique community in financial services, and Roknabadi has played a key role in that. In 2016, she launched FinJS, the company's global flagship tech event. At that first meeting in 2016, 120 programmers, developers and engineers came together to discuss JavaScript and its React library. Today, these events draw more than 400 attendees.

Additionally, as that community has grown, it helped OpenFin to lead the Financial Desktop Connectivity and Collaboration Consortium (FDC3) initiative, which comprises banks, asset managers, and vendors in the capital markets aiming to bring universal connectivity and standards to desktop applications. Growing these communities has proven key to OpenFin's plans for advancement.

"Interop is all about community," Roknabadi says. "We keep [FinJS] neutral; it's not an OpenFin-related event, [the discussions are] around how OpenFin uses best practices on the web to deliver a functional engine that you could use out of the box. It's not about OpenFin—it's about the web and the FDC3 community is exactly about that."

—AM



“OpenFin has found its footing because it has created a unique community in financial services, and Roknabadi has played a key role in that.”

## Vendor professional of the year (business development)

# Stephanie Sparvero, Bloomberg

“At heart, I’ve always been a frustrated engineer,” says Stephanie Sparvero, global head of BVAL (evaluated pricing) at Bloomberg and winner of the vendor professional of the year (business development) category in this year’s Women in Technology and Data Awards.

With the engineering degree from MIT that she secured in 1996, as well as her MBA from Columbia, Sparvero has gone on to become a “seasoned and bloodied veteran” of the financial markets, with experience on the sell side, the buy side, private equity, short-term startups and vendors alike. She joined the data giant nearly four years ago as BVAL COO before taking charge of the business in July 2019. The division has seen double-digit growth each year since she joined the firm.

Her path has been a winding one: Prior to the sub-prime mortgage meltdown of 2008, she ran portfolio management at buy-side shop C-Bass. In the following few years—which included stints at Barclays and Markit Group—she did an about-face. Rather than brainstorming great investment ideas and convincing investors to bite, she instead wanted to spend her time working closely with clients, strategizing with them and educating them on issues such as risk. Those are the parts of her job—which are some of her favorites—that are timelier than ever.

In the age of coronavirus, Sparvero and her team are finding opportunities to think critically, re-tool and optimize existing processes in the wake of heightened market volatility.

“I think we have a very exciting year ahead of us with some of the new products we’re developing, and really re-investing in the platform,” she says.

Sparvero is also intensely focused on continuing to build and empower a community of data and technology minded women across the industry. A founding member of Bloomberg’s Women in FinTech, she’s helped grow the industry group to more than 1,000 members since its inception in December 2017.

“What we’re able to do is really talk about issues on a professional level that intellectually challenge our members—things like artificial intelligence and STEM education. This is not just your run-of-the-mill, traditional female subject matter,” Sparvero says. “What we’re really doing is providing them [with] a platform to discuss these more advanced professional topics in a supportive environment.”

—RN

“Sparvero has gone on to become a “seasoned and bloodied veteran” of the financial markets, with experience on the sell side, the buy side, private equity, short-term startups and vendors alike.

## Vendor professional of the year (data and operations)

# Julie Armstrong, ChartIQ

Julie Armstrong is from a small town in northeast Kentucky called Ashland, which has a population of 20,000 or so. Upon graduating, Julie and her mother took a trip to Europe. While in Paris, she told her mom that she would one day work in the City of Lights. “I called my mom from France [years later] on a business trip and I said that I did it. I had just conducted my first meeting in French and it was a powerful moment for me,” she recalls.

Since joining the capital markets in 2002, the best advice she can give to up-and-comers is to “believe in yourself.” It’s that belief in herself that has driven her entrepreneurial spirit. At CME Group, she created the first market technology sales team and the first commercial offering for third-party alternative data distribution, and she co-founded the Women’s Network Group within the exchange. Prior to that, at RealTick (post-Lehman Brothers acquisition), she established a company multi-broker software model that was both innovative and in many ways served as a precursor to today’s application interoperability movement.

Armstrong, who was named vendor professional of the year for data and operations, likes to create and build. After almost eight years at CME Group—and after a pitstop at a software-as-a-service (SaaS)-based technology vendor called Uptake—she joined ChartIQ last year. Armstrong was already serving on the charting company’s board as an independent member, and the time seemed right to help ChartIQ grow an ambitious new project: Finsemble, its desktop application integration platform.

“I got to a point in my career where I really wanted to be working at a company that was building the tech specifically to disrupt a marketplace,” she says. “I was enticed to go from corporate to a smaller shop and really be a presence while working at a company that was building a new trend in technology.”

Finsemble’s aim is to bring efficiencies to the desktop workspace, allowing multiple applications from vendors and/or internal sources to come together on the desktop and “talk” to each other. In her new role, Armstrong, ChartIQ’s chief revenue officer, wants to help the vendor find its market presence and help with market research.

“One of my jobs is to help them realize the potential of our products, and [explain to clients] how a company like ChartIQ can help them move a little bit more nimbly and work more efficiently, and to visualize all this data that’s out there,” she says.

—AM



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Since joining the capital markets in 2002, the best advice Armstrong can give to up-and-comers is to “believe in yourself.” It’s that belief in herself that has driven her entrepreneurial spirit.

## Vendor professional of the year (trading and risk)

# Irina Slobodyanyuk, Numerix

Irina Slobodyanyuk, product specialist on Numerix's risk product management team, wins the vendor professional of the year (trading and risk) category in this year's Women in Technology and Data Awards. As a product manager for the XVA module of Numerix Oneview, the firm's flagship offering, Slobodyanyuk focuses primarily on designing functionality for the platform, while also supporting pre-sales as the subject matter expert for risk.

It's fair to say that the recipient of dual MSc degrees in quantitative finance and finance with a risk management concentration from Hofstra University has valuation adjustments in her blood. When asked about what she is most proud of with respect to her contribution at Numerix, Slobodyanyuk cites her XVA work—valuation adjustments pertaining to derivatives held by capital markets firms—and the role she played in productizing it within Oneview. "I am most proud of bringing the XVA module to fruition," she explains. "It's probably our most well-developed product in the Oneview solution, and we've incorporated a number of really complex measures and improved its performance quite a bit."

Slobodyanyuk explains that margin valuation adjustment (MVA) and capital valuation adjustment (KVA) are the two risk measures most on clients' radars, given the regulatory implications and potential financial losses on the back of inadequate disciplines and controls. "With respect to MVA, as the regulations change, more and more institutions are finding that they have to post initial margin, which means that now it is a real cost that they have to think about, not just for today but also in terms of how that will change in the future," she says. "They really need to get a handle on their risk because they could be putting on trades that are actually non-profitable. KVA is less standardized [than MVA] because it is institutionally specific—all firms' capital needs are different and so they need to get an individual handle on the capital they need to set aside for regulatory compliance."

When it comes to people who have positively impacted her career, Slobodyanyuk points to a past colleague who rose to the top in arguably the most male-dominated function across the capital markets: trading. "At my last job, there was a female trader trading the most complex securities traded at that firm and she always brought a sense of kindness to the role—she was always willing to help others and I feel that early in my career that was very helpful for me," she says.

—VBA



“As a product manager for the XVA module of Numerix Oneview, the firm's flagship offering, Slobodyanyuk focuses primarily on designing functionality for the platform, while also supporting pre-sales as the subject matter expert for risk.



# CORONAVIRUS



# BCP in an Unknown World

It's business as usual—except when it's not. Traders, investment bankers, asset managers, and the vendors who serve them will operate using their business continuity plans indefinitely. Tech innovations over the last decade have made these plans better, but they're far from perfect. By **Rebecca Natale**, with additional reporting by **Anthony Malakian**

**O**n Friday, March 20, Finastra, which was formed in 2017 after the merger of D+H Misys, detected that “a bad-actor was attempting to introduce malware into our network in what appears to have been a common ransomware attack,” which resulted in the vendor taking its servers offline.

Finastra counts some of the largest banks in the world as clients—with an especially strong presence in the retail space—and as a result, several banks saw disruptions to their services, according to notices put up on their websites. Also, as the *Wall Street Journal* reported, “financial firms encountered problems moving Treasury bonds among themselves [on March 20], reporting slowdowns and outages on the Federal Reserve’s electronic securities ledger,” due to Finastra server shutdown.

Finastra’s servers were returned online on Sunday, though full IT operations were not restored as of Monday afternoon. “At this time, we do not have any evidence that any customer or employee data was accessed or exfiltrated, nor do we believe our clients’ networks were impacted,” Finastra’s COO, Tom Kilroy, said in a statement on the company’s website.

Ransomware and similar cyber-attacks are simply a fact of life in the financial services industry, but they’re likely to become more common as a result of firms enacting their business continuity plans (BCPs). The emerging coronavirus pandemic has forced cities across the globe to enact measures to keep its citizens in their homes to curb the spread of Covid-19, the disease resulting from the coronavirus.

Because of their embrace of cloud and software-as-a-service (SaaS) solutions, banks, asset managers, and vendors are

better prepared for a remote workforce, as only minor disruptions have thus far been reported. Still, it is to be expected that bad actors will look to take advantage of this situation, and due to their embrace of cloud, financial services firms have increased their potential attack zones.

**“What I’m finding now—our biggest concern—is security. With many of our bankers using new networks and devices to do work, our attack surface has increased a lot. And though we planned for remote security, we are still seeing some holes in our strategy, which we are working on.” CTO of a US-based bank**

“My company is now completely working remotely, and we have not had a lot of challenges having already adopted many cloud apps,” says the CTO of a US-based bank. “But what I’m finding now—our biggest concern—is security. With many of our bankers using new networks and devices to do work, our attack surface has increased a lot. And though we planned for remote security, we are still seeing some holes in our strategy, which we are working on. Also, cybercriminals are taking advantage, putting viruses into Covid-19 information sites, phishing government or health care emails, etc.”

As of right now, there’s no way of knowing if the ransomware attack on Finastra was related to the coronavirus crisis—did a criminal spy a new vulnerability created by the company enacting its BCP? Or was it just a normal attack

that would have happened regardless? (As ZDNet reported, Finastra had issues previously with its Pulse Secure VPN servers and its Citrix servers.)

What is clear is that even if firms’ BCPs hold up to government-enforced shut-downs and mandatory working from home, there are new and unique questions that will have to be answered.

## Without Delay

On March 9, Alex Fleiss, CEO of quant hedge fund Rebellion Research, ran 33 miles—but not because he wanted to.

In Florida, on a trip to visit his college roommate, who works for a health insurance company, he was supposed to be having a good time. Instead, the pair of investors watched the stock market as it crumbled around them. They decided to run it off.

“I was going nuts,” Fleiss says. “We were both getting annihilated in the market, and we were losing it, so he kept running, and I kept running.”

The financial markets have been dealing with disruptions and crashes for decades. It comes with the territory for traders. But new innovations have helped to mitigate disruptions. While Fleiss was very concerned about markets, from a technological perspective, Rebellion was “essentially built for Armageddon.” Its proprietary machine-learning trading engine is built on the cloud and comprises Bayesian networks that are physically separated across several locations far apart from one another. That way, if one becomes corrupted, the fund can see it immediately.

The biggest concern, says Rebellion’s Fleiss, is how the government handles cyber-threats from abroad. The hedge fund recently hired a former agent from the International Criminal Police



**“The reality is that today, cloud security and the tools available to manage compliance are there. So it’s not that the cloud is not secure. It’s simply that the industry has not moved fast enough to embrace it. And this should be a wake-up call.”**

**Mazy Dar, OpenFin**



Organization (Interpol), and Fleiss says he is now much more concerned with the government’s vulnerabilities to cyber-attacks than he is with finance’s.

“Your average PC is more secure than Plano, Texas’ municipal government. So often, you’ve got these local governments that are getting hacked into all over the place,” Fleiss says. “Yes, technically, without a doubt, there will be more cybersecurity issues. There’s no question.”

Tech innovations over the last decade have allowed for BCPs to run more smoothly than before, such as the terrorist attacks of September 11, 2001, or when Hurricane Sandy struck America’s East Coast. Cloud, SaaS platforms, and increased bandwidth have made it easier for staff to work remotely. Teleconference and messaging apps ensure essential communication doesn’t

drop off. Yet for all of these advancements, new challenges have emerged.

Institutions that have been slow to adopt cloud policies will be cut off to certain sensitive data that is stored only on-premise; traders will have to contend with less screen real estate; a multitude of new home networks and VPNs are beckoning cybercriminals, and there’s the question of whether the bustling traffic thrust upon Wi-Fi networks in residential areas can support widespread home working.

“We’re in a much better place than five or 10 years ago, but you realize how much more there is to do,” says Mazy Dar, co-founder, and CEO of industry operating system provider OpenFin, which works closely with many of the biggest banks.

One area that still leaves much to be desired is chat, Dar adds. In a confer-

ence call last Friday, Dar sat on the line with about 15 to 20 people, some of whom were on the client-side. The person leading the call instructed everyone on the line to use a Symphony chatroom to communicate so that no one would miss important conversations or messages.

Dar asked to be added into the chatroom but was told it was restricted, and that he’d first have to go through an onboarding process, which could take weeks. It’s just a simple example, he says, but in an environment like the current one, it becomes clear that some rules in the capital markets—put into place for good reason, such as ensuring compliance—are limiting.

However, while some banks and asset managers have gotten comfortable with using the public cloud, that transition might not have happened soon





enough to help with this latest disaster. Large banks still look to maintain a majority of their data on the firms' local servers. Dar says this leads to two problems: one, data is less accessible. Two, those firms are banking on believing their own backup systems are built on par with the major cloud providers: Google, AWS, and Microsoft.

In 2000, Dar joined electronic trading venue Creditex Group as chief strategy officer, working through the SARS outbreak in 2003. He remembers the time distinctly. Traders had commonly accessed the platform through desktop applications in their offices, and a security measure many firms had taken by that time was to lock down the IP addresses so that the app was only available through bank-owned IPs. When SARS—the respiratory disease caused by the SARS coronavirus—took hold,

traders who were working from home couldn't access the platform.

"These things are always hard because it's a balance between security, compliance, and privacy on the one hand, and then, on the other hand, ease of accessibility, as well as things like redundancy and scalability, which the cloud provides," Dar says. "The reality is that today, cloud security and the tools available to manage compliance are there. So it's not that the cloud is not secure. It's simply that the industry has not moved fast enough to embrace it. And this should be a wake-up call."

OpenFin, which is based in downtown Manhattan, moved to allow its staff to work from home starting the week of March 16. In the days leading up to peak market and cultural hysteria, the vendor, upon reviewing its existing BCP plan, tripled its accounts for video conferencing service Zoom. All internal and client meetings are being conducted virtually or via phone.

Similarly, Trading Technologies (TT), the order management system and futures trading platform provider, has instituted a work-from-home policy for all its employees through April 3 at the earliest. After introducing its SaaS platform TT in 2014, and announcing the sunset of its over 20-year-old predecessor, X\_Trader, TT has finished the migrations for more than 50% of its customers and has been working to round that figure off to 100%.

Brian Mehta, TT's chief marketing officer, acknowledges that despite enthusiasm from other clients to start or complete remaining migrations, the mass work-from-home situation and general uncertainty spurred by the ongoing spread of the virus is causing some delays. However, he anticipates the ordeal will be a positive overall for the company, as it may bring a surge in cloud and SaaS adoption. (Rebellion's Fleiss predicts the same outcome.)

Migrations remain the top priority for the vendor, but other initiatives, particularly around custom solutions, have stalled for the time being. "With something like Covid-19, those plans do get delayed. And with delays, not only does it impact our clients in terms of what they want to do, but also us

in terms of making sure that we're there not only to do the work but also address it when they need it," Mehta says. "Then obviously, there's a trickle-down effect across the board."

Individual project and roadmap delays can lead to diminished growth—even shrinkage—and thinner profits. Aside from those battles, there's the question of whether at the end of the crisis, as clients jump back into the swing of things all at once, will that lead to bottlenecks?

And though it hasn't yet received any complaints or heard any concerns related to outages, or latency as a result of working on residential networks, Mehta says it's a possibility if businesses and offices stay shuttered for several weeks.

## New World

Big banks, in particular, are accustomed to having a certain number of remote laptops connect to their local servers via VPNs either because the user regularly works from home, or for when employees are traveling. That alone carries some security risk, but suddenly, the banks now have a free-for-all on their hands.

This is an unprecedented time when it comes to having a remote workforce, says Brad Bailey, research director of capital markets technology at Celent. It's also likely that it's not just the employee who is working from home—as many cities across the globe are locked down to some degree, that means that roommates, significant others, and children are also competing for internet resources.

Bailey, who's currently working from his home alongside his son and daughter, who are completing coursework online, says that's a potential hazard, especially for bankers or traders with young children.

"What if they start banging on your computer while you're in the restroom? God knows," he says. "I mean, theoretically, a monkey could type Shakespeare. But there are things you need to think about that are both technology and security, but also making sure people are using these tools properly. I think this is all being played out, and I'm very curious to see what happens now in light of—hopefully—this short experiment in virtual communication."

Perhaps the only known right now is the unknown. [wt](#)



# Alt Data Lends a Different Light to Coronavirus Impact

Smog, traffic data—even movie rentals—can help analysts track the economic effects of the virus. By **Rob Mannix**

**B**ig data is already on the front lines of the fight against coronavirus. China's authorities are using advanced technologies like thermal imaging and facial recognition to track infections and enforce quarantines. Now investors are putting similar technologies to work to analyze the financial impact of the epidemic.

Coronavirus fears caused markets to lurch more violently than at any time since the Lehman Brothers meltdown. In response, some firms are digging deep into data, unearthing non-traditional data sources—from air quality indexes to traffic jam counts—in attempts to forecast possible losses. Or even turn a profit.

New data can shed light on how fast countries are getting back to work as the epidemic recedes and can identify which companies are hurting—or benefitting—from the fallout. Much of the effort is focused on China, but

the principles can be applied elsewhere as the virus moves on.

So-called alternative data is timelier and can be more reliable than official statistics. It can fill the void created by the lack of comparable events. Alt data will allow investors to build an understanding of the coronavirus's local effects and extrapolate from there.

It can be a delicate subject to broach, however. One practitioner describes the coronavirus as the “perfect application” for the new data science—but is at pains to emphasize the global pandemic was not welcome.

And gears are grinding to get alt data in motion across the industry. JP Morgan, Morgan Stanley and UBS are among the sell-side shops employing alt data to get a quicker and more

accurate picture of the virus's impact.

On the buy side, AllianceBernstein has set its technology to monitor what different companies have to say on the virus. “We realized there was going to be a peak in cases outside China and the economic impact was going to be a lot larger than people had thought—and we wanted to understand what European and US corporates were saying,” says Andrew Chin, AB's chief risk officer.

Other asset managers also report working on alt data applications but chose not to be named for this article.

## First test

The coronavirus represents the first big test for alt data's ability to help investors during a global, macro market-shaping event. It has come into play during

previous crisis scenarios, but on a smaller scale.

After the Mumbai terrorist attack in 2008, some analysts gathered information from rickshaw drivers about the number of foreigners they were carting around the city in order to get a handle on the attack's economic impact.

Today, firms like UBS can collect ground-level data from thousands of sources to “swarm” an area of investor uncertainty, says Barry Hurewitz, head of UBS Evidence Lab, which produces research using new data sources.

Buy-side firms such as Schrodgers and Goldman Sachs Asset Management have established teams to gather and track new sources of information. Other banks have reinforced research functions with the addition of data scientists following the Evidence Lab model.

Much of the work happening now aims to track how fast China's workers are returning to their jobs after enforced factory closures and an extended Lunar New Year holiday.

JP Morgan's China equities team has incorporated air quality data into its research to assess how industrial production is rebooting after shutdowns.

Several firms, including JP Morgan, Morgan Stanley and UBS, are using traffic data from China's Baidu internet service provider—akin to Google Maps—to determine the rate at which employees are returning to work.

Other data is helping gauge the impact of the epidemic at the company level and to identify the most exposed industries.

Airline capacity data—sourced from the airlines themselves—shows a far greater drop in travel than after the September 2001 terror attacks or Sars outbreak in 2003.

“The airline industry has never seen such a dramatic reduction in airline capacity from one event. As of mid-February, the industry had lost 10 million seats to, from and within China, which could result in a revenue shortfall of nearly \$2 billion,” says Ronan Crosson, director of data strategy and analytics at Eagle Alpha, a broker of alt data.

Buy- and sell-side firms alike are using natural language processing (NLP) algorithms to trawl for insights into the epidemic's impact on companies.

“When there are no established patterns, when an event is rare, you need to understand what's going on in real time.”  
Barry Hurewitz, UBS Evidence Lab

AllianceBernstein set its algos to search company releases for mentions of coronavirus in mid-February to spot clues on sales or earnings trends. “An algorithm can do this much faster than analysts can and a lot more comprehensively,” says Chin.

The new data can provide targeted insights. At investment manager Havelock, chief executive Matthew Beddall says the firm may use data on



Andrew Chin  
AllianceBernstein

cruise ship moorings to gauge the industry's performance.

Online video services are among the companies that appear to be benefitting from the crisis, with purchase receipt data showing a 30% growth in subscriptions in China in the past month, says Crosson.

Tracking mobile app downloads, UBS saw the use of online schooling services double in the month to February 9. It also used geolocation data to work out which fast food chain was most prevalent in Hubei province.

Tracking the movement of app users, an Eagle Alpha webinar reported a fall-off in trips to Nike stores in China—and to Macau casinos.

### Tracking anxiety

Certain firms are trying with new data to map company supply chains, something Goldman Sachs Asset Management has worked on.

Dun & Bradstreet, the business data company, is pitching to investors a database of billing relationships between entities that shows how businesses are linked to others in afflicted areas. Some 51,000 companies around the world have a direct relationship with a supplier in China's Hubei province, the epidemic's epicentre, the firm says.

One vendor, analyzing web data by NLP, identified 69 companies that had suspended operations as a result of the virus outbreak.

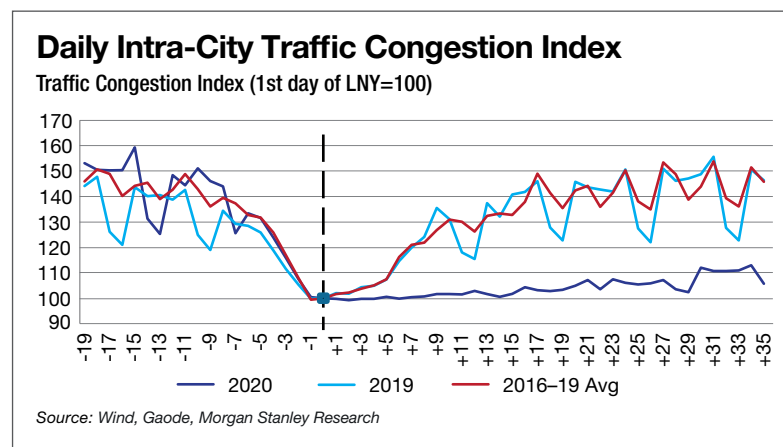
New data can help also to gauge market anxiety, some think.

Quants at Wolfe Research have constructed an index of coronavirus sentiment using NLP to analyze news stories about the epidemic.

Wolfe looked at the sensitivity of different sectors in China to worsening Covid-19 sentiment and found energy, capital goods, transport, retailing and real estate to be the most exposed.

Conversely, real estate was one of the less vulnerable sectors in the US, due to the more defensive nature of the sector, which is dominated by real estate investment trusts, says head of quantitative research Yin Luo.

Using alternative data from China could also serve as guidance for what's





likely to happen in Europe and the US as the outbreak spreads.

Hurewitz describes this as building “real-time base rates”—benchmarks against which statistics from other regions or periods can be cross-checked. He compares the epidemic to other natural catastrophes that alternative data can render into data points as the events unfold.

In a tropical storm, Evidence Lab tracks rainfall by zip code, for example, building a live picture of the storm unfolding. It can then track its economic impact through data from transaction receipts or data on traffic levels.

“When there are no established patterns, when an event is rare, you need to understand what’s going on in real-time,” says Hurewitz. “Alt data is one of the few mechanisms with which you can start to establish reference points so

“**“The airline industry has never seen such a dramatic reduction in airline capacity from one event.”**

**Ronan Crosson, Eagle Alpha**

as to triangulate the data and figure out what it means.”

And what the data disproves could be as valuable as its revelations.

Analysts armed with a cloud of facts are better able to challenge the hunches that dominate investor behavior in panicked markets, such as the idea that coronavirus spreads more slowly in hot climates—which, so far, is uncertain.

Many investors are using models based on the Sars epidemic to gauge the likely impact of coronavirus. But alt data says the epidemic will likely follow a dif-

ferent pattern, not least because travel times have halved across China since 2003, making for a more connected population.

### **Fast and fair**

Alt data is seen as especially useful in determining activity in China where many investors mistrust official statistics—including reported numbers of coronavirus cases.

At Havelock, which is keeping an “informal” watch on air quality data as a measure of industrial activity in China, Beddall says alt data reported by US embassies and consulates is potentially more reliable than numbers from China officials, which could be biased.

Alt data is also fast data. Maurizio Luisi, a quant who built a nowcasting apparatus at Goldman Sachs, and now heads research at alt data-driven nowcaster



SquareMacro, says China's inflation indicators spiked by one standard deviation at the beginning of February. Such a big move pointed to a "major disruption", Luisi says, well ahead of the global market sell-off.

Metrics of consumer and business sentiment, based on hundreds of surveys collected by SquareMacro's partners in China, plunged an "astonishing" eight standard deviations last week, he adds.

In the seven years since its inception, Eagle Alpha has seen nothing comparable to recent events, says Crosson. "Every so often there's a spike in interest in Tesla or Bitcoin or something like that. We've never seen such a sustained spike in interest and in a single topic."

Around 50 buy-siders joined the company's webinar last week in which 11 vendors touted datasets showing the impact of the epidemic using data from satellite imagery to airline ticket sales or subscription rates for video-streaming services, such as iQiyi and Tencent.

Rado Lipus, founder at broker Neudata, says a trickle of coronavirus-related inquiries started in February and in the last week nine out of 10 inquiries have concerned the growing epidemic.

The Evidence Lab team at UBS has organized a "swat team" of senior managers to gather up existing data that might be relevant and commission new hunts for data it expects to be in demand. Coronavirus is now the number one inquiry among the lab's data users.

Across the industry, rapid mobilization has tracked the speed of events. Coronavirus emerged in China's Hubei province in December last year, infecting more than 96,000 people and killing over 3,300 at the time of writing.

The spread of the virus to other countries triggered an 11% fall in the MSCI World index in the week of February 24, only exceeded in the past 50 years by the aftermath of Lehman's 2008 collapse and in 1987 by Black Monday.

Economists are sketching a hazy picture of the likely effects on the real economy. Consensus forecasts predict a sharp dip in China's GDP in the first quarter, but a recovery in Q2 and a modest 0.2% downward revision of forecasts for the year. Those projections, though, come laden with qualifiers.



"Next month we just have to press a button and out comes what companies have been saying, how that's different from January and February, and so on. That's how we expect to use this."

**Andrew Chin, AllianceBernstein**

China's purchasing managers index sank to an all-time low in February, implying Q1 GDP could be as much as 5% lower than the last quarter of 2019, Wolfe Research analysts estimate.

### Shifting perceptions

On the buy side, it's easier, for now, to find those eyeing alt data with interest than to find firms using it to make trading calls.

This is partly because of the speed at which the coronavirus epidemic has unfolded. The chief quant at one leading asset manager describes the situation simply as "pure uncertainty". Havelock's

Beddall calls it a "massive unknown".

But investment managers agree, alt data has a growing role to play, particularly for firms investing on shorter horizons. "I can see how firms focused on next quarter's earnings for companies can get some juice out of this," Beddall says.

Chin says AB's insights into managers' sentiment on the virus mainly expose uncertainty at this stage but will become more meaningful in time. "Next month we just have to press a button and out comes what companies have been saying, how that's different from January and February, and so on. That's how we expect to use this."


As for what the broader data says now, coal consumption by power stations in China has reached 62% of pre-Lunar New Year levels, compared with about 90% in other years. Passenger traffic and intra-city congestion suggests workers are trickling back to their posts. Congestion has edged up to 83% of the comparable level this time last year, Morgan Stanley reports.

The data on coronavirus sentiment is limited because it relates only to recent weeks, warns Luo, but it seems to be saying to go long China stocks, particularly beaten-down stocks in domestically focused companies.

The picture in Europe and the US is different, he says, as uncertainty rises and sentiment deteriorates. "There is probably more upside in China," he suggests.

"China may yet emerge as a winner rather than a loser from this, compared with Europe, where arguably the risk of the epidemic spreading is bigger," says Luo.

Since the end of the enforced holiday on February 10, although air pollution in China has increased, it remains at about 50% of the historical average.

Every cloud... 

### Private Flights to Macau



Source: UBS

### Total Flights to Macau



Source: UBS



# Breaking the Doom Loop: The Danger of Self-Fulfilling Prophecies in Credit Risk

*WatersTechnology's* sister brand Chartis Research is the leading provider of research and analysis on the global market for risk technology. Chartis' goal is to support enterprises as they drive business performance through improved risk management, corporate governance and compliance, and to help clients make informed technology and business decisions by providing in-depth analysis and actionable advice on virtually all aspects of risk technology. This feature is dedicated to showcasing Chartis' latest insights.

**T**he ability to distribute trustworthy credit is a societal cornerstone. But what happens when traditional credit scoring methodologies aren't available? Will new 'advanced' credit models in emerging markets be self-fulfilling prophecies?

## Big Data and New Credit

The Big Data revolution promised many things, not least that more is better. Financial institutions (FIs) in particular, the thinking went, would be able to scoop up the vast oceans of data washing around in their systems, and build three-dimensional, 'holistic' images of their counterparties that would far outstrip their old-fashioned, simplistic models.

But as the hype subsides we are seeing that more is not necessarily better. Adding more factors to a model may make it more accurate, but the efficacy of each addition can only be proven in the real world. This becomes a challenge when 'real-world' feedback from a process is delivered slowly—notably in the case of credit risk, where it is often very slow indeed (consider mortgage defaults, for example).

## More Complexity is Not Always the Answer

For this reason, credit scores tend to be fairly straightforward, which is partly why some—such as the FICO score, the CE Score and the Credit Optics score—have gained market share in the US. The FICO score in particular has been established for over 60 years, but attempts to enrich it with additional

factors or advanced analytics (such as machine learning techniques) have had limited success<sup>1</sup>. Consequently, a significant underlying factor in the US economy remains one that is driven by a relatively simplistic algorithm.

The US may be a vast experiment in credit scoring analytics, but larger ones exist. There has been much talk of how the Chinese government, for example, has been investing in complex analytics to develop its Social Credit System. This aims to standardize the assessment of citizens' and businesses' economic and social reputations, by combining credit scoring with numerous other factors—including 'esoteric' ones such as playing too many video games and indulging in anti-government online speech.

This may represent an Orwellian intrusion into citizens' lives, or an unyielding universal framework upon which individuals can build trust and trade—or something between the two. However, one thing is relatively certain: it doesn't represent an optimal credit scoring system.

This is because it has a dual purpose: it is not simply trying to determine who is likely to default on loans, it is also attempting to enforce an image of what a model citizen looks like. It would take a lot of time and effort to determine the influence of excessive video games and online speech on probability of default, and any correlation would likely be weak at best. In fact, throwing lots of these factors into the mechanism is likely to add significant noise and degrade the impact of the parts that actually work.

The results could vary, from a range of unexpected defaults, to the harder-to-measure (but even more unpleasant) effect of innocent people being denied access to credit and economic stability.

Technology is not necessarily best served by an onward march toward increasing complexity. Those designing analytics should consider what the time-scales are for validation, how easy it will be to test outcomes, and whether there are clear lines between the questions the analytics are asking and the expected outcomes ('risk of default', for example, versus 'good citizen').

## Right in the Wrong Ways?

Given the time it takes to tune credit scores, then, it's likely that loading social engineering into a credit model will distort its outcomes. A more subtle question is 'what if credit scoring models are right, but in the wrong ways?'. Arguably this is another risk posed by the new breed of models. Primarily, what if predicting someone to be at risk of default *causes* them to default? What if a credit scoring mechanism predicts a risk of default and this then causes the default because the individual cannot gain access to other ways of earning money?

## Unpredictable Predictions

Typically, the vast amounts of data now available are used in one of two ways: to influence (as in advertising), or to predict customer outcomes. The results of predictions in particular can be unexpected, as illustrated by one notable example. In the retail space, one particularly profit-

able type of customer is newly expectant mothers: they have to buy a lot of things for a new baby, and are time-constrained enough that they will likely do so in one place. Back in 2012, US retailer Target sent catalogs of maternity items to a customer that its system, based on her buying patterns, had identified as probably expecting a child. As it turned out, the expectant mother was a teenage girl, whose father was somewhat taken aback by the revelation that not only was his daughter pregnant, but that Target had picked up this information before he did<sup>2</sup>.

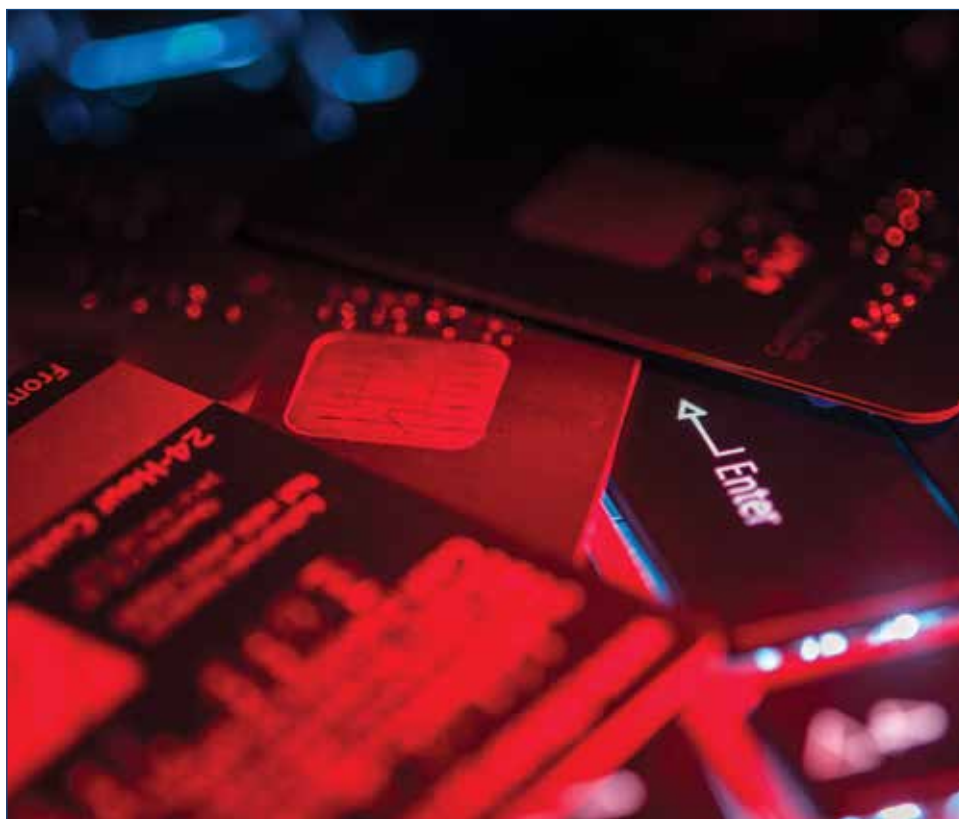
This ability to predict outcomes is at the core of much of credit risk analytics. Reliable credit ('if I lend to this person, am I likely to get it back?') is broadly considered one of the foundations of a functioning capitalist society. Institutions lend mortgages so people can own houses, and loans so they can start businesses. Typically an institution will use external data (whether observed or inferred) to predict how likely someone is to be a credit risk—fundamentally, how likely they are to default on loans.

Ideally, the best indicators for credit risk scoring are transaction data and credit history. The problem arises when access to transaction and credit data is limited, or when credit data doesn't exist at all. According to the World Bank's 2017 Global Findex report, about 1.7 billion adults globally remain unbanked<sup>3</sup> (and hence lack a transaction history). To compensate for the lack of traditional scoring inputs, firms must employ proxies, which use other factors about how people behave to figure out how likely they are to default.

### Proxies, Prophecies and Loops

A number of scoring companies are currently using proxies. Approaches include using mobile data services to build a model of someone's lifecycle and corresponding credit risk profile, or calculating credit scores based on people's online behavior (such as how they use mobile apps).

New 'proxy' credit models are being targeted at users in several emerging marketplaces (mainly South America



and Africa but also parts of Asia), where people have access to mobile or internet data but are otherwise unbanked, and where they may be using services such as mobile banking application M-Pesa.

The concept of 'self-fulfilling prophecies' in credit risk has been noted in the corporate space with respect to ratings agencies<sup>4</sup>, but also with respect to activities such as job applications<sup>5</sup>. In the latter case, people were analyzed for employment opportunities using their credit score and ultimately turned down, which then caused their credit score to deteriorate.

Basing credit scoring on even more tenuous factors could cause more of these 'doom loops' to arise. It could justifiably be pointed out that an opaque or inaccurate credit-score proxy is better

than nothing at all (institutions need to build a case to lend money, after all, otherwise they simply won't lend). But this means little to someone who becomes excluded from the financial system for, say, not charging their phone enough.

Many FIs will be looking at emerging markets—with their rising middle class—as key places to invest. While there are significant opportunities, however, it's worth examining some of the underlying assumptions behind financial growth and what it means, and how potential winners and losers can be created by 'new' methods just as they can by old ones. Emerging credit-scoring methods aren't a protection against either default risks or potential reputational damage, and for investors, pulling the trigger on these new firms may be riskier than they expect.

#### Footnotes

- 1 <https://www.fico.com/blogs/risk-compliance/can-machine-learning-build-a-better-fico-score/>
- 2 <https://www.forbes.com/sites/kashmirhill/2012/02/16/how-target-figured-out-a-teen-girl-was-pregnant-before-her-father-did/#7b22e65d6668>
- 3 <https://globalfindex.worldbank.org/>
- 4 [http://www.fimaconferences.org/Nashville/Papers/Ratings\\_causality\\_jan14.pdf](http://www.fimaconferences.org/Nashville/Papers/Ratings_causality_jan14.pdf)
- 5 <https://www.thenation.com/article/why-are-employers-checking-job-applicants-credit-histories/>

For more information, and to continue the discussion, visit [www.chartis-research.com](http://www.chartis-research.com) or contact us on [info@chartis-research.com](mailto:info@chartis-research.com)

# Covid Drags NYSE Into the 21st Century

The coronavirus has achieved what decades of competition and automation could not—halted trading on the NYSE floor. With no end to the pandemic in sight, and with technology now running the show, Max asks whether the floor is likely to ever reopen.



As I write this, the New York Stock Exchange's trading floor has been empty and closed for a week, and NYSE—which has long resisted moving away from open-outcry trading, despite dwindling numbers of floor traders—has been conducting trading on a fully electronic basis.

The “temporary” move—to protect floor specialists and brokers from the spreading Covid-19 disease—sees NYSE finally fall in line with rival exchanges that either closed their floors years ago, or have operated fully electronic since inception, and with other exchanges that have also closed floor operations in response to the disease. The Chicago Board Options Exchange, for example, preemptively closed its trading floor on Friday, March 13.

This isn't the first time NYSE has closed its floor in response to an emergency, though it is the first time in history that not a single physical exchange trading floor worldwide has been open for business. So while for most exchanges, operating in the age of the coronavirus has meant business as usual, it has represented a major shift for NYSE, which officials say was made possible by the NYSE Pillar platform that the exchange rolled out last year.

Not only has the new platform provided capacity to support a more than three-fold increase in orders to over a billion orders per day during the recent volatility, it has been vital in being able to move to an all-electronic model with minimal disruption.

“We, as a practical matter, are always ready, any day, for a potential

disaster. So we regularly test on weekends, both with the exchange alone, as well as with the industry broadly, for disaster recovery scenarios that range from our 11 Wall Street building being unavailable, or our New Jersey datacenter being unavailable, or some combination of doomsday scenarios,” said Michael Blaugrund, NYSE Group COO, in the days between deciding to

cretion to operate at a more aggressive price during the closing auction period.

“It has become a growing proportion of the closing auction, and a tool that more people are using. So ensuring that the Street is ready to operate without that in their toolkit is something that our team has been working on ... with urgency over the last several weeks in case this type of transition had to come to pass,” Blaugrund said.

Of course, the continued participation of DMMs, even only electronically, depends on the individual brokers employed by those firms being healthy enough to make markets electronically—or on them having sufficiently responsive trading algorithms to take over in the event of the pandemic decimating their active workforce, or firms' preventative measures rendering a proportion of that workforce unavailable.

And though the floor closure is a “temporary” measure, there's no definition of how “temporary” it will be. The floor could be closed for several months, at least. And if exclusively electronic trading becomes the “new normal” in the meantime, and NYSE's model falls into line with other exchanges around the world, it begs the question: Why would NYSE ever reopen the floor?

Between that and the possibility of machines taking on more of their work, specialists or floor brokers may want to consider a career change. Maybe it's time to write that novel, kick off that startup idea, or—once travel restrictions are lifted—take that trip you've always talked about. Because the old ways may not have a role in the “new normal.” [wt](#)

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Though NYSE has deemed the floor closure a temporary measure, there's no definition of how “temporary” it will be.

close the trading floor and reopening as an electronic-only exchange. A key requirement of Pillar was that it could withstand any disruption to NYSE's Wall Street home, he said.

Despite the floor closure, “The designated market makers (DMMs) who have accountability to each of our issuers, and who have a regulatory obligation to provide continuous displayed bids and offers to the market—as well as additional liquidity throughout the book to ensure volatility is dampened—continue to have that same responsibility in that electronic fashion,” Blaugrund said.

However, losing the floor broker community—which makes up around one-third of activity during closing auctions—is not completely without disruption. For example, a pure electronic environment does not support D-orders, which gave floor brokers dis-

# Earn It? Burn It



Jo looks at an attack on end-to-end encryption that is winding through the US law-making process this month.

**T**hese are confusing times. We're afraid of ourselves and our loved ones getting sick, we're adjusting to social distancing, and we're wondering if we need to wear a tie on Zoom.

There are some things you can always count on, however. The sun will rise, spring will come, and lawmakers will take the opportunity of mass distraction to launch attacks on civil liberties. On March 5, a bipartisan group of senators led by Republican Lindsey Graham and Democrat Richard Blumenthal introduced the Earn It Act of 2020—a cynical attempt to mobilize anxieties around child abuse to erode privacy and free speech.

The bill is the latest salvo in the decades-long Crypto Wars, in which US authorities have launched multiple assaults on privacy and security of the public. First there was the Clinton administration's failed attempt to get the Clipper Chip, a hardware “backdoor” into encrypted devices, to catch on. More recently, in 2016, there was the determined effort by the Federal Bureau of Investigation and the Justice Department to force Apple to give them a backdoor into an iPhone 5S belonging to one of the San Bernardino shooters.

But by and large, government campaigns against encryption have not been successful, partly because the tech companies are staunchly fighting against them. This may be why the Earn It Act doesn't go about trying to introduce backdoors. It doesn't even mention encryption. What it tries to do, under the cover of controlling the explosion of child sexual abuse material (CSAM)

on the internet, is to make encryption so prohibitively expensive for tech firms that they would have to stop offering it.

Earn It ostensibly seeks to put an end to online CSAM by forcing tech firms to follow a set of best practices. These best practices do not exist yet, so the act also establishes a commission whose task it would be to come up with them. The commission, a mix of gov-

sive. They could rule that firms have to monitor all communications for CSAM automatically. Tech companies already do this, scanning unencrypted communications with artificial intelligence and human moderators to flag potential CSAM, and then blocking accounts and reporting to authorities. But they cannot scan encrypted communications.

The fear is that, should this bill pass, tech companies won't want to risk liability and will stop offering end-to-end encryption, and then they will aggressively censor what users publish on their platforms.

The bill gives a lot of power to the attorney general, as he or she would become the commission's chairman. The current attorney-general, William Barr, has been publicly and vocally in favor of back doors for the government.

During a Senate hearing in mid-March, Blumenthal denied that the bill is about ending encryption, and he denied that it gave any disproportionate power to Barr or the commission.

But it's difficult to believe this is a well-intentioned piece of legislation. If the senators really cared about the children, they could have written a bill beefing up support for child protection organizations, or mandating specialized technical training for law enforcement. Instead, they wrote a bill that could stifle innovation at tech firms, leave users open to malicious cyberattacks, and erode the rights of Americans to privacy in their communications—and all of this cynically manipulating Americans' fears for the safety of their children. [wt](#)

**“**  
The fear is that, should this bill pass, tech companies won't want to risk liability and will stop offering end-to-end encryption.

ernment officials and industry experts (that need not include any experts on security or encryption), would be led by the US attorney general.

The commission could punish tech firms for failing to adhere to the best practices—including by eliminating their statutory immunity from liability for content published by users on their platforms or websites, which they have had by default for 20 years under Section 230 of the Communications Decency Act. “Earn It” is the sort of backronym that senators think is snappy and clever (it stands for Eliminating Abusive and Rampant Neglect of Interactive Technologies Act of 2020). But it also refers to Graham's central aim with this bill: to make tech firms “earn” their right to Section 230 immunity.

What worries privacy activists like the Electronic Frontier Foundation is that the commission could set best practices that make encryption expen-



# Bright Lights, Where Are You?

Are you suffering from cabin fever? You're not alone. Wei-Shen writes about some of her struggles and how we need to stay positive to overcome this together.



**I**mprovise, Adapt, Overcome. I learned this US Marine Corps slogan from our editor-in-chief Anthony Malakian who spoke about it during a recent Waters Wavelength Podcast. (PS: I'm the host!)

I am generally a positive person who sees the brighter side of dark situations, but lately, I find myself feeling more melancholic. I'm away from my family in Malaysia, and the coronavirus pandemic inundates the news and my social media feeds.

I know better than to let my worries get the best of me though. I choose to believe that this trying time presents an opportunity to self-reflect, evaluate, discover, and shine. So, I'm improvising, adapting, and—hopefully soon—overcoming. As it turns out, all it takes is a good weekend chatting with family and good friends, some hard sessions at the gym—which is now the hallway in my tiny apartment in Hong Kong—my trusty Nespresso coffee machine, and an awesome music playlist to help me in this endeavor.

I'm not saying we should ignore what's happening in the world. Instead, I'm advocating for a chin-up mentality. These lockdowns and restrictions can seem like a punishment, but they're a necessity and provide an opportunity to better ourselves.

## Cloud Gazing

This doesn't apply only to humans. Companies around the globe are coming to this realization, as well.

Few could have imagined a world where more than 90% (if not more) of

the workforce was either working from home, furloughed, or laid off.

But this is becoming the new reality, which is significantly impacting the global economy and financial institutions. In a recent report, consultancy firm Quinlan & Associates estimates global GDP to contract by 4% from 2020 to 2021, or roughly \$3.5 trillion. In a worst-case scenario, the firm estimates -15% GDP growth over the next 24 months.

**“It will be interesting to see how firms shift their tech priorities during this pandemic, and what new technologies and processes they invest in.”**

Covid-19 is fundamentally reshaping the way we as humans interact, and also how business is conducted on a global scale. Some firms are realizing their business continuity plans (BCP) are inadequate. Mandated work-from-home arrangements have also led firms to rethink their approach to technology.

One such area is cloud acceptance. The cloud has been gaining wider acceptance in the institutional finance sector—if you've been a regular reader of this publication, you have seen many stories on the subject. However, some are still reluctant to put critical workloads and data on the cloud, for security and privacy reasons.

In episode 188 of the Wavelength Podcast, I spoke with Mazy Dar, CEO and co-founder of OpenFin,

who pointed out that it has been challenging for many firms who primarily rely on on-premise infrastructure.

“I think this is a real wake-up call for our industry. We've largely stuck to an on-premise approach for anything that is confidential—customer data, and we've done that in the name of security and data privacy, which is obviously incredibly important. But, you realize that at a time like this, that approach becomes incredibly problematic and is now contributing to a huge hit in productivity and, quite frankly, the scale, resiliency, and agility that the cloud offers particularly in this environment is something that we should all be benefiting from,” he said.

Dar believes the industry needs to embrace the cloud more proactively and overcome concerns about security and regulatory compliance—but he stresses this doesn't mean compromising on them. “It simply means taking advantage of the tools available in the cloud from the major cloud providers and doing that while aggressively moving infrastructure to the cloud,” he said.

It will be interesting to see how firms shift their tech priorities during this pandemic, and what new technologies and processes they invest in.

If there is a key takeaway from all of this, it's this: Whether you're thinking from an individual perspective or as a firm, everyone should use this time to evaluate areas in our lives and companies that we need to work on—Improvise and Adapt. If we do that, we will Overcome. [wt](#)

# Human Capital



## Finra Appoints Executive Vice President

Greg Ruppert will join the Financial Industry Regulatory Authority (Finra) as executive vice president, national cause and financial crimes detection programs. He will report directly to executive vice president of member supervision, Bari Havlik.

Ruppert fills a new role created after Cameron Funkhouser, head of Finra's office of fraud detection and market intelligence, retired at the end of last year.

Previously, he was a special agent at the Federal Bureau of Investigation, where he worked on complex financial investigations, terrorism and cyber threats. Most recently, Ruppert worked at Charles Schwab for six years as senior vice president and chief of the financial crimes risk management group.

## First Derivatives Appoints Global Marketing Chief

Software and consulting firm First Derivatives has hired Kathy Schneider as chief marketing officer. Schneider will take responsibility for marketing strategy and brand, including demand



Kathy Schneider



Greg Ruppert



Marshall Saffer



Miriam Marascio

generation and communications. She will report directly to CEO Seamus Keating.

Schneider previously held the same role at Sungard Availability Services. She entered the technology sector in 1999 when she joined Dell.

## Hazeltree Hires Saffer as VP

Integrated treasury and portfolio finance solutions provider Hazeltree has announced the hiring of Marshall Saffer to the role of vice president and head of Americas sales. This is in line with the firm's plans to expand after the acquisition of Enso Financial Analytics.

Saffer has over 25 years of experience in the alternative software industry, from sales and business development to professional services as well as experience in portfolio management and operational solutions. He held senior management positions at MIK Fund Solutions, Viteos Fund Services, and Financial Models (acquired by SS&C Technologies).

## Head of Client Services Joins CloudMargin

Miriam Marascio has been appointed head of client services at CloudMargin, the collateral and margin management solution firm. She will report to the firm's CEO, Stuart Connolly, and will be responsible for the end-to-end care of the firm's clients. This includes onboarding, support and ongoing relationship management.

Marascio began her career as a cultural mediator in Florence, Italy. She has held previous client services roles before joining CloudMargin including 13 years at Clearstream Banking, a European-based supplier of post-trade infrastructure services.

At Clearstream banking she led projects aimed at improving the client experience as well as the departments adoption of new technologies.

## Former IBM, Amazon Executive Joins R3

Enterprise blockchain software firm R3 has appointed Dorothy Copeland as global head of partner ecosystem and alliances. She will lead the company's engagement, says chief revenue officer, Cathy Minter, and further develop the firm's worldwide partner sales and ecosystem programs throughout vertical market industries.

Copeland previously held a tenure at IBM, where she was responsible for ecosystem partner sales, programs, and business development. She was also a member of the IBM acceleration team, an internal board of top-performing IBM executives.

Prior to that, Copeland held senior positions at Amazon Web Services, where she built the company's global ecosystem programs.

## Eventus Systems Makes First Key London Hire

Eventus Systems, a global trade surveillance and market risk software platform provider, has announced that Roger Chandler will join the firm as senior sales engineer as they expand the business to London. Chandler will be responsible for servicing existing clients and for growing the business and forging new relationships with prospective clients. He will report to Scott Schroeder, global head of sales.

Chandler was most recently technology sales manager for Bloomberg in London, where he was responsible for enterprise technical sales in the Europe, Middle East and Africa regions. Prior to that, he spent



11 years at Fidessa PLC, initially as a service delivery manager and ultimately as global account director.

### Executive Team Hire at Big XYT

Richard Hills is joining independent provider of market data analytics Big xyt as head of client engagement. Hills will be based in London and work alongside Mark Montgomery, head of strategy and business development.

The new role will see Hills help to drive client innovation using a partnership engagement model and promote client awareness of the full suite of the firm's products.

Hills joins the firm from Societe Generale, where he built the equities electronic trading business.

### RJO Bolsters Market Expertise With Industry Veteran

John H. Porter is joining futures brokerage and clearing firm RJ O'Brien & Associates (RJO) as strategic advisor. Porter will be the lead macro-economic speaker at conferences and will serve on RJO's investment committee.

Porter was previously global head of fixed income and structured finance at Axa Investment Managers. Prior to that, he served as a managing director and global head of portfolio and liquidity management at Barclays Capital in London.

### RegTech Vendor Nexus FrontierTech Adds Execs

Nexus FrontierTech, a London-based provider of AI-powered regtech solutions for financial services, has made several hires in response to increasing demand for its services and support ongoing growth.

The vendor has hired Matt Purcell as CFO to help bolster its growth through efforts including fundraising. Purcell was previously finance director at fund manager and investment services provider Parmenion Capital Partners.

## EURONEXT ANNOUNCES LAUCHARD AS NEW COO

Georges Lauchard will join Euronext as chief operating officer and member of the managing board, based in the firm's Paris office. In his new role he will oversee the exchange's operational strategy, policies, and execution.

Lauchard previously spent over 20 years at JP Morgan and was most recently the COO/CFO of its corporate and investment bank technology team. He held a number of leadership roles at the firm, including head of global front-office markets supervision and COO of global



Georges Lauchard

currencies and emerging markets trading. Before that, he worked in the emerging markets division at BNP Paribas in New York.

Nexus has also hired Dilpreet Sall as artificial intelligence and automation analyst. Sall previously spent two years at IT consultancy Cognizant as associate and business analyst in its AI and analytics advisory division.

The hires follow that of Sardor Karimov last year as business development manager.

### Magnifi Announces Executive Co-Chairman

Magnifi, an investment search platform for mutual funds, exchange-traded funds and model portfolios, has hired David Pottruck as executive co-chairman.

Pottruck will aim to help identify, structure and execute on strategic partnerships as the business scales.

Pottruck was a former chairman of HighTower Advisors and CEO of Charles Schwab.

### CityExecutive Expands London Recruitment Team

London-based capital markets and fintech recruitment company CityExecutive has hired Yianna Florides as associate director to build on its existing fintech search and recruitment activities.

Florides joins CityExecutive after senior roles at other technology-focused recruitment firms, including most recently director at IWorkInPayments.com. She reports to CityExecutive managing director Miles Nicholls.

### Algo-Logic Systems Hires Sales Director

Chicago-based FPGA trading and risk management solutions provider Algo-Logic Systems has hired Kevin O'Connor as sales director for North America.

O'Connor was most recently vice president and head of North America sales at low-latency trading hardware supplier Enyx, prior to which he was a sales executive at hardware-based feed handler vendor Celoxica.

He reports to VP of business development and marketing John Hagerman, and Algo-Logic founder and CEO John Lockwood.

### PJ Solomon Hires MD to Launch New FinTech Group

PJ Solomon, a financial advisory firm and independently operated affiliate of Natixis, has created a new fintech group to expand its services into the technology sector, and has appointed Nate Stulman as its managing director.

Stulman is a senior financial advisor to clients across the financial technology and financial services sector and will aim to utilise his relationships and experience across the credit card ecosystem.

Stulman spent 12 years at Greenhill and Co., where he was most recently a managing director and co-head of the firm's financial technology corporate advisory group, which he also co-founded.



Richard Hills

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Predictive analytics



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