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Head Space

Three years ago, at about age 38, I started to experience anxiety in a significant way. This is not unusual, as it tends to happen to men in their late 30s and early 40s—or so my shrink says.

I've never liked traveling, but I have flown to Asia, Europe, and to South America, as well as all over the US and parts of Canada. I never enjoyed flying, but I could do it. Then, one day … I couldn't. I started working from home more and more—next thing I knew, I couldn't take the subway for fear of being trapped. Then it was bridges, then elevators. Things I'd done a thousand times in my life were suddenly nightmares. I can't explain why it happened, and it's scary to think about what could be next, but I'm doing my best to address it before I become a hermit living in a cabin in the woods. Weird … trust me, I know.

I bring this up because I think the greatest challenge facing Wall Street—and every street—is how to deal with employees and teams that work remotely and, as a result, feel isolated, disinterested, or overwhelmed. How do you keep them engaged? How do you make them feel that they're on a real team and working toward a common goal, rather than robots, typing away in their living rooms for a paycheck? How do you develop those bonds that stem from working side by side for eight hours or more, five days a week? These have always been difficult questions for managers to answer, but it's only become more complicated.

There's another reason I bring this up—during the pandemic I stopped seeing my psychologist. I need face-to-face visits because video calls for something like this don't work for me. The pandemic has posed challenges for those of us who see psychologists or psychiatrists—and to quote comedian Neal Brennan, if you don't know the difference between the two, congrats on having a great life. Even for those who have not sought out mental health experts in the past, it doesn't mean that the pandemic has been easy on them. I'm lucky; I'm in a great relationship, I have amazing friends, I enjoy my job, and everyone I know who has been infected by Covid-19, including myself, is OK (knock on wood again). I know there are a lot of people who cannot say the same things.

People do not like to talk about mental health. I'm an open book, but that probably comes from years of drinking and spilling my guts at the bar. This is to say, though, that managers should try to keep their people in mind—as humans, not as job roles—as they bring back their workforces. While I don't expect folks to develop the same phobias I did, I do believe that there is an untold number of people out there who are suffering from something, and this pandemic has not helped.

Listen to people. Reach out to them. Talk to them. Be open to new ideas and requests. For somebody who clearly doesn't have all the answers, that's the best advice I can give. wt

Anthony Malakian
Editor-in-Chief

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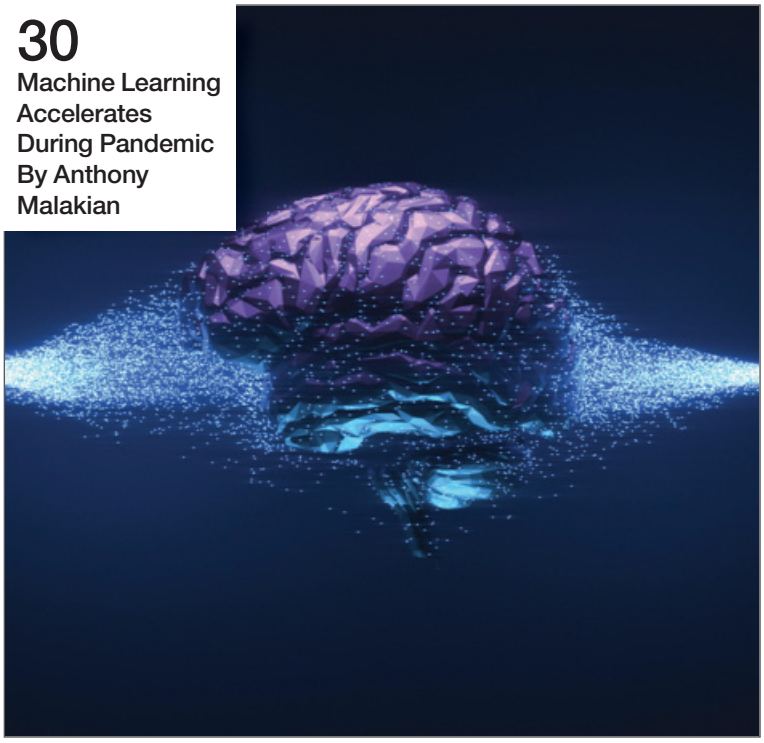


ICE 'Bonds' Acquisitions into Fixed-Income Powerhouse

In this profile of the Intercontinental Exchange, Lynn Martin explains how the company's ICE Data Services unit is creating a unified offering with fixed-income data at its core, after a series of acquisitions that began with its purchase of IDC in 2015. By Anthony Malakian

In October 2015—almost four years before London Stock Exchange Group announced its plan to buy Refinitiv—it was the Intercontinental Exchange (ICE) shaking up the exchange data world with its purchase of Interactive Data Corporation. This deal would set off a string of acquisitions that would help the Atlanta-based derivatives exchange—which also owns the New York Stock Exchange—to significantly grow its presence in a new area: fixed income.

The following October, ICE completed its acquisitions of S&P Global's Standard & Poor's Securities Evaluations business, which provides fixed-income evaluated pricing, and Credit Market Analysis, a provider of data for the over-the-counter markets, including credit derivatives and bonds.

In October 2017, it added Bank of America's Global Research division's fixed-income index platform. That same month, ICE announced its intention to acquire BondPoint from Virtu Financial. Finally, in July 2018, it closed its deal for TMC Bonds.

The acquisitive exchange has since gone silent in the fixed-income M&A space. Rather, the last two years have been focused on unifying these data, index, and execution platforms under the ICE Data Services umbrella. Lynn Martin, president of fixed income and data services at ICE, spoke with *WatersTechnology* about the company's growth in the fixed-income space and what it has planned going forward.

Much like many of the other major acquisitions the industry has seen in recent years, these moves have been all about creating a data behemoth that provides front-to-back services, in this case specific to the fixed-income market. As evidenced by the LSEG–Refinitiv, State Street–Charles River, S&P Global–IHS Markit, Ion–Broadway, TP Icap–Liquidnet, and Confluence–StatPro deals—and the list goes on and on and on—data is God. And in the fixed-income space, finding religion can be a difficult task.

> "The way we view Fixed Income Select is it's an integrated technology solution that services the entirety of the fixed income ecosystem. We have all of these metrics in-house; it's about uniting them and then being able to, at the click of a button, execute on the transaction."
> **Lynn Martin, ICE**

"The way we've always thought of our businesses at ICE is that they're ecosystems. If you looked at the fixed-income ecosystem, data is an incredibly important component because it's a complex market; it's not as simple as the securities market where a stock of ICE is the stock at the single instrument," Martin says. "If you look at the fixed-income market, you really need data to understand what the risk is of each of those single instruments; it's not as simple as looking at earnings or things of that nature."

Select Hubs

In 2020, ICE has worked to combine its fixed-income execution business with its fixed-income data line to help drive the continued electrification of the market. After all, the more that fixed income becomes electronified, the more data that becomes available to price this illiquid market, therefore creating more opportunities to sell unique data and analytics to traders.

While not ruling out future deals, Martin says the exchange refrained from making additional purchases in order to focus on integration projects and building operability between various internal and acquired components.

The result of this effort is ICE Fixed Income Select (FI Select), which was launched in April. The workflow platform provides connectivity to the entire ICE fixed-income ecosystem, including the ICE Bonds execution platforms and ICE Data Services evaluated pricing and analytics. It has also been integrated with major order management systems in the space.

Through FI Select, users will no longer need separate execution connections to BondPoint, TMC, and Creditex, which was acquired in 2008. Additionally, users can also access all of the pre-trade data products that ICE has

around services like evaluated pricing, market research, terms-and-conditions data, liquidity metrics, best-execution scores, and transaction-cost analysis (TCA) metrics, Martin says. Previously, a trader would largely have to piece these components together themselves.

Also connected to FI Select is ICE ETF Hub, a service that aims to bring further automation to the creation-and-redemption process in the primary US-listed domestic equity and fixed-income ETF markets. The service, which was rolled out in October 2019, was built in partnership with BlackRock after the issuer and exchange found that it was a challenge to efficiently execute creation and redemption messages in the ETF space.

In order for BlackRock to scale up, it would have needed to hire a lot of people to match the forecasted growth in the market, Martin says, which was consistent with what ICE had heard from other issuers. Additionally, the Securities and Exchange Commission's (SEC's) introduction of the ETF Rule in 2019 made custom creation-and-redemption baskets available for all ETFs, creating both opportunities and challenges for the issuer community that technology could help solve.

The ETF Hub uses an API to exchange messages between issuers and clients, rather than sending spreadsheets via email and communicating via phone. Again, automation helps to bring in more assets under management—and thus liquidity—which leads to more data and transparency in the fixed-income market.

"The way we view Fixed Income Select is it's an integrated technology solution that services the entirety of the fixed income ecosystem," she says. "We have all of these metrics in-house; it's about uniting them and then being able to, at the click of a button, execute on the transaction. That's where the magic really starts to happen."

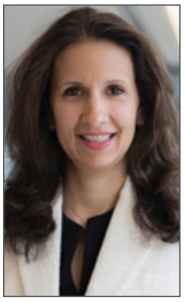
As the exchange acquires additional assets in the fixed-income space, Martin adds that ICE can plug those data sources and tools into FI Select and have them more easily interoperate with previously acquired and internally built offerings.

The Interop Movement

ICE is not unique in looking to build out its fixed-income suite of data and tools, creating a full front-to-back workflow: This movement extends to different types of firms in the capital markets. For example, investment banking giant Goldman Sachs is embracing cloud, open-source tools, and APIs to build out its Marquee platform—which provides institutional investors with market views, hedging tools, and trade execution across multiple asset classes—to create a one-stop-shop managed-services offering. "Most of our content, historically, in Global Markets was distributed via email," Anne Marie Darling, a partner at Goldman Sachs, told *WatersTechnology* in October. "We need to move that into a much more digital format, where you can search, sign up for alerts, tag certain items, and make it much more user-friendly, similar to what we see in the consumer market. That will be a key driver as we head into 2021."

On the vendor front, Refinitiv will eventually sunset its legacy Eikon and Thomson One platforms to focus on Workspace, its next-generation data platform that provides distinct content and capabilities tailored to the needs of different user types via a front-end display and APIs. "Workspace is our response to a transforming industry—we're clearly at the beginning of a new era," Mitko Yankov, global head of platform at Refinitiv, told *WatersTechnology* in September. "Asset managers and banks are responding to margin compression and looking to drive greater productivity across their workforce, and their tools and capabilities."

Goldman's move is consistent with other moves in the trading platform space, while Refinitiv's is in line with others in the collaboration space.



Lynn Martin
ICE

Martin says creating interoperability between the various ICE assets will help to drive automation, but will also create a more efficient ecosystem for traders, no longer forcing them to hunt around for information that resides under the ICE umbrella.

"As you get into the weeds of the market structure, the complexity really comes through. Making sure that for each of the protocols that allows the market to trade in the way that it wants to trade is the most challenging aspect of integrating all of our components together," she says.

And as ICE acquires new companies, it will need to ensure that it is future-proofing the exchange with the ability to incorporate new technologies, which makes the creation of FI Select all the more important. Additionally, as ICE's work with BlackRock on the open-architecture ETF Hub shows, the exchange has also been open to unbundling data, and thus making new API-connected solutions easier, says one vendor executive who asked not to be named for competitive reasons.

After making inroads in corporates, sovereigns, and US government bonds—ICE also owns and operates the NYSE bonds fixed-income platform, part of its acquisition of the New York Stock Exchange—these initiatives in ESG and munis are all part of ICE's broader push toward building its own data assets while creating interoperability with execution tools.

Though ICE's current focus is on combining its fixed-income assets, its end-game may be a much broader vision: With its equities and derivatives markets, and now its fixed-income data and analytics, ICE as a whole now has a unique insight into every aspect of an issuer's financial performance. Data aggregators may also capture and aggregate this data, but ICE represents the source of the data—and owning the origins of that data is potentially even more valuable than the data itself. wt

Hedge Funds Incorporate Behavioral Analytics to Optimize Performance

Regardless of fund type, portfolio managers can analyze their trade data and behavior to make improvements, according to Essentia Analytics' CEO. By Wei-Shen Wong

Self reflection is not always comfortable, but it can be beneficial for mental well-being or when it comes to learning from and improving upon past decisions and ultimately becoming a better human—or at least striving to be.

Fund managers often disregard self reflection, for a number of reasons. Sometimes, it's pride. Sometimes, they don't have the tools necessary to help them reflect on investment decisions they've made. Other times, it's the institution itself that hinders this type of personal development. Take, for example, a long-only fundamental fund. Since these types of firms typically don't often trade, is it beneficial to analyze their data?

Clare Flynn Levy, founder and CEO at Essentia Analytics, says the assumption is that data analytics won't work for that type of fund. But, there's still value in analyzing data about decisions a fund manager makes that don't result in trades.

One of the funds Essentia worked with—"Fund A"—is a $1 billion equity portfolio within a $50-plus billion investment management firm, managed by two portfolio managers. Fund A is a highly concentrated fund holding 30 positions and has an annual turnover of less than 5%.

Fund A implemented three of Essentia's tools—Brain Dump Nudge, Alpha Decay Nudge, and Vulnerable Positions List Nudge—which led to an overall improvement of an additional 600 basis points, or $60 million of additional profit on a $1 billion fund.

Essentia set up a daily Brain Dump Nudge for Fund A to capture the manager's thoughts as to why they traded—or why they didn't. Then, Essentia combines it with trade data to connect the dots between.

Managers can be "nudged" to check on positions they may be at risk of holding for too long based on previous patterns

They implemented a monthly Alpha Decay Nudge to remind the managers to check on positions they may be at risk of holding on to for too long based on previous patterns.

Fund A began using Essentia in November 2016, by first doing a bulk import of their historical trade and holdings data, and then with an ongoing daily feed.

Usually, Essentia looks for at least 2,000 historical trades as a starting point to find statistically significant insights. Although Fund A didn't have a long trade history, the data could still be analyzed.

Too Long-Term?

Some portfolio managers are trained to be long-term, and that can lead to unnecessary pressure. "Every fund manager is taught that you're supposed to be long-term. If you're a trader, you're not—you're trying to make short-term gains—but a fund manager, typically, it's all about being long-term," she says.

However, the risk of being too long-term is that markets change and so do companies. "If we've learned anything in 2020, it's that you don't know what's going to happen. You can't just necessarily assume that every company you own is going to last for the next 20 years," she says.

The important thing to figure out is where they tend to stop adding value in the lifecycle of positions. For example, it could be that the average position in a portfolio tends to run out of "alpha juice" by month 33.

In Fund A's case, Alpha Decay Nudge was set at months six and 24, representing the managers' particularly effective decision points to review a stock's investment thesis.

On the flip side, Essentia has also dealt with high-turnover funds. One recent example is "Fund B"—a $150 million long/short hedge fund within a multibillion-dollar family office. Fund B had over 3,400 trading decisions over 18 months.

The manager for Fund B suspected that trimming positions into earnings reports—one of the manager's heuristic techniques—no longer generated alpha for the fund. The data showed that Fund B's manager was a strong stock picker both on the long and short sides. However, the insights showed that his trimming behavior was destroying more than 700bp of value per year.

Essentia implemented a daily Brain Dump Nudge asking the manager what the upcoming catalysts are in the portfolio and whether he had done sufficient research to make decisions ahead of those catalysts. Essentia also created a new Add/Trim Context Nudge, prompting the manager with questions like whether the research process is complete whenever he trades a position he already holds.

As a result, the manager's trimming behavior went from negating 723bp annually to 229bp—an improvement of almost 500bp. Overall, his performance improved by 553bp per year, or $8.3 million profit on a $150 million fund.

"The moral of the story is, for portfolio managers who are brave enough to look in the digital mirror, there are massive performance gains to be made—we call that 'behavioral alpha,'" Flynn Levy says. wt

SS&C Advent Looks to the Cloud for Future Tech Deployments

After the rollout of its Genesis platform, SS&C Advent is thinking about how it can transition platforms like Geneva, Moxy, and APX to the cloud, though it's a long-term project. By Anthony Malakian

Karen Geiger joined Advent Software in 1999, soon after graduating from Santa Clara University in California. Steve Leivent came aboard in 2000, soon after graduating from Rowan University in New Jersey. Two decades later—a span that included the bombshell 2015 acquisition of Advent by SS&C Technologies—the two have seen numerous technological advancements cause disruption for the company, but none so existential as that of cloud.

In the institutional asset management and hedge fund world, Advent is best known for the Geneva portfolio management system, the Moxy order management system, the APX client management solution, and Genesis, the company's portfolio construction and rebalancing offering. Of those fairly ubiquitous tools, only Genesis is cloud native. It's going to take time, but the company's delay in adopting cloud more broadly is now set to change.

"We'd like to do a transformation where we can offer an entire suite that is cloud-based, whether that means building additional cloud-native capabilities, or transforming some of our legacy solutions, like a Geneva, to be able to plug-and-play with a much more open cloud platform," says Geiger, co-general manager of SS&C Advent, along with Leivent. "This would be a multi-year endeavor, but we're starting by building off what we already have with Genesis."

While Genesis does rebalancing and order creation, Geiger says that there are opportunities to expand further into the front and middle offices thanks to the platform's software-as-a-service delivery mechanism. More than that, though, the company is considering how to move an offering like, say, Moxy—which SS&C Advent can currently host for users—and make it a more cohesive front-to-back experience via the cloud.

Geiger says the way that she thinks about this transition is a user can pick and choose which components of the Advent offering make the most sense for them. In this scenario, certain specialized components might fit better for a hedge fund rather than a traditional asset manager, but those pieces would nonetheless "seamlessly talk to each other" so that users could scale up or down depending on their needs.

So while Genesis was the first cloud-native platform under Advent's asset management umbrella, the long-term goal is to have every platform deployed via a SaaS model. To accomplish this, the company is coming at the overhaul from two angles, Geiger says. The first will look at Genesis and see which capabilities can be extended to the front and middle offices. At the same time, Advent will look at the legacy platforms—which can be hosted via SS&C Advent's outsourcing business—and make sure that users have the same experience in the cloud as they would via an on-premise installation.

"So we're looking to really transform that so that it isn't just a lifting-out of your software into our infrastructure, but having a more cohesive front-to-back experience," she says. "But we're coming at it from two angles and it's a longer-term initiative."

While the company is still working out the exact form that this platform transformation will take, it's not like SS&C Advent is starting from scratch.

Karen Geiger
SS&C Advent

Beyond the lessons learned from the launch of Genesis—and the fact that the platform can serve as the backbone for future development—Advent also has its Outsourcing Services unit.

Leivent, who oversees the vendor's outsourcing business, along with Advent's wealth management and advisory services division, says that today, somewhere in the region of 90% of new sales made by SS&C Advent have "some flavor of our hosting and outsourcing services," which is a "dynamic" change from just five years ago.

"In the future, I don't think that clients are going to care if they're multi-tenant SaaS applications, as long as they can access the data and systems in the same way," Leivent says. "It's our half-step toward the future of Advent, which is all-cloud-native systems."

Connecting the Pieces

SS&C Technologies has grown through the M&A market (with more than 50 acquisitions over the past 25 years). Its voracious appetite has brought DST Global Solutions, Citi's Alternative Investor Services, Varden Technologies, Primatics Financial, Algorithmics, among many others, into the SS&C universe, in addition to Advent.

This acquisitive nature, combined with Advent's push toward the cloud, begs the question: Will this move to the cloud also help bring greater uniformity across these various other companies where, in the future, these pieces are all accessed from a centralized cloud hub?

Geiger says it's a balancing act, but she doesn't see the company incorporating "a very strict, top-down mandate" where every entity has to "come together on a single platform." wt

Refinitiv Says Goodbye TREP, Hello RTDS; Bolsters Cloud Support

As the "vast majority" of customers are shifting to the cloud, Refinitiv is looking to broaden its own cloud capabilities to help customers with their transitions. By Max Bowie

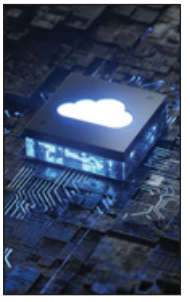
Refinitiv's latest release of its enterprise data platform steps up its cloud compute capabilities, and rebrands the platform from Thomson Reuters Enterprise Platform, or TREP, to Refinitiv Real-Time Distribution System.

The name change is part of a project to eliminate instances of branding relating to former owner Thomson Reuters, but also sees the vendor roll out simplified and standardized branding across its product lines.

For example, RTDS components Advanced Data Hub (ADH) and Advanced Distribution Server (ADS) become Refinitiv Real-Time Advanced Distribution Hub and Refinitiv Real-Time Advanced Distribution Server. Additionally, its Data Access Control System (DACS) permissioning system becomes Refinitiv Real-Time Data Access Control System. And its Elektron-as-a-Service architecture becomes Refinitiv Real-Time Managed Distribution Service.

Despite the name changes, Matt Eddy, head of real-time delivery and integration at Refinitiv, says the new 3.5.0 release of RTDS is not a "watershed" release, but rather is part of a "continuous evolution" and a commitment to get new releases of its software to clients on a regular basis.

This version and upcoming releases scheduled on the vendor's development roadmap add significant capabilities to support the ongoing rollout of RTDS in the cloud as an alternative to traditional client-premise deployments of its data platform, says Steve Moreton, global head of product management at technology support provider CJC.



Refinitiv plans to expand its cloud capabilities

"For the components released—ADH, ADS and Advanced Transformation Server—it's essentially the same software," he says. "The software contains many enhancements, however—for example, on the ADH, improvements to load balancing."

Moreton adds that one notable change is that the ADS component, which distributes data, is now certified for Amazon Web Services (AWS), which will help support Refinitiv's plans for rolling out RTDS in the cloud. Another small but "important and symbolic" change is support for Amazon Linux 2, an operating system designed to work best in AWS testing environments.

Catering for All 'Cloud Journeys'

Eddy says the "vast majority" of customers are shifting to the cloud, but they are largely going about that transformation in different ways.

"Yes, everyone is on a cloud journey, but the destinations are all different, and everyone is moving at a different speed," Eddy says. "So we need to cater for all eventualities. Some clients are moving at a very aggressive pace, while others are still exploring this. And as we refine our offering, we'll be ready for the majority of customers when they are ready to move."

Future versions of the platform and its components will introduce pre-defined, off-the shelf deployments of software within clouds operated by AWS, Microsoft Azure, and Google Cloud Platform.

"We've placed an emphasis on reusability across that spectrum, so any enhancements to the platform made for the cloud version will also be available in the on-premise version of RTDS," Eddy says. "Of the 60 or so enhancements we've introduced over the past two years, 40% of those are cloud-related … to give clients parity, whether they use RTDS on- or off-premise."

Taking a REST

Separate from the vendor's cloud efforts, version 3.5.0 builds on the previous introduction of a Representational State Transfer (REST) API to make it easier for users to monitor and interact with their real-time systems.

"In an earlier release in 2020, we enabled clients to remotely monitor their TREP platforms using a REST interface. For some customers that have complex environments, having a command-line interface to query the platform directly is very useful," Eddy says. "So with the version 3.5 release in November, we've been pushing REST capabilities … to ensure customers can access what they need using rules-based systems … and can consume market data snapshots off that, simplifying our range of offerings, and enabling them to build out new capabilities."

This becomes particularly important for accurately monitoring infrastructures, for example, in the case of zero-trust architectures, where security policies place strict permissioning requirements on administrators needing to access data, or where monitoring systems require ongoing access to data platforms.

As such, Refinitiv has built in the ability to get key metrics direct from the platform via a RESTful API, to help users regardless of whether they have a cloud or on-site version of the system. wt

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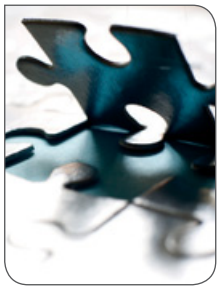

"We really want to be open. There's this theme of choice. If you found the best-in-breed provider in the risk analytics area, or you just have a separate provider in custody, we're interoperable in that you can take components of this solution without necessarily being bound to all of it." **Spiros Giannaros, CEO of Charles River**

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"Rather than trying to predict something based on correlations, you are really trying to dig in and understand those cause-and-effect relationships both through sophisticated statistical tools, but also in many cases through interventions." **David Cox, IBM director of the MIT–IBM Watson AI Lab**

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"Yes, everyone is on a cloud journey, but the destinations are all different, and everyone is moving at a different speed. So we need to cater for all eventualities. Some clients are moving at a very aggressive pace, while others are still exploring this. And as we refine our offering, we'll be ready for the majority of customers when they are ready to move." **Matt Eddy, head of real-time delivery and integration at Refinitiv**

» *see page 8 for full story…*

"We'd like to do a transformation where we can offer an entire suite that is cloud-based, whether that means building additional cloud-native capabilities, or transforming some of our legacy solutions, like a Geneva, to be able to plug-and-play with a much more open cloud platform. This would be a multi-year endeavor, but we're starting by building off what we already have with Genesis, and extending that." **Karen Geiger, co-general manager of SS&C Advent**

» *see page 7 for full story…*

"The field is bigger than it used to be, so when a revolution like [transformer models] happens, all of a sudden there are many hungry young researchers ready to do the exploiting. That is what we are seeing now. In the early 2000s, there were really only two dozen people who could exploit a release, but now there are maybe 20,000." **Amanda Stent, NLP architect at Bloomberg**

» *see page 20 for full feature…*

"Banks are working more closely with fintechs, and many banks have set up accelerators on their own premises, in a WeWork style." **Anthony Woolley, head of business development in Europe at Ownera**

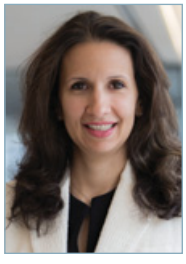
» *see page 10 for full feature…*

"Your job is to be a decision-maker, but no one's capturing the decisions you're making not to trade, so how do you know that those are good decisions or not? You don't." **Clare Flynn Levy, founder and CEO at Essentia Analytics**

» *see page 6 for full story…*

"We see opportunity in terms of challenging our design, thinking more specifically, and working with Google to think about enabling more advanced interoperability as a theme." **Chris Bezuidenhout, CIO for corporate and investment banking in Asia-Pacific and emerging markets at DB**

» *see page 26 for full feature…*



"The way we view Fixed Income Select is it's an integrated technology solution that services the entirety of the fixed income ecosystem. We have all of these metrics in-house; it's about uniting them and then being able to, at the click of a button, execute on the transaction. That's where the magic really starts to happen." **Lynn Martin, president of fixed income and data services at ICE**

» *see page 4 for full story…*

How Will Covid Lessons Reshape Fintech in 2021?

As 2020 comes to a close, Anthony Malakian looks at how firms have adjusted their short- and long-term plans in the face of Covid-19, focusing on office space, innovation, alt data, and mental health.

At the end of 2019, we didn't know the dumpster fire that awaited us in the new year. On the eve of 2021, we're at least aware of, if not prepared for, plenty of uncertainty that will lie ahead. People who like to state the obvious say the future is unknown, sure, but I think 2020 showed us there are definite degrees to that truth. One of the few absolutes we can count on next year is that Covid will continue to roil the markets. As for how, people have their guesses and ideas, but if you're betting the house on your predictions, beware the odds are in the casino's favor.

As Covid-19 spread around the globe, we spoke with numerous tech executives about potential long-term effects. I picked out just four areas that I think will reverberate for a while to come. While these stories are so-called "think pieces," hopefully they paint a picture of how capital markets firms are adjusting their plans in the face of this new reality that we live and work in. You can find all of our pandemic-related stories on waterstechnology.com.

Think we're missing something? Let me know: anthony.malakian@infopro-digital.com.

Office Space

Perhaps one of the most pressing questions is of all that pricey, urban office space, and what banks, asset managers, and data providers will do with it if employees continue to work remotely.

While the pandemic has shown that capital markets firms are adaptable, the genie is now out of the bottle. While Wall Street has long been a 9-to-5 (maybe 7-to-7) job with many tethered to their desks in full business attire, some employees are going to dig this new remote-working environment. For the biggest institutions, the future is not a workforce that is 100% remote. Rather, it's likely to be some hybrid mix either through adopting rotation systems or offering smaller, remote offices outside of the major financial centers of New York, London, and Hong Kong.

For most of us though, it's likely the days of near-100% office capacity are coming to an end (knock on wood). Of course, the coronavirus isn't going to just disappear in 2021—no matter how much we might hope for that to happen. That means that social distancing rules will still be in effect and intermittent office closures will still occur.

Real estate is typically a financial firm's second-highest expense, behind staff and above the cost of market data—which

> "Banks have realized that if they are going to have a VC function, it should not be a classic VC function, but should be more strategic. Yes, the aim is to make money, but it should also be a strategic investment that is backed by one of the business divisions. So there is a lot of benefit to having those parties working closely and on-premise."
> **Anthony Woolley, Ownera**

itself can run to hundreds of millions of dollars for medium to large financial institutions. Firms that own their buildings may be able to easily sell off or rent out unused space—although they may lose the right to name their building if their ownership and occupancy levels fall below a certain percentage—but those who lease space may be tied to lengthy rental agreements. And though landlords may be willing to offer rate cuts for leases coming up for renewal in the near term, they are unlikely to forgo long-term income by allowing clients to wiggle out of their leases.

As both a short-term and long-term thought experiment, firms—especially those that own space or are locked into leases that aren't set to expire anytime soon—are thinking about what they can do with their office-space footprint. One idea my colleague Max Bowie explored was turning these spaces into something akin to "WeWorks for fintechs."

The idea is that the largest banks and asset managers have been busy in recent years setting up innovation hubs/accelerators, venture capital practices, and buying unique tech companies so as to not fall behind in the innovation arms race. Why not bring these startups in-house to help them cut down on overhead costs, while having the benefit of working side-by-side with their end-user counterparts?

Banks are highly regulated, bureaucratic entities, meaning the prevailing tech mantra of "move fast and break things" can only be taken so far. Machine learning has explainability issues. Commercial quantum computing is still in utero, let alone in any kind of infancy. Banks have grown disillusioned with blockchain and its practical benefits for the capital markets. These internal innovation hubs and financing practices help banks to stay abreast of emerging technologies while allowing their own IT staff to stay focused on day-to-day trading operations.

Anthony Woolley
Ownera

So the thinking here is that banks and asset managers can expand these efforts by creating ecosystems within their four walls to house and create workspaces for startups using a so-called WeWork structure (though hopefully with a better business model) or, as others have put it, a college environment.

Anthony Woolley, head of business development in Europe at Ownera, a blockchain platform for digitizing ownership of digital securities, told Max that finance firms have been increasingly embracing working from home for the past five years, as these companies are looking to attract tech talent by offering flexibility while building a more geographically diverse workforce.

"Parallel with that, banks are working more closely with fintechs, and many banks have set up accelerators on their own premises, in a WeWork style," said Woolley, who served as chief innovation officer at French bank Societe Generale prior to joining Ownera. "And in the last two or three years, we've seen the rise of banks as venture capital (VC) firms. Originally, banks' VC arms tended to be quite separate from the rest of the organization. But in the last two or three years, banks have realized that if they are going to have a VC function, it should not be a classic VC function, but should

be more strategic. Yes, the aim is to make money, but it should also be a strategic investment that is backed by one of the business divisions. So there is a lot of benefit to having those parties working closely and on-premise."

For the full rundown of the pluses and minuses that surround this idea, read Max's story. The key takeaway, though, is that firms have to think strategically about what to do with their office space. Renting out space willy-nilly can bring in outsiders that make the regular workforce feel alienated. Leaving space empty can create an environment that feels like a hoary library … or a crypt. Making short-term, knee-jerk cuts can hurt the firm in the long-term. This valuable space doesn't have to go to waste, it will just take some creative thinking.

Moonshot Projects

Speaking of innovation, while banks don't always have the best track record on this front, they can't quite be blamed for putting some of their "moonshot" projects on the back burner this year.

In mid-August, we published a feature looking at how large banks are devoting their IT budgets to technologies that facilitate remote working, and turning their backs on so-called ambitious moonshot projects meant to have longer-term payoffs for their organizations.

Oliver Bussmann, the former chief information officer of UBS who now heads his own consultancy, said big, multi-year transformation projects are being put on hold at tier-one banks "because that has an immediate effect on capital expenditure and cashflow. There is much more focus on short-term impact and cost-efficiency. The investment priorities have changed significantly since the beginning of the year."

As the pandemic pushes banks into remote working, they are rethinking their approach to technology—and their IT priorities. Cloud-based "soft turrets" enable traders to work from home in compliance with policies and procedures that apply in the office. Digital toolkits facilitate cross-regional communication through visualizations of trade flows. It's more important to focus on the day-to-day and the seemingly mundane back-office needs, such as data quality,

"Big, multi-year transformation projects are being put on hold at tier-one banks "because that has an immediate effect on capital expenditure and cashflow. There is much more focus on short-term impact and cost-efficiency. The investment priorities have changed significantly since the beginning of the year." Oliver Bussmann, UBS

Oliver Bussmann
UBS

as Covid-19 has emphasized the need to remove errors and enable banking controls. As a result, innovation projects are proceeding with a renewed focus on what works for trading desks and clients.

While some belt-tightening should be expected for some time, the one good thing is that—unlike in 2008—tech and ops departments have not been gutted (not yet, anyway). That means that the institutional knowledge honed over the last decade will still be there when firms are ready to play ball again.

Right now the game is about keeping the lights on and using duct tape to plug the floor boards. But technologists, by nature and by demand, are innovative, and one thing that the pandemic has laid bare is the need for innovative solutions to unthinkable problems.

It's also important to remember this: Companies like UBS and Deutsche Bank had already made significant investments in remote-working solutions prior to the pandemic, potentially freeing up resources and time to dedicate to moonshots, while others play catch-up. In either case, now isn't a time to stand still—it's a time to envision what you want your organization to look like in the future, and figure out how innovation can get you there.

I also think that there's something being lost in translation here: Moonshot projects are still in the works at banks across the globe, even the ones that were unprepared for Covid-19. It's just that those banks—which could be described as stodgy when it comes to innovation—are, and have been, relying on vendors to do the heavy lifting. Rather than build a Charles River-esque OEMS, State Street goes and buys the company. RBC doesn't build an operating system to pop its internal OMS into; it partners with OpenFin. Banks don't build video conferencing technologies, they license tech from providers like Symphony.

Rest assured, there are plenty of capital markets businesses shooting for the moon; they're just not always the ones calling the shots.

Alternative Data

As I've written many times in 2020, this pandemic offers a proving ground. If your product falters when the market is in turmoil, users will abandon ship. Take, for example, the field of alternative data. The market of providers has been growing rapidly over the last few years, but practically overnight, buy-side firms needed data to help explain market volatility and the effects of the coronavirus.

While banks and investment firms were pumping money into alt data providers in 2019, a lot of the oxygen left the room in 2020, as outside inves-

tors decided to play it safe and sit on the sidelines, and asset managers looked to trim costs.

At the same time, though, certain types of data became incredibly valuable. Analysts employed alt data to help understand the economic impact of the coronavirus epidemic, such as tracking how fast China's workers were returning to jobs after being forced to leave in an effort to contain the virus's spread. Firms also tracked data on air quality, traffic jams, airline bookings, app downloads, and more. Some used natural language processing to scan company releases for coronavirus mentions and check what managers were saying about its impact. Geolocation data of all sorts took center stage. Vaccine tracking data went from a niche subset of the alternative world to prized information. And credit card data helped to show the worsening economic conditions for unemployed and underemployed individuals, as well as small businesses.

But the fact remains that incorporating alternative data is hard. First, there's so much of it—environtmental, social and governance (ESG); consumer spending; employment data; geolocation; sentiment; shipping—and that's before considering a firm's own internal data that can be captured and repurposed to create a unique dataset.

Earlier this year I spoke with John Walsh, director of strategy and innovation at Refinitiv, for the Waters Wavelength Podcast. He says that where buy-side firms most often go astray is failing to understand just how challenging it can be to blend these datasets together to gain valuable insights. Essentially, each dataset is a small piece of a big puzzle—combining those pieces helps the user to see the full picture.

He noted that users have to keep in mind that the revenue gained from any one alt dataset is likely to be relatively small, so fund managers need to balance projected revenue against cost—both explicit (the cost of the dataset) and implicit (the cost of building the infrastructure to ingest, blend, and incorporate alternative data into the portfolio management process).

It's also a highly competitive field, in which the savviest quant funds have a large head start. Plus, when you have multiple parties use the same information, you also get alpha decay, so firms have to consider whether their datasets can withstand that to justify the cost.

If you can't determine how to use a dataset to create a novel approach to investing, odds are you're only going to spin your wheels. Alternative data requires commitment.

While the coronavirus pandemic has highlighted the need for including alternative data into the investment process, it's easy to get lost in a sea of information. If that lesson hasn't already been learned, it will only be a matter of time before the new year presents another surprise. wt

App Interop in 2020

Anthony Malakian takes a look at some of the major projects that involved application interoperability from last year. The list includes feats by Goldman Sachs, BlackRock, Barclays, ICE, State Street, Refinitiv, and FactSet.

Last January, I wrote a column titled "For the App Interoperability Movement, 2020 Will be a Big Year." Un-objectively speaking, I think I was spot on, if I might say so myself. While the idea of "how" to achieve interoperability varies from company to company, creating a front-to-back offering for users is of paramount importance across the board.

Cloud architectures and data delivery systems have revolutionized the capital markets, though financial institutions have been slower to move to the cloud than other industries. While many firms say they are fully embracing the cloud, there's a canyon between where they are and where they'd like to be (or already think they are). But the fact is, as Lynn Martin, president of fixed income and ICE Data Services at the Intercontinental Exchange, (ICE) recently told me, "gone are the days of the installed heavy terminal, heavy workstation."

Still, interoperability has different definitions, depending on who you ask. Some banks, asset managers, exchanges, and vendors still want to build and control the central ecosystem, but ensure their systems can play nice with other third-party applications that clients want to use (BlackRock and Goldman Sachs). Others went out and bought platforms to merge with their own platforms (State Street and ICE). And others prefer to outsource the heavy lifting of containerization to the likes of OpenFin, Cosaic, and Glue42 (RBC and Barclays).

Enough of the preamble—you want proof that interoperability is the most important trend sweeping across the capital markets. Here are a handful of major projects from 2020 that show how this app interop movement is getting on.

BlackRock

With its flagship Aladdin trading solution, BlackRock is aiming to create a stickier platform. The reason, said Robert Goldstein, COO and head of solutions at BlackRock, is that the asset manager is seeing demand for interoperability with asset servicers, trading venues, and market data providers.

"We are seeing that demand continue to grow on this ever-aspiring quest for true straight-through processing, consolidating the number of systems that people use to do their jobs to manage their processes, and, importantly, to maintain optionality in their counterparty relationships," he said.

One way Aladdin was meeting the demand for increased interoperability was through Aladdin Studio, a suite of tools focused on integration and collaboration. Goldstein said this allowed clients to build custom apps directly on top of Aladdin.

"These Aladdin APIs, as they're used by developers at BlackRock [and] our clients within the Aladdin community, are providing building blocks to create custom applications and integration tools for solving what may be their own idiosyncratic workflows," while allowing the firm to embed content from Aladdin and other applications directly into the platform, he said.

And part of this interoperability project involved the integration of eFront, the alternative investment management software and solutions provider that BlackRock acquired in 2019, with the aim of providing clients with the ability to manage portfolios and risk across public and private asset classes on a single platform.

The integration project involves three streams, said Sudhir Nair, global head of BlackRock's Aladdin business. First, the firm will continue to sell eFront as a standalone offering for private markets-focused clients. Second is the technical integration of Aladdin with eFront for clients that want to buy both.

"We have created something called the 'whole portfolio view,' which is really a risk management view that blends risk exposures and performance, and public and private assets in one place," Nair said. "It brings the data from eFront together with the risk-modeling capabilities of Aladdin. That's a capability that's out in the market [as of June 2020]—we have clients using it actively."

The third area of focus involves leveraging eFront within BlackRock itself. Nair said it is important that the asset manager is not only the provider of the technology, but also its largest user. To that end, the company is implementing eFront across its private markets business.

"Clearly, the data associated with private markets is behind that of public markets," he said. "And we think there is an opportunity to make that easier by creating a flow between general partners (GPs) to manage investments with limited partners (LPs) to invest, and having Aladdin and eFront sit in the center of that ecosystem."

Intercontinental Exchange

While the Atlanta-based exchange has famously expanded its fixed-income footprint through acquisition, it has spent the last 18-or-so months looking to build interoperability between those various assets.

Lynn Martin
ICE Data Services

After making inroads in corporates, sovereigns, and US government bonds—ICE also owns and operates the NYSE Bonds fixed-income platform, thanks to its acquisition of the New York Stock Exchange—the exchange is now growing its environmental, social and governance (ESG) and munis offerings as part of a broader push toward building its own data assets while creating interoperability with execution tools.

"Fixed income has an opaque market structure, but if you put a lot of good tech and data around that, you can turn that into an electronic marketplace that is much more transparent and liquid," Martin said.

Though ICE's current focus is on combining its fixed-income assets, its end-game may be a much broader vision: With its equities and derivatives markets, and now its fixed-income data and analytics, ICE as a whole now has a unique insight into every aspect of an issuer's financial performance. Data aggregators may also capture and aggregate this data, but ICE represents the source of the data—and owning the origins of that data is potentially even more valuable than the data itself.

Sudhir Nair
BlackRock

The more interoperability it can create not only between its fixed-income assets, but with the rest of its asset-coverage base, the more analytics and services it can offer, making it a true cross-asset one-stop shop.

Refinitiv

Perhaps the most intriguing financial technology rivalry over the last two decades was between Bloomberg and Thomson Reuters/Refinitiv over the trader workspace and terminal niche. That rivalry now appears to be shifting, as Refinitiv is replacing the Eikon terminal and Thomson One offering with Workspace, its next-generation data platform.

Workstation provides distinct content and capabilities tailored to the needs of different types of users via a front-end display and APIs. While Workspace's GUI is the most visible representation of this shift from its legacy trading solutions, its strength is its API-driven back

end that enables clients to make use of its data in other applications, depending on a firm's needs and model.

Rather than a closed-off trading platform, Refinitiv is shifting toward a more open front-to-back workflow solution. This is happening as the London Stock Exchange Group (LSEG) nears closing its acquisition of Refinitiv.

If you look at what ICE and the Chicago Mercantile Exchange (CME) have done on their data fronts, they have essentially brought together exchange data for equities and derivatives, and, through acquisitions, blended traditional data with over-the-counter (OTC) content. They then combine that with enhanced communications tools to create something that is more front-to-back for traders.

Refinitiv allows LSEG to follow suit, but the exchange isn't going to care as much about the trading platform portion of the Refinitiv offering—it's about data, workflows, and collaboration.

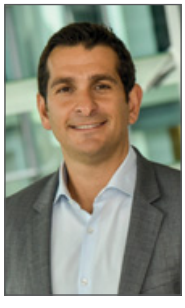
"Workspace is our response to a transforming industry—we're clearly at the beginning of a new era," said Mitko Yankov, global head of platform at Refinitiv. "Asset managers and banks are responding to margin compression, and are looking to drive greater productivity across their workforce, and their tools and capabilities."

Mitko Yankov
Refinitiv

State Street

In an era of consolidation, one of the most signification acquisitions was State Street's purchase of Charles River Development in 2018. After the Boston wedding, the bank is now looking to integrate its Alpha trading platform with the Charles River Investment Management System (IMS), which now serves as the front-office component of Alpha, while State Street supports the middle- and back-office roles.

With IMS, users can view their portfolios, run analytics, view products' risk and investment profiles, and use the information gleaned to make a decision, scan different pools of liquidity in the market, and execute a trade. Middle-office functions center mainly on operations, and validating the quality of the transaction, position, and cash.



Spiros Giannaros
Charles River

From there, the back office steps in to communicate with the custodian that holds the securities, maintain a record of the transaction, ensure compliance, and update the accounting books.

"We really want to be open. There's this theme of choice," said Spiros Giannaros, now CEO of Charles River. "If you found the best-of-breed provider in the risk analytics area, or you just have a separate provider in custody, we're interoperable in that you can take components of this solution without necessarily being bound to all of it."

While the acquisition of Charles River was an important move, it's all for naught if the bank can't combine its data and expertise with the buy-side order and execution management system (OEMS) specialist, and vice versa. The key is to create a true front-to-back trading ecosystem so that buy-side firms won't go sniffing around BlackRock, Goldman, SS&C, and Ion, among others.

Startups

Speaking of Ion, it's been two-and-a-half years since Ion Group acquired Fidessa—and it hasn't been an easy integration, to say the least. But where there is challenge, there is also opportunity.

Two former Fidessa employees have entered back into the fray, and the common thread connecting the two is OMS technology and interoperability. Steve Grob, the former director of group strategy at Fidessa and former Ion chief marketing officer, founded his own consultancy for cap markets fintechs called Vision57. And Mitchell Robertson, a former product manager at Fidessa, has

settled in at another consulting startup, Leading Point Financial Markets, as a derivatives specialist.

For the latter, Leading Point is working with Glue42, a desktop application interoperability vendor that is working closely with Ion to extend the life of the trading platform by building new apps and open APIs that allow clients to integrate Fidessa into their fintech ecosystems, according to a source who currently works at Fidessa.

Here's how Robertson described how the trader-user interface works: A trader pulls up a stock portfolio on their screen. Near it is an options matrix, some charts, maybe a pricing model, all inside the Fidessa platform. Clicking on an instrument within the portfolio updates those other tools through Fidessa's tracking facility, but the capability doesn't extend to apps outside the platform. Glue42 joins the applications at the data and user-interface levels, so that in the Glue42 application, all applications—for example, Fidessa, Bloomberg, Salesforce, and Microsoft Excel—track together in the same fashion as Fidessa's built-in tracking facility.

Grob is also working with Glue42, with the aim of assisting Fidessa and other legacy trading providers to help these companies to reinvent themselves.

The pair, whose businesses and projects are not affiliated with each other, are both looking to surf the next wave of capital markets interop—which, Grob noted, is even more pressing now that the coronavirus pandemic has forced traders into remote work, meaning they most likely have drastically less screen real estate at their disposal.

Steve Grob
Vision57

"There is a real sense that when people do go back to [their] offices, they won't go back in the same way. So technology that talks to distributed workforces—connecting people, connecting different applications—is actually finding itself in a pretty good place" at the moment, he said.

FactSet

In the world of desktop application interoperability, OpenFin's finance-specific operating system has become one of the—if not the—most popular options on the market for those also looking to tap into this paradigm shift. Proof can be found with two projects that *Waters Technology* wrote about this year. Let's start with FactSet.

The software solutions provider has made its Workstation research platform available in the OpenFin operating

system. As Patrick Starling, director of sales engineering at FactSet, noted, the FactSet Workstation is available as an installed or fully web-based platform, and the web solution is getting "close to parity" with the installed workstation.

While the installed app is still the top preference for many users—such as those that want Microsoft Office integrations—the future state of Workstation is being driven toward the web.

"We've been trying to pivot to an open and flexible approach to all of our different solutions here at FactSet, so that means being open on the front end and embracing stuff like OpenFin," Starling said. "Because we've moved to web technologies for the front-end, we can also do stuff like disaggregate the workstation and clients can take individual views or components of FactSet and embed them in their own portals, they can put them in OpenFin, and we've been building digital experiences for clients using all of those same properties."

By embracing web technology, everything underneath the Workstation hood on the back end now has an API. This push began before the OpenFin partnership, but because of it, FactSet has been able to more quickly roll out browser functionality for the service. While the vendor has long used APIs, about 18 months ago, FactSet started rolling out a new generation of APIs, the first of which was an analytics API, which serves as the underlying calculation engine that powers Workstation's portfolio analytics tool.

Patrick Starling
FactSet

Ying Cao
Barclays

Daniel Nehren
Barclays

Barclays

The other OpenFin-related project we wrote about in 2020 was the one that involved Barclays, as it is revamping its BARX single-dealer, cross-asset electronic trading platform using the OpenFin operating system.

In April, Daniel Nehren, head of statistical modeling and development for equities at Barclays, told *WatersTechnology* that within five years, all trading desktops will be web-based, where they will be an assembly of external and internal applications integrated to provide a "best-in-class" trading environment.

The aim of the project, said Ying Cao, Barclays Markets' head of digital product, is to be able to offer new features that are essentially embedded within the legacy technologies underpinning BARX, and to create a build-once-deploy-anywhere model.

She says the buy side began to look at the single-dealer platform differently, in that they wanted access to information in different ways. Single-dealer platforms tend to be big and bulky, and they require users to choose how and where to access information. Integrated analytics was—and remains—a challenge.

"As electronic trading platforms continue to evolve, at Barclays, we see some critical components becoming increasingly important, such as clients' ability to access our APIs directly, interoperability so that clients can access multiple applications quickly and easily, and their ability to use new digital tools, such as artificial intelligence (AI)-powered alerts and chatbots," Cao said.

Barclays first worked with OpenFin about three years ago to develop an application for its credit trading team, and later made a strategic investment in the company. In revamping BARX—which began in 2019—Barclays has deployed the OpenFin container around BARX.

When *WatersTechnology* spoke to Barclays about the transition, the OpenFin solution was in production for Barclays' internal equities traders. The team was also building a "complete spectrum" of analytics around pre-, post-, and intra-trade analytics, where internal traders will provide feedback to create a robust package of analytics that can then be delivered to users.

The bank was also in the process of relaunching its "next-generation web portal," which is built using a microservices-based architecture where clients can get analytics straight from the portal, and they can also directly interact with other Barclays products.

Goldman Sachs

Goldman Sachs's Marquee platform is aimed at institutional investors, providing them with market views, hedging tools, and trade execution across multiple asset classes. The bank is in the process of creating an ecosystem that is more interoperable with other Goldman applications so that its users can get everything they need around market intelligence, risk, and execution in one place, rather than having to bounce around between different systems, applications, and content providers.

Last year, Goldman announced that it was moving Marquee onto Amazon Web Services' cloud infrastructure. The end-state goal, though, is to create a managed-services offering, taking on processes for clients that do not deliver alpha and are costly. Anne Marie Darling, who oversees Marquee's product and development, told *WatersTechnology* that this could include data sourcing and ingestion, or maintaining a security master, though the bank is at the beginning of this exercise and doesn't know exactly how the managed service will take shape.

"Moving to the cloud is a multi-year investment for us. We are also very focused on looking at things that clients would want to outsource to Goldman Sachs that are costly for them to maintain and not providing alpha to their investment process. This is what we mean by the creation of the 'financial cloud' for our clients," she said.

Before Goldman can do that, though, it must first expand and build on its partnership with AWS, and ensure that Marquee is interoperable with other tools and platforms offered by the firm for data management and analytics, pricing and risk services, and trading automation.

Marquee, which is now being enhanced using an "API first" strategy, has 65,000 monthly active users. From one screen, Goldman wants users to be able to see the bank's internal data services alongside external data, and have that tied to risk and execution modules, so that users don't have to bounce around.

"Most of our content, historically, in Global Markets was distributed via email," Darling said. "We need to move that into a much more digital format, where you can search, sign up for alerts, tag certain items, and make it much more user-friendly, similar to what we see in the consumer market. That will be a key driver as we head into 2021." wt

Instinet Poised to Integrate New "Green Screen" Strategy

Environmental, social and governance (ESG) investments and green technology are not new phenomena across the capital markets, although they have struggled to gain widespread acceptance. But now, in the wake of the Covid-19 pandemic, investors' priorities appear to be changing, breathing new life into the ESG and green movements.

One positive development to have emerged from the chaos and uncertainty of the Covid-19 pandemic is the extent to which environmental, social and governance (ESG) data, sustainable investing and green issues in general have been thrust into the financial services spotlight. Whether this is purely coincidental or down to ESG and green considerations reached a watershed during 2020 on the back of a succession of streamed documentaries and Greta Thunberg's astonishing rise to prominence is a moot point: ESG-focused investments and green drivers are here, and they're here to stay.

In a recent survey carried out at the *WatersTechnology* virtual Innovation Exchange in October, 42 out of a total of 113 respondents (37%) indicated that their firms are currently looking to significantly increase their use of ESG data, while just shy of 20% reported that their firms already use ESG data extensively, underlining the extent to which ESG considerations are figuring in capital markets firms' immediate plans.

Pivotal Role

More than 50 years old, Instinet—the New York-based institutional brokerage business that played a pivotal role in the electronification and general evolution of the capital markets in the 1980s and 90s by way of its ubiquitous "green screen" terminals—has made significant strides to position itself as the industry's go-to green broker. "The original emergence of ESG criteria focused primarily on investment decision-making and financing, but we anticipate a more sweeping adoption of these principles," explains Ralston Roberts, Instinet's global chief executive. "We already see signs that ESG is expanding beyond a publicly traded security's investment valuation or selection. ESG principles will impact an enterprise's core DNA and value proposition, and will be reported and judged by a wide array of stakeholders, including their customer base, employee base, resource chain, the media and the market overall. We've already had a few thought-leading, major asset management client organizations ask us about our plans with regard to ESG," he says.

Credentials

Instinet has also made notable advances on the infrastructure front as a means of underpinning its green and ESG credentials. For example, 90% of its employees worldwide work in buildings certified by the Leadership in Energy and Environmental Design or the Building Research Establishment Environmental Assessment Method, while in 2019 it embarked on a process to ensure its third-party datacenters utilize renewable energy on its platforms as quickly as possible.

"Currently, well over 60% of our energy usage is renewable, and we have a multi-year plan to drive that percentage to 100%," says Minor Huffman, Instinet's chief technology officer. According to Huffman, Newport—Instinet's execution management system—is now almost carbon-neutral, while the firm is implementing a new cloud strategy with Amazon Web Services, which will not only warehouse its data lake for its suite of machine learning and artificial intelligence tools, but will also help expand the firm's transition to fully renewable energy over the next five years. "We're proud to call this strategy the New Green Screen," says Huffman.

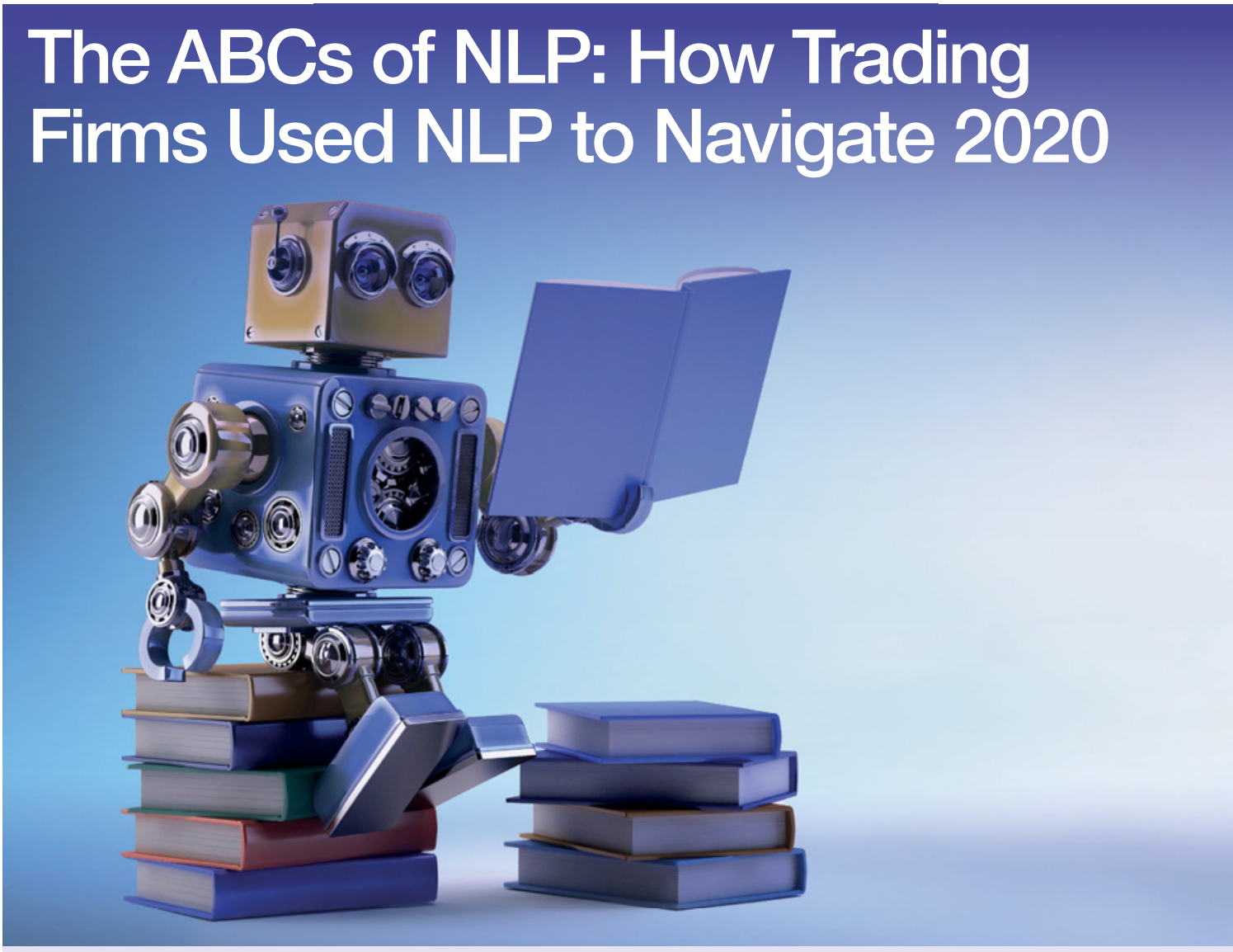
Ralston Roberts

About Time

Looking forward to 2021, it's clear to see how ESG and green factors will play a pivotal and potentially transformative role in institutional investors' deliberations. After all, their own end-investors wield the true power to bring about meaningful change, and now that the "green genie" is well and truly out of the bottle, change is inevitable. Not only will this new dispensation transform portfolios and investment decisions, but it's also likely to influence investment managers' decisions to partner with execution services providers—a scenario that Instinet is poised to respond to and, by so doing, leveraging it as a differentiator in the highly competitive landscape.

"First and foremost, we believe that integrating ESG into Instinet's culture and operations is the right thing to do—it's time to take serious action on these issues," Roberts continues. "We chose to kick this off with sustainability, since we've already made progress in this area, and it is a very measurable way to kick-start our efforts. Aside from the intrinsic value of the strategy itself, we also believe it will further differentiate us and give our clients, many of which are also making significant commitments to ESG, another reason to make us a trading partner of choice." wt

The ABCs of NLP: How Trading Firms Used NLP to Navigate 2020



Natural language processing has come to the fore in capital markets, helping firms of all kinds parse huge, unstructured datasets. By Joanna Wright

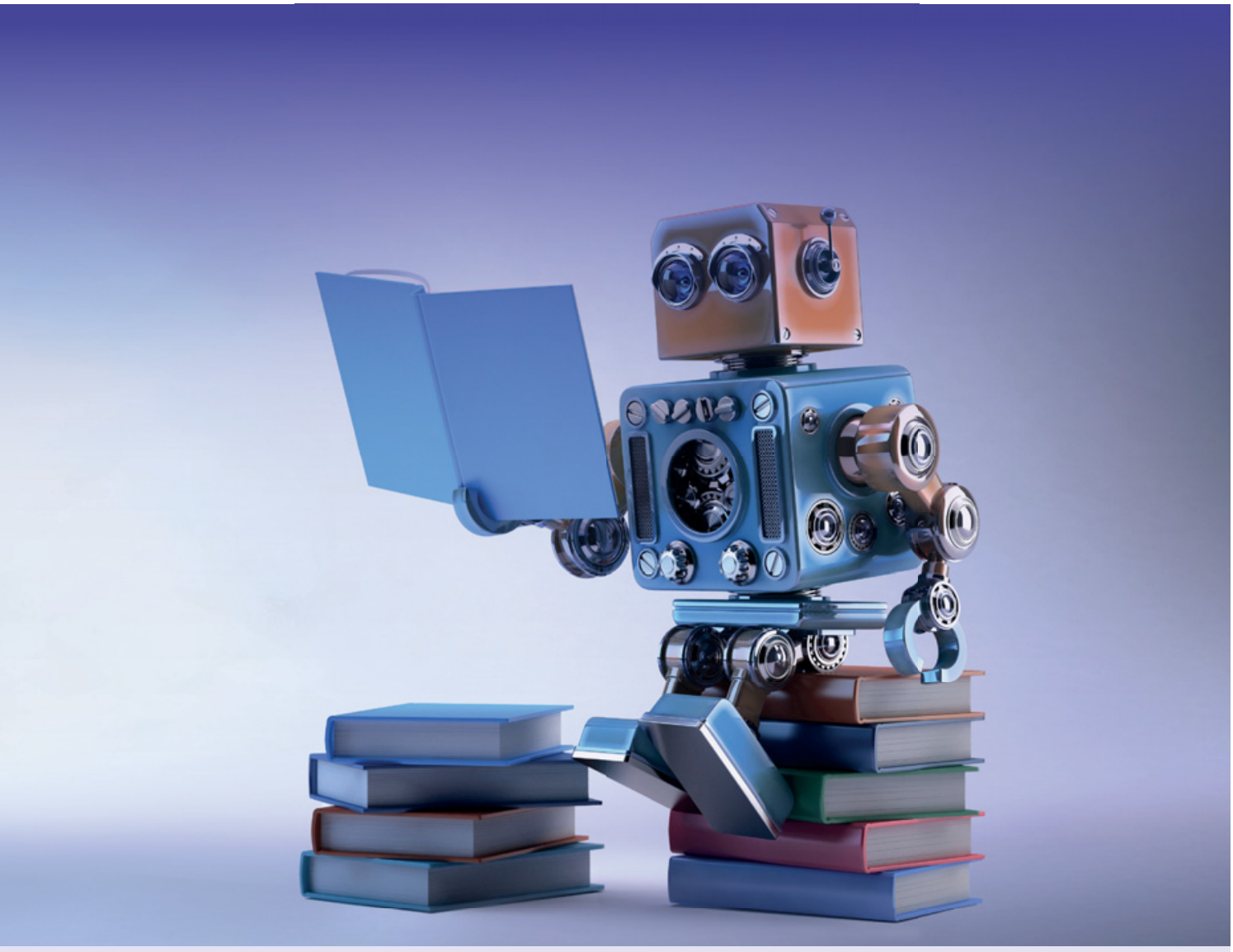
Looking back to last year, investors discovered that the fancy algorithms they were using to drive alpha, which used long histories of data to understand the markets, failed spectacularly in the extreme context of the pandemic, forcing a reassessment of these models.

Desperate times call for new ways of understanding the world, and many asset managers and banks turned to alternative data—everything and anything from air quality indexes to traffic jam counts to social media posts, and of course alternative forms of healthcare data—in an attempt to better understand the volatility roiling the market. Much of that data (tweets, earnings call transcripts, regulatory documents) is text-based and unstructured and, as a result, natural language processing (NLP) came into its own in the capital markets.

Trading firms have long been excited by the technology, if not always fast to adopt it for technical and regulatory reasons, but many banks and asset managers are now not only using NLP algorithms to trawl for insights into the pandemic's impact on companies, but also for more quotidian tasks, such as improving the experience of customers interacting with their chatbots, interpreting internal documents, and analyzing companies in investment portfolios.

Vendors and data providers catering to the needs of these firms have bolstered their NLP offerings for a range of needs. As Amanda Stent, NLP architect at Bloomberg put it, what was once a previously academic discipline has become a proposition for product development, especially with the evolution of the field represented by BERT, Google's transformer model, which the tech company released in 2018.

"The field is bigger than it used to be, so when a revolution like [transformer models] happens, all of a sudden there are many hungry young researchers ready to do the exploiting. That is what we are



seeing now," Stent said. "In the early 2000s, there were really only two dozen people who could exploit a release, but now there are maybe 20,000."

In 2020, there were more than 80 stories mentioning NLP published on *Waters Technology*—that's more than half the total number of stories ever published on our site that mention the technology. Below is a look at some of the bigger NLP-focused projects that we wrote about in 2020.

Bloomberg, Refinitiv, and BERT

Refinitiv added a Covid-19 News Tracker app to its Macro Vitals offering to help firms find actionable information on specific companies and how they were affected by the pandemic. The tracker uses machine learning to ingest and filter news articles, and classify reported events as "risks," "opportunities," or "neither" for specific companies.

This tool employs BERT—or Bidirectional Encoder Representations from Transformers—a game-changer for NLP that Refinitiv and Bloomberg, among others, have since its release in 2018 been working on adapting to financial services use cases.

The power of BERT is that it reads a sentence bi-directionally, supplying a lot more context about the text to the model, making its interpretation stronger.

Companies like Bloomberg and Refinitiv have access to massive amounts of data, and have been training BERT on that data to apply it to use cases for client solutions.

Refinitiv has been looking into selling news feeds to customers wanting to get an edge, whether in pre- or post-trade processes. The data giant's Innovation Lab built a transformer model based on BERT, and—crucially—trained with financial data, that has been adapted for use throughout the business.

Refinitiv ingests huge amounts of news data for its Intelligent Tagging platform, which derives meaning from unstructured data, such as news articles going back to 1996, and processes millions of these document sources daily, making information available to customers on the Eikon terminal.

Refinitiv's World Check team, which collects information about financial risks of individuals, is also using it. And in Eikon, the model helps return the most relevant articles possible to users who search for news about companies in the terminal's Investor Briefs.

At Bloomberg, similarly, BERT is helping Terminal users access the most relevant financial information. Bloomberg takes in a huge number of articles every day and clusters them by topic or category, and then again by event. Relevant stories appear to Bloomberg Terminal users grouped under an automatically generated headline that the transformer itself has produced.

The model is further trained by Bloomberg journalists, who can use "thumbs up" and "thumbs down" icons—like the same buttons on streaming music service Pandora, which the company uses to tailor music channels more accurately to users' tastes—to teach the model what humans consider to be good headlines. A bad headline gets a thumbs down, a good one, a thumbs up.

Bloomberg is using the solution in other areas too, including helping customer service staff to answer user queries.

The data giant also developed a new search functionality that is embedded into its Trade Order Management (Toms) Trade Analyzer. This new question-answer interface is, at its core, an engine that heavily leverages NLP and machine learning algorithms to deliver answers to questions that are unique to the needs of traders. It aims to reduce the number of clicks needed to search for and within certain datasets, such as querying trade histories with a buy-side customer or looking up missed trades during a given time period.

Amanda Stent
Bloomberg

JP Morgan Asset Management

JPMAM looked to build out its NLP tool, Textual Analysis, to read Chinese and Japanese documents.

Textual Analysis, which went live in November 2019, is used by the firm's portfolio managers in both its quant and fundamental investment teams to read millions of documents, ranging from company filings and corporate event transcripts, to employee reviews on sites like Glassdoor.

For quant teams, Textual Analysis generates a raw signal, which has demonstrated strong investment returns, according the firm. The investment teams can then interact with the front end of the tool to better understand what is driving that score. For fundamental analysts, the offering creates a dashboard they can use as a screening tool, and allows them to do a deep dive into a company's holdings in a portfolio.

Textual Analysis relies heavily on BERT, which gives the model context to the text it reads in documents. JPMAM added features to make BERT suitable for application in finance.

Ping An

Ping An Insurance Company of China is arguably one of the leading companies—regardless of industry—when it comes to NLP development.

Ping An is the country's largest insurance firm. Its platform, Omni-Sinitic, is based on semantic technologies, including NLP, knowledge graphs, and robot testing. Omni-Sinitic scored higher than tech leaders like Microsoft and Google in benchmarks that evaluate systems on their level of natural language understanding.

Jing Xiao, chief scientist at Ping An, said the firm is using NLP in cases like its Smart Audio Robot, which helped to contain the spread of Covid-19 in Wuhan, China, the epicenter of the original outbreak. The robot completed over a million screenings to thousands of households in Wuhan, and identified thousands of cases for tracking by local officials.

Omni-Sinitic comprises a pre-trained language model called Albert, a "lite" version of BERT; an internally adaptive filter that augments data in the model; and neural-architecture search, which is used for designing neural networks.

Lazard Asset Management

Lazard developed a Covid-19 data model to more accurately reflect the health of corporates throughout the virus outbreak. As part of this model, the firm uses NLP and sentiment analysis from alt data sources, such as online content, news, and transcripts, to complement its Covid-19 investment strategy.

The firm has developed themed asset categories, and uses NLP and network theory to identify new associations between companies, looking at areas such as their supply chains, location, or mentions in the same press article.

Morgan Stanley

AlphaWise, a research unit within the bank that services hedge funds managers through an online web portal, leveraged alternative data to track the outbreak of Covid-19. The research business uses three core means of offering insights on the coronavirus outbreak as it developed in China, including web research, visualization tools, and market research.

The web research method uses a multinational corporation sentiment index, which can aggregate and analyze sentiment from company documents and investor-meeting transcripts using machine learning and NLP. The bank used this approach in the early days of the pandemic to gain a better understanding of how corporates were responding. In early January, the research unit was able to extract data from 2019 fourth-quarter earnings to determine how foreign companies were approaching the crisis and handling their operations in China, and to learn from uncertainties associated with the crisis as it was worsening.

"We were able to get all of these very precious data points—[at a time] when you would not be able to get much corporate or economic-related information during the Chinese New Year holiday period—overlayed with a nationwide quarantine," said Laura Wang, equity strategist at Morgan Stanley.

S&P Global Market Intelligence

S&P Global released Machine Readable Filings, the fourth product within its Textual Data suite. The tool cleans and parses regulatory filings to generate

machine-readable text, on which users can then apply NLP to look for directional indicators of how companies are faring amid the Covid-19 outbreak.

Machine Readable Filings covers about 35,000 companies and was trained using filings dating back to 2006. The product uses the concept of topic modeling, which goes further than looking for whether or not keywords, such as "coronavirus," appear in a text. It first identifies which Securities and Exchange Commission (SEC)-mandated sections the word appears in—for example, in a 10-k filing, it could be in the business overview, risk factors, or management's discussion and analysis—and then analyzes the N-grams, or the words that follow and precede the keyword.

"It's one thing for an executive to mention growth margin or net profitability; it's another thing for them to mention net profit is going up or net profit is declining," said Kevin Zacharuk, senior product manager for Textual Data.

Manulife

Creating investment portfolios for consumers who are interested in environmental, social, and governance (ESG) factors has become a hot subject in recent years. In many cases, firms are using NLP to parse unstructured data for more insight into the ESG performance of the companies that comprise a portfolio.

Insurer Manulife spent two years fine-tuning its ESG methodology for investing in equities and fixed income, as it tried to integrate ESG principles into its entire investment process, from how it sources ESG data, to how it incorporates it into its valuation models, to securities selection, portfolio construction, and risk management.

One area that the firm is exploring is using NLP for analytics that allow it to quickly find ESG news and get a sense of its implications. The firm's ESG teams use AlphaSense, a provider of market intelligence and NLP solutions, to round out or map its ESG data, complementing the firm's existing datasets by pulling in textual information from traditional and alternative sources to create a coherent ESG signal.

MSCI

Market index and data provider MSCI is using NLP to measure company exposure to innovation for passive and active management, evaluating and mapping portfolio exposures to make conclusions.

NLP is used to screen company information, including business descriptions and standard industrial classification of economic activities (SIC) codes, to identify keywords related to innovation. For example, the artificial intelligence (AI)-based engine will scan words related to research and development activities or projects tied to improving efficiencies, which are then cross-checked with company filings to see how much of those innovative investments are linked to revenues and performances.

Hitendra Varsani, a quantitative investment strategist at MSCI, said that although it is difficult to measure the concept of innovation and translate that into data factors, the index firm has been able to use these alternative methods to evaluate and map portfolio exposures.

"We can quantify that number on home ground, we can quantify it and then normalize it versus the rest of the [investment] universe and say, for example, 'Tesla is more innovative than, say, BMW.' Once we can do that, we can measure the new factor exposures, and then we are in home territory and can measure the performance attribution to innovation," Varsani said.

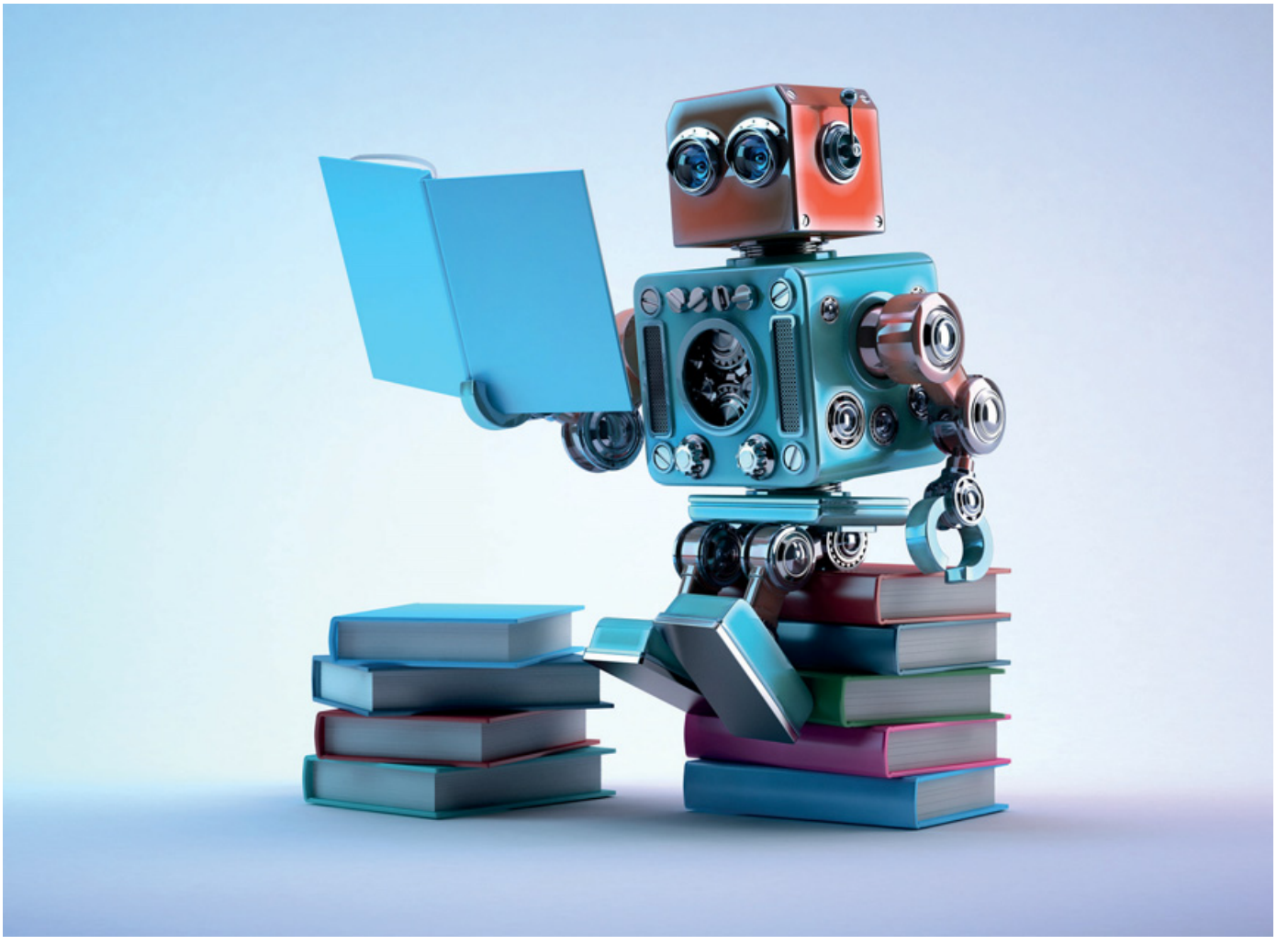
DNB Bank

This year, DNB, Norway's largest financial services group, began the final stage of its three-year big data and data science initiative. The strategy, which included the launch of its big data repository deployed on Amazon Web Services' cloud last year, has since allowed the firm to leverage new technologies, including NLP, to drive better business practices, data governance, and customer insights.

The bank has developed its NLP capabilities through a partnership with the Norwegian University of Science and Technology's PhD program. One model the groups have developed interprets documents, understands what department to send them to for processing, and then automates that process.

Numerix

Firms are also using NLP to navigate the Libor transition. Risk technology provider Numerix teamed up with NextGen Strategic Advisors to introduce a new module, called Oneview for the Libor Transition. The module aims to help firms (mainly those outside of



the top 10 largest banks) overcome the legal, operational, technological, and risk challenges associated with Libor's discontinuation.

This is a massive technological haul, said Steven O'Hanlon, Numerix's CEO. First, a bank will have to locate these contracts, as many of them are not digitized and are off-premises, he said. After that, the lawyers come in to review all those legal documents, find all the language pertaining to Libor, and then set forth addendums for replacement language around the alternative reference rates.

The Libor Transition module, which was written in Python, uses an open-sourced NLP tool to read documents and pluck out the necessary legal terms, and Google's open-sourced TensorFlow for the machine-learning component to provide a modeled curve structure and volatility surface—volatilities used to price trade instruments—as well as to flow documents either into a bank's internal systems or into Numerix's Oneview platform.

Xceptor

Data ingestion and process automation provider Xceptor is building out the NLP and machine learning functionalities of its no-code platform, in which the end user performs the configuration, rather than a data engineer.

Xceptor can consume simple, structured and unstructured data. As more firms begin to automate an increasing amount of unstructured data, Xceptor uses NLP to read and route email instructions from clients to identify clauses in complex contracts.

Deutsche Bank recently onboarded Xceptor's platform to automate its core operational processes in Indonesia. Xceptor will help the bank automate reconciliations with multiple external parties for its securities services business.

IPC & GreenKey

The two companies, which specialize in communications technology, extended their partnership on Blotter, a data visualization and front-end dashboard that allows traders to view and analyze voice-trade information. This latest advancement will leverage GreenKey's NLP engine to convert voice quotes into a structured data feed and allow IPC's customers to choose their own transcription services.

"With regards to AI, what we are looking to do is extend our portfolio of partners and leverage their technology capabilities, across both our voice and data network," said Rob Coole, vice president of cloud technologies at IPC.

Through GreenKey's NLP engine, Blotter already has an instant transcription service that removes the need for manual inputs, thus saving time and reducing human error. What IPC wants to do next is open the platform up to other transcription-services providers after containerizing Blotter on the OpenFin platform.

BNP Paribas

The French bank developed a model to find sentiment indicators in news reports to forecast company returns. The bank said it is not yet a major user of NLP, but wanted to leverage two powerful trends: the widespread availability of—and easy access to—unstructured text data, such as news reports; and major advances in NLP.

The current focus of the project, which BNP began working on in early 2018, is on finding sentiment signals for equities, but it planned to look at corporate bonds in the future, also.

HSBC

HSBC Securities Services sought to improve the customer experience with its chatbot. Through the messaging platform Symphony, the firm has been able to facilitate a chatbot-to-chatbot interaction that is handling customer problems independently of humans.

The chatbot has been available externally since 2019, and Stephen Bayly, global head of securities services technology at HSBC, said he has seen a dramatic difference in the number of phone-related queries since the firm implemented the chatbots.

"In the first month of activity, we had a reduction of 27% in the number of phone calls and manually answered queries we were receiving, and that's just continued," he said.

Steven O'Hanlon
Numerix

Rob Coole
IPC

Users type questions into the chat box and the bot then automatically interprets the meaning using NLP, and then sends the query to the appropriate HSBC system via an API, with users getting a response back almost instantly. This routine problem-solving has in some cases turned into interaction with customers' own chatbots, meaning that issues are resolved without any human interaction, and often faster because they are fully automatic.

When the pandemic hit and remote working became the norm for the vast majority of financial services, HSBC updated the bot to become a virtual assistant that is able to take action on use queries, such as ordering new hardware, deploying software, or setting up Zoom meetings.

IHS Markit

The company added unstructured data, in the form of research articles and papers, to its proprietary Data Lake. By the end of the fourth quarter, it had aimed to upload about a million documents published by internal analysts over the past 10 years that cover multiple industries and sectors. The documents were to be summarized and tagged so that users can understand their gist, and search for articles and reports by topic. IHS Markit used various machine learning and NLP techniques for the tagging system, including BERT.

Financial Conduct Authority

The Financial Conduct Authority (FCA) is using NLP and machine learning as part of a broader strategy of utilizing data more effectively, according to Steven Green, head of central data services, part of the innovation division in strategy and competition at the regulator.

Green said the FCA is looking at NLP for analyzing business plans and other documents to understand where it should be looking to police the markets.

"We are looking at combinations of new datasets to spot outlier firms, to look at patterns of firm's behavior, to look at the way the data reflects those firms that act differently to others, to see what's going on there, and maybe that allows us to focus our efforts when we have such a broad suite of firms we are looking after," Green said. wt

Asia at the Forefront of Innovation

WatersTechnology looks at some of the major projects coming out of Asia that are leading the way for firms around the globe.
By Wei-Shen Wong

When compared to industries such as defense, health care, and retail, innovation in the capital markets can seem slow. This year, though, the coronavirus pandemic forced workers around the globe to stay home, which put an incredible strain on IT teams at most every bank, asset manager, and vendor in the space.

As a result, automation stepped to the forefront. Firms relied on the cloud. They experimented with emerging technologies. And as employees shifted to working from home on the fly, financial institutions had to ensure that important tech projects that were already underway at the beginning of the year didn't atrophy.

While these projects are not limited to any single region, firms in Asia had the advantage (or disadvantage) of facing the shock and impact of the Covid-19 outbreak first.

The list of stories below is by no means an exhaustive list of all the innovation stories we've covered in the region. Instead, they are highlights of the lot and meant to serve as a glimpse into some of Asia's more cutting-edge projects. For full stories, visit waterstechnology.com.

Deutsche Bank

Many of Deutsche Bank's (DB's) innovations this year sprouted from its Singapore base. Just before the coronavirus pandemic, DB had been ironing out unnecessary manual processes across the institution.

Its efforts have helped the bank execute its business continuity plan better, said Stuart Gurr, group CIO for Asia-Pacific. Within two weeks at the end of February, DB enabled 50,000 people globally to work remotely with the videoconferencing capabilities on its internal platform.

He added that the bank focuses on what it calls "production engineering" to support the infrastructure, development, and technology teams. One of the tools it uses is intelligent virtual assistants (IVAs) that provide automated capabilities around the self-provisioning of products. DB's IT service desk came under a lot of pressure as staff moved to remote working. The IVAs helped to direct traffic coming into the desk, as well as handle requests without the need for human intervention, thus freeing up human agents to focus on more complex requests.

In July, DB also announced it is partnering with Google Cloud, as it looks to redefine how it develops and offers its financial services. Chris Bezuidenhout, CIO for corporate and investment banking in Asia-Pacific and emerging

markets at DB, said the bank hopes to design new solutions with interoperability in mind. "We see opportunity in terms of challenging our design thinking more specifically, and working with Google to think about enabling more advanced interoperability as a theme," he said. The focus in the beginning will be around advanced analytics, improving volume distribution and bank transaction processing, and strengthening its engineering acumen.

Google can also help expand its use of NLP for its "Debbie" bot, which is designed to provide client trade status information and facilitate foreign-exchange workflows.

One of the more interesting projects at the bank that incorporates Debbie involves its partnership with BNY Mellon. The two developed an API-enabled foreign exchange (FX) workflow to address the challenge of dealing in restricted currency markets, which often involved manual processes in performing validations and approvals before executing a trade.

Darren Boulos, head of FX for Asia-Pacific at BNY, said that before entering into an FX transaction in those markets, the steps involved include the communicating of account balances, making sure trade details are accurate and ensuring that any income and corporate action components are approved and have settled.

Gordon Alexander, head of client access and flow execution for Asia-Pacific at Deutsche Bank, said helping international investors conduct FX conversions to buy a security can sometimes take as long as 36 hours to complete, as it involves satisfying various rules and approvals. Throw in the additional back-and-forth communication between operations, global custodians, and sub-custodians, and different time zones, and you have the perfect recipe for a long and drawn-out process.

The API-enabled FX workflow has been applied to custody of FX transactions in Korean won, and successfully reduced the pre-trade lifecycle from hours to seconds, Alexander said.

The solution uses chatbots built by DB and BNY—Debbie and Selina, respectively—which have since been integrated with collaboration services provider Symphony's platform. Debbie and Selina were integrated in 2018 to facilitate the flow of information for clients trading securities on the Hong Kong Stock Exchange.

Citi

Citi is another firm working with Symphony. Its corporate venture arm, Citi Ventures, was completing work on a bot that helps traders deal with event data from sources that potentially affect commodities prices before traditional sources confirm it.

The Price Shock Detection System (PSDS) bot was built by D10X, or Discover 10 Times, Citi Ventures' internal program looking at new solutions for the bank and its customers.

The bot was built during Symphony's APAC hackathon in September, where it won in the "Work From Home Workflow" category. It will progress to the global Symphony Hackathon Olympics in 2021, competing against other contenders worldwide.

As a start, the work on PSDS is focused on oil traders in the commodity space. It uses artificial intelligence (AI) to sort and classify signals on a variety of features to present traders with information before mainstream news sources write about those events. These sources can be from social media platforms, microblogs, as well as chat forums.

"The question was, 'How do we capture alternate sources of data and extract trends and developing events from them, and present them in a way that is actionable so that you get to be ahead of the curve long before someone confirms

the news?'" said Agrim Singh, hacker-in-residence at Citi Ventures D10X in Asia-Pacific. "The added angle there was that this might be a rumor and there's a reason [a major news outlet] hasn't posted about it because they're trying to confirm the facts. But markets may move regardless."

The D10X team used Symphony's platform to request the stream of notifications or subscribe in a way that every few minutes, as events develop and more information becomes available, they can push the notification out to traders. In a day, they built a rudimentary version of the bot.

Singh and the team are working to incorporate Citi's data and build the bot out.

After that, it will go through testing with traders and get feedback. Once it's in production with the oil trading team, only then will D10X look to scale it to other desks and traders.

Symphony

Symphony Communications integrated support for more text messaging applications such as LINE, which is widely used in Japan, and Apple iMessage. These are additional options to its existing portfolio of messaging applications, which allows financial firms to onboard customers and interact with them on these platforms.

Symphony launched WhatsApp Connect earlier in April, and before that, in December 2019, it launched a connectivity channel for WeChat, the Chinese social media and messaging platform. David Gurle, CEO at Symphony, told *Waters Technology* that Symphony is developing additional functionality for all its WhatsApp and WeChat integrations.

This will allow clients to exchange files, such as research documents or trade confirmations. The individual messaging channels are encrypted to ensure the secure transfer of information between counterparties. All communications and activities are also monitored to comply with regulations like Mifid II. They are then exported to the institution's surveillance systems and checked by the compliance teams if needed.

David Gurle
Symphony

Gabriele Columbro
Finos

"You can continue to send messages to an external party on Symphony with all the compliance capabilities and information abilities that are the discretion of the institution for which you work, and all the messages are logged and tagged to distinguish them from Symphony messages, WhatsApp, or WeChat," Gurle said.

Symphony's WeChat integration differs from the other messaging channels. It had to create a mini app on Tencent's app store (Tencent owns WeChat). Users can onboard counterparties to the WeChat stream using a QR code.

Deutsche Bank, for example, is using WeChat on its Symphony platform to allow corporate and institutional clients to complete multiple steps in the FX trade process.

Finos

The Fintech Open Source Foundation (Finos), a non-profit organization promoting open-source development, has built its name within the investment banking space. It has relationships with Citi, Deutsche Bank, Goldman Sachs, JP Morgan, Nomura, RBS, UBS, and many more.

But that's not enough for Finos. It wants to expand its reach to retail banking too. Gabriele Columbro, founder and executive director of Finos, told *Waters Technology* that the firm's ultimate goal is to host open-source or open-standards collaborative efforts that solve industry-wide business challenges in the retail space.

It has two approaches to help it inch towards its goal of going "inside-out" and "top-down." Using the inside-out approach, Finos will use existing technology within its member and contributor base, of which it has over 300 contributors in the capital markets.

Meanwhile, the top-down approach means that Finos will turn to existing open collaborations such as open banking, or regulations like the revised Payment Services Directive (PSD2), and evaluate where open-source projects can accelerate standardization and implementation processes.

Closely intertwined with its retail plans is the Asia region. According to Columbro, the line separating incumbents from start-up fintechs is "more blurred" there than in the US or Europe.

Since April 2020, Finos has been working with the Linux Foundation, which Columbro said has a very developed organization in Asia, especially in China, Korea, and Japan. "This is just one more step toward what we think Finos can become—the worldwide umbrella for any type of open-source and open-standard collaboration in financial services," he said.

ASX

The Australian Securities Exchange (ASX) is well-known for being one of the first to take the plunge with distributed-ledger technology (DLT) with its ambitious Chess replacement project. While it has yet to successfully roll that out, in part due to Covid-19—which has extended its implementation timeline—the ASX has other projects up its sleeve.

In September, it opened up DataSphere to third parties looking to partner with the exchange to solve data challenges. Since launching in late 2019, the data science platform has added new datasets, including data from outside entities.

David Raper, executive general manager for ASX's trading services, said the exchange is trying to figure out how to capture and monetize more of the data it creates. "ASX makes a lot of data available today, so when you see the news that BHP Group has been up 3%, for example, that's from ASX data. But there's a lot of other data that is generated within the organization that has never been surfaced," he said.

The exchange is working on a range of products using DataSphere to allow traders, banks, brokers, asset managers, and custodians to understand the bond, money, and repo markets better. Data in these markets are traditionally opaque, he added. The platform will help make these markets more transparent and will help participants understand the volatility of bonds and money market instruments and the liquidity and concentration risks associated with particular securities.

ASX DataSphere has two workspaces—business and data science. Business workspaces allow users to analyze datasets through visualizations and spreadsheets, where participants can also upload private data.

HKEX

Hong Kong Exchanges and Clearing Ltd (HKEX) is exploring opportunities to monetize the data it produces. As an example, it is creating a scalable Data Marketplace platform, which will allow the sharing of data and analytics through a commercial pricing mechanism.

However, it seemed that the exchange is still forming its strategy on how it will execute plans to do that.

In 2019, HKEX bought a minority stake in Beijing-based data technology company, Huakong TsingJiao Information Science (Beijing) Ltd, which HKEX believes will play a key part in helping develop its future data marketplace.

TsingJiao specializes in multi-party computation technologies—a subfield of cryptography—that allows for collaborative data analysis without revealing private data during the analysis process.

Charles Li, HKEX's outgoing CEO said in a press briefing that HKEX's role could be in the organization, development, and implementation of a technology platform that solves the problem of data privacy and data protection. "We are constantly looking at that particular role that we are very good at, which is connecting the dots and bringing everybody together, building up our alliances so we can start to build out our ecosystem in data, and that's where we put the investment in," he said.

HKEX has also bought a 51% stake in Shenzhen-based Ronghui Tongjin—now known as BayConnect—which specializes in regulatory and exchange technologies. It has also signed a memorandum of understanding with Ping An to explore potential collaboration areas in fintech, artificial intelligence, and data analytics to support the mutual connectivity of the mainland Chinese, Hong Kong, and international markets.

Ping An

The battle for AI supremacy may yet be called, but China is showing off its advancements, particularly in the field of natural language processing (NLP) and generation.

Although not a household name in Western nations, Ping An, the Shenzhen-based insurance, banking, and investment giant, is consistently ranked at or near the top of the General Language Understanding Evaluation benchmark—a list that often includes the likes of Google, Alibaba, Huawei, Microsoft, and Facebook.

Capital markets firms are increasingly leaning on NLP for chatbots to extract information out of dense, unstructured reports. We at *Waters Technology* have written a lot about NLP this year.

Ping An's Smart Audio Robot was built in two days using the firm's Omni-Sinitic core framework to help contain the spread of Covid-19 in Wuhan, China. The robot was equipped with investigation functions, follow-up alerts, and the ability to send reminders automatically. It made daily phone calls to gather information on residents' symptoms and body temperatures, allowing epidemic prevention personnel to focus on more important tasks.

Jing Xiao
Ping An

Although this particular use case first serves the consumer market (and government), as it further develops its core framework, the use cases will naturally extend into the wholesale and capital markets.

Jing Xiao, chief scientist at Ping An, said the firm also applied the Omni-Sinitic framework within its investment research and risk management processes.

JP Morgan Asset Management

In line with NLP technologies, JP Morgan Asset Management (JPMAM) is building out its Textual Analytics tool to read Chinese and Japanese documents.

The tool reads millions of documents, ranging from company filings and corporate event transcripts, to employee reviews on sites such as Glassdoor. Currently, the tool has only been trained to read English documents.

Over the summer, Will Coulby, global equity data science lead at JPMAM, told *Waters Technology* that the team is debating whether it makes more sense to add language variance to the model, or to translate other languages into English before putting them through the model.

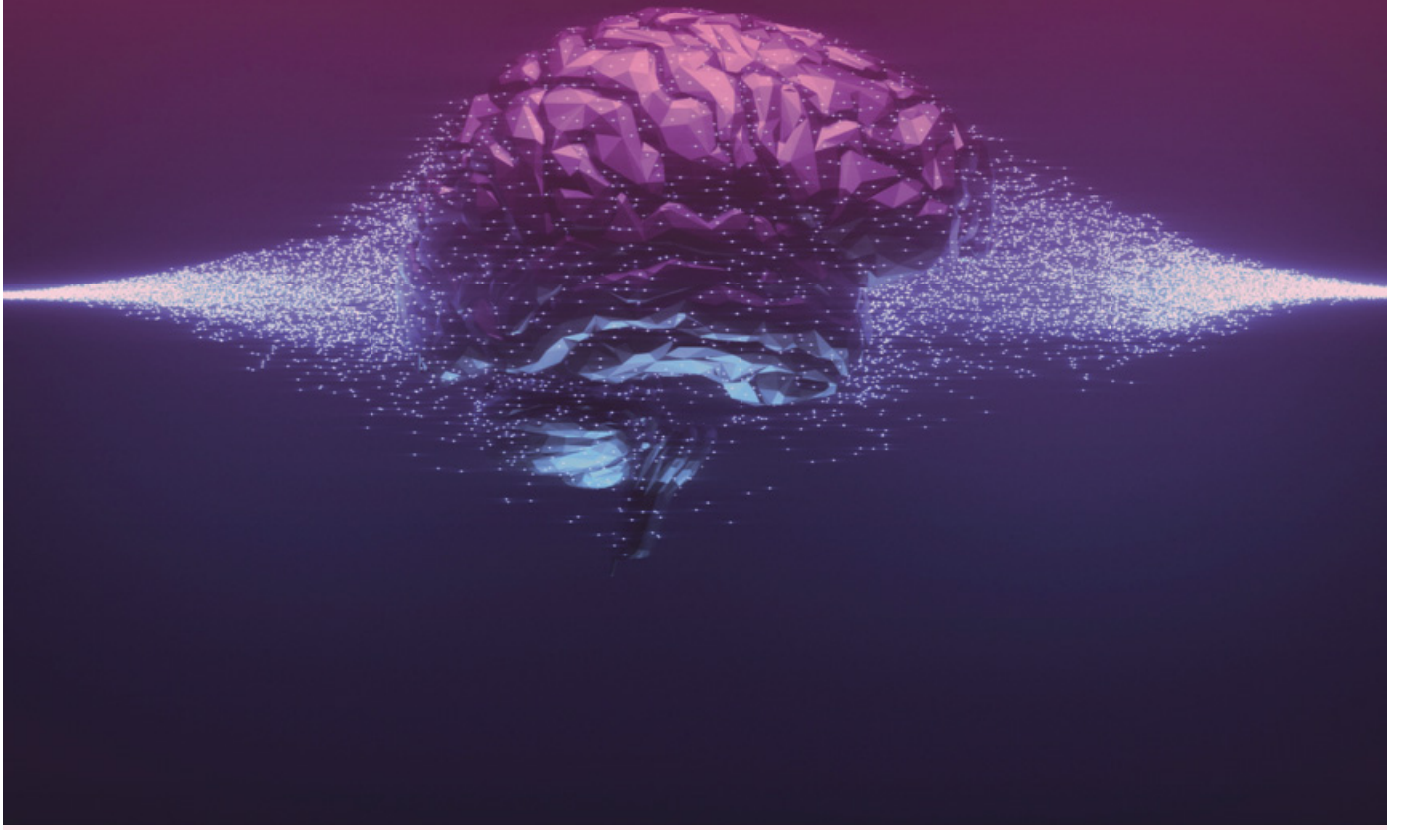
"At the moment, we're tending towards the translation, just because the scale of the documents we've got seems to work a bit better through this model. The core of this type of approach is that the model needs to have to read a lot of information to gain value from it," he said.

Besides potentially adding new language variants to the model, JPMAM also considered new datasets on which to train the model.

Although Textual Analytics is now used by its internal portfolio managers, JPMAM could commercialize it later. Both its quantitative and fundamental investment teams use the tool.

Over time, JPMAM will add more data, topics, and predictions to the model. "With every new piece of feedback, the model is able to better understand this data. Having an ongoing team [providing] specialist, targeted feedback gives us a real competitive advantage in model training," he said. "More importantly, though, it builds upon our approach of the model trying to read content like our analysts do." wt

Machine Learning Accelerates During Pandemic



WatersTechnology looks at how 10 different firms are embedding machine learning algorithms into their platforms and tools.
By Anthony Malakian

Various forms of machine learning (ML) techniques are beginning to permeate the capital markets. From trading and portfolio management platforms, to reconciliations and surveillance systems, ML algorithms are finding a home within the major investment banks, asset managers, and vendors.

While there are a fair number of snake-oil salesmen when it comes to this form of artificial intelligence (AI) and marketing, we look at some of the more interesting projects involving machine learning from the past year.

IBM & Refinitiv

The market effects of the Covid-19 pandemic have thrown off machine learning models that historically relied on correlations between different types of datasets—correlations that are no longer making sense. "All of our tools are fundamentally correlational," David Cox, IBM director of the MIT–IBM Watson AI Lab. "[When] people talk about big data, they talk about recognizing patterns in the data; what they are finding is correlations—this variable is correlated with that variable. Now, there are a couple of problems with that."

To address these kinds of correlational problems, Refinitiv Labs and MIT–IBM Watson AI Lab have been working together on causal inference, an emerging AI discipline.

First, some history. The concept of deep learning, which relies on complex neural networks, has been around for decades, but in 1982, it had its own renaissance. The problem it then ran into was that the hardware wasn't there to commercialize this highly advanced subset of machine learning. It wasn't until 2012 that neural networks started to evolve as GPUs emerged and CPUs grew exponentially faster.

There was finally enough power to make these neural nets run efficiently, and that opened Pandora's box. Data scientists began looking at other problems that were previously inaccessible around reinforcement learning and more advanced and complicated statistical methods. It

was only a matter of time until capital markets firms started experimenting with deep learning.

Causal machine learning is the next link in a long evolutionary chain that started with statistics, which matured into data science, which then became machine learning, then deep learning, then reinforcement learning, and then statistical learning. It's an advancement built upon the needs of the more modern methods in modeling technologies. At its core, you can crunch more numbers more efficiently.

"Rather than trying to predict something based on correlations, you are really trying to dig in and understand those cause-and-effect relationships both through sophisticated statistical tools, but also in many cases through interventions," Cox says.

The IBM–Refinitiv project is still in the early stages, and involves testing out different theories. After that, Hanna Helin, head of emerging tech strategy and alliances at Refinitiv Labs, said the companies will "engage with customers" to incorporate what they've learned into clients' internal analytics processes.

Some believe that causal machine learning will represent a major evolution in the field of AI.

BNP Paribas Asset Management

BNP Paribas Asset Management is in the process of rolling out an natural language processing (NLP)-based model that finds sentiment indicators in news reports to forecast company returns.

For the project, the firm is relying on an external data provider with the necessary licenses to scrape reputable online news outlets. The vendor then structures the data, removing unnecessary words, and producing a numerical signal from the material information. BNP Paribas then uses the structured data to construct its models, selecting only the information that is necessary to build long-term investment signals. Within the model, the news is classified by different topics that cover various aspects of a company's operations and activities.

> "All of our tools are fundamentally correlational. [When] people talk about big data, they talk about recognizing patterns in the data; what they are finding is correlations—this variable is correlated with that variable. Now, there are a couple of problems with that."
> **David Cox, MIT–IBM Watson AI Lab**

Raul Leote de Carvalho, deputy head of BNP Paribas Asset Management's quantitative research group, said the current focus of the project, which BNP began working on in early 2018, is on finding sentiment signals for equities, but the firm plans to also look at corporate bonds in the future. BNP Paribas already uses various machine learning techniques for a variety of applications, including to build risk models.

David Cox
MIT–IBM Watson AI Lab

Leote de Carvalho said machine learning has been particularly useful for conducting and improving upon principal component analysis (PCA), a technique that reduces the variables in a dataset to bring out more vivid patterns. This can be useful constructing covariance matrixes, which measures the relationship between assets in a portfolio.

To calculate the expected volatility of a portfolio, a risk manager must first determine expected volatility of each stock and then account for the diversification effect of buying many stocks, which requires a correlation matrix.

"If you put the volatility and correlation matrix together, you get the variance/covariance matrix, and that is a key question of risk modeling in equities: What is the best variance/covariance matrix you can come up with?" Leote de Carvalho said.

Then BNP separates the two parts. It uses econometric models for forecasting stock volatility, and for the correlation matrix it uses approaches such as PCA. Leote de Carvalho said that using PCA can reduce the matrix into "a much smaller matrix with just a few risk factors, and then it just tells you how each stock is exposed to the factors, and the number of factors—and how that reduction in dimensionality is done is unsupervised."

Broadridge

In the first quarter of 2021, Broadridge Financial Solutions will launch its AI-driven corporate bond trading platform, LTX. While the tech stack for LTX is live, the vendor is currently in the process of gathering liquidity on the platform and working out bugs.

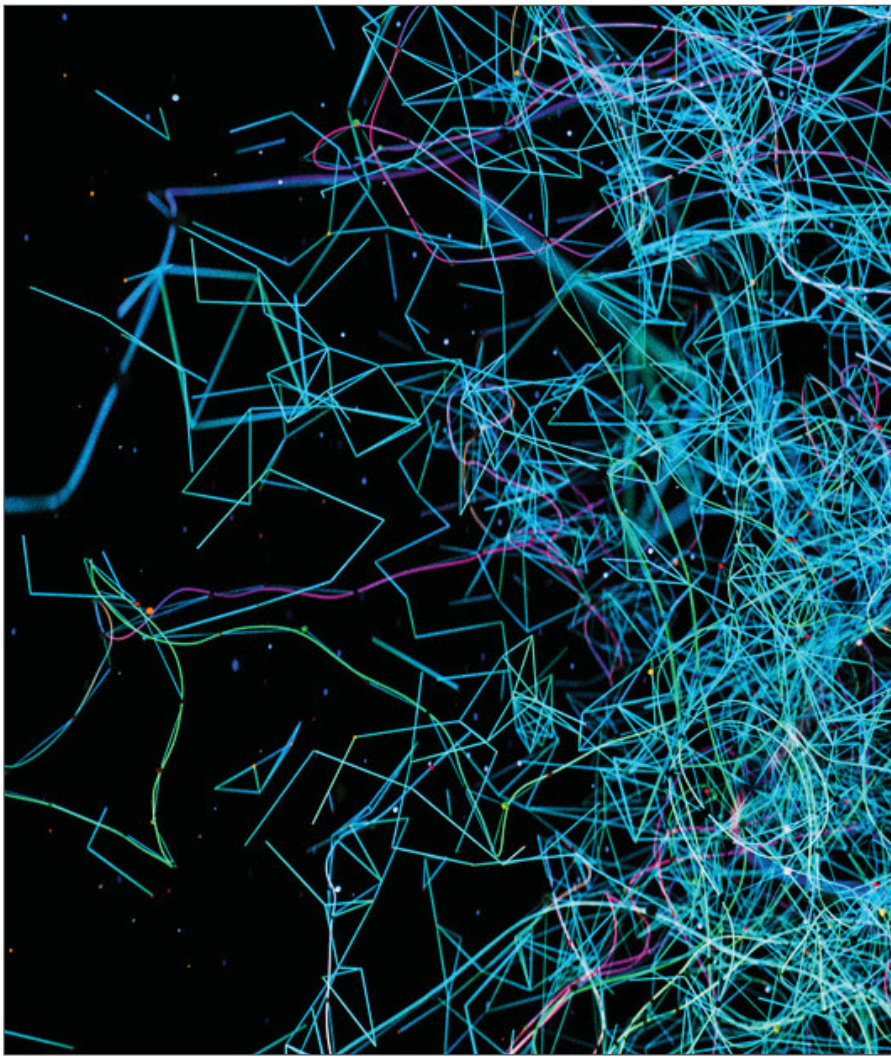
The AI engine underpinning the platform was built using the open-source machine learning platform TensorFlow. It incorporates a convolutional neural network, a type of deep neural network used for image analysis.

"It is a neural network with multiple layers of neurons," said Vijay Mayadas, head of capital markets at Broadridge. "One of the reasons we chose that model was because of the complexity of the corporate bond market. There is so much information in a set of trades that we felt a neural network was the best way to understand how to interpret all of that data in such a way that you can help a dealer come up with actionable insight."

The AI will look at the dealers' data and publicly available data to determine the optimal set of customers available that would most likely be the ones to invite to the trade with the greatest chance of executing a deal. After that, the AI picks the customers and puts them into a protocol, which then drives a type of auction mechanism to generate the best pricing for the buy-side customer, and also helps the customers on the other side of the trade with price discovery.

Crédit Agricole

In 2019, Crédit Agricole's Corporate and Investment Bank (CIB) restructured its markets division into two units, one focusing on financing and funding, and another dedicated to hedging and invest-



"As we build out content, we want to consider how we can use machine learning to create a recommendation system for Marquee, similar to what Netflix or Amazon does: If you like these five things, you should also be thinking about this."
Anne Marie Darling, Goldman Sachs

ment solutions, including trading, sales, structuring, and research.

Within the second unit, it also created two specialist technology teams focused on capital markets data and operational transformation. Their role is to ensure the front office can rapidly develop technical solutions to the problems and opportunities it encounters when dealing with clients.

To start with, the team focused its attention on markets with rich datasets. Interest rate swaptions were the perfect testing ground. The bank built a dataset of requests for quotes (RFQs) and used a machine learning-based model—which relies on straightforward decision tree techniques—to divine patterns within it.

But in an esoteric market, a pure machine learning-based approach can quickly run into problems. An algorithm will struggle to make sense of data unless it understands the context of the requests and what motivated the client to trade: the shape of the yield curve at that point in time or its rolldown on a particular day; the coupon's z-score (its standard deviation from the mean); implied versus realized volatility levels; or a news announcement. This information was manually curated and fed to the model—meaning it operates in a "supervised learning" environment.

Though most clients request prices for receiver and payer swaptions simultaneously to avoid showing their hand, 80% of the time a human trader can guess which way they want to trade. But the machines have started to beat them, with an accuracy rate of 85% on average.

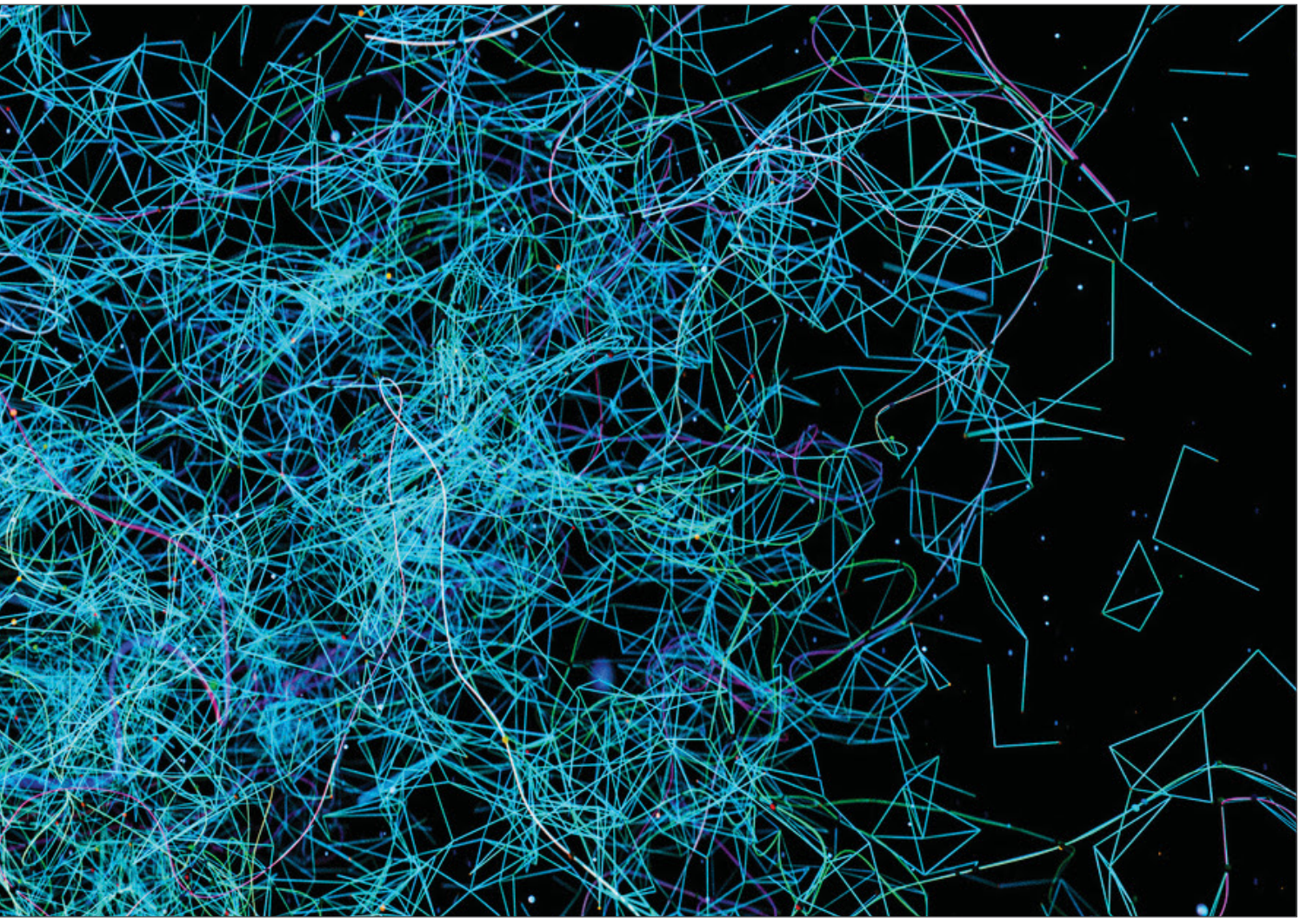
That extra 5% has given the bank a crucial edge: The algo's ability to spot patterns and learn the client's typical behavior allows traders to preempt an inbound request, and be ready to show a highly competitive price at precisely the right time. Since it switched the tool on in April 2019, Crédit Agricole has become the largest swaptions counterparty to many fast-money clients, and the main provider of swaptions to one of Europe's largest asset managers.

Goldman Sachs

The Wall Street giant is in the process of upgrading its Marquee platform, which provides institutional investors with market views, hedging tools, and trade execution across multiple asset classes. Through this upgrade, Goldman Sachs is working to build out its cloud strategy, buying further into the open-source arena and adopting APIs to develop microservices for topics like environmental, social and governance (ESG) or the US presidential election. The end result would be the bank, through its Marquee offering, having developed managed services for ingesting data, sourcing data, or maintaining a security master, though it's still early days.

This move toward cloud-based services will also allow the bank to better embrace machine learning and other analytics tools so that Marquee can be more proactive in delivering information to users.

"As we build out content, we want to consider how we can use machine learning to create a recommendation system for Marquee, similar to what



Netflix or Amazon does," said Anne Marie Darling, a partner at Goldman Sachs who wears several different hats. "If you like these five things, you should also be thinking about this. And so we are moving to be proactive with clients about delivering and personalizing things that they value. I think that will be the next evolution for us around content as we head into 2021."

Arabesque Group

Through the asset manager's Arabesque AI subsidiary, the firm is working to build out its artificial intelligence engine to predict stock price developments, using techniques such as decision trees, neural networks, and natural language processing.

Arabesque's AI engine is built around five computational layers: data input; representing the pre-processed data into "features," a term in machine learning that refers to alternative representations of the original data that are more suitable for consumption by machine-learning models; the addition of various supervised machine-learning techniques to generate asset price forecasts from the data; the combination of a battery of models; and finally, the representation of the actual asset price forecast.

The company expects the system to go live in the first quarter of 2021. "The proof of concept is there. There are certain components that we want to add to the proof of concept," said Michael Neumann, head of AI quant investment strategies at Arabesque AI.

Raul Leote de Carvalho
BNP Paribas Asset Management

UBS

UBS Evidence Lab, which specializes in analyzing alternative datasets for financial services firms, is using machine learning to sift through shipping data.

Some shipping data is input manually by the ship's captain or operators of the ship and is subject to human error. UBS Evidence Lab uses machine learning to distinguish odd or anomalous data points from human input errors.

A machine is ingesting data and then running it through a system, using various statistical techniques to identify odd behaviors in the data. The Evidence Lab has an anomaly detection layer that sits on top of the whole system and acts as a check for irregular patterns.

> "There is so much information in a set of trades that we felt a neural network was the best way to understand how to interpret all of that data."
> **Vijay Mayadas, Broadridge Financial Solutions**

Jeremy Brunelli, global head of frameworks at UBS Evidence Lab, gave an example of a simple data chart that appears flat for seven consecutive days, but on the eighth day, the chart jumps and there is a spike in the data. The UBS system will flag that spike and notice that something is wrong, and the information will then be passed on to a data steward who can investigate the exception. The data steward will curate the data and label it "inaccurate," making an adjustment to ensure the anomaly does not poison the analytics.

Vijay Mayadas
Broadridge Financial Solutions

"That model can then be trained to see how that data steward reacts. The machine sees the behavior of that data steward every time that reaction happens. They start to look at each of those incidences and segment them into vectors," said Brunelli.

The machines learn, and the number of exceptions in the data starts to diminish over time as the machine begins to make decisions about the anomalies ahead of the UBS data steward. Brunelli says that with this machine learning model, the data that has to be manually checked can go down from 7% to 2%, saving the team a significant amount of time.

IHS Markit

IHS Markit has released a new product, dubbed Risk Bureau, aimed at helping buy-side firms calculate and model their risk using alternative data, machine learning, and cloud computing.

By leveraging GPUs run on the AWS Cloud and incorporating machine learning, IHS Markit has reduced the time it takes to calculate valuation adjustments (XVAs) for complex and simple derivatives portfolios by 200% to 250%, compared to traditional Monte Carlo models. XVAs include credit valuation adjustments, funding valuation adjustments, collateral valuation adjustments, and capital valuation adjustments.

Where a Monte Carlo simulation uses a forward-looking stochastic process, Risk Bureau works backward with a regression technique. By pre-computing all the different simulated parts with machine learning, users who are plotting and moving data points around on a graph can cut the lag time associated with calculating paths of single lines down to milliseconds.

Machine learning will guide the further development of the tool, especially as it starts to include oil pricing and inflation. Currently, it shows a correlation between risk factors on-screen in the credit forecasting utility. Eventually, it will allow users to override that with what their firm decides the correlations are, and machine learning will provide the speed needed to accomplish that, so that the real-time component of the risk model stays intact.

Essentia Analytics

Essentia Analytics, which provides behavioral data analytics and consulting for investment firms, has enhanced its Insight Enterprise platform to allow internal peer portfolio managers to benchmark against one another.

The new tool, dubbed Multi-Portfolio Views, allows chief investment officers and heads of equities trading to have a clearer picture of their portfolio managers' strengths and weaknesses, which would allow them to potentially structure their teams more efficiently. It can help higher-ups to determine which managers on their team are best at, for example, enter-timing and exit-timing, and which need improvement.

In 2021, Essentia plans to add external peer benchmarking that will show how a given manager's skill compares with other external managers with similar strategies.

Synechron

Synechron, a New York-based consultancy and tech provider, is in the early stages of building differential privacy solutions in partnership with an unnamed start-up. The solutions will allow teams within a financial firm to analyze and query data from various parts of the business without breaching global data protection regimes such as the EU General Data Protection Regulation.

The tools will aim to automate tasks involved in data sharing where privacy is a concern. Anantha Sharma, senior architect for technology and innovation at Synechron, described one use case where an individual at a bank forwards data to another part of the business. In this instance, the privacy technology will function as an intermediary between the sender and the receiver by first combing through the documents or unstructured data. Then using machine learning techniques, it will identify any personally identifiable information (PII) and sensitive information and either remove, hide, or obfuscate the data, unauthorized to be seen by the receiving end-user.

Differential privacy solutions should function differently depending on the context and the type of data they are applied to, whether it is structured or unstructured. Take chat data, for example. ML privacy tools may find it more challenging to understand a conversation between, say, a portfolio manager and their client if a lot of the context of the conversation is inherently understood by both parties. Other issues arise if some of the conversations have taken place outside of typical work channels, leaving gaps in the chat data and making it difficult for the ML to interpret the context accurately.

"The biggest problem, in this case, would be to infer the context correctly, and there are a lot of language models and techniques that need to be applied to understand and realize these contexts so that the [privacy] system will do a better job [at interpreting it]," says Sharma.

Differential privacy solutions only apply to numeric data. Therefore, once the ML accurately interprets the context, it can decide what parts of the PII or sensitive data—such as postcodes, bank details, dates, or phone numbers—need to be removed, hidden, or obfuscated before it reaches the receiver. wt

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Max Bowie

Crunch Time for Covid-Era Tech

Covid culture is set to continue this year, as are the associated changes to working practices in the financial markets and the technologies that support them. Max wonders what the new 'virtual' reality will look like in 2021 and beyond..

Last year saw unprecedented events, including—and resulting from—the Covid-19 pandemic, such as exchange floors shuttered, 90% of capital markets employees working remotely, trading systems overwhelmed by the resulting volatility, and perhaps most surprising of all, financial firms raking in record revenues, despite an economic near-catastrophe.

With efforts to return to normalcy thwarted at almost every turn, these changes look set to continue through 2021. And with the status quo likely to stretch into 2022, short-term measures are now being reassessed, and incorporated into medium- and long-term strategies. So, what should we expect in the world of fintech this year?

First, remote working is no longer a short-term contingency plan. Entire workforces have been doing it for the past 9-12 months, and in many cases will continue to do so for some time to come. Solutions hurriedly thrown together to keep businesses running last year must now become permanent and powerful. As remote working becomes the norm, IT architectures also need to work remotely by becoming virtual.

Ironically, for IT to be virtual and distributed, data needs to be more centralized, and the dynamics of this Covid era are both driving and hindering change. For investment firms that typically operate in silos, working from home during the pandemic has heightened the need to break down silos and highlighted the importance of ensuring everyone is working from the same dataset, say officials at Ledgex, a provider of data management technology for buy-side firms.

Solutions like Ledgex's may give users more confidence in their data, but can't replace the feeling of working within those silos. So I expect collaboration platforms to become more widely adopted and used in 2021, and to integrate more data and tools to fully replicate users' workflows, bringing content and capabilities to consumers, making it easier for them to access what they need, while making it harder for outside agents to access or disrupt critical systems and networks.

> Solutions hurriedly thrown together to keep businesses running last year must now become permanent and powerful

Once firms can have the data and tools for staff to do their jobs from anywhere, financial firms' expensive offices that sat empty during 2020 may be relics of the past. If staff can work from anyplace, then they don't need to be in a specific place. And if home will suffice for much of their work, then firms can right-size their office space based on how many employees need to be in the same space at the same time. Similarly, most business travel—except, perhaps for high-value M&A deals—may no longer be needed, and could be replaced by video calls and e-signatures.

Covid has also created opportunities as alternative methods of communication have boomed. For example, UK-based Citycom Solutions has grown from 10 to around 40 people and raised around £200,000 in new funding to develop and grow its surveillance offering.

Originally in the business of monitoring, recording, and transcribing phone calls, Citycom recognized that the growth of videoconferencing apps during the pandemic created a "minefield" of potential opportunities for abuse, as these new channels were largely unmonitored. The vendor launched a first iteration of its tool last year, and has since developed it into a full-fledged product, dubbed Arc (Augmented Reality Compliance), which can record and analyze video calls and monitor employees working from home to ensure they are fully compliant with regulatory requirements and a firm's security protocols.

In short, Arc is like having your own individual compliance officer monitoring each employee at home. Intrusive, maybe; but compliant, yes. I expect to see this technology—or similar home-grown solutions—become an integral part of any software designed to be used remotely in regulated markets.

Spotting opportunities such as this to not just exploit a bad situation, but offer solutions that benefit the industry as a whole, is what will set the innovators of this Covid era apart, and bring them to the forefront as firms assess how to make longer-term changes.

Nothing went as expected in 2020, and 2021 is off to an equally unpredictable start. While unpredictability is bad news for some, every new situation creates new opportunities. wt

Not So Fast…

Jo is skeptical that the SEC's finalized market data infrastructure rule will make the public market data feeds faster.

The Securities and Exchange Commission (SEC) says market data consumers operate in a two-tier system, where the haves can afford direct feeds from exchanges, and the have-nots make do with the public, consolidated feeds from securities information processors (SIPs), which contain less information and are slower.

As SEC commissioner Allison Herren Lee put it last year while announcing the agency's finalization of its market data infrastructure modernization rule: "In today's markets, while some can afford a pricey trip along a freshly paved, proprietary high-speed toll lane, others are relegated to a cheaper ride on a public highway with cracked pavement and potholes."

The commission's rule, which it finalized in December, will upgrade the road surface for these less well-funded customers, ensuring that the "trading experience on the SIP data highways is closer to that of the trading experience on the proprietary autobahns," Lee said.

That metaphor, once you stop to think about it, isn't one that accurately represents how market data is consumed in real life. The SIPs aren't just for Main Street investors, humans looking at prices on a screen: The association of the direct feeds with more sophistication is less and less true, as the exchanges have upgraded the SIPs' speed, and many institutional users have come to rely heavily on them.

Trading technology provider BestEx Research looked at regulatory filings on alternative trading systems (ATSs), including large broker-dealers, and found that they use SIP feeds a lot: either as a single source of pricing information, as a supplement in lieu of select direct feeds, or as a backstop for certain data. "More than one third of ATSs use the SIP—exclusively—for pricing trades. In some cases, ATSs use direct feeds for some markets but use one SIP for the primary markets, perhaps due to the high cost associated with those feeds in particular," BestEx CEO Hitesh Mittal wrote.

But, clumsy metaphors aside, it's the regulator's job to worry about leveling the playing field for all investors. And since all kinds of users rely on the SIPs, there's an argument to be made for reducing the differentials between them and exchanges' direct feeds. The commission has sought to do this in the final rule by mandating the exchanges to send market data to the SIPs in the same manner as they do direct feed customers, while providing for the emergence of multiple SIPs, called competing consolidators. These measures—and the hope that competing consolidators could be located in the same datacenter as their subscribers, who would no longer have to wait for the data to come from Mahwah or Carteret—is how the SEC hopes to reduce latency in the SIPs.

> There is little agreement about whether the SEC should try to reduce the latency of the SIPs

Like everything related to market data regulation, there is little agreement about whether the SEC should try to reduce the latency of the SIPs. Some market participants say the SIPs are fast enough. And for, say, large broker-dealers, which couldn't compete in algorithmic executions if they were to rely on the SIP feeds alone, the rule is unlikely to reduce SIP latency sufficiently to benefit them, since factors like the consolidation of the data itself adds latency.

Others, like BestEx's Mittal, say that if indeed there are a variety of users reliant on the SIPs, then there should be a real attempt to reduce latency. But the question now is whether a system of multiple SIPs will reduce latency in the consolidated tapes.

It doesn't necessarily follow that competing consolidators will reduce these geographic latency differentials. The SEC acknowledges that in this new world, broker-dealers that perform their own data consolidation would have a speed advantage over market participants that consume data from a competing consolidator. Not to mention the fact that the competing consolidators themselves would wind up competing over speed, since—while they might get the data from the exchanges at the same moment—their own switches and hardware and how long they take to consolidate the data will produce a speed differential among them.

So, in trying to mitigate the expense to investors of a two-tiered system by introducing more competition, the regulator could be in danger of introducing… a two-tiered system. wt

Do Firms Make New Year's Resolutions?

The only certainty that 2021 brings is that Covid-19 is still around. Wei-Shen ponders how the pandemic has changed corporate culture.

In year's past, Jan. 1 offered something special—a new beginning. It's a milestone date to make changes and better oneself. I don't know about you, but for me, Jan. 1, 2021, felt very much like Dec. 31, 2020—or Oct. 4, or Aug. 21, or any other random day since the pandemic took hold last year. New Year! Same shit!

As I write this, we're only a few days into 2021 and many are still suffering. Covid cases in many countries are still rising as people and governments try to fight against a new, highly contagious strain of the virus. In the UK, there's great uncertainty around Brexit—just like last year. Here in Hong Kong, there's great political uncertainty—just like last year. And in the US—well, America's political scene managed to become even more of a dumpster fire after the pro-Trump rioters took control of the iconic United States Capitol building.

Ushering in a new year usually means making resolutions to improve your life, or to achieve certain goals, whether they be, "I will stick to a strict exercise regime this year," or, "I will get that promotion this year,' or, "I'll quit drinking." (Ha, not me! I'm not even doing dry January.) For those who have made—or are still in the process of making—New Year's resolutions, I wonder if 2020 and the chaos brought about by the coronavirus has changed how they go about it.

Living through a pandemic certainly hasn't been easy. Many of us have been kept apart from loved ones—even those in the same country. We've had to adapt to working from home, perhaps using the dining table as a workstation and sharing that with a partner, and maybe children "attending" school via Zoom. I, personally, had more than my fair share of days where I was sitting on the floor, back against the edge of the couch, with a coffee table as a desk in my small-but-comfortable rented apartment in Hong Kong. Staying focused on the task at hand took a different type of focus and determination than if I had been at my desk.

> **Companies will need to continue to consider the mental health of their employees, and even clients.**

What Do You Want to Be?

As Tony Malakian notes in his editor's letter at the beginning of this magazine, one of the greatest challenges facing firms in 2021 will be around employee mental health and engagement. It's a topic that Tony and I have delved into on the Waters Wavelength Podcast, and it's a subject that many of our guests have mentioned, as well.

Even though vaccines are now going into people's arms, Covid disruptions and remote working are likely to persist well into this year—and there's no guarantee that we won't be celebrating New Year's Eve 2022 under lockdown. This means that financial services firms will have to continue to manage a remote workforce and cater to clients in this new disintermediated world that we live in. Yes, that will bring additional technical challenges—and opportunities—but it means that these companies will need to continue to consider the mental health of their employees, and even clients.

Don't misunderstand—I'm not saying that firms should expect less of their employees. Rather, they should be more understanding of their individual situations. Blanket decrees—while never ideal—only exacerbate problems in a world that's under stress.

I think that the firms that will best navigate this continuing storm are those that show the most empathy and understanding toward their workers. Employees have a job to do, and during difficult economic times that means working harder, but there has to be an understanding that the coronavirus is not simply a business stressor, it's a human illness that doesn't care about geography or ethnicity.

So, as a business, what's your New Year's resolution? Will you choose to nurture and provide more training for your employees? Will you maintain open and honest communication channels? Provide support and a little more kindness? After all, a grateful employee is more likely to pay it back than one who is treated like a drone.

If you have any thoughts or interesting experiences to share about how your firm did well or, perhaps, not so well this past year, drop me a line at wei-shen.wong@infopro-digital.com. I'd love to hear from you. wt

Human Capital

Fitch Group Taps Heidi Lanford as Chief Data Officer

Fitch Group has announced the appointment of Heidi Lanford as its chief data officer.

Lanford will be responsible for transforming the way Fitch leverages data across its businesses to enhance current products and internal applications, as well as exploiting the value of data for new product development.

She joins Fitch from Red Hat (IBM), where she was the vice president of enterprise data and analytics. Formerly she held executive positions with Avaya and WPP.

Lanford is a frequent keynote speaker on topics such as building a data culture, data literacy, applied analytics, data science and women in STEM, and sits on the board of the School of Data Science at the University of Virginia.

Heidi Lanford

John White to Lead 3d innovations

John White is the new CEO of data management solutions company 3d innovations (3di).

White's appointment was made alongside the announcement of 3di's acquisition of Charlotte-based Investment Data Licensing Advisors (IDLA) a market and investment data licensing advisory firm serving the US market. White was founder and principal at IDLA.

John White

He has over 35 years' experience across the investment data industry. Prior to founding IDLA, he served as managing director and global head of market data and distribution for the London Stock Exchange, and held senior level data roles at State Street Global Advisors, Columbia Management Group and Wellington Management Company.

Kiti Pantskhava

Torstone Makes Senior Hires

Torstone Technology has announced the onboarding of new senior talent within its business development and product development teams.

Donal O'Brien joins in the UK to manage the global pre-sales function, working closely with sales, product management and professional services teams. He has more than 30 years' experience in capital markets, most recently with firms such as GBST and Broadridge.

Alvaro Del Pino Aguilera joins as head of sales for Iberia. Based in Madrid, he has more than 25 years' experience working with financial technology firms, including AxiomSL and SunGard/FIS, covering the wholesale and institutional market.

In North America, Suki Dewan has been appointed as Torstone's head of sales for Canada. Dewan has over 20 years' experience in capital markets, gained through his previous roles at Iress, Fidessa, SS&C and State Street.

In Asia, Hidetoshi Kobayashi joins as head of sales for Japan. He previously spent 12 years at Finastra working with banks and brokers in the region.

Donal O'Brien

These appointments, along with several other hires in Torstone offices around the world, follow the firm's announcement earlier this year that David Pearson joined its London office to help strengthen product focus and delivery, following his long tenure at Fidessa. Pearson also now represents Torstone as the co-chair of the FIX Global Post-Trade Working Group.

BCS Global Markets Hires Deputy Head of Research

BCS Global Markets, the investment banking division of BCS Financial Group, has hired Kiti Pantskhava in London as deputy head of research, fixed income.

Pantskhava will co-lead a team responsible for fixed income strategy in Russia and other emerging markets. She will also oversee development of the firm's fixed income research offering and help its client base.

Pantskhava joins from emerging market investment analytics specialists Tellimer (formerly Exotix) where she spent two-and-a-half years as a senior credit analyst. She has also held fixed income analyst positions at leading international and Russian institutions, including Nomura and VTB Capital.

Seiichiro Miyaoka to Head IHS Markit Global Markets in APAC

IHS Markit has appointed Seiichiro Miyaoka as managing director and APAC head of the Global Markets Group (GMG).

In this newly created, Tokyo-based role, Miyaoka will collaborate with the GMG regional commercial and technology leadership teams. He will also engage the firm's Asia-Pacific clients to drive scalable innovation and enhanced capabilities in the region.

Miyaoka joins IHS Markit from

Mizuho Securities, where he engaged both in primary and secondary business.

Daniel Klein to Lead Client Services at BNPP AM

BNP Paribas Asset Management (BNPP AM) has appointed Daniel Klein as global head of client services.

Klein will aim to enhance BNPP AM's client services across all regions and ensure that the firm nurtures and develops its understanding of client needs and expectations.

Klein is a BNP Paribas veteran of 27 years, with the past 18 spent at BNPP AM, His previous roles include head of the discretionary portfolio management team, head of product specialists, and CEO of Japan and, latterly, the USA.

Klein will be based in Paris and reports to Sandro Pierri, head of the global client group.

Facteus Names Mohammad Shaalan as Chief Data Officer

Facteus, a provider of financial data business intelligence solutions, has appointed Mohammed Shaalan as chief data officer, responsible for uncovering new insights for investors and analysts from across the portfolio of Facteus' data sets.

Most recently, Shaalan was principal and senior consultant at Carlson Capital, where he designed and implemented the firm's alternative data strategy. He was also founder and CEO at Finweavers, a fintech startup.

Tourmaline Hires Two Managing Directors

Tourmaline Partners, a specialist in outsourced trading solutions, has made two senior hires: Keir Collins in Dallas, and Yuki Shimada in Sydney.

Collins joins Tourmaline from HBK, a global multi-strategy alternative investment management firm, where he was global head of equity trading. Prior to HBK, Collins traded options for Goldman Sachs's Speer Hull Derivatives business in Chicago.

Collins will head Tourmaline's new office in Dallas.

Shimada brings more than two decades of global equities trading experience in senior roles on both the buy and sell side. He most recently served as a senior equities trader at CBRE Clarion Securities, a global investment manager, where he spent the past decade overseeing all Asian trading.

LSEG TAPS JULIA HOGGETT AS CEO

Julia Hoggett

London Stock Exchange Group (LSEG) has announced the appointment of Julia Hoggett as CEO of the London Stock Exchange.

Hoggett joins from the UK's Financial Conduct Authority (FCA) where she was most recently director of market oversight, having previously led the wholesale banking supervision department. Prior to joining the FCA in 2014, she spent four years at Bank of America Merrill Lynch as managing director and head of the FIG flow financing business for Europe, the Middle East and Africa, head of covered bonds for EMEA and head of short-term fixed income origination in EMEA.

She also headed BAML's green debt capital markets efforts in EMEA. Prior to joining BAML, she was board member and latterly CEO of Depfa ACS Bank and managing director and head of capital markets for the Depfa Bank Group. She began her career as an investment banker in debt capital markets at JP Morgan.

Hoggett takes over from interim CEO Denzil Jenkins.

Rich Robinson

Daniel Klein

Rimes Adds Three New Hires

Rimes Technologies, a provider of managed data services and regtech solutions for financial institutions, has hired three senior executives.

Alex Myers joins as chief product officer, Scott Miller as chief revenue officer, and Matthew Bagley as chief financial officer.

Myers will develop the firm's Benchmark Data Service and RegFocus offerings, and take Managed Data Services through its next phase. He joins from Exact Software, where he led strategy and product functions and oversaw business transformation.

Miller joins from T-Rex Group, where he was chief business development officer. Previously, he was CRO at FactSet, and held several roles at Bloomberg, including COO of enterprise products and solutions.

Prior to joining Rimes, Bagley was CFO of eFront, where he managed the LBO sale to Bridgepoint in 2015 and, subsequently, the sale of eFront again to Blackrock in 2019.

ISITC Announces Board of Directors for Coming Year

ISITC, the industry trade group focused on developing standards and best practices in financial services operations, has announced its 2021-2022 board of directors.

The organization has given one-year term extensions to chair Lisa Iagatta, vice chair Kristin Swenton Hochstein, second vice chair Rich Robinson, and immediate vice-chair Erica Borghi.

IQ-EQ Hires Wendy Piergolam for Senior Role

Global investor services group IQ-EQ has hired Wendy Piergolam for the new role of head of client development for the United States.

Piergolam will operate primarily under the banner of IQ-EQ's subsidiary brand, Blue River, which became part of the group following its acquisition earlier this year. She will focus on building relationships between IQ-EQ and fund managers, while enhancing cross-selling and collaboration across the group. wt

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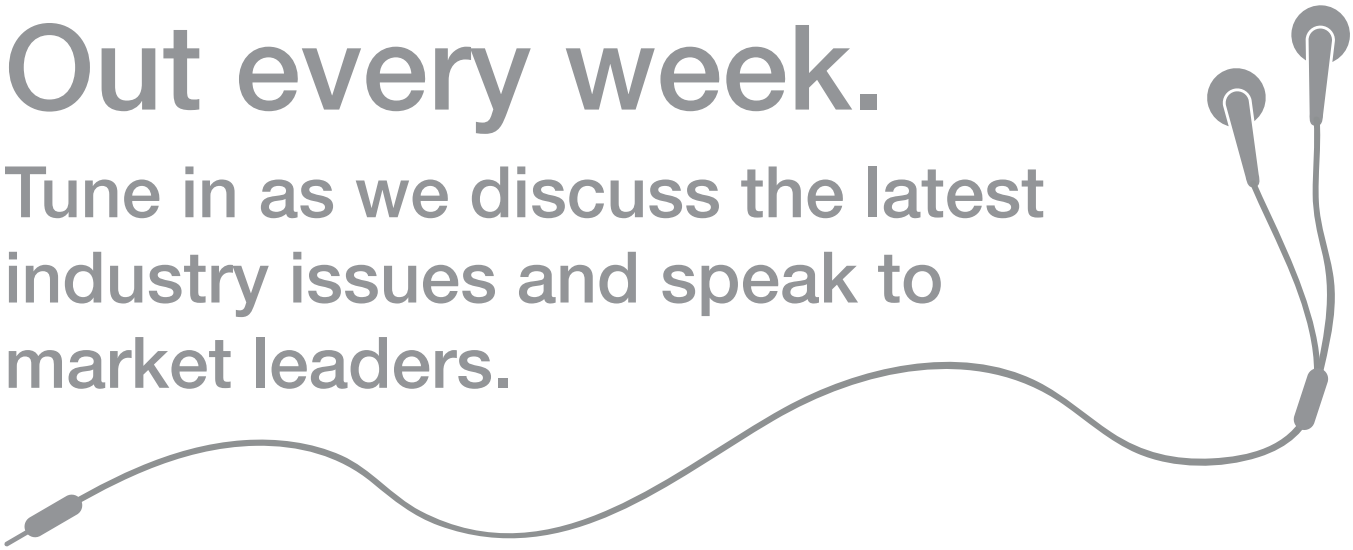

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