



*“Data Mining is Bulls**t”*

Data mining is a divisive topic, with strong feelings on both sides. Goldman Sachs' Matthew Rothman believes it's a bunch of BS. Others, like UBS Asset Management's Suvrat Bansal, believe it's a vital piece of the investment process. Where do you stand? Page 24

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May 19, 2020
1 Liberty Plaza Convene,
New York

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To receive **WatersTechnology** magazine every month you must subscribe to a **WatersTechnology Subscription** or a **Waters Premium Subscription**. For more information and subscription details, visit waterstechnology.com/subscribe

WatersTechnology (ISSN 1068-5863) is published monthly (12 times a year) by Infopro Digital Risk Limited. Printed in the UK by Stephens & George Print Group, Dowlais, Merthyr Tydfil, Wales.

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Bullshit Detector

“Blockchain is going to be bigger than the internet.” I call bullshit! “Traders will be completely replaced by machines in the next decade.” I call bullshit! “Alternative data is more important than market data.” I. Call. Bull. Shit.

When you write about technology for a living, it's difficult to sift through the massive pile of manure shoveled your way on a daily basis to pick out an actual nugget of a trend. As you might have noticed, the cover of this issue does not fit the usual *mise-en-scène* for this magazine. I apologize for the language sprinkled throughout this issue, but if you're reading this publication, I have to believe that you're an adult who has also been on a trading floor and have heard much worse than references to crap. And hopefully the cover caught your eye. Quite frankly, there's a need to stand out from the noise—whether it's in journalism or alternative data.

While the cover story—Reb Natale's fun look at the world of data mining (*page 24*)—is the article that references Goldman Sachs' Matthew Rothman's statement that data mining is bullshit, I like to think that every feature in this magazine digs into the dung, both actual and perceived.

Is data mining bullshit? Honestly, it depends on who you ask and their experiences. But what is fact is that much of the hype around the alt data space is excrement, as only 5% to 10% of datasets actually yield value, according to some of the people Reb spoke with. Then there's Wei-Shen Wong's look at the use of gamer tech in the capital markets (*page 30*). I would have thought this was bogus—we all remember the virtual reality/augmented reality hype of a few years ago, which we did write about—but Bank of America, in partnership with Epic Games, is seriously exploring how video game companies can help improve trader visualization tools. Mariella Reason's examination of the Legal Entity Identifier (*page 36*) looks at how adoption has been well behind what was originally hoped for, while Jo Wright looks at both advancements and limitations of natural language processing (*page 40*). And finally, there's Max Bowie's expert unpacking of TREP and how competitors are vying to overtake the ubiquitous market data platform (*page 18*).

Hopefully these stories help you to better tune your BS detector. Let me know if you think we're talking shit: anthony.malakian@infopro-digital.com. [wt](https://www.watertech.com)

Anthony Malakian
Editor-in-Chief

waterstechnology

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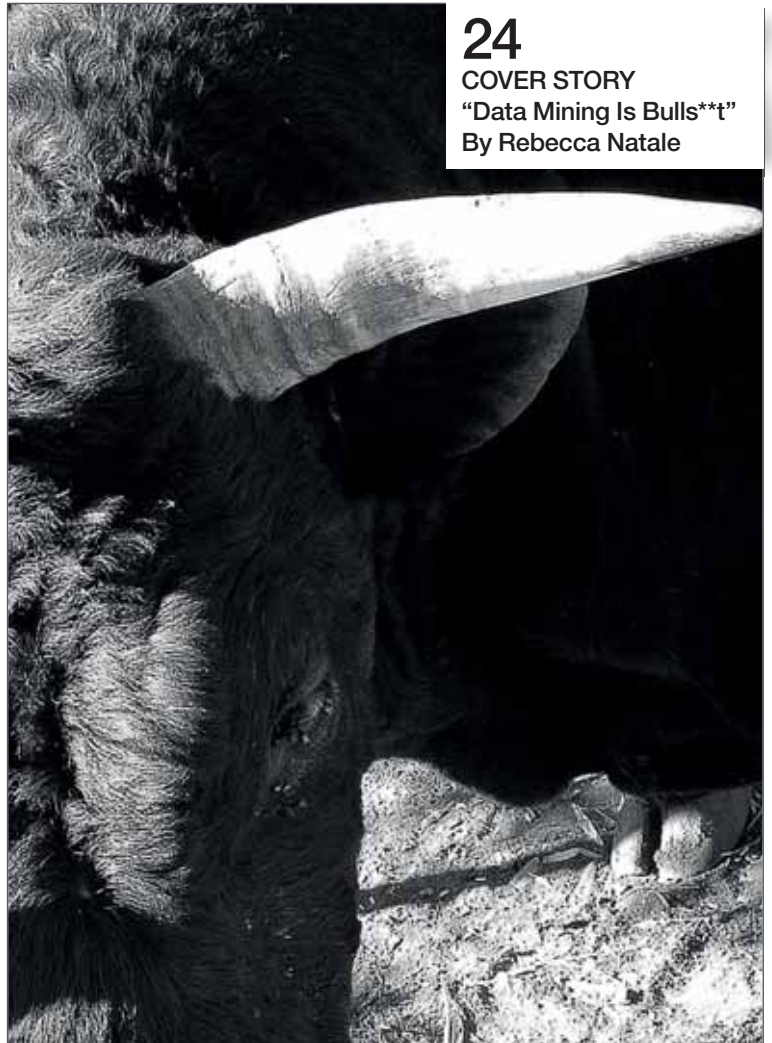
Refinitiv's TREP market data platform and its predecessors have been central to financial firms' data architectures for more than 20 years. But with the vendor embroiled in a sale to LSEG, and rivals touting alternative migration paths, can a bold cloud gambit maintain TREP's position? By Max Bowie

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As the saying goes, 'Bad data in, bad data out.' With the growth of alternative datasets in the capital markets, firms are struggling to find value, and are disillusioned by the loss of time, human capital, and money. Goldman Sachs' Matthew Rothman believes this has created a situation where vendors and buy-side firms are promising vast riches, but much of that talk, he says, is BS. As you might expect, not everyone agrees. By Rebecca Natale

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Capital markets firms are continually looking for new ways to package and visualize a rising tide of information. It turns out there's another industry looking to handle the same challenge—the video game industry. Wei-Shen Wong reports that a crossover is afoot.



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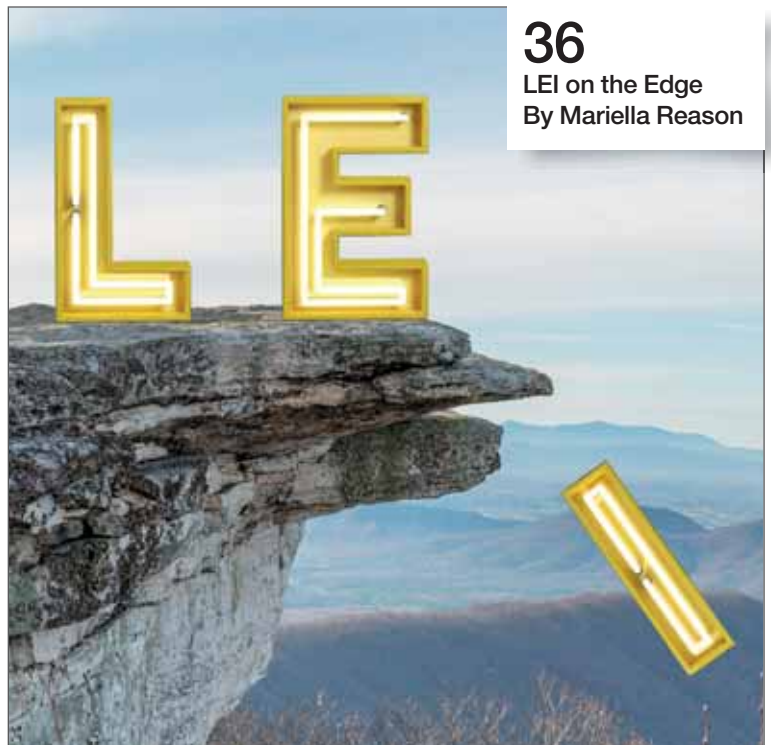
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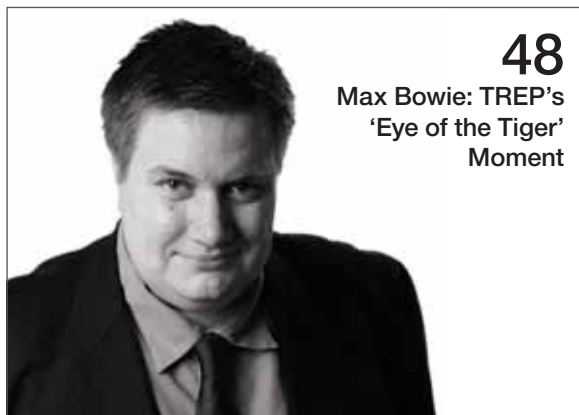
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HSBC Securities Arm ‘Strangles’ Legacy Tech with API Wrapper

The securities services business has embarked on an API strategy to offload its legacy tech and produce better-connected products. By [Josephine Gallagher](#)

H SBC Securities Services (HSS) is using a technique called the “strangler pattern” to modernize its technology stack and unravel some of its legacy estate.

The design pattern, first proposed by software developer Martin Fowler in 2004, is based on the analogy of a parasitic strangler fig tree, which survives by surrounding and living off other trees for many years until it strangles its host to death.

Pleasant, right?

Translating this into tech terms, HSBC is wrapping HSS’s legacy platforms in APIs and replacing parts of their functionality with new applications in incremental stages, until the old system has been “strangled” or is no longer needed and can be decommissioned. HSS’s data and functionality are being migrated to a new core platform called Unity, which also operates as the API wrapper, or “strangler” in this case.

“This is a hugely important development for us because replacing legacy is one of the thorny issues in the industry, and doing a ‘big bang’ is not very attractive,” Stephen Bayly, chief information officer of securities services at HSBC, says. “You’ve got 30 years-plus of embedded knowledge, and, let’s be honest, it is not always clearly documented in some of these older platforms.”

Global institutions have been hacking at their legacy systems for decades in an attempt to improve operational efficiency and curtail costs. The strangler application is an alternative to rewriting monolithic applications from scratch, which can take years and carries a lot of risks when having to replace an entire

platform with a brand-new one. Bayly says the strangler approach minimizes those risks by spreading the migration and development process out over time.

“Building an API on some of those external, older platforms is a more challenging technical experience, but using new technology in the form of Unity to wrap it [in APIs] is a way of accelerating that adoption,” he adds.

The thinking behind this is that the old systems will function alongside their replacements and other new platforms until they are no longer needed. HSBC went live with Unity and its API framework in April 2019. In its initial stages, the bank is tackling its custody estate, meaning the entirety of its security settlement and clearing platforms.

With legacy technology, there can often be variations in a platform’s front end in multiple countries, or functionalities specific to local jurisdictions, markets, and regulatory requirements. Using Unity, HSS can target a periphery functionality based on a market or a core system and replace multiple global platforms at once.

Bayly says Unity allows HSS’s internal team to pick and choose what systems to replace, and to create a roadmap for the changes, on a daily basis, depending on where the next migration will offer the most business value.

In the short term, the company plans to go live with Unity by replacing a cluster of its clearing and settlement functions in the middle of this year.

Chatbots and Desktop Apps

As part of a wider strategy over the past 18 months, HSS has been devel-



HSBC offices in London’s Canary Wharf

oping an API-based infrastructure to improve connectivity between systems—including old, new and external platforms. The securities arm has built an API gateway and has gone live with a number of APIs across its suite of services, such as its internal and external chatbots, which are developed on Symphony and were rolled out last year.

The client-facing chatbots use natural language processing (NLP), a subset of artificial intelligence (AI), to interpret and automate answers to client questions.

The APIs in the technology allow for the instant, frictionless flow of information between internal and external systems. Bayly says there was a reduction of 27% in phone-call or manual-driven queries in the first month of the client-facing chatbot going live. HSS aims to reach a target of 70% of addressable queries or queries of a simple nature being managed through the chatbot.

The firm is also piloting chat-to-chat functionality with clients and Symphony users, through which client chatbots will communicate with HSS’s chatbots for typical routine queries during the course of the day, without any need for human interaction.

Further to HSS’s API strategy, it has begun developing a desktop application that will include its entire suite of services. HSBC is working with OpenFin to integrate the HSS digital hub into the vendor’s operating system.

“We’ve found it to be a good experience on the desktop, and it’s something that I think we will see more of,” Bayly says. [WT](#)

Hedge Funds Use Shopping Center Cameras in Hunt for Alpha

Buy-side firms in search of alternative insights to drive returns are turning to sentiment analysis to fine-tune their strategies. By [Josephine Gallagher](#)

Prior to the spread of the coronavirus, the US stock market was nearing a historic milestone: the S&P 500 equity benchmark was 5% away from posting its largest ever rise without falling more than 20%—a bull run not seen since the tech boom of the 1990s, according to the *Financial Times*.

But if investors can see their money grow by simply following an index, what's the point of paying a fee to a hedge fund manager? This is leading buy-side firms to look to alternative datasets in order to find alpha and justify their services. Tim Harrington, co-founder and CEO of alt data platform provider BattleFin, says that sentiment data is seeing a growing interest of late, with insights taken from camera footage in and around shopping centers becoming one particular area of demand.

"We've had a massive bull market for so long, it's very hard to just rely on earnings estimates and private equity ratios," he says. "[Portfolio managers] are really looking for the shift to sentiment."

Harrington says the demand for sentiment data is driven by buy-side firms looking to better predict the long-term valuations of company shares. This is where shopper sentiment comes into play. The idea is that valuable trading insights can be derived from camera footage in and around shopping centers to evaluate how customers might feel or react to a product or brand.

The data can also be used to assess factors such as age, gender, and shopper experience, which can also offer some indication of how well that company is performing among key demographics. This is done using biometric techniques



Sentiment data from surveillance footage is in demand

and a training model to detect and analyze the facial features and expressions of individuals, says Geoff Horrell, head of the London Labs unit at Refinitiv. (Last year, Refinitiv made a strategic investment in BattleFin.)

"The industry uses mobile data to work out how many people have visited [the Westfield, Stratford shopping center in London], but if you can also detect if they were happy or sad, if they were a man or a woman, if they were old or young—that information can potentially give you a few early alerts to revenue or potential sales generated for retail," he says.

To some, this demand for shopper sentiment is seen as a natural progression. While retailers stockpile this type of data for security reasons, to inform their ad spending, and for marketing, the next logical use case is for monetizing these insights.

However, sentiment data is only one small piece of the puzzle.

Harrington says sentiment analysis

should be used alongside traditional market and reference data, as well as other forms of alternative datasets—such as geolocation, web data, credit card transactions, and receipt data—to create company profiles and performance measurements.

"On the other side of this, you can come up with all this alternative data, build your models, but unless you really have fundamental and reference data ... you only have half the equation. So, you really need alternative data, plus fundamental data to really execute or use this effectively," he adds.

Ethics and Bias

This kind of information is likely to become more prevalent with the advent of 5G networks and the Internet of Things. But there are major security and privacy concerns that regulators around the globe are grappling with.

Knowing that traders are using your facial expressions and physical data to inform their strategies is enough to make anyone feel uneasy. This is where data providers and buy-side firms using this type of data will have to scrutinize how they source and manage this sensitive information to avoid breaching data privacy regulations, such as the General Data Protection Regulation in Europe.

Harrington says data collectors such as retailers or phone app providers will have to be fully transparent in how they use their customer's data.

"We want clear rules that when you are signing up for that free service, it says: 'You're signing up for this free app; in exchange for the free app, we're going to anonymize your information and we have the ability to sell it,'" he says. [WT](#)

Vendors Feel Heat as Regulators Pile Pressure on Third-Party Resiliency

UK regulators have proposed new laws to clamp down on operational resilience and third-party risk, pushing fintechs to put some skin in the game. By [Josephine Gallagher](#)

Third-party providers could get a taste of what it's like to be as heavily regulated as their clients, under newly proposed rules in the UK covering operational resilience and outsourcing that are intended to zero in on third- and fourth-party risk.

The new laws will require fintech firms to scrutinize their control frameworks for dealing with system failures—which includes mapping out systems, identifying important business services, and establishing impact tolerance.

Vendors will have to hand over detailed information about their operations to clients to comply with the proposed laws. And some expect the major cloud providers—Amazon (AWS), Microsoft Azure, and Google Cloud—to push back on how much information they will disclose, because of their market share and dominance in the industry.

“It’s going to be one of the big caveats. Who you’re dealing with is going to determine the amount of information you get and the service levels you agree, and the cloud providers generally run the extreme of giving the least,” says Douglas Wilbert, a managing director in the risk and compliance practice at Protiviti, a California-based consultancy firm.

Similarly, Jason Harell, head of business and cybersecurity partnerships at the Depository Trust & Clearing Corp., says fintech companies will be reluctant to part with information that will give industry firms an intimate view of their operations.

“From a third-party perspective, that would require them to provide



The Bank of England

potentially sensitive information about their operations in order to demonstrate that they have the ability to recover quickly,” he adds.

On December 5, the Bank of England, the Prudential Regulation Authority and the Financial Conduct Authority jointly released a series of consultation papers aimed at strengthening the operational resilience of financial services firms and modernizing the regulatory framework on outsourcing and third-party risk management. The consultations follow the UK authorities’ discussion paper, Building the UK Financial Sector’s Operational Resilience, published in July 2018.

The proposed rules require institutions to determine which business services are critical to the market and what is the maximum tolerable disruption to services they can withstand, and prove how they or their critical third-party providers can recover from a failure within the necessary period of time to avoid “intolerable risk,” according to one of the papers, which complement each other.

Institutions have been subject to operational scrutiny for years, so why the fuss now?

The difference in the latest proposed rules is that there is a greater focus on third- and fourth-party risk, and being able to manage firms’ growing networks of outsourced vendors.

Many institutions rely on one or two major service providers, like the big three cloud providers, to manage critical operations, such as clearing and settlement, asset servicing and data management.

“The challenge is that it is difficult for financial institutions to understand the resilience capabilities of third-party vendors to recover their services in a defined timeframe,” Harrell says. “It is therefore challenging to demonstrate that [the banks who require these third-party services] can recover their important business services in a specific timeframe.”

Changing Relationships

In some cases, the new pressure on outsourcing could make it more difficult to work with third parties in the future, says David Ostojitsch, director of technology and operations at the Association for Financial Markets in Europe, due to the level of information needed to understand vendor and sub-outsourcing behavior, prompting firms to manage certain operations in-house instead.

And the growth of outsourcing and interconnectedness has cybersecurity implications. “One thing about cybersecurity is the contagion risk—it is a big part, as financial services are only getting more and more connected,” Ostojitsch says.

Implementing the proposed laws won’t be cheap. Wilbert says that for institutions to do so effectively, they will have to install front-to-back mapping of important business services to have a holistic view of data flows, system resiliency and the web of interconnected risks. Additionally, institutions may have to consider whether to employ an independent auditor to validate their third parties’ systems and ensure they can recover in the appropriate timeframe. [WT](#)

Deutsche Börse Foresees DLT Role as Network Operator

The exchange says its function may evolve from a traditional market infrastructure provider to managing decentralized networks. By [Hamad Ali](#)

Deutsche Börse's distributed ledger-based collateral swaps initiative with start-up HQLAx could be the first step toward a new role as a network operator, says Simon Seiter, head of digital assets at the exchange.

"For us, it was the first step to deliver real value to the market through a new operating model with HQLAx and to explore where our role in a decentralized world could be in the future," Seiter says. "This role might be [as] a financial market network operator."

HQLAx and Deutsche Börse jointly developed a distributed ledger solution based on R3's Corda blockchain for collateral management in the securities lending market. The platform launched with transactions executed by Commerzbank, Credit Suisse and UBS on the Eurex repo trading system.

The parties exchanged baskets of German government bonds and corporate bonds, with the exchange's Clearstream Banking acting as custodian, without the securities having to be physically transferred between the collateral agents. Instead, the change in ownership was recorded in a registry built on Corda.

In a distributed ledger environment, a network operator is an entity that manages the network fairly for all users, and implements governance rules. It may also decide who to admit into the network. For Deutsche Börse, Seiter says, being a network operator might involve guarding the integrity of the decentralized networks and managing rule books to help participants interact with each other.

Seiter says that with the advent of digital and decentralized finance, the exchange is convinced that over time, markets and their roles will change. In a decentralized world, markets will be organized as networks, implying a higher degree of direct interaction between market participants compared to the situation today.

Seiter says transactions in a decentralized setting will still need a secure environment that complies with regulation and ensures the same standard of investor protection as in traditional markets.

"The role of Deutsche Börse might therefore expand from a traditional market infrastructure provider to a network operator, being able to serve both worlds."

While the role of the exchange may evolve, he says, some duties, such as know-your-customer procedures, will not. "We will provide the capabilities we already have and offer them through reliable services to the new digital financial markets as well, ensuring the same level of security, compliance and transparency as today's traditional financial markets," Seiter says.

The Frankfurt-based exchange partnered with Luxembourg-headquartered HQLAx in order to use the vendor's collateral swaps operating model. The start-up provides an additional service for security lending to banks in order to facilitate a better allocation of liquidity. Collateral baskets stored at custodians are tokenized, and can then be exchange based on DLT, Seiter says.

A digital collateral registry records



Deutsche Börse headquarters

ownership of the baskets of securities, while the underlying assets remain off the blockchain.

The baskets have different qualities of liquid assets, ranging from high-quality liquid assets (HQLA) to non-HQLA. Market participants that need a better allocation on a short-term basis can simply exchange the tokens instead of taking the baskets out of the custodians, which takes time. "It enables [users] to very quickly manage liquidity as a bank, as an additional service without having to move the collateral out of the custodians," he says.

One of the key benefits of working on a DLT network is speed. To move custody from one custodian to another can take at least two days, says Seiter. "The exchange on the DLT can be really instant, probably within minutes; we are targeting intraday transactions. That is really a benefit, especially if there is a short-term demand for high-quality assets with little credit or liquidity exposure," he says.

The first transactions on the model went live last year with the participation of Commerzbank, Credit Suisse, and UBS. Seiter says there are more banks currently going through the onboarding process.

"With the new clients and banks onboarded, the network will get more traction because more network participants mean more possibilities to exchange collateral," he says. "It is simply an additional service that the industry can't provide with existing technology, and we assume that it will constantly grow. It's not a disruption, not a revolution, but an evolution." [WT](#)

TRG Screen Buys Partner MDI to Boost **Managed Data Services**

The deal will allow Market Data Insights to provide other TRG offerings as fully managed services, and to benefit from being part of a larger company. By [Max Bowie](#)

New York-based data expense management software vendor TRG Screen has acquired Market Data Insights (MDI), a provider of managed services for data inventory and cost management, for an undisclosed sum, to bolster its managed services business.

MDI ran its managed services business using the InfoMatch software platform from Screen Consultants, which TRG acquired in 2018. Screen had a stake in MDI, which then transferred to TRG. And after working on joint client projects, the vendors realized it made sense to work even more closely together, officials say, and after talking about a tie-up for around six months, signed the deal on January 31.

MDI was set up in 2014 by Richard Sigillo, who has spent almost 35 years in market data technology roles, most recently as director of North American operations at UK-based data consultancy CJC, and as director of professional services at MDSL. He has also worked at CSK Software and Micrognosis. MDI employs 10 staff, including two consultants, all of whom will remain on board—as will the MDI brand, Sigillo says.

“We will integrate some of the administrative functions, but the rest of the business will initially operate on a standalone basis, and we will share knowledge and make sure Rich [Sigillo] has access to assets from across the TRG business,” says TRG CEO Steve Matthews. “They are distinct offerings, so we think it makes sense to keep them separate for now. But over time, I imagine we will find opportunities where it makes sense to bring them



MDI will eventually be able to incorporate more of TRG's portfolio of services into its offering

closer together. At the end of the day, it's about what's best and most seamless for customers.”

This will mean that over time, MDI will be able to incorporate other tools and services from TRG's portfolio into its offering as managed services, such as the PEAR (Policies, Explanations and Reporting) database of exchange license policies from Axon Financial Systems, which TRG acquired last year, and the XMon reference data usage tracking tool from UK-based Xpansion FTS, which licensed global distribution rights to TRG last year.

“What we're seeing from our clients is demand beyond just inventory and expense management. So, for example, with PEAR and XMon, I'm going to be able to take these products and expand the offering. Clients are pushing us, because once you sort out inventory, the next challenge is exchange reporting and datafeed management,” Sigillo says. “We understand how to deliver these services, we understand the prod-

ucts ... and it's not a long time horizon to take those products and wrap them in a manner that fits what clients want. It's about having the right partner with the same vision who will invest in them and help build them out.”

TRG's managed service—which was rolled out since Matthews joined the company as CEO five-and-a-half years ago—sees clients deploy its FITS (Financial Information Tracking System) on site, but with TRG's remote staff running the processes of managing invoices and reconciling inventory. By comparison, MDI's offering—based on the InfoMatch product—runs and manages these processes completely remotely.

“In the smaller to midsize market, it saves clients from having to learn the tool, so they can focus on other areas of their business,” Sigillo says. “From a staffing perspective, a lot of firms don't have a large market data staff in place. That function may be managed by finance or procurement groups, whereas we can use a team approach for each client so we can deliver the right mix of resources that a client couldn't achieve by just going out and hiring one person.”

The news follows the decision of Screen founders Kees Brooimans and Peter Fruitema to leave the company and set up a market data recruitment firm, but Matthews says the acquisition of MDI is unrelated to losing their expertise. “Peter and Kees will continue to be actively involved in the business as advisors. We have a strong management team in the Netherlands, and we spent a lot of time on that transition,” he says. **wt**



Richard Sigillo
MDI

Man and Machine Need Each Other – Systematica CEO

“The errors made by humans and robots are different,” says Leda Braga. By [Faye Kilburn](#)

Self-driving cars may have already begun to replace human drivers but the end goal of AI in asset management should not be fully autonomous investing, according to Leda Braga, chief executive of \$8.2 billion quant hedge fund Systematica Investments.

“Autonomous investing is not the target. The target is the powerful association of machine learning and human investment management skills,” she said, speaking at the Cayman Alternative Investment Summit on February 6.

Braga described a case study of an AI program that was trained to predict cancer in humans. Human doctors were accurate 96% of the time, the AI algo was accurate 92%; but when combined, they were 99.5% accurate.

“So that’s where the magic is—each one of us learning to incorporate new techniques in what we do, since the errors made by humans and robots are different,” Braga said.

Many people confuse the presence of AI in investment management with the idea of autonomous investing—throwing data at a machine and telling it to make money, given a certain risk budget, she said. But this is unlikely to happen in financial markets, since machine learning algorithms need huge amounts of data to calibrate themselves.

Braga pointed to the “vast quantities” of data consumed by Netflix and Amazon’s recommender systems—a successful application of AI that makes recommendations to users based on what others in similar demographics watched or bought.

“To do that safely you need large amounts of data. Netflix has 100



Braga wants a “powerful association” of machine learning and traditional investment management skills

million subscriptions globally and 1 billion hours of video watched a week. Amazon has 250 million subscribers,” she said.

However, financial data is relatively sparse. Take the cleanest dataset that all investors have access to—securities prices. There are roughly 5,000 investable stocks and one price a day in the historical data. Meanwhile, other datasets like financial statements are sparser.

“The idea of deploying algos than can fit on the data we have in finance is actually dangerous. [The data is] noisy and, not only that, there’s a lot of randomness in it,” Braga said.

Instead, the firm applied AI in other areas, including using natural language processing to group companies based on what they say about themselves and how they make revenues in annual reports. Braga said this has delivered a “great improvement” over relying on third-party sector classifications in Systematica’s equity and macro strategies.

Braga also had a stark warning for

firms that fail to embrace alternative data: “If you are not using it you are falling behind,” she said.

Last year, the firm’s BlueTrend fund was up 13.6%—its best performance since it was launched five years ago.

Forget predictions

Also at the conference, Jessica Stauth, head quant at Fidelity Labs, the internal start-up incubator at \$7 billion asset manager Fidelity, said predicting returns was one of the worst use-cases for artificial intelligence.

Instead, applications of the technology to improve operating efficiency are more likely to succeed, she said. These resemble successful applications of AI outside the sector, such as Google using neural networks to recognize images of cats on the internet.

“There are a lot of use cases that look like that in investment management—such as pulling data out of PDFs—that will improve operating efficiency,” Stauth told delegates.

Speaking on the same panel, Caroline Sherman, advisor to Quantopian, said proprietary data is likely where hedge funds will get a competitive edge, a view that Stauth agreed with. “Pause and think about what data you have that can give you an interesting edge. How can you be different?” Sherman said.

Christina Qi, founding partner at quant hedge fund Domeyard, bemoaned the quality of alternative data providers. She said that 95% of alternative data providers who approached the firm have data that was not of high enough quality to be useful. The firm runs a high-frequency trading strategy. [WT](#)

Google Exec: Regulators Insisting on Multi-Cloud for Financial Firms

As regulators fear vendor lock-in and concentration among cloud providers, Google Cloud pushes its Anthos platform. By [Hamad Ali](#)

Google Cloud is seeing demand from the financial sector for software that allows its clients to manage workloads on rival clouds like Amazon Web Services (AWS) and Microsoft's Azure, as regulators increasingly focus on pushing multi-cloud strategies, says Adrian Poole, head of financial services for UK and Ireland at Google Cloud.

Authorities fear that vendor lock-in would hinder portability of services in the event of operational disruption of a major cloud provider, concerns that have shown up in European and UK guidelines.

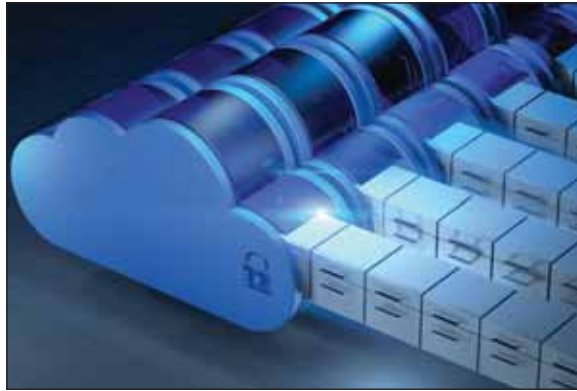
"The regulators are insisting on multi-cloud from a contingency and exit-strategy perspective," Poole says.

In its own outsourcing guidelines, the UK's Financial Conduct Authority says firms need to ensure they can exit outsourcing plans without undue disruption. They must have exit plans and know how they would transition to an alternative service provider and maintain business continuity.

Poole says he expects that the interoperability of cloud platforms is going to become increasingly important to Google Cloud's clients.

Google launched an open hybrid and multi-cloud platform, Anthos, in April last year. Anthos allows customers to operate different apps and tools like Kubernetes across on-premise and cloud environments. Since the launch, large banks known to have signed up to the platform include HSBC Australia and KeyBank.

Switzerland-based software provider Temenos recently announced it would be running on Anthos, making



Multi-cloud platforms may help allay regulators' concerns about concentration risk

it the first company of its type to do so. Temenos offers software for a range of financial services uses, including digital front office, payments, and fund administration. The company says 41 of the top 50 top global banks rely on its services for processing daily transactions and client interactions of more than 500 million banking customers.

"For Temenos to recognize not only that they need to be on Google Cloud Platform, as they did last year, but then to say, 'We want to utilize the Anthos platform as our way of making sure that we are available in every cloud, and in every on-premise environment,' just speaks to the pull the market is having to Google Cloud," Poole says.

Anthos should help Temenos handle the fragmented regulatory environment in which it operates, Poole adds. "One of the things global banks have to deal with is different jurisdictions and different restrictions on where data can go, and whether data can move between those different countries," he says.

"So Temenos and Google Cloud are giving them a solution that says, build it once and you can deploy it in multiple environments without having to make huge changes."

Anthos enables clients to increase their speed of deployment by starting to build on-premise while they await regulatory and compliance approvals, and scale up as soon as they get them, utilizing the cloud, Poole says.

Google Cloud isn't the only major provider to launch such a multi-cloud platform. In November, Microsoft launched Azure Arc, a Kubernetes-based platform that can also run on AWS and Google Cloud. AWS says its Outposts service allows its clients to extend AWS infrastructure, services, APIs and tools to any datacenter, co-location space or on-premise facility.

Google built Anthos using Kubernetes and other open-source tools. It is available on Google Cloud Platform with Google Kubernetes Engine (GKE), and also in the data-center with GKE On-Prem.

"What we've seen before is this big, disparate gap between the cloud, on-premise and hybrid," Poole says. "What we are going to see is that divide really closing, and that is what Anthos is going to enable. We'll also see wider adoption of cloud. It is very clear from the conversations we are having with regulators that they expect a wider adoption."

Regulators worry that most financial firms utilize one of the three main cloud providers. Google Cloud made \$8.92 billion last year, according to its 2019 earnings statements. AWS earned around \$35 billion, while Azure's revenue was around \$16.4 billion. [WT](#)

Rimes Wards off Sale Speculation with Investment from EQT

A sale was originally reported, but this private equity investment will allow the firm to grow its ESG and ETF offerings while considering a sale at a later date. By [Josephine Gallagher](#)

In mid-December, *Barron's* reported that Rimes Technologies was up for sale. The data management specialist, which has been growing its sphere of influence in the regtech space, was reported producing “annual earnings before interest, tax, depreciation and amortization (Ebitda) of \$20 million to \$25 million,” and that it was “expected to sell for a ‘big price,’ ... which some pegged at around \$400 million to \$500 million,” according to the article.

In various publications, several of the largest data giants in the capital markets were mentioned as possible suitors, as was the London Stock Exchange Group (LSEG). A source with knowledge of the deal tells *WatersTechnology* that LSEG, which is also in the processes of closing a deal for Refinitiv, was the leading candidate. But then the rumors started to shift, and outside investment became the most likely near-term path forward for Rimes.

Sure enough, on February 3 it was announced that Swedish private equity firm EQT, through its Mid Market Europe fund, was making “a significant growth investment” in the managed-services provider, though the amount has not been disclosed and a spokesperson for Rimes declined to provide a figure.

Rimes has only taken one investment before, a small stake from Abry Partners in 2017. Otherwise, the company has grown organically, until now.

One source at a market structure firm, who is familiar with the original sale discussions, tells *WatersTechnology* that several exchanges had made offers to acquire the company in recent months, but that Christian Fauvelais, Rimes's



Rimes plans to expand its product offerings focused on the environmental, social and governance space

founder and CEO, was likely more keen to hold off on a sale until there was more clarity in the market (Fauvelais was not available for comment).

“My initial thought is that this is a good way to take a breather,” the source says. “It’s suggestive of Rimes’s desire to carry on for the time being on their own without the need for a mothership or a parent company.”

Virginie O’Shea, an independent capital market technology researcher, says the deal makes sense, particularly in servicing the needs of Rimes’ client base. “As a data services provider, it makes sense for Rimes to remain independent for now, as buy-side firms are often hesitant to work with the same firm for data provision and data cleansing and support. Investment from EQT allows Rimes to remain independent,” O’Shea says.

There has been increasing appetite to strengthen, build out or acquire data businesses in the financial technology industry. The clearest example of that trend is the LSEG-Refinitiv deal,

which is to be finalized later this year after a failed counter by Hong Kong Exchanges and Clearing.

The market structure source suggests that, given the high demand for data and data services, Fauvelais is apprehensive of any acquisition, and is likely to hold back on any offers until Rimes can secure a satisfactory deal and perhaps create an environment for a “pseudo-bidding war” in the future. Rimes’ IP is attractive: while the company does not own content, it aggregates data and customizes it for users’ needs, aiming to relieve clients of the burden of data management.

Beyond RegTech

EQT is not a name often heard in the capital markets space, though it has a substantial number of investments in the technology, media, and telecom sector. The private equity firm has 19 active funds, with more than €60 billion (\$66 billion) in commitments across more than 240 companies and 110 exits since its inception in 1994. Its most recent numbers have it at €41 billion in assets under management (\$45 billion), up from €30 billion (\$33 billion) in 2018.

The EQT investment will enable Rimes to follow through with its strategic objective to expand its data management and regtech product offerings—with a focus on new services around Environmental, Social and Governance and data for exchange-traded funds.

The additional funding will also allow Rimes to strengthen existing partnerships, broaden its global market reach, and more effectively cultivate talent. [WT](#)

Illuminate Rounds Out Baton Systems Funding with \$4m Investment

This is the first investment ILLUMINATE has made in a company offering DLT-based tech. By [Joanna Wright](#)

Venture capital firm ILLUMINATE Financial has made a \$4 million investment in Baton Systems, rounding out the start-up's \$16 million funding total. Baton, a provider of distributed ledger-based clearing and settlement technology, will use the investment to expand into Europe, the Middle East and Africa, and beyond.

Baton has already received investments from three Silicon Valley-based VC firms: Trinity Ventures, Alsop Louie, and Commerce Ventures. But the company also wanted a VC with expertise and existing networks in the capital markets technology industry, and found their match in ILLUMINATE.

"We wanted an investor who understands capital markets and putting together very complex deals, because we are starting to see that banks want to invest in companies like Baton, and in the blockchain," Arjun Jayaram, Baton Systems CEO and founder, tells *WatersTechnology*. "Now that we are past the blockchain hype cycle, the companies that are left standing are the ones that will last," he says, adding that Baton's product is not blockchain *per se*, but is blockchain inspired.

Luca Zorzino, an investment director at ILLUMINATE, says his firm had been in contact with Baton since it was founded. "We originally looked to do an investment in 2016. But part of the mandate and criteria we look for [is] meaningful commercial traction. At the time, though we found the proposition interesting, they were still finding their feet."

Baton aims to automate the clearing and settlement process. Its tech is based on permissioned distributed ledgers that can integrate with clients' legacy systems and existing payments rails to



Baton plans to bolster its London operations

move real assets into accounts. Jayaram says Baton has been able to consistently reduce the time these processes take—12 to 16 hours—to three minutes.

Baton now has major global banks live in production, including JP Morgan, on its two DLT-based platforms, one for the settlement of margin collateral, and one for FX transactions that launched in April 2018 and for which the company won Best DLT Project in the WatersTechnology Sell-Side Technology Awards 2019.

Baton has opened a small London office and hired former Citi prime brokerage FX veteran Alex Knight to drive its expansion into EMEA. There are three people in the City office currently, which Jayaram says will increase to seven or eight sales and support staff by Q3.

ILLUMINATE founding partner Mark Beeston, who was formerly CEO of Icap's risk and information business, says his firm made the investment in Baton because its product addresses the cost and inefficiencies of settlement processing, and gives "organizations significantly higher levels of control over the settlement journey than they had in the legacy, batch-processed, barely visible world of settlement, which is historically backward-looking and reconciliation-driven."

This is the first investment ILLUMINATE has made in a company offering DLT-based tech. "That might come as a surprise for a fund so focused on market infrastructure and technology, given the focus there has been on blockchain initiatives over the last three years. That is not to say we had not looked at a lot of propositions—we had. And we said no to every single one of them, till now," Zorzino says.

The other propositions did not consider clients' existing infrastructure and workflows, whereas Baton emphasizes integration with existing operations and systems, he adds.

Expansion

Baton will now be looking to branch out into more complex transactions, such as securities lending and repo, Jayaram says. Baton initially went for clearing settlement of securities and FX transactions because these are relatively simple problems to solve.

"The action of a pledge [promising securities as collateral] is a futures commission merchant pledging securities and getting the cash back. We said, 'Let's solve this particular problem ... because you don't need to build a network for this. It's between the central counterparties and the FCMs, and you don't have to build a network,'" he says. "But we believe that once we solved this problem, we can use the same solution for doing more complex transactions like repos and sec lending.... That is the next natural frontier for us."

The company will also look to expand geographically, starting with the UK, as London is still the center of the FX world, and then to Asia.

"For our next expansion, the logical place is likely to be either Singapore or Hong Kong," Jayaram says, adding that at the current rate of growth, Baton could open up operations in Asia by Q2 of 2021. "There is a lot of demand for Asian currencies and non-CLS settled currencies, so Asia seems a natural progression. People are wanting delivery of those assets," he says.

To fund these activities, the company will consider another funding round next year. [wt](#)

Nomura's Head of Digital Warns of AI's Predictive Limitations

The bank's deputy chief digital officer says machines cannot predict markets, as it consolidates trading operations and builds an AI platform for fixed income and FX. By [Josephine Gallagher](#)

Could artificial intelligence (AI) predict market movements? Matthew Hampson, deputy chief digital officer at Nomura, is not convinced that this will ever happen, as he warns of the technology's limitations.

"The market is stochastic. It has a level of randomness that is challenging to model," Hampson says. "It's not like it's a turbine failure, or the way retail shoppers buy food, or whether you're going to develop an illness. Those areas are based on physics or biology, and [therefore] statistical models work well. With the market, you can have a singular event that is not statistically relevant, which can pivot a market."

Machine learning, a sophisticated form of AI, follows a set of coded rules and learns from large sums of pre-existing data. But how do you develop a structured model for something as uncertain as the capital markets? Hampson says it would be "incredibly naive" to rely on pure AI for trading. Traders have years of experience, and often make split-second decisions based on instinct or undefined market knowledge, rather than structured rules.

Although some analytics, such as online sentiment and historical analysis, can offer weighted averages or suggestions of how the markets might react, it is unlikely that machines will fully replace real-life traders any time soon, especially when it involves trading large sums of capital, Hampson says.

His view is that AI and algorithms can provide some automation around the trading process, but in his experience, even that is difficult to achieve.

"Just the automation is incredibly hard to do. It is a significant engineer-

ing problem to do something like basic automation of what a trader does, and there's certainly nothing off the shelf that people can just plug [into their systems]."

Hampson says the media and misinformed commentators are partly to blame for the misconceptions and hype around AI technology and what it can do. He calls it "unicorns and fairy dust." All strategic plans for the e-trading business over the next three to four years will include a human, and emerging tech like AI will not obviate the need for market supervision and risk management, he says.

Hampson is not the only banking executive to poke holes in the capability of AI technology. Speaking on a panel at TradeTech last year, Michael Steliaros, global head of quantitative execution services at Goldman Sachs, said markets are far too complex to develop predictive AI models for them, and spoke of the difficulty of translating trading strategies into programmable code.

And in many cases, the machine "is limited by the human that is coding it," Steliaros said.

E-Trading Strategy

However, despite their limitations, AI-based tools are increasingly used to enhance trading practices. Nomura, in fact, is one example of that: the bank is in the process of developing an AI-powered trading platform for fixed income and foreign exchange. As part of its multi-year global e-trading strategy, Nomura has spent the past nine months consolidating its trading operations to create a single front-office unit.

Over the next 12 months, the bank



AI technology is no crystal ball, says digital chief

will look to merge the trading desk infrastructure to create a cross-asset platform, enabling functions such as auto hedging, skewing, spreading, and internalization.

The restructure has involved Nomura cutting jobs, while bringing together its quants and data scientists into one business stream.

"Forming that organization has been challenging," Hampson says. "There are a lot of legacy practices within the organization. The data scientists, the technologists and the quants were heavily siloed from each other. Getting those teams to interact and to work globally, and finding a way to govern that; for example, facing the various stakeholder communities—both at the strategic level and individual business units."

Nomura has hired more than 20 people for the global e-trading team in the past eight months, with well-known names such as Duncan Larraz joining from hedge fund Brevan Howard, and Steven Grossman joining from KCG Holdings. But the revamp of the trading unit hasn't necessarily resulted in cost savings, Hampson says, as it has sought to spend money on its talent.

"Now we have a smaller, higher-quality team in place," he adds.

Nomura is also developing a graduate stream as a long-term strategy to help develop grassroots talent. Availability and retention have become a concern among institutions as they compete with big tech firms or start-ups to attract new recruits. Additionally, the growing use of emerging technology has exacerbated the demand for graduates in the areas of science, technology, engineering, and mathematics. [WT](#)

Interactive Brokers Creates Vendor Arm to Consolidate Data Ops

The creation of GFIS is the culmination of a three-year plan to consolidate and improve how the broker managed hundreds of data sources. By [Max Bowie](#)

Greenwich, Conn.-based online broker Interactive Brokers has set up a new data vendor subsidiary, based in Switzerland, to consolidate the firm's data-acquisition operations under a single entity. It also aims to provide lower data costs to its brokerage clients.

The broker first conceived the idea for the vendor arm, dubbed Global Financial Information Services (GFIS), three years ago, and formally set the wheels in motion at the start of 2019. Last July, they formed a separate entity, and IB plans to go live with the subsidiary at the start of February.

GFIS provides data from more than 125 trading venues in 31 countries, plus around 100 sources of free and fee-labile news and research.

The aim, says Yochai Korn, managing director of GFIS and global head of market data and research at Interactive Brokers, is to provide a quality product to clients at the lowest possible price. Within that, there were two main drivers for creating GFIS as a standalone business.

First, there were internal factors: As Interactive Brokers grew over the past 40 years, it accumulated a wealth of data contracts and licenses under different entity names, which was not the most efficient way to manage market data consumption. The new structure represents a "complete revamping of all data contracts into a single entity name," and allows the broker to offer clients "a more flexible product offering," Korn says.

Second were external industry factors that made the broker realize that it required more control over its data assets. "We identified that we needed a



Yochai Korn
GFIS

global response to the changes that were happening across the industry—including automation, privacy protection, data cost compared to value, and flexibility, recognizing the industry is not static—and we could sit back and watch or take the lead," Korn says.

"After the dust settles, GFIS will have the ability to package product for end-user clients in a manner that is not part of the Interactive Brokers practice today. For example, to create a futures offering that is cross-geographic regions, or a bundled depth-of-market service that incorporates multiple diverse trading platforms, or to present data by instrument, rather than just by platform," he says.

The independence from the brokerage business also gives the vendor arm greater freedom and control over its data. In the past, Interactive Brokers would add datasets based on whether they would result in more trading. Now, so long as demand is sufficient to cover the costs associated with sourcing a new dataset, GFIS can bring on any data that will broaden its offering.

"We are investigating how we can best communicate with users to gauge demand. We also have had a significant interaction with data sources to assist them in getting their new products in front of a large, sophisticated audience," Korn says.

The move has elicited a mixed—but mostly positive—response from data sources, he says. Some allowed Interactive Brokers to simply novate the agreement to GFIS, while others agreed and signed new contracts. "Other than the logistical challenge of opening and examining all agreements, we are finding it to be beneficial," he adds.

Specifically, having all data agreements under control of a new, single entity generates "greater accountability and better reconciliation of inventory to invoices. If we know what we are paying for and how it is designated in the agreements, we can coordinate with suppliers to get the best result," Korn says. "It gives us a clean slate from which to build. Rather than spending time and effort to patch what was in place, we have developed a uniform organized database of agreements. This allows us to speak to our counterparties in a standard language, and we anticipate contributing to improvements to the industry that recognize 'unique is not better' when referencing definitions of terms and conditions."

This new uniform database of licenses now contains all the novated and newly agreed contracts. "In this process, we were able to verify all agreements as complete to current conditions, and all exhibits and amendments are in a single database. Prior to this, the different Interactive Brokers affiliates had differing practices on contract storage and maintenance," he says.

Customers will be able to access data from GFIS via Interactive Brokers' IB Trader Workstation, and via other third-party displays, where compliant.

Located in Cham, a short drive around the north shore of Lake Zug from Interactive Brokers' European headquarters, GFIS will initially be staffed by a mix of dedicated personnel and others with shared duties at Interactive Brokers. Relationship management functions will remain within Interactive Brokers, while administrative functions will have a reporting structure into GFIS. [wt](#)

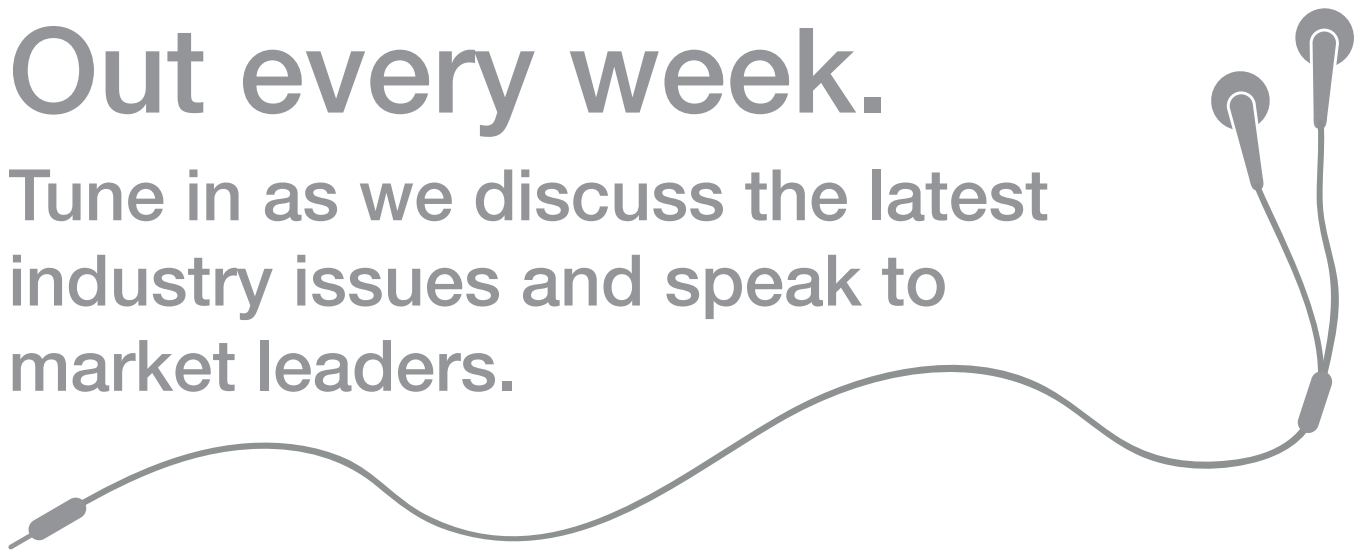
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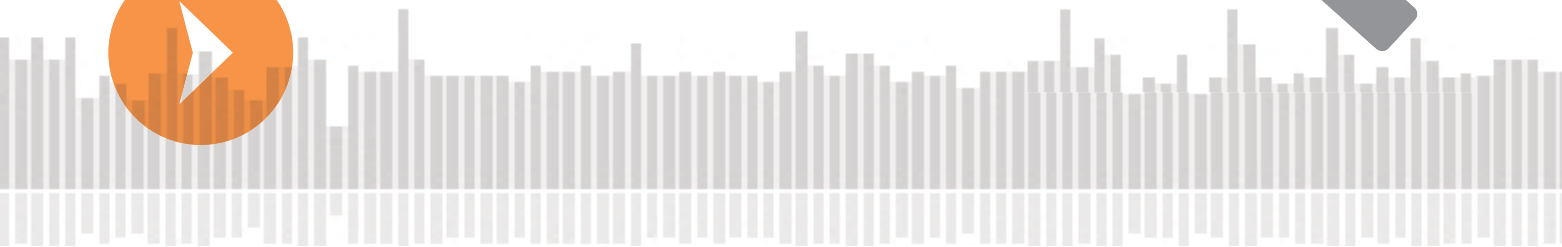
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OPEN OUTCRY

What the key figures in fintech are saying this month

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“We are going slow here, and people are perhaps not believing that this could ever be successful as envisioned. While we have 1.5 million legal entities [registered for LEI] now, the projections are that anywhere from 40 million to 200 million are needed to complete this project.”
Allan Grody, president at consultancy Financial InterGroup Advisors
» see page 36 for full feature...

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“They throw in every piece of junk they can think of, and in the end, they get a piece of junk. It’s not just: ‘I’m going to make a big stew, and take every piece of crap that I can find in the kitchen cupboard, throw it in there and hope it tastes good at the end.’ It won’t taste good because you’re putting licorice in with fucking kidney beans.” Alexander Fleiss, co-founder and CEO of quant hedge fund Rebellion Research
» see page 24 for full feature...



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“BERT is a general-purpose language model, so its benefit is that it’s not based on financial information, or any other kind of specific information. The model is built in such a way that it can be re-used for building other machine learning models.”

Elena Treshcheva, business development manager and researcher at Exactpro
» see page 40 for full feature...

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“Autonomous investing is not the target. The target is the powerful association of machine learning and human investment management skills.”
Leda Braga, chief executive of quant hedge fund Systematica Investments
» see page 9 for full feature...



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“What are the different ways for a trader to absorb information? We don’t think it’s just going to be visual. We think there will be an audio supplement to it as well. All

of that is coming from the experience we’ve had with the gaming companies.”
David Reilly, chief information officer for Bank of America’s Global Banking & Markets group
» see page 30 for full feature...

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“TREP is the beast of Wall Street. You need it. But they’ve lost a lot of good people and salespeople, and it’s hard to recover from that. There are not a lot of experts in this field.”
Executive at a large US bank
» see page 18 for full feature...



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“Are you willing to take the risk of investing in bullshit? Or do you think that by not investing on what might be bullshit, you’re leaving alpha on the table, and you’re going to lose to the people who are more comfortable, potentially, investing in bullshit—or found something that’s just really cool—and [that] your minds are really shallow?”
Matthew Rothman, a managing director at Goldman Sachs
» see page 24 for full feature...



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“No serious scholar at this point in time will say we have enough consistent evidence on whether ESG investing can relate to superior performance.”
Gianfranco Gianfrate, a professor of finance at Edhec Business School
» see page 44 for full feature...

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“The industry uses mobile data to work out how many people have visited [the Westfield, Stratford shopping center in London], but if you can also detect if they were happy or sad, if they were a man or a woman, if they were old or young—that information can potentially give you a few early alerts to revenue or potential sales generated for retail.”
Geoff Horrell, head of the London Labs unit at Refinitiv
» see page 5 for full feature...



NEWSDESK

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

ASX on Track for CHES Replacement Testing



ASX headquarters in Sydney

The Australian Securities Exchange (ASX) is on track to commence industry-wide testing on its distributed ledger technology (DLT)-backed CHES replacement program in July 2020.

The exchange greenlighted the project to replace

CHES, its equity clearing and settlement platform, with a DLT platform developed by Digital Asset Holdings in December 2017. ASX had earlier aimed for the platform to go live by the end of 2020, but since extended it to April 2021, the end of its proposed timeline.

ASX CEO Dominic Stevens said on February 13 during a results briefing: "We understand that replacing a complex and sophisticated 26-year-old system is a major undertaking for the industry, but it needs to be done. Much of the original CHES has enabled customers to generate efficiencies, reduce costs, and offered new products and services. So the replacement of CHES, in the same way, will enable innovation for the next quarter of a century. We're very excited about the long-term benefits this can bring to clearing and settlement specifically, and to the efficiency of the securities industry in Australia generally."

S&P to Unveil New Data Platform, Capabilities



Warren Breakstone, S&P Global

S&P Global Market Intelligence is working on a new platform, dubbed S&P Global Marketplace, which will serve as a "storefront" for the data provider. The goal is to provide clients with an easier way to explore and discover datasets from

across the organization, says Warren Breakstone, S&P Global's chief product officer of

data management solutions. The launch target is set for this spring.

Through Marketplace, clients will be able to access data documentation, sample data, data dictionaries, visualization tools and, for the first time, a suite of solutions from Kensho Technologies, a machine-learning specialist acquired by S&P in 2018. As part of the initiative, the vendor is also incorporating complementary third-party alternative data into the offering, such as court-case, patent, and healthcare data, and S&P is utilizing its quant team to curate proprietary alt data to sit alongside its traditional data.

"Very few decisions are ever made with discrete data; decisions are made when the data converges, which is a critical component of what we're able to offer," Breakstone says.

Fenergo Taps ABN Amro, DXC for \$80M War Chest



Joe Dunphy, Fenergo

Dublin-based Fenergo, a provider of client lifecycle management, client onboarding, and KYC/AML solutions, has sold a 10% stake in the company to Dutch bank ABN Amro's venture capital fund and IT services provider DXC

Technology in return for a combined \$80 million investment, to fund further acquisitions.

The investment marks the end of a funding round that began last summer with a €66 million (\$72 million) investment from DXC, giving the service provider a stake in the company of around 9 percent. ABN Amro gets roughly a 1 percent stake in return for the remaining investment. The combined deal values the privately held, venture-backed company at almost \$1 billion.

Fenergo plans to use some of the money to fund acquisitions of other, unnamed regtech providers under the direction of Joe Dunphy, who it appointed head of strategy and corporate development last year.

Knoema Buys Adaptive Management

Knoema, an end-to-end data and knowledge management platform, has acquired Adaptive Management, an alternative data aggregator and solutions provider, for an undisclosed sum. Adaptive brings 1,300 alternative datasets into Knoema's global time-series database. The addition of Adaptive brings Knoema's total number of datasets and data sources up to more than 30,000 and roughly 1,700, respectively. Charles Poliacof, Knoema CEO, says the pairing will offer a user experience with a heavy emphasis on workflows and the ability to work in an any environment.

OpenFin Launches API to Improve Development

OpenFin is hoping to simplify the platform and application development experience for banks, asset managers, and the vendor community with a new API, dubbed Platform API. It will be included in its JavaScript API, which allows for a common user experience for developers across multiple applications. OpenFin CEO Mazy Dar says the API will allow central architecture teams building their own platforms to define the behavior, look, and feel of the platform.

TP Icap Eyes Cloud, More Tech Partners

TP Icap is aiming to make more of its market data available via cloud providers, as part of an initiative to reach a broader client base who may lack access to its data via premium vendor services. "Working with companies that have a presence in cloud providers is something we're exploring. And if you're in that space, you have to look at working with the cloud providers themselves," says Roland Anderson, CTO of TP Icap's Data and Analytics division.

TREP's Rough Voyage



Refinitiv's TREP market data platform and its predecessors have been central to financial firms' data architectures for more than 20 years. But with the vendor embroiled in a sale to LSEG, and rivals touting alternative migration paths, can a bold cloud gambit maintain TREP's position? By Max Bowie

Change is almost never without uncertainty. And major change—especially in the typically conservative world of investment banks—creates even greater uncertainty. So it should come as no surprise that Refinitiv's plans for the next evolution of its TREP market data platform are being met with a mix of excitement and apprehension.

At its core, TREP is the ubiquitous platform—more than two decades old—that was created to solve the problem of getting market data from point A to point B. Think of TREP as the heart, lungs, and entire nervous system of any trading operation. When it functions properly, the body

runs smoothly. But if it experiences problems, parts of the body are starved of oxygen—in this analogy, oxygen represents data—and don't work properly. Even worse, trading on stale data could cause losses as the market moves but the data in the system remains stagnant.

There's another reason this analogy represents TREP well: Trying to replace it would be a lengthy—not to mention risky—operation, to be performed only by teams of skilled doctors, probably involving multiple surgeries spread out over a long time to mitigate any dangers.

“You can't just rip TREP out; it's a much longer-term plan,” says one market data consultant who has worked directly on TREP at multiple end-user firms.

Now, to add to the difficulty, imagine that all those surgeons are constantly worrying about who owns and runs their hospital, while performing these intricate operations. Refinitiv's two-year existence has been clouded by uncertainty around its ownership.

In 2018, Thomson Reuters sold its Financial & Risk division to a group of investors led by Blackstone Group.



Under Blackstone, this division took shape as a completely separate entity, badged Refinitiv. But after around 18 months, Blackstone agreed to a deal to sell Refinitiv to the London Stock Exchange Group (LSEG). The deal has since been blessed by LSEG shareholders—after a failed counter by the Hong Kong Exchanges and Clearing Ltd. (HKEx)—and is expected to close later this year. After a run of uncertainty, those data surgeons may be as worried about job security as they are about their patients.

And that's a big part of the problem: Financial clients who rely on Refinitiv's systems feel that the vendor has been distracted—more focused on a sale than on customer service. One data manager spoken to by *Waters Technology* chronicles a litany of support incidents, while another grumbles about a lack of communication regarding the vendor's roadmap for TREP. Both work at large financial firms with significant investments in—and exposure to—the platform.

Rival technology providers, spotting an opportunity, are fanning the flames

of uncertainty—not necessarily outright scaremongering, but seizing any opportunity to promote themselves as long-term alternatives to the incumbent, whose origins date back to the 1990s-era TIB and Triarch platforms. But Refinitiv does have a roadmap, and is now working hard to communicate that TREP is not only safe, but is being developed to offer more flexibility and efficiency in the future. And to do that, the vendor is making a big bet on the cloud.

“Refinitiv's focus point whenever we're doing any forward-thinking is

that we're always looking at backwards compatibility ... and ease of architecture moving forward. We have a vision of a unified platform, where—whether you're a deployed customer, use managed services, or the public cloud—the connections will be transparent to you ... with tiers of latency, content, and value-add,” says Anthony Mazzocchi, director of enterprise integration at Refinitiv, who joined the vendor last year after 30 years as a senior engineer on some of TREP's forerunners and as a consultant who has worked on market

“We are committed to TREP in a deployed fashion that everybody has used for more than 20 years, and we are looking at how to deploy it in our private managed cloud and in the public cloud. I think clients may hear about one of these and think we're abandoning another—but that's not the case.” **Anthony Mazzocchi, Refinitiv**

data infrastructures at some of Wall Street's largest financial firms.

“We are committed to TREP in a deployed fashion that everybody has used for more than 20 years, and we are looking at how to deploy it in our private managed cloud and in the public cloud,” he continues. “I think clients may hear about one of these and think we're abandoning another—but that's not the case.”

Next Steps

Indeed, of seven items on TREP's roadmap for the first half of this year spread over versions 3.3.1 and 3.3.2, equal effort is spent on enhancing the core functions of deployed-TREP instances and on enabling a move to the cloud. Deployed enhancements include specific customer-driven changes, as well as support and tuning for new hardware, such as Intel's Skylake processors and HP's G10 servers. Meanwhile, cloud-supporting enhancements include the ability for hosted instances of ADH (Advanced

Data Hub, TREP's datafeed server) and ADS (Advanced Distribution Server) to access Refinitiv's Elektron Real Time (ERT) Cloud, and use of VMWare virtual machines, and containerization, while threading will significantly increase throughput on hosted instances of ADS (ADS/POP) from 50,000 to 500,000 instruments.

“The public cloud has forced us to look at becoming more efficient with our deployments, to move outside our comfort zone of the deployed world, and to look at how we can be more effective in the world today. As we move into the public cloud, we're hoping to offer something with more economic value to customers, with a lower footprint,” Mazzocchi says. “One thing we really need to nail down for customers before we can move [to the cloud] is latency. If we can offer a true end-to-end latency measurement through that public cloud, and be able to say to clients ‘You're not just getting resiliency and redundancy; you're also only adding five microseconds—not 10 seconds,’ then I think we'll see some real adaptation there.”

The market data consultant also notes that Refinitiv's plan doesn't just make sense for clients seeking the next evolutionary leap for their data platform; it also makes a lot of economic sense for the vendor itself. “The more clients they can get onto a shared environment, the more cost-effective it is for them, and they can be much more profitable,” he says, adding that the vendor is “aggressively” pushing hosted TREP options—possibly as a way to sign up recurring revenue that will make it even more attractive to the LSEG, or to build momentum behind the new services.

It also makes sense from the ease of architecture philosophy that Mazzocchi describes, where, under a service-based model, clients could access real-time and reference data—and soon, delayed (i.e., fee-free) exchange data in the public cloud, as clients can already get from deployed and private cloud-hosted TREP instances—via a single API. In addition, a service-based cloud architecture means firms can do more offsite, and can reduce their hardware footprint by only taking the data they truly need into their own environ-



ments, rather than consuming all the data on the more than 84 million instruments covered by Refinitiv.

“I think our managed-services and hosted platform could be a sweet spot for us in the future because ... we can very quickly deploy value-add services in that space. We can deploy even quicker in our private cloud than we can in the public cloud,” he says. “Part of the overall plan is about blending [delivery options] to make it easier to get the data, whether in a private or public cloud. I think what will drive people back to us is when it becomes too easy to refuse.”

Mazzocchi also notes that some of the vendor's key strategic accounts may never move everything to the cloud. “They may be the ones who always stay on deployed technology, and that's why there will always be a deployed



Anthony Mazzocchi
Refinitiv



TREP option,” Mazzocchi says. But he adds that others among Refinitiv’s lower and middle-tier clients are already set to make the move. “And as we start to add more value, they will start to see this as the way to go,” he says.

Walking a Wire

Refinitiv’s plan is ambitious, and any ambitious plan contains inherent risk. And it is end-user concerns about this risky element that other vendors are playing up, presenting themselves as safe options for the future.

For example, data vendor and low-latency data technology provider Activ Financial last year released a set of data integration tools, dubbed Enterprise Data Integration Suite (EDIS), citing end-user concerns over the long-term viability of legacy data platforms as a key driver behind the project.



“The more clients they can get onto a shared environment, the more cost-effective it is for them, and they can be much more profitable.”

Market Data Consultant

“EDIS is a set of components designed to integrate with internal and third-party feeds and data platforms, and is aimed at people with exposure to incumbent platforms like [Refinitiv’s] TREP data platform, and recognizes that people are concerned about the technology roadmap and costs...and offers a path toward an alternative, based on Activ’s underpinning technology,” says Activ COO Jim Bomer.

EDIS is vendor-neutral, multi-tenant, and includes symbology cross-referencing to support other vendors’ data formats. It runs on Activ’s Activ One Platform (AOP) messaging middleware to provide a bridge between different technology platforms and data sources that can also cache, conflate, and delay data; connect to Activ’s global distribution network; and handle on-demand calculations.

Bomer says the idea for EDIS came around 2014, when Activ was figuring out how to optimize elements of its underlying infrastructure—which ultimately became AOP—and how it could best serve its clients in the future. “We asked ourselves: what is the key problem that people face when trying to de-risk their future,” he says. “We’ve often developed our systems at clients to interoperate with TREP, so we took that concept and looked ahead.”

New Entrants, Old Problems

Certainly, rivals are keen to seize on—and exploit—any perceived weakness on the part of TREP or Refinitiv. And if there's one person who knows TREP's weaknesses, it's Bob Bonaguro, who is credited with being the primary architect of Refinitiv's enterprise technology stack, having spent the past 18 years at Reuters and Thomson Reuters in a range of senior technology roles.

But he's no longer at Refinitiv. Instead, he's joined forces with Terry Roche, former global head of Enterprise Platform at Thomson Reuters, to set up Pegasus Enterprise Solutions. Pegasus offers a suite of APIs—available in C-sharp, C++, and Java—as well as a data viewer, a Microsoft Excel interface, and other tools that provide a neutral abstraction layer between firms' TREP deployment, other transport layers, and client applications.

At Pegasus, Roche serves as CEO, while Bonaguro is CTO. The third co-founder and chief product officer, Brian Stephens, a former market data and technology exec at Royal Bank of Scotland and Dresdner Kleinwort, also spent almost six years at Reuters as a product support consultant for its RMDS and TIB data platforms (the forerunners of TREP).

Roche stresses that the vendor is not trying to displace Refinitiv and TREP, but rather is offering a solution to broader industry problems that leverages—and enables users to “extract maximum value” from—their existing investment in TREP. Indeed, the open “ecosystem” that Pegasus envisages relies on a multitude of components, including market data platforms—whether operated by Refinitiv or someone else.

“We're not trying to replace TREP; we're building software for the market to transform itself—and we think we can drastically accelerate that transformation at dramatically reduced cost,” he says, explaining that employing Pegasus' APIs allows firms to create abstraction layers around their data platforms, opening the door to easier migration to open platforms in the future. Then, “if you want to switch to a different platform in the future, you will be able to do so with

“Clients are all finding that there is no 100% replacement for Refinitiv's content and technology. You can get 85% to 90% of the way there, but that still leaves you at least 10% to 15% dependent on Refinitiv. And the cost of doing all that is a big deal.”
Steven Roe, West Highland Support Services

a simple configuration change,” Roche says.

Activ's Bomer strikes a similar note, describing gradual migrations rather than a wholesale rip-and-replace of existing platforms.

“The big firms have very complex environments that have grown over the years. We're not expecting that anyone will turn their back on their existing investment, but this gives them a way to support all their existing applications and migrate them gradually to a new platform,” he says. “Ultimately, we hope people will use this as ... the new bedrock of their data architecture. No one is going to turn around and completely shift just like that, so this needs to integrate [with other platforms] for some time. You need to be thinking about your platform in five to 10 years' time, and asking whether you are happy sitting on the same technology stack that you have now.”

One reason for this kind of time horizon is the sheer number of systems inextricably linked to TREP that must either be abstracted or rewritten. Another reason why a quick rip-and-replace isn't practical is that other vendors simply can't yet offer everything that TREP does.

“Firms all have folks looking at sources of risk, and have identified Refinitiv as a potential area of risk, so they've been given their marching orders to identify how risky it is, and where else they can find that data,” says Steven Roe, CEO of New York-based systems support and software provider West Highland Support Services.

Firms are enlisting alternative desktop and feed providers to mitigate their risk and dependency, but, “clients are all finding that there is no 100% replacement for Refinitiv's content and technology. You can get 85% to 90% of the way there, but that still leaves you at least 10% to 15% dependent on Refinitiv. And the cost of doing all that is a big deal,” Roe says.

Mind the Gap

Since TREP's origins extend back more than 20 years, while others are new to the enterprise platform space—even if they have been active in certain areas of data platform functionality—it's not surprising that Refinitiv's full lineup of functionality is tough to match like-for-like.

“We're not trying to duplicate all of the esoteric features of a platform like TREP, but instead we're focused on addressing the core functionality that everyone needs,” Bomer says, adding that firms can adopt elements of EDIS at their own pace to meet specific needs, then expand its use within their firms, integrating with their existing data sources, and transferring applications to run natively on the new platform.

The platforms offered by Activ, Pegasus, and others will become functionally richer over time—but, under Mazzocchi's vision, so too will TREP. And while Activ's 10-year view gives time for firms to migrate slowly, the current reality is that TREP leads the field. So the reason why abstraction layers and APIs are important is not only to potentially migrate away from TREP, but also to integrate multiple third-party systems that firms may need to combine to replicate the full capabilities of TREP.

Another such third-party system is the ONE cloud-based platform for consumption and distribution of real-time, historical, and reference data, and other content, such as news, provided by Frankfurt-based BCC Group International, which is working on two proof-of-concept projects to replace TREP.

“The financial markets are becoming more adventurous, and see the future as not one big platform, but many different



Steven Roe
West Highland
Support Services

platforms,” says BCC Group CEO and founder Mauricio Gonzalez Evans. BCC Group also provides an adapter, dubbed Elisa, to connect to TREP sites.

Gonzalez Evans says they were originally looking to integrate with existing TREP installations, but then they got the idea of replacing, using BCC Group’s ONE platform, while still connecting to Refinitiv’s content but via the cloud instead, or using the Elisa adapter to replace connections between applications and TREP with connections to other sources. The platform also allows users to publish and sell their own datasets, and BCC Group aims to provide a marketplace offering in partnership with Amazon Web Services (AWS), he adds.

Indeed, the big picture for data transport layers in the future, says Pegasus’ Roche, is not focusing on a single component with a firm’s data architecture, but interaction between multiple open platforms, using standards that eliminate vendor lock-in and mitigate users’ exposure to proprietary data platforms.

“With our software, you can create a consumer or publisher in hours, not months, and our dialog channels allow full peer-to-peer messaging through a firm’s entire environment,” Roche says. In addition, Pegasus is already developing gateways to brokers, as well as a broader data platform and an entitlements system to address this.

“We see this as going well beyond TREP and data, so anyone can deliver any service to anyone else in an efficient manner. Our end-goal is an open enterprise ecosystem whereby the market operates in a standardized manner for open interaction. What we’ve created so far is an important step toward that, which allows migration to open standards while getting more value from existing services,” Roche says. “The point is to remove the friction associated with providing a service and delivering data, because most of that now is under proprietary lock-in.”

And Pegasus isn’t just looking to replace lock-in to one vendor with a lock-in to its own services instead—Roche says the vendor will provide its source code to clients so they can maintain and develop the platforms internally, should they want.

“We don’t want to own or define standards. We will provide the technology foundation for the industry to do so in an open way. We don’t want clients to be locked into us any more than they are locked into anyone else, and thus we provide source code to our clients,” he says.

This isn’t the first time abstraction has been on the agenda—various groups have tried this approach in the past, with limited success—but Roche says the difference is a new sense of urgency

“We’re not trying to replace TREP; we’re building software for the market to transform itself—and we think we can drastically accelerate that transformation at dramatically reduced cost.”

Terry Roche, Pegasus Enterprise Solutions

as firms become uneasy about their current platforms and feeds. And a big part of what’s making people uneasy is, well, people.

Brain Drain?

Much of Pegasus’ value is tied up in the experience of its founders, and Roche views the united front of himself, Bonaguro, and Stephens as something of a coup. “If you’re a user of an enterprise platform, or an entitlements platform, it’s likely you’re using something we have built in the past,” he says. “We’ve spent decades—not just years—understanding these solutions and tackling the needs of the market. We understand, because we’ve lived the lives of service providers and data and liquidity consumers.”

This is another factor that has led to concern among consumers over Refinitiv. Because while Pegasus is touting its experienced staff, sources say Refinitiv has been losing its own expert sales and support staff, including a number of redundancies at its Oak Brook, Ill., office—widely viewed as the “brain trust” behind TREP.

“TREP is the beast of Wall Street. You need it. But they’ve lost a lot of good people and salespeople, and it’s hard to recover from that. There are not a lot of experts in this field,” says one executive at a large US bank.

Mazzocchi acknowledges some “consolidation” of roles at the location, but says this mostly accounted for instances where overlap existed between roles there and at its campus in St. Louis, MO, in areas such as quality assurance, and that the core team remains in place.

“We’re aware of our customers and their concerns. But the key decision-makers and the key people writing code have been retained. They were not let go,” Mazzocchi says. “We’ve trimmed some fat, not cut to the bone.”

And even some of Refinitiv’s rivals acknowledge that, whether or not some firms get cold feet, the future of multiple platforms and ecosystems they envisage is one that still incorporates TREP, and definitely still relies on Refinitiv’s data—that support for 84 million-plus instruments that is the “jewel in the crown” of the vendor’s assets, which would be tough for anyone else to replicate, Mazzocchi says.

“I think TREP will be around for the next 20 years, because it is doing a good job in many places,” says BCC’s Gonzalez Evans. “But once in the cloud, clients can cherry-pick. And vendors will have no choice but to compete on the quality of their data, rather than on selling technology.”

Certainly, TREP and its predecessors were never devised to lock clients in to Refinitiv’s data, but to solve the challenges of getting market data from A to B when similar data transport mechanisms simply didn’t exist. And almost certainly, if industry-standard, cloud-based technologies emerge that can perform that task more cost effectively, Refinitiv will also ultimately stand to gain from adopting those practices over time.

Clients’ concerns over “legacy” on site-deployed data platforms is really just exposing their reliance on old-school practices. Once firms are willing to commit to entertaining new approaches, all providers—no doubt including Refinitiv—will be ready to fulfill those needs. [WT](#)



Terry Roche
Pegasus
Enterprise
Solutions



“Data Mining Is Bulls**t”

As the saying goes, ‘Bad data in, bad data out.’ With the growth of alternative datasets in the capital markets, firms are struggling to find value, and are disillusioned by the loss of time, human capital, and money. Goldman Sachs’ Matthew Rothman believes this has created a situation where vendors and buy-side firms are promising vast riches, but much of that talk, he says, is BS. As you might expect, not everyone agrees. By Rebecca Natale

“Are you willing to take the risk of investing in bullshit? Or do you think that by not investing in what might be bullshit, you’re leaving alpha on the table, and you’re going to lose to the people who are more comfortable, potentially, investing in bullshit—or found something that’s just really cool—and [that] your minds are really shallow?”

This is the controversial question posed by Matthew Rothman, a managing director at Goldman Sachs, during his opening presentation—*Data Mining: The (un)Original Sin*—at the Quandl Data Conference on January 23 in New York.

Like alternative data, his talk even had its own backstory: It was originally titled “Data Mining: The Second Oldest Profession”—a coy reference to prostitution being the first. Unsurprisingly, the idea didn’t fly with the bank’s compliance department.

Next, he tried his luck at naming it “Data Mining By Dummies”—a play on the real book, *Data Mining For Dummies*—but compliance didn’t seem to like that one any better. In a third attempt, he vied for “The Astrology of Finance: Unlocking Patterns in Nonstationary Data with Machine Learning,” before realizing that was the

actual title of an upcoming talk someone was planning to give during an IBM plenary session.

“And then I was going to name it ‘On Hogwash’—there’s another word [for that]. We’ll just say it once: bullshit—‘In Empirical Analysis and Finance.’ ... That really is the true topic, the true title of this talk,” Rothman said.

When he first started out in the industry as a research associate at Goldman Sachs Asset Management in 2001, the worst thing you could call someone



“I don’t really think that we have a problem in finance of people producing things that they know are just wrong and putting them in their models. I think there’s a problem of people not knowing anything about data or science—and so they produce bullshit.”
Matthew Rothman, Goldman Sachs

was a “data miner,” Rothman said. Now, firms have carved out specific roles for the practice, such as the hedge funds who now hire “data hunters,” who are to tasked with finding new and unique datasets—a byproduct of the alternative

data boom, which has created a world where anyone can access practically any kind of data they want, Rothman said. If you don’t already have the data you want, he added, it’s only because you haven’t looked hard enough.

But while having all the data in the world at your fingertips is an enticing thought, it’s not necessarily useful—or even a good thing.

Investors, asset managers, and hedge funds have flocked to alt data—a trend driven by FOMO, otherwise known as the fear of missing out, Rothman said—in pursuit of increasingly elusive alpha. But in their quests, many realize there is no “there” there.

Regardless, the toil continues. Outlandish datasets are a burgeoning area of research for financial markets participants. For example, face width-to-height ratios can indicate a portfolio manager’s tendencies toward unnecessary risk-taking, according to a study by Yan Lu of the University of Central Florida, and Melvyn Teo of Singapore Management University, which has been downloaded more than 3,800 times. Rothman attributes this, along with the shift in the dirty-word status of “data miner,” to firms’ newfound willingness to accept type-one errors,



or errors that generate positive results despite being clearly false.

“I don’t really think that we have a problem in finance of people producing things that they know are just wrong and putting them in their models,” Rothman said. “I think there’s a problem of people not knowing anything about data or science—and so they produce bullshit.”

To illustrate his point, Rothman offered up a half-dozen datasets, including one involving penis size correlated to a country’s GDP growth over the long-term, which is a real dataset, but here are three austere examples, with two that are real, and one that is fake: First, in 2003, Cesare Robotti, professor of finance at Warwick Business School, and Boston College’s Anna Krivelyova published a paper that found that unusually high geomagnetic activity is associated with negative stock index returns—5.5% lower—even after controlling for other calendar effects across international markets (real).

“**It’s not just: ‘I’m going to make a big stew, and take every piece of crap that I can find in the kitchen cupboard, throw it in there and hope it tastes good at the end.’ It won’t taste good because you’re putting licorice in with fucking kidney beans.”**

Alexander Fleiss, Rebellion Research

Second, a 2009 study led by Cambridge neuroscientist John Coates found that the traders at a major high-frequency trading firm in London whose index fingers were relatively shorter than the ring finger earned 5.4 times the profit than their inverse colleagues, controlling for age and experience (real).

Finally, a 2017 working paper by MIT concluded that nations in which country singer Shania Twain had at least two local Billboard-charting songs from 1995 to 2002 saw GDP growth rates 2.6 times

higher on average over those years, compared to countries where she did not top the music charts (fake).

“The only one that actually has some real economic story is actual bullshit,” Rothman said. “So on that, I conclude—be diligent, be skeptical, and be wary of bullshit.”

Data Stew

The problem isn’t necessarily a question of selecting the best alt data vendor or analytics platform; rather, the heart of the issue is not having the faintest idea what you’re looking for or what you want to prove, says Alexander Fleiss, co-founder and CEO of quant hedge fund Rebellion Research. Fleiss, also an adjunct professor teaching artificial intelligence and machine learning at Cornell Financial Engineering Manhattan, “100%” agrees with the view that finance as a whole is undereducated in data and science. As a result, many so-called data-mining exercises prove to be futile efforts.



All too often, he says, he comes across students and engineers—“brilliant kids”—who don’t have clear objectives for their data and their algos, and because of that, their projects fail.

“They throw in every piece of junk they can think of, and in the end, they get a piece of junk,” Fleiss tells *WatersTechnology*. “It’s not just: ‘I’m going to make a big stew, and take every piece of crap that I can find in the kitchen cupboard, throw it in there and hope it tastes good at the end.’ It won’t taste good because you’re putting licorice in with fucking kidney beans.”

That said, alpha has to be found somehow. And sometimes, traders and portfolio managers do put some faith in riskier, unconventional datasets. To illustrate the point, he gives the example of a portfolio manager who’s stuck a lot of their position on arts-and-crafts company Michaels. A data vendor comes along and offers real-time data

on the business’ returns. In looking at that data, the portfolio manager decides those returns are highly correlated with XYZ and takes a position based on that information.

“Is that outlandish? Kind of. Will that guy survive? Maybe not. Will he pay a lot for it? Probably. Would he have 40 years ago? Maybe not—but now it’s harder to find alpha,” Fleiss says.

A Rebuttal

Suvrat Bansal, chief data officer and head of innovation at UBS Asset Management, who has a long history working on big-data endeavors at buy-side firms, rejects the theory that FOMO runs amok on the buy side, along with the view that finance has a data science knowledge problem. Rather, he believes the issue is that firms are still learning how to incorporate these new sources of information—particularly smaller firms and newcomers, which have long journeys

ahead to unlock full value. But when managed properly, these datasets do hold a lot of promise.

The first thing the science and data field teaches the industry, he says, is that correlations are not causations. If they were the same, everyone could start making money on correlations. Despite that, markets are ripe for disruption, resulting in not only information overload, but requiring new means of interpreting that information.

“At the end of the day, long-term returns speak to the value. The dynamics in the market right now are changing,” says Bansal. “Based on traditional value drivers, Walmart should have never been displaced by companies like Amazon. When you look at the macroeconomic drivers and the changing digital space, I think you have to say, ‘Look, while I don’t know exactly which factors are transpiring for me to understand what is the future of a high-value company, which has reigned in the market for 20 years, I have to first start with being open [to new data].’ That doesn’t mean you draw correlations and start shorting or longing Walmart.”

For asset managers with a long-term focus, the strongest use-case for alt data is as another form of research, which can add context to—and validate—broader fundamentals, Bansal says. One area of focus for him is climate awareness and sustainability. In a recent discussion with an academic about companies’ physical and transition risks—i.e., the change in assets’ value in a low-carbon economy scenario—the pair concluded that every company is exposed when it comes to weather and data, making mining for that data crucial.

“If you do not understand that data, which has nothing to do with your fundamental data, how would we ever understand that?” says Bansal, referring to the exposure of each company to physical and transitional risk, which he believes is so crucial to understand that it basically makes the subset of alt data, fundamental.

Asked whether he thinks data mining is bullshit, he responds that it’s “kind of catchy to say these things,” but “it goes to the very discipline of what finance does as a field.”

Though he doesn't see FOMO prevailing within the buy side, Bansal says alt data has allowed traders and investors to trust previously unreliable data. For example, in the energy market, in which certain countries are suspected to be fudging reports when it comes to how much oil they're transporting or how full their containers are, data sources such as satellite imagery and shipment weights have alleviated some of those concerns.

"I want to go after the truth; I want to go after fully understanding what's moving this company or this sector of the market," Bansal says. "And wherever I do not fully trust official sources, I want to really try to leverage alternative data and data science techniques to extract an independent view."

Finance and Science: Strange Bedfellows

Most people who have taken a statistics class know that correlation and causation are not the same thing. But humans are wired to seek out patterns and dissect them. That same instinct is the one that compels people to see images of Jesus in potato chips—or ill-fated gorillas in Cheetos, in the case of one individual, who paid \$99,900 for a single Cheeto because it resembled the now-infamous Harambe. And it can come into play amid the limitless influx of new datasets.

If you disagree with Rothman and Fleiss that finance's problem is a data and science knowledge gap, and also disagree with Bansal that the majority of asset managers aren't being played by "bullshit" data, then you might agree with Jay Finkelman, professor and chair of industrial-organizational business psychology at the Chicago School of Professional Psychology, who says the worlds of finance and science are diametrically opposed.

"[In science], if there's more than a 5% chance that something may not be true, you don't publish it because that could be embarrassing. In finance, you may have to shift those around because fame goes to those who call things correctly, and people tend to forget about the missteps," Finkelman says. "They're in a fast-moving market where you have to stay ahead. And the risk of letting something hot escape you is probably



Jay Finkelman
Chicago School
of Professional
Psychology

perceived as a greater risk than the risk of making a mistake."

Of course, no one smiles on those who lose millions of dollars of other people's money, and the reputational damage that comes with making mistakes is huge. Still, those blunders don't typically disqualify market participants from playing the game. Finkelman points to another example: History remembers who called the last downturn, especially if no one was listening, but it will forget all the wrong calls in between.

Anyone looking at information or data sources, in general, is unconsciously using principles of cognitive consonance and cognitive dissonance, Finkelman says, meaning they're more receptive to things that are consistent with their own worldview and more hostile toward what isn't. It's a defense mechanism that protects oneself from information overload. In a sea of data, it's easy for traders to select information to prove their hypothesis—full-fat ice cream consumption correlates to Treasury yields, but that can fail to take in a range of other, vital information that could potentially reject that theory, or better explain why the two track together.

It's also why, in searching for a signal, a more intuitive idea doesn't always work either, noted Goldman's Rothman, who declined to expand on his talk. There's an idea that if you obtained the history of Equal Employment Opportunity Commission (EEOC) complaints by organization—which are available from vendors or via a Freedom of Information Act request—the signal would be that companies with more complaints filed against them would have more hostile

work environments, and therefore, are low-quality companies that will get negative publicity.

"Makes perfect sense on the face of it," Rothman said during his talk. "But there's a bit of a problem here. You have a big [censoring of data] problem, and you have a huge bias into what's actually going into that dataset. Think about it: The complaints that have a high likelihood of having the most damaging and egregious information ... as we all know, never see the light of day—they all get settled with NDAs. ... So what you end up [with] is that companies that should have the lowest promise—the lowest score on your measure—aren't anywhere in there and might actually appear good."

A skilled data skeptic would see additional problems with that dataset. Mike Chen, director of portfolio management at PanAgora Asset Management, says there are even more issues to parse with that example—the need to correct for size, industry, and the nature of different job roles, are among just some of them. However, he adds, not accounting for those types of things is a common mistake.

"Because there's so much variety and volume, you can pretty much have anything you want to have confirmed, confirmed. So therein lies the danger: A, do you know what you're doing? And B, are you being honest with yourself? I think, sometimes, you're so hoping your hypothesis to be right, you believe it, so you see it," he says.

Though yes, portfolio managers, data scientists, and analysts do have to follow their intuition right up until they find out whether they're right or



Philip Brittan
Crux Informatics

Make of It What You Will

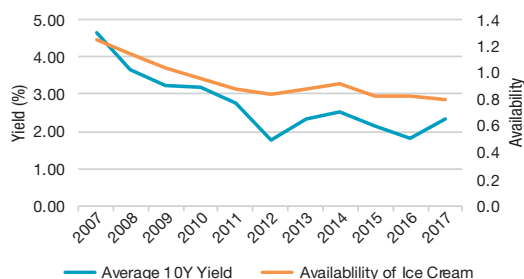
WatersTechnology asked Tradeweb, which operates trading platforms in fixed income, money markets, and ETFs, and trades more than \$800 billion per day, to look at clearly spurious data points that could correlate with yields, and—hypothetically, as Tradeweb is not in the business of offering investment advice—how those findings could be used.

Tradeweb's head of research, Jonathan Rick, looked at average daily Treasury yields alongside reports from the US dairy industry. In summary, as Treasury yields have fallen, so has the consumption of full-fat ice cream (Chart 1), while low-fat ice cream has seen rising demand (Chart 2); Americans are eating more butter (Chart 3); and Treasury yields seem to move in lockstep with availability of sherbet (Chart 4).

"Obviously, we hazard against drawing conclusions about Treasury yields from dairy data," Rick says. "If you were, though, then other things to consider would be crop and dairy production reports, or issues with supply lines. If you're really keen, you could look at satellite imaging and analyze supply-chain blockchains to determine which products might be produced. There are also qualitative signals to consider—like whether everyone you know has gone keto, or whether *The New York Times*' recipe website has pivoted toward dairy alternatives."

There probably won't ever be a consensus on whether unearthing the most unique and outlandish of data is useful for finance or not—but from a theoretical perspective, the correlations are limitless.

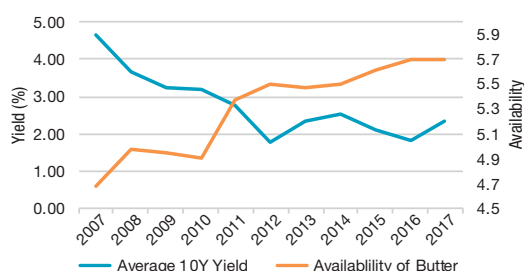
1. As yields have fallen full fat ice cream consumption has declined



2. While low-fat increase has generally seen rising demand



3. As yields have fallen, butter has become more available



4. Sherbet availability moves in near lockstep with average daily Treasury yields



“

“Because there’s so much variety and volume, you can pretty much have anything you want to have confirmed, confirmed. So therein lies the danger: A, do you know what you’re doing? And B, are you being honest with yourself? I think, sometimes, you’re so hoping your hypothesis to be right, you believe it, so you see it.” **Mike Chen, PanAgora Asset Management**

wrong, they should be able to validate (or invalidate) that intuition along the way through a concept called ancillary testing—a traditionally medical term reserved to describe a wide range of diagnostic tests. If fewer complaints truly led to better workplaces, then one should also see, for example, higher average ratings on employment feedback websites, employees taking fewer sick days, and higher profit margins from high productivity.

And it can’t be overstated that different factors can make for odd bed fellows, but that doesn’t mean, “Buy, buy, buy!” There’s a famous correlation that says the amount of butter churn in Bangladesh is 99.9% correlated with the S&P 500—it’s an investment correlation that has been largely debunked. The fact is that data in capable hands is power, Chen says. If you can construct the right hypothesis and run the right statistical tests, you’re better off—but that’s a big “if.”

‘Really, Absolutely No Idea’

Others take the view that it doesn’t actually matter whether the data is good or bad, useful or not, because it’s always going to be subjective. The key to evaluating all of it in order to decide which of those categories data falls into for yourself is having the ability to onboard and process it at scale—a lofty task that data management and engineering firm Crux Informatics is looking to tackle. The startup counts Goldman Sachs, Citi, and Two Sigma as investors.

Philip Brittan, Crux’s CEO, says firms he talks to—primarily hedge funds—tell him that only about 10% of datasets they look at actually have some kind of value, leaving money, time, and effort wasted most of the time. (It’s worth noting that PanAgora’s Chen found

that figure a bit high, estimating that between 5% and 10% of alt datasets he comes across are useful.) So even though a firm incorporates a scientific process, two people can look at the same dataset and derive completely different levels of value. On top of that, in the hedge fund world, which promises high rewards for high risks, the pressure is heaviest.

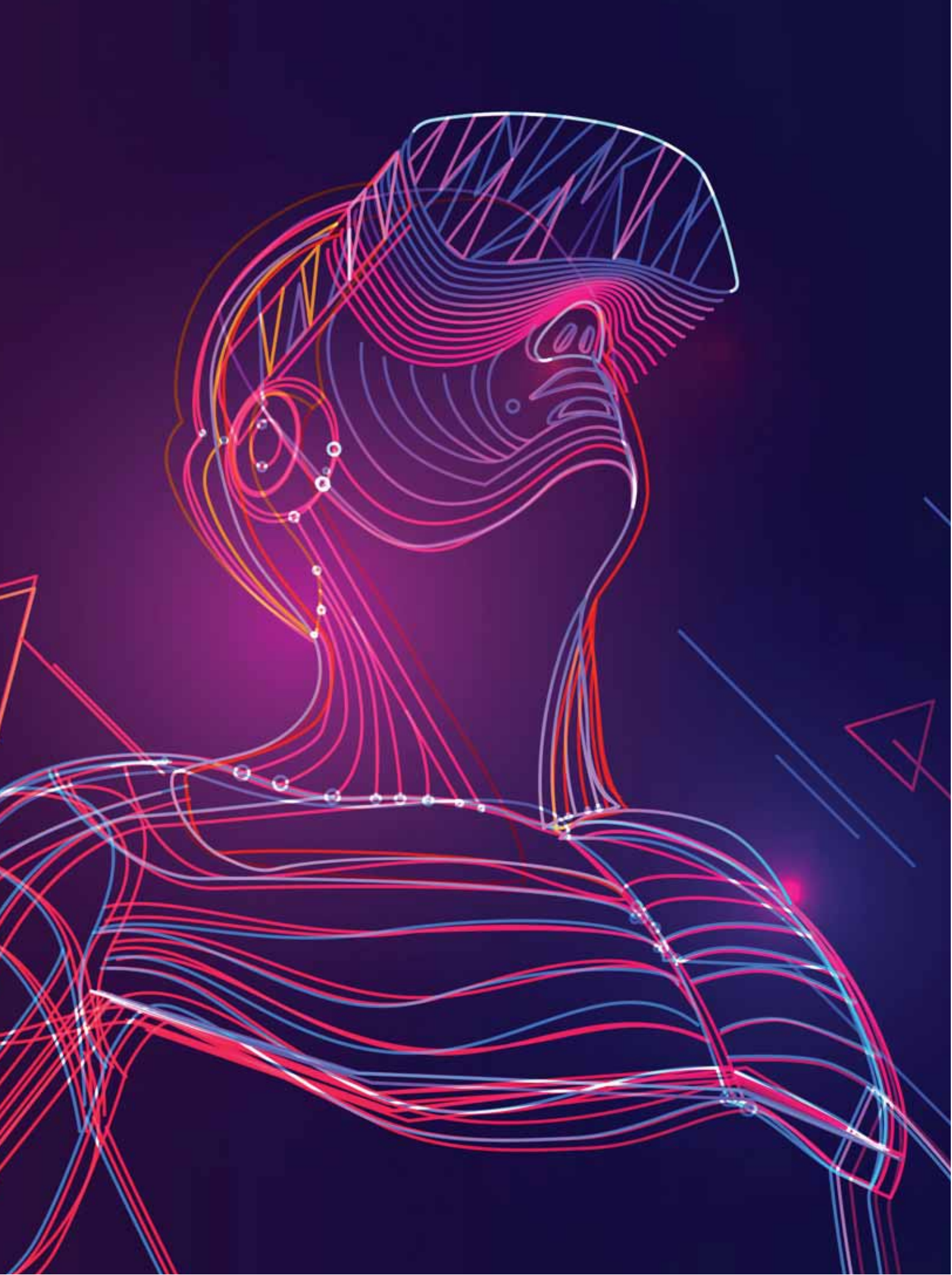
“People don’t want to overlook anything. But they are coming to the realization that useful data are really needles in haystacks, and you go through a lot of hay before you find a needle,” Brittan says.

And to find a needle, two questions must be answered: Does it have predictive power and add alpha? And is it novel compared to other data a trader might have access to?

While the questions seem black and white, the answers rarely are—that’s why some alt data vendors, like geo-spatial data provider Thasos Group, are shrinking, consolidating, or going out of business, Brittan says. The market can’t hold too many entities of a uncertain value.

Still, according to statistics provided by alternativedata.org, the alt data market is expected to be worth \$350 million in 2020, and 78% of firms use or expect to use alt data (up from 52% in 2016). Bullshit or not, there are plenty of buyers in this market.

There’s a metaphor that says data is the new oil, and you need to mine that data to find the valuable oil. But maybe data-as-manure is actually the more apt: When combined effectively with scientific methods, it can be used to improve crop production and soil quality; it can be used as an energy source and even as a material to help build structures. Not all shit is bad ... the key lies in knowing your shit and how to use it. **WT**



Game On

Capital markets firms are continually looking for new ways to package and visualize a rising tide of information. It turns out there's another industry looking to handle the same challenge—the video game industry. **Wei-Shen Wong** reports that a crossover is afoot.

The 2019 *League of Legends* World Championship Series drew a peak viewership of 3.9 million people. The *Fortnite* World Cup Finals pulled in a peak of 2.3 million. While those numbers are dwarfed by football's Super Bowl or soccer's Champions League Final, the popularity of e-sports is growing exponentially, as is investment in the field.

A recent *Washington Post* article noted that between 2010 and 2020, "annual game industry revenue grew from \$78 billion to \$137 billion—more than either Hollywood or the American music industry," and that "as Netflix put it in its fourth quarter 2018 letter to shareholders, 'We compete with (and lose to) Fortnite more than HBO,'" referring to the popular online video game and the US premium television network that aired *Game of Thrones*.

As more money has entered the space, video game makers have used that investment to improve their products. First, there's the player experience. The gaming industry has been at the bleeding edge when it comes to visualization, texture, and resolution techniques for maps and game play. The ability to track movements of numerous players in real-time has also improved. Additionally, the viewer experience has been vastly enhanced as the likes of *League of Legends*, *Fortnite*, *Counter-Strike*, and *Ovenwatch* have worked diligently to make it easier to reconstruct a match, provide deeper pre- and post-match statistics and charts, show where on a map a particular player gets most of their kills, and how players compare to their peers.

Visualization, mapping, charting, real-time statistics, pre- and post-match statistics—sound familiar? As more money has funneled into the world of

e-sports, the gaming industry has poured that investment back into the player and user experience, and capital markets firms are taking notice.

Consider this: What attributes make for an elite gamer? Hand-eye coordination and stamina—their mechanics—are certainly vital, but they also need to take in an array of inputs, distill that information, and make rapid-fire decisions. They need to be able to keep

“Gamers typically spend hours trying to figure out the new stuff in the game, or the loophole in the game to leverage, and that links back to how traders try to think outside the box to find a loophole, or where the alpha might lie, for example.”

Sanjna Parasrampuria, Refinitiv Labs

calm—what's known as having “good mental”—and they need to be efficient in chaotic environments. Many—if not all—of those traits are also found in elite traders.

Comparing a kid playing Nintendo Switch to a professional e-sports gamer is like comparing a kid looking at stocks in a newspaper to the head of equities trading at a bulge-bracket firm. Gamers and traders both work in stressful, competitive, and volatile environments. And the best of these professionals can find patterns where others cannot, says Sanjna Parasrampuria, head of applied innovation at Refinitiv Labs in Asia.

“Gamers typically spend hours trying to figure out the new stuff in the game, or the loophole in the game to leverage,

and that links back to how traders try to think outside the box to find a loophole, or where the alpha might lie, for example,” she says.

According to numerous scientific studies, those who play video games tend to have better memory, attention, and visuospatial skills—the ability to represent, analyze, and mentally manipulate objects. *Positive Effects of Videogame Use on Visuospatial Competencies: The Impact of Visualization Style in Preadolescents and Adolescents* published in 2019 by Luca Milani, Serena Grumi, and Paola Di Blasio is a good summary of this phenomenon.

While video games and the world of institutional finance haven't yet collided in a meaningful way, some in the capital markets are looking to tap into aspects of the gaming world, specifically around visualization techniques. However, integrating the two worlds may not come easily, depending on how banks want to use these gaming advancements.

A Different Game

One video game company making inroads into finance is Epic Games, the creator of the massively popular online game *Fortnite*, which runs on the Unreal Engine, a cutting-edge gaming engine written in C++.

Craig Laliberte, who oversees Unreal Engine business development at Epic Games, tells *WatersTechnology* that the company is using the engine to provide a platform for financial institutions—among other industries—to prototype new methods of visualizing their data in immersive environments.

“The open architecture and Blueprint Visual Scripting (the gameplay scripting system inside the Unreal Engine) are key to giving them an out-of-the-box



Sanjna Parasrampuria
Refinitiv Labs



“Visualizing this simulated data, and then using it as a resource to train AI models, could be an exciting new approach for the banking sector.” Craig Laliberte, Epic Games

platform to build upon, without the need to write applications from the ground up,” he explains.

Laliberte says his team is looking to build on the way it incorporates real-world inputs for other industries, and banking is an obvious area of expansion. “Visualizing this simulated data, and then using it as a resource to train artificial intelligence models, could be an exciting new approach for the banking sector,” he says.

Game engines provide the ability to visualize big data in new ways, freeing companies to think outside of the box. “Teams no longer have to settle for simple charts and graphs; instead, now they have the ability to map data with creative and comprehensive 3D visualizations,” he says.

Immersive environments allow users to process information spatially, which is how humans naturally digest data in the real world. He says immersive environments make for a quicker, more collaborative way of learning and decision-making than what can be achieved through two-dimensional screens and linear methods alone.

While gaming offers the ability to crunch data and visualize actionable information quickly and easily, this doesn't mean that development stops there. Epic's Unreal Engine enterprise team is continuing to add new features to support non-game initiatives, Laliberte says. It is working on adding Python scripting, as well as new visual data prep, which, he says, will provide users with more functionality.

‘Truly Immersive’

Bank of America (BoFA) is one of those companies currently experimenting with the Unreal Engine for trading. BoFA turned to a video game company



Craig Laliberte
Epic Games

because of its ability to render information in real time, according to David Reilly, chief information officer at the BoFA's global banking and markets group.

“And they do that over a public network through the internet, into people's homes, and there's no latency—there's no lag. And it's immersive—it's truly immersive,” he said, while speaking at last year's Waters USA conference on December 3.

The bank is working on a prototype using the Unreal Engine that could be applied to the trading floor.

Reilly said the trading world is due for a shake-up, and the way traders consume information needs to change. “A two-dimensional rendering of what's happening on your trading floor—we don't think in time that is how it's going to work,” he said.

Although the prototype is still a work in progress, in theory, the platform could show each trading desk on a single screen. So, for example, the bank is looking to create a three-dimensional bar that pops up in red to show when a trader is taking on a significant amount of risk. This could help the trade manager decide whether to step in or not.

“So, now we can present the information to you in a way where quickly you can say, ‘That's pretty much what I would have expected,’ or, ‘no it isn't, I need to go check that out,’” Reilly said.

The bank aims to have a prototype rolled out this year, though it declined to add further comment for this story.

However, beyond incorporating a three-dimensional view of trading infor-

mation, Reilly foresees a product that also includes other senses beyond sight. For example, there could be a tone that speeds up to mimic an accelerated heart rate, or an actual pulsating sensation delivered through a chair, keyboard, or wearable. After all, while video games are primarily visual, there are strong audio and tactile components that add to the experience and convey information.

“What are the different ways for a trader to absorb information? We don't think it's just going to be visual. We think there will be an audio supplement to it as well,” Reilly said. “All of that is coming from the experience we've had with the gaming companies. It's very early days, but the great thing about it is when you present that to someone, right away they know how to interpret the information. There's no training. You don't have to explain how to do it. You don't have to explain how the spreadsheet works, or how the terminal works. It's immediately immersive, and the conversation we start to have is what works in terms of you—the individual: How do you want to consume that information? And that might be different from your colleague in London or in Tokyo.”

The Net Effect

One of the big reasons why firms have been looking at new data visualization techniques is because there's simply more data available. The explosion of the alternative data market, when combined with market and reference data, can create an overwhelming firehose of information that traders need to distill quickly.



John Lin
Grasshopper

Bringing Financial Tech Outside

When it comes to gaming technology, it's not a one-way street, as techniques used in the capital markets have found their way into the world of gambling. Take, for example, Nasdaq's Longitude tool, a Pari-mutuel calculation system that facilitates the trading of financial contracts on economic events. Longitude looks to give investors a hedging opportunity in advance of market-moving events.

Pari-mutuel models place bets into a pool, and payouts are distributed among winning votes. The system looks at an event and deconstructs it into a large number of mutually exclusive outcomes. The platform has since been re-engineered and expanded for horse racing and sports betting. Among its users is the famed Hong Kong Jockey Club, which uses Longitude for its Pari-mutuel calculations.

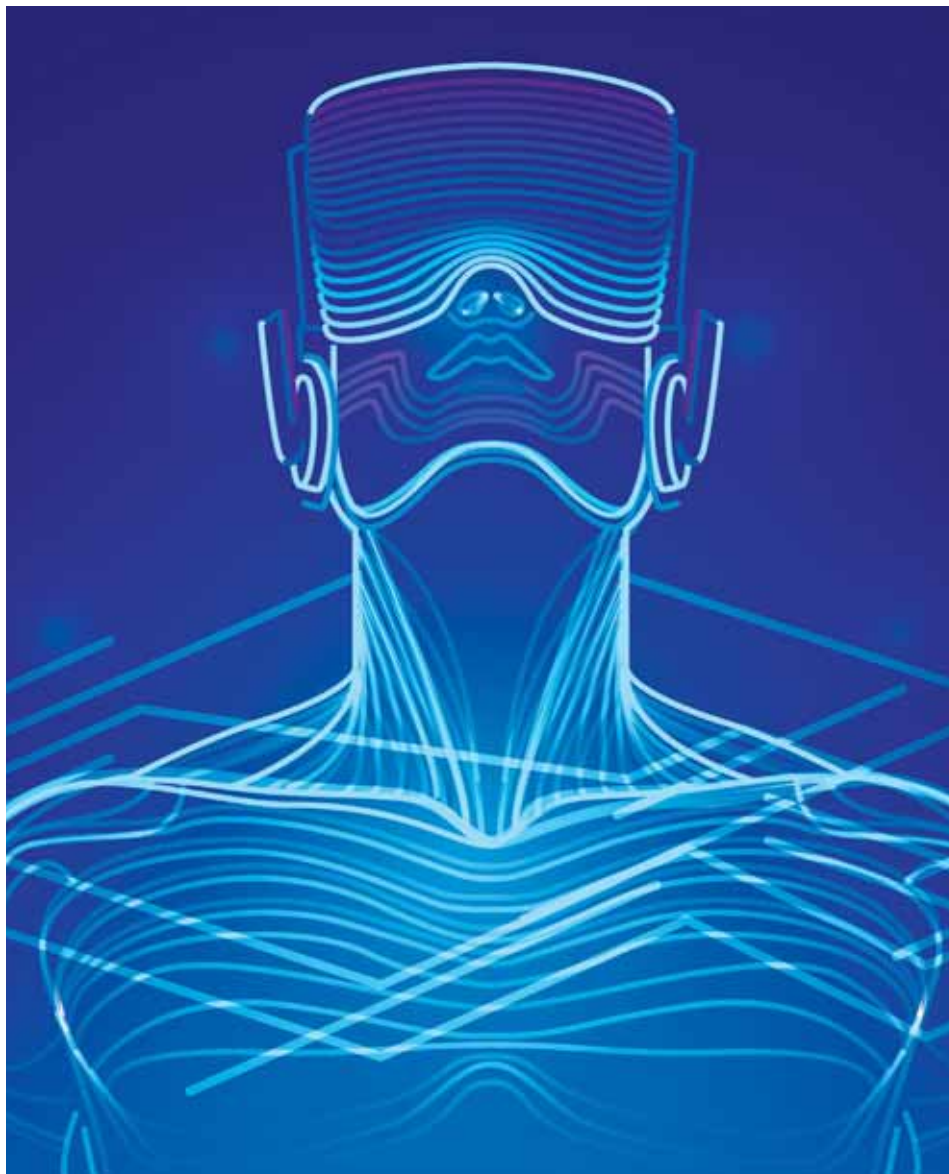
Patrons can place large bets without having as significant an

impact on the odds compared to more traditional betting systems. The platform also allows operators to offer a wider variety of bet types, such as exotic, international, and user-defined slips, without needing to create new betting pools.

Inversely, this model is applicable to financial markets, as well. It allows participants to take direct exposure to future events that they don't have access to now, except through proxy strategies. The framework can be customized and can include binary payout structures or traditional options payout structures.

One of the potential use-cases for this is trading customized options on indices and economic statistics. Also, users could structure positions directly correlated to the value of an underlying product—such as quarterly earnings or the sum of a dividend basket—and gain exposure to fluctuations in those values. The Pari-mutuel framework eliminates the noise associated with other factors that may impact traditional proxy strategies.

Longitude uses the latest Nvidia graphical processing units that are also used in the gaming industry.



John Lin, CEO of proprietary trading firm Grasshopper, believes the next wave of gamification technology will work off of data and be very potent. “We have too much data,” he says. “Turning data into information is the key catalyst.”

Traders actually sitting at a desk looking at a 2D screen will, to some extent, fade away, Lin believes. However, there are steps where human interaction is useful, so the “experience,” he says, becomes more about representing mission-critical data into information that is quickly actionable by a human, and that could eventually center around 3D information consumption, even if that’s still a long way off.

Changing the way traders consume information, and trying to make the trading environment more effective and efficient, has been talked about for decades. Indeed, as traders deal with larger, more diverse datasets, which are increasingly provided in unstructured formats, it poses an important question: Is there a need for another way to process and display information?

The fact that the trader workspace is so busy has been talked about for the past two decades, notes Joel Hurewitz, head of sales for Asia-Pacific at Instinet, Nomura’s Asia-Pacific equities execution business.

“They’ve got bells and whistles going off all day. Putting more bells and whis-

ties in—that gives the traders more information, but could it not be more data overload, and in real-time? Traders have enough to worry about. Is adding more going to ultimately make things easier, or harder for them?” he asks. “One of the problems that we and every other broker struggle with is the number of alerts. You may set up alerts to show orders are reaching this or that, but at the end of the day, you get so many alerts you ignore them, or you miss them. The question I would ask is whether adding more alerts will be a net positive or a net negative.”

To Patrick Mohr, executive director at Instinet, the term “gaming technology” could suggest somebody who is adrenaline-driven and constantly reacting to little things popping up on the screen all day long. Of course, traders need real-time information. The best systems will notify traders of big moves, potential moves at a certain probability, and the success rate of the model at predicting outcomes on trades it has not seen previously. According to Mohr, if the term can be expanded to include these perspectives—which essentially represent a more data science-driven approach to trading—then it can be very powerful.

For this reason, Instinet has placed a lot of focus on trying to find patterns across thousands of orders. This is so that, when talking to clients, it can advise them on how to trade, or how to use their algos more effectively.

Mohr’s offering pays attention to the parameter settings that clients are exposed to. He tries to help clients understand if they’re too aggressive, or passive, or whether they should be giving the algo more breadth to maneuver. Rather than incorporating new gamification techniques, Instinet would prefer to incorporate more traditional algorithmic models to help drive alerts.

To do this, the firm uses a decision-tree model to help parse trading data into clusters so it can help clients see what is impacting performance. Every order is screened before Instinet trades it, and the team looks for potential problems with the way clients are using the algos.

“These are all orders that haven’t been executed yet. For example, say it’s a Japan VWAP order that’s 5% of bid and



Joel Hurewitz
Instinet

volume: We have a decision tree to know the parameters and the algo affecting performance,” Mohr says. “We have a statistical measure of how well that tree has explained behavior historically. Then, we summarize all of that information for every single order before it’s been executed. That goes to our sales coverage team. It’s up to them, then, whether or not they want to call our clients and advise that they should change the way they’re using the algo.”



“Everyone’s unique and some people like lights, some people like bells, some people like text messages, or reminders, or emails, or whatever. There’s probably some value there. Just like trying to consolidate all of the different screens that the traders are exposed to—I would agree with that.”

Patrick Mohr, Instinet

Technically, the decision tree could run in real time, but the danger is that there’s already so much noise in the trading data. “If you get into shorter and shorter periods, you’re just yanking people around with stuff that is just like the flavor of the last five minutes,” he says.

Still, Mohr is not totally closed off to the idea of gamer tech seeping into the capital markets; it’s just a question of effectiveness. If there were a platform that consolidated everything and presented information that a trader wants to see in a customized way, that could be valuable, he says.

“Everyone’s unique and some people like lights, some people like bells, some people like text messages, or reminders, or emails, or whatever. There’s probably some value there,” Mohr says. “Just like trying to consolidate all of the different screens that the traders are exposed to—I would agree with that.”

A Different Reality

It’s also impossible to talk about gamer tech and the capital markets without touching on the use of virtual reality (VR) and augmented reality (AR) wearables. The challenge the industry still faces is trying to hook up these flashy new tools to their more traditional trading systems, from order and execution

management systems, to portfolio management systems and analytics platforms.

Refinitiv’s Sanjna says it is one thing to have, for example, 30 years of data, to put it in a sample, run different scenarios on it, and then show the data points coming in and out using advanced tech, but can that really be done in real-time? If a trader still needs to go back to their traditional desktop and place the trade there, that defeats the purpose of incorporating new tools. “All [of] that is not

yet stitched in,” Sanjna says. “There’s a lot of interest, certainly.”

Again, these efforts are not necessarily new. Refinitiv has also tried its hand at creating trader immersion within its Eikon platform. Several years ago, for instance, the company experimented with the HoloLens—Microsoft’s AR headset—to see how data on Eikon could be displayed.

Sanjna says this was done to help Refinitiv experiment with new data visualization techniques, but, in the end, it did not lead to a revolution in the trader experience.

“Is that something which has come to life in the market? I think we’re very far away, from an industry maturity standpoint, in terms of how our back-end systems can actually support these kinds of front-end technologies,” she says.

Similarly, Bloomberg was developing a VR wearable headset that could, in theory, replace traders’ workstations and cut back on the need for multiple screens. Back in 2014, it was working with Facebook’s Oculus unit. Though Bloomberg has yet to produce anything formal, *WatersTechnology* has seen first-hand a demo of this wearable workstation. While it’s currently being used only for marketing purposes, the data and tech giant is still experimenting with the technology.

Mihir Shah, senior director of digital at technology consultancy and services firm Synechron, notes that as the gaming industry has evolved over the decades, from stick-based games to wireless remote controls, to AR and VR visualizations, those advancements will continue to bleed into other industries. “In the current era, AR and VR have great potential for creating some emerging and engaging experiences for trading and other processes across the bank,” Shah says.

While it’s important and useful for the industry to keep on working with new visualization techniques, the big question, according to Refinitiv’s Sanjna, is how much of this can truly be stitched into existing workflows?

“It’s ensuring this doesn’t become like a separate thing that I’m going into, checking out, and then I have to go back in to my original workflow to actually execute,” she says. “So [there are] a lot of steps to take in order to change the experience of how we have traditionally consumed data in capital markets.”

Seeing the Data

It can’t be said enough: It’s still early days when it comes to incorporating these new gamification techniques into the trading ecosystem. *WatersTechnology* reached out to a dozen banks to see if anyone else was exploring gaming technology for data visualization—on background, some said they were not, while others said they were exploring the idea, but weren’t ready to discuss those efforts publicly.

And it’s also notable that BofA is not looking to roll out a fully functioning platform this year; rather, it is merely hoping to create a prototype in 2020, according to Reilly. At the start of this year, there were only two technologists working on the project, and they hadn’t written a single line of code. “It’s all in configuration,” he said.

Yet Reilly said these early efforts would serve as the foundation for future innovation.

“It’s not an obvious thing for us maybe to have done, but it holds real, real promise,” he said. “And it’s that whole point of immediacy and real-time—that’s what we’ve learned from the experience.” **WT**



Patrick Mohr
Instinet

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LEI ON THE EDGE

The financial industry is losing faith in the LEI initiative as regulatory mandates remain patchy, but some see hope in SFTR's unique-issuer LEI. By Mariella Reason

It was supposed to be the “barcode for business”—but the Legal Entity Identifier (LEI) is taking so long to get to a critical mass of adoption that the financial industry is losing faith in the initiative, observers say.

“We are going slow here, and people are perhaps not believing that this could ever be successful as envisioned,” says Allan Grody, president at consultancy Financial InterGroup Advisors. “While we have 1.5 million legal entities [registered for LEI] now, the projections are that anywhere from 40 million to 200 million are needed to complete this project.”

Currently, 1,560,608 entities (as of January 31) have been assigned an LEI—a far cry from the 40 million low estimate that Grody cites, let alone the 200 million some say is needed to build the view of the industry that the code is supposed to facilitate.

The LEI—a 20-digit, alphanumeric code based on ISO standard 17442—was developed after the financial crisis at the behest of the Group of 20, after authorities realized there was no standardized mechanism to relay every piece of the bankrupted Lehman Brothers back to its parent company.

A group of 60 public authorities from around the world set up the Regulatory Oversight Committee in 2013, which, according to recommendations from

the Financial Stability Board (FSB), set up the code and its oversight body, the Global LEI Foundation (GLEIF). The resulting global framework of issuers (called Local Operating Units, or LOUs) overseen by GLEIF is known as the Global LEI System (GLEIS).

The idea was—and still is—that the LEI would be a means of uniquely identifying a legal entity, but particularly financial ones. While any ice cream parlor could get an LEI—as the joke went in the industry for a while—the real point was transparency into the twisted family trees of financial institutions. Never again should administrators take 10 years to pick through the post-Chapter 11 remnants of a global investment bank with 6,000 subsidiaries; never again should counterparties to trades be ignorant that the legal entity they were exposed to was owned by a bank in administration.

And so, unusually for news from the world of reference data, the topic of the LEI generated excitement among industry bodies, regulators, and the media, even making headlines outside the trade press when no less a star than the *Financial Times*' Gillian Tett called it the “bubblegum fix for banks.”

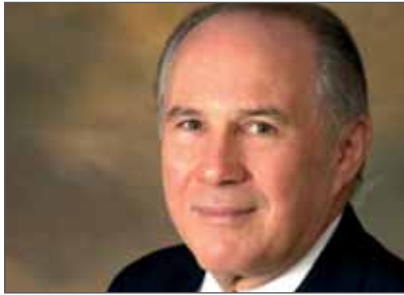
However, some industry observers, like Grody, say the simmering hopes for the LEI have now congealed into a colder reality.

Price to Pay

The fact is that regulatory mandates are the only way to drive full adoption, and regulators across the world have adopted patchy approaches to the code. Regulatory compulsion is necessary because the LEI costs money to register for and maintain. In order to make sure the reference data to which the LEI refers is current, entities have to update their LEI registration annually; LOUs charge not only a registration fee, but also roughly £100 to £200 (\$130 to \$260) per legal entity, depending on the LOU, as fee models differ between these entities. Most sources say they set them on a cost-recovery basis.

As Grody estimated in a research note, the financial industry has spent almost \$500 million registering these 1.5 million LEIs in 200 countries and territories, but “no member is reporting significant cost savings. Industry members are instead reporting that complete adoption of the LEI (GLEIF estimates this at 20 million to 200 million LEIs) is necessary, along with full adoption of [other identifiers] unique product identifiers, unique transaction identifiers, and standard critical data elements for identifying each financial transaction, for these cost savings to be realized.”

If someone told you that you could buy something for £100, but you didn't have to and it wasn't compulsory for your



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“Without solving this accelerating lapsed rate problem, the data quality of the GLEIS database will increasingly become suspect, negating the expected value of the LEI as the best-in-class source for legal entity identification.” Allan Grody, Financial InterGroup Advisors

business, and none of your competitors had bought it, would you buy one? Probably not. So another incentive is needed: the force of regulation. Grody says the crux of the low adoption issue is that critical mass won't be achieved until firms are essentially forced by regulatory mandates to adopt LEIs.

“There is no global regulator with the power to command that everyone does it,” he says; instead, what has happened is that multiple financial regulators have taken their own different approaches.

In Europe, authorities adopted the attitude of “no LEI, no trade” in the second iteration of the Markets in Financial Instruments Directive (Mifid II). That means EU parties to a financial transaction may not act on behalf of counterparties who do not have an identifier. LEI mandates show up in other EU regulations, from the Market Abuse Regulation to the upcoming Securities Financing Transactions Regulation (SFTR). So it's no coincidence that the EU leads the world in LEI adoption.

In fact, Mifid II's dictum saw LEI registration surge so much that regulators allowed a temporary grace period to relieve the burden on LOUs from the flood of new registrants. The year up to July 2018, when Mifid II went into effect, saw nearly half of the total population of LEIs registered. At the end of 2016,

481,522 LEIs had been registered in total; that number had more than doubled to 975,741 by the end of 2017, according to Grody's figures.

In the US, on the other hand, while the Treasury Department's Office of Financial Research, and the Commodity Futures Trading Commission have called for mandatory adoption everywhere, the Securities and Exchange Commission mandates it only in some cases, and the other federal agencies merely “request” it—meaning it's optional.

Catherine Talks, product manager at UnaVista, a subsidiary of London Stock Exchange Group and an LOU, says SFTR may help drive adoption. LEIs are embedded in Esma's SFTR transaction reporting technical standards, she says, in order to identify parties to a transaction. Uniquely, however, counterparties with a reporting obligation under SFTR must provide the LEI of the issuer of the security they are trading on, calling this a point of contention because, especially if you are trading a security outside of Europe, there isn't an obligation for an issuer to get an LEI.

“If you're trading on a US stock or an Asian stock or a Chinese stock, there's currently no obligation for them to get an LEI. So participants may not pay if it's not something they currently need for their own purposes,” Talks says.

Market participants were worried that this rule would impact liquidity, and put pressure on the European Securities and Markets Authority (Esma), which reviewed the requirement. The result was a guidance paper that came out in January this year, which grants a grace period of a year to reporting parties, during which the national competent authorities (NCAs) will accept transaction reports without the LEI of third-country issuers of securities involved in a securities financing transaction.

However, “Esma would expect that the counterparties, as well as the other entities that participate in SFTs ... that lend, borrow or use as collateral securities issued by third-country entities that do not have an LEI, to liaise with those issuers to ensure that they are aware of the requirements under SFTR and are able to further facilitate the use of their securities by the counterparties subject

to SFTR reporting requirements,” the regulator said in a statement in January.

Talks says that once the grace period is over, there will be a hard stop on trading with counterparties without LEIs. “A number of firms have started noting that a year's extension is fantastic,” she says. “But then what do they do after that year?”

Lapsed LEIs

In addition to the issue of slow adoption, firms that have obtained an LEI have not been updating them after their year's registration was over, and so they fall into “lapsed” status. A lapsed LEI might not reflect recent changes in reference data—for example, those caused by corporate actions.

Grody's research note says lapsed LEIs now make up just under a third (29.8%) of all registered LEIs. “Without solving this accelerating lapsed rate problem, the data quality of the GLEIS database will increasingly become suspect, negating the expected value of the LEI as the best-in-class source for legal entity identification,” he says.

Even EU authorities have not wanted to insist on active LEIs, and allow lapsed LEIs to be used in regulatory reporting. The validation rules for SFTR allow “lapsed” or “retired” LEIs in some instances. However, in other parts—mainly the fields where the reporting entity identifies itself—the LEI cannot be lapsed, Talks says.

“If you're a reporting party, your LEI has to be active. This is one of the slightly more contentious things because many of the fields will not allow for a lapsed LEI. If you have a look at the validation rules, in a lot of instances, that LEI has to be in specific statuses to be accepted by the repository,” Talks says. “If you don't report within your timeframe, you're in breach of the regulation and the NCAs won't take kindly to not reporting when you should, because there's been plenty of time to prepare for it.”

Lapsed LEIs could get firms into more trouble with regulators than not having one at all, Talks says.

The GLEIF says in its fourth quarter 2019 report that renewal rates were on average 66.7%, slightly lower than previous quarters, where they hovered around

70%. “At the end of the quarter, 69.2% of all LEIs were in good standing (last quarter: 72.1%),” the report says.

Renewal rates in the US and UK are among the lowest. In the US they were at 55.4%. The UK, the country with the densest concentration of LEI registrations, saw a rate of only 54.2%. The highest reporting nation for the fourth quarter was Japan, at 90%.

A GLEIF spokesperson tells *WatersTechnology*: “Regulations such as Mifid II and Mifir necessitate that financial services firms renew their LEIs annually, but the same does not apply to non-supervised organizations, which are often counterparties. This can cause the issue of lapsed LEIs. The LEI RoC and the FSB have addressed this issue as part of the recommendations contained in a recent FSB peer review report.”

Slow But Steady

Talks says LEI adoption is growing, and will grow more as not only more regulations demand it, but also as it is demanded in more contexts.

“The LEI for issuers is new—it’s a change that issuers have to go out and get this data. As time progresses, we will see wider and wider adoption, much like we have [with the] LEI for counterparty fields.”

OFR director Dino Falaschetti said in a speech last year that the LEI has made amazing progress, growing in a mere eight years from just a twinkle in the FSB’s eye to a reality with 1.5 million registrants.

Falaschetti concedes that “take-up by the largest financial firms is not sufficient to crown LEI a broader success”; but, he says, “evaluated against LEI’s original goal—that is, identifying counterparties where financial stability concerns may arise—we could argue that at 1.5 million, the LEI has already achieved an important milestone. Globally, most large financial firms have LEIs. And identifying those counterparties today is much easier than it was even a decade ago.”

GLEIF CEO Stephan Wolf tells *WatersTechnology* that the LEI provides something unique: a global, standardized way of trusting counterparty information and free tools with which to check the accuracy of the data.

“Please compare this with any other data product that you have in the world. It gives you, the user, flexibility to take care of it: you can decide what to do with the data, the level of trust you associate with it. If you were to buy a data vendor feed, for instance, you would have absolutely no idea about the timeliness of that data.”

Lapsed LEIs still link to useful data, and the lapsed status gives the user more information about whether to trust the information, Wolf says.

Business registries don’t carry all the validated information the LEI database does; some countries don’t even have proper public listings of business information. And all this information is available to download, for free, under



Stephan Wolf
GLEIF

“The figure of 40 million was a rough estimate made in the earliest days of the LEI initiative that was communicated to the public prematurely, says GLEIF’s Stephan Wolf. The figure of 200 million appears to come from an assumption of the number of eligible legal entities in the world based on World Bank data. That number has been repeated throughout industry commentary by various trade bodies as a kind of yardstick for critical mass.

a creative commons license. It is usable not just in trade and transaction reporting, but also in customs declarations and internal processes such as invoicing.

“It’s a multi-purpose tool,” Wolf says. “And what we are trying to do now is extend the reach into other industries to make the LEI a tangible and valuable asset in those industries as well. We started with the banks, but we now want to cover large corporates, cross-border traders, supply-chain firms and health-care firms in the long run.”

In terms of the financial industry, Wolf says the figures for full adoption that analysts tend to quote do not reflect the numbers of entities that should have an LEI, which is probably far lower. The figure of 40 million was a rough estimate made in the earliest days of the LEI

initiative that was communicated to the public prematurely, he says. The figure of 200 million appears to come from an assumption of the number of eligible legal entities in the world based on data from the World Bank, and has been repeated throughout industry commentary by various trade bodies as a kind of yardstick for critical mass.

However, Wolf says the GLEIF is aiming for more like 20 million entities with LEIs. “[That] is based on research that we conducted over the last few years. That translates pretty much into roughly 50% of all companies engaged in international, cross-border trade. The vast majority of companies only work domestically. ... That [20 million] is a pretty ambitious goal, and that will happen in the next five to eight years,” he says.

As for costs, Wolf says the LEI can save the financial industry money. The GLEIF partnered with McKinsey & Co. on a research report published late last year, which found that banks adopting LEI could save at least 10% of total operational costs for client onboarding and trading processes.

“For the broader investment banking industry alone, this would yield savings of over \$150 million annually,” the report said. “Banks in trade financing could save an additional \$500 million per annum overall by using the LEI in the issuance of letters of credit.”

Wolf adds that “the banks have internal costs—data management and shuffling data from left to right, mapping and matching of data. That is an operational cost that [can] be dramatically decreased if the LEI would be deployed everywhere.”

If banks help clients get LEIs, that could become part of their overall service and increase client satisfaction, he adds.

Additionally, Wolf says GLEIF studies have found another potentially huge cost saving for banks. “When consumers want credit, sometimes they don’t have time to wait for the bank to do the due diligence, so banks can lose an average of 15% of business during onboarding because customers don’t want to wait,” he says.

The LEI can also help save money in compliance fees, lower regulatory risk and fewer sanctions from regulators, he says. [wt](#)

Transforming NLP

The evolution of natural language processing is rapidly progressing. Jo Wright takes a look at BERT, one of the more game-changing innovations that is helping to transform the field of machine learning in the capital markets.



It's the ultimate, groan-inducing dad joke: Where do horses go to school?

Answer: Hayvard.

Is it a funny joke? That is debatable. But it is an impressive one, because it wasn't actually cracked by someone's dad, but by a conversational agent, otherwise known as a chatbot. Specifically, the joke was told by Google's new bot, Meena.

Google published a paper outlining Meena's development in January, but did not make Meena available to chat to the public, saying the bot would be tested for bias before it is unleashed upon the world

(We know it can tell jokes because Google released screenshots of an interaction Meena had with a human).

In a blog post that accompanied the research paper, Google said Meena is supposed to be able to chat about anything a user wants, comprehensibly and specifically. Chatbots generally perform well as long as users don't expect them to stray beyond their intended line of questioning, the blog says, but Meena is just like talking to a person.

Incidentally, one bot already lays claim to the unofficial title of "best

bot in the world": Mitsuku, a five-time winner of the Loebner Prize, which is awarded to computer programs that are perceived by a judging panel to be the most human-like. When I asked Mitsuku, which has passed multiple Turing tests, if Meena would oust her from her spot, she said: "Unfortunately, Meena is unavailable to talk and so I can't say whether it is as good as Google claims."

Mitsuku has a point, one that has been echoed by human critics, who are skeptical about its performance

when they can't see its code or even speak to it. Still, the tech giant probably won't open-source the bot's code any time soon: At an estimated cost of \$1.5 million to train, Meena is valuable IP. However, Google has been generous with other releases in the past, and these are revolutionizing the field of natural-language processing (NLP).

Meena is based on an architecture called a transformer. In 2018, Google released a model that is also transformer-based called BERT—or Bidirectional Encoder Representations from Transformers—which has been a game-changer in the field.

When Google published BERT, it supplied the code and downloadable versions of the model already pre-trained on Wikipedia and a dataset called the BookCorpus—about 3 million words in total. Anyone could download and run the model without having to duplicate the costly and energy-intensive process of training it, so companies that offer NLP products and services have been able to update their offerings to transformer models, for increased efficiency and speed.

“BERT is a general-purpose language model, so its benefit is that it's not based on financial information, or any other kind of specific information,” says Elena Treshcheva, business development manager and researcher at Exactpro. “The model is built in such a way that it can be re-used for building other machine-learning models.”

Because BERT is a pre-trained model, “the only thing we have to do is fine-tune it using relatively small datasets of financial data, which is not such a big task,” Treshcheva says.

Thanks to the open-source movement in the field of NLP, vendors and data providers in the capital markets space are now able to experiment with newer and more sophisticated techniques, which has the trickle-down benefit of better products for banks and asset managers to incorporate into their investment processes and regulatory needs. As more text sources become available to train NLP models, companies are able to run more interesting experiments. To articulate this trend, *WatersTechnology* looks at how Refinitiv

“The field is bigger than it used to be, so when a transformation 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, Bloomberg

and Bloomberg are incorporating NLP into their product lines. But first, it's important to understand how we got here.

The ABCs of NLP

BERT has had a major impact on the field of NLP since 2018, but it's not the first major advance. The most important innovation in recent times was the introduction of Word2Vec in 2013, which is a set of shallow neural networks. Prior to Word2Vec, the field had been dominated by support vector machines, supervised learning models used mainly for data classification. Word2Vec's major advance was that it could represent words as vectors, or lists of numbers, capturing the semantic characteristics of words to make language understandable to a machine.

That was a major breakthrough for NLP, and at the same time, more researchers were becoming interested in the science, and more companies were building products and monetizing the science. Stanford University's NLP group improved on Word2Vec in 2014 with GloVe, and then Facebook in 2016 came out with FastText, which was comparable to Word2Vec, but more accurate and faster.

By the time the transformer architecture and deep neural networks that underpin Meena and BERT came along in 2017, there were whole industries and academic research labs poised to take advantage.

“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,” says Amanda Stent, NLP architect at Bloomberg. “In the early 2000s, there were really only two dozen people who could exploit a release, but now there are maybe 20,000.”

The tech and tools are easier to use than before, Stent adds, and companies have started open-sourcing their models, as Google did with BERT, driving development.

“In some ways, these architectures are uniquely designed to focus on things that are readily monetizable by companies—like machine translation, machine reading, information extraction, [and] speech recognition,” Stent says.

BERT is not the only transformer model. It continued on the insight—and Sesame Street nomenclature—of ELMo (Embeddings from Language Models), which was developed by the Paul Allen Institute. While BERT, ELMo, and other models like OpenAI's GPT-2 are trained in different ways, the basic architecture is the same, Stent says.

“You have something called an encoder that reads words in context and outputs the weights for these words; that is, a representation of the words in that context. And then a decoder spits out other words,” she says.

ELMo represented a major advance on models like Word2Vec because it recognized that the meanings of words can change in particular contexts. The same word—“bank,” for example—could have vastly different meanings depending on context within a sentence. Bank can be a verb or a noun; it can mean a place to store money, or what an airplane does to change direction, or the edge of a river.

ELMo can read surrounding words to output a context-specific vector; BERT does this even deeper and faster. BERT and ELMo manage this because they are bi-directional, meaning they can read a sentence from left to right and from right to left, generating stronger results with deeper contextual information.

BERT has had a huge impact on the field of NLP, says Tim Nugent, a senior research scientist at Refinitiv. It has allowed companies, including his own, to access the models and improve their own work.





“The diversity of text sources is increasing, and this makes it interesting for people building the models, because the more you look into it, the more you realize how variable language is between these different text sources. Twitter and social media are conversation, they can be humorous and sarcastic. Transcripts are not. So there are very distinct stylistic differences. To make most of those data sources you need different models to maximize your performance for a given source of text.”

Tim Nugent, Refinitiv

“If it wasn’t as parallel as it is, it would only be Big Tech that would be able to run these sorts of models, or very well-funded industry R&D labs,” Nugent says.

Case Study: ESG Controversy

Firms like Refinitiv and Bloomberg have an advantage in NLP: access to massive amounts of data.

“The industry has had access to pricing and financial data, and other kinds of data, for a very long time. We are seeing more and more that firms are asking, ‘How do I differentiate myself in terms of pre-trade analysis, executing more effective trades?’ That area has been growing and driving our business of selling our news feeds and other document feeds to customers wanting to get an edge. We think there is a lot of value in this unstructured data, whether in pre- or post-trade,” says Nugent, who worked within Refinitiv’s Innovation Lab to build a transformer model that is now in use throughout the business.

Nugent has an academic background in life sciences, and he noticed that these fields have their own distinct discourses—different vocabularies, acronyms, and terminology. Life scientists have built their own BERTs—SciBERT and BioBERT—trained on bodies of field-relevant texts, on top of BERT’s already pre-trained texts.

Nugent believes that this kind of domain specificity is the best approach to make use of NLP, especially as the diversity of what is considered text is increasing.

“The diversity of text sources is increasing, and this makes it interesting for people building the models, because

the more you look into it, the more you realize how variable language is between these different text sources. Twitter and social media are conversation—they can be humorous and sarcastic. Transcripts are not. So there are very distinct stylistic differences. To make most of those data sources, you need different models to maximize your performance for a given source of text,” Nugent says.

Building on this insight, Nugent thought BERT should act as a base that could be trained with texts relevant to the downstream tasks to which the model would eventually be applied. “The research questions was: Can we perform better at these business NLP tasks if we perform further pre-training using in-domain data—that is, business and financial data?” Nugent says.

The question then became, which data should he use? Refinitiv ingests huge amounts of news data for its Intelligent Tagging platform, which derives meaning from unstructured data, such as news articles, and processes millions of these document sources daily, making information available to customers on the Eikon terminal. Nugent had to think carefully about how best to use it.

“We have a news archive that goes back to 1996, covering 435 sources. So we could throw that in and train the model using all that. But there was a trade-off between quantity and quality,” Nugent says.

The news itself may have been high-quality as news, but was it high-quality in terms of its suitability for the downstream tasks it was to power?

“So rather than using all of the news archive, I decided to focus on Reuters stories, and specifically using

rich material in Reuters news, I was able to pull out only articles that corresponded to business and financial news,” Nugent says.

Trimmed down, the dataset ended up at 700 million words, on top of the already pre-trained Wikipedia and BookCorpus data, for a total of about 4 million words. It required a lot of pre-processing and training time to get right, but Refinitiv is now applying the model to various use cases.

One of the first areas to which it was applied was environmental, social and governance (ESG) issues. Refinitiv offers ESG scores to customers, and as part of these services, keeps note of controversies affecting corporations.

“ESG is a hot topic; it’s a nice place to start,” Nugent says. “We have a lot of ESG data; a lot of it is annotated by our many analysts; we deem it to be high-quality; it has had a lot of human input. Analysts have scrutinized and classified it, and the specific controversy dataset into one of about 20 different ESG controversy types—things like privacy and environmental controversies.”

The way it works is a user shows the transformer model a news article and the model attempts to classify it into a controversy category.

“We ran this using standard BERT, and then we ran it using our domain-specific version of BERT. We didn’t worry too much about the absolute level of perfection—we were looking for the relative level of improvement between BERT and the domain-specific version of BERT,” Nugent says.

The former performed at 78% accuracy, while the domain-specific BERT scored 82%. “This is a 4% improvement in performance, and that is in line with the improvement in performance we saw in the life sciences research. So this confirms our suspicion that perhaps financial data is different enough from general domain text to justify a domain-specific model,” Nugent says.

Once this was verified, Refinitiv could widen the model’s application to the rest of the business. In content operations, for instance, deals and development teams are using it to extract relevant news from huge sets of documents for users. For example,

a user might be looking for all the news on ESG-related M&A activity, and the model will help quickly and accurately identify which articles are actually about an ESG transaction. The 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.

"Within our news product, we want to get that information faster and more accurate. We work with the product teams on how we get this into the roadmap and which areas they want to apply it to," Nugent says.

Reading the News

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.

"So you aren't just seeing a cluster for a company like IBM, for example: You are seeing several clusters for IBM that correspond to particular events that have happened to IBM in the past two days," Bloomberg's Stent explains. "We may end up with five or 20 events that have happened to that company in the past two days, and then we take each cluster of headlines and we use one of these transformer architectures to automatically construct a new headline, a summary of that cluster."

The model is further trained by Bloomberg journalists, who can use little "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.

"Now occasionally we get some horrible clunker, but we can train this solution with the thumbs up and the thumbs

down so that over time we get fewer and fewer absolutely horrible ones," Stent says. A "clunker" might be the model publishing a summary excluding the word "not," which could make the headline completely factually inaccurate, she says.

Bloomberg is using the solution in other areas too, including helping customer service staff to answer user queries. "Our customer service analysts are subject matter experts with finance backgrounds. We used this very same kind of architecture to help provide good answers to our clients' questions," Stent says, adding that customer satisfaction has measurably improved since the tool was introduced.

Exactpro's Treshcheva is researching ways to evolve how NLP is used at the company, a specialist in software testing. "We work with traditional financial systems—complex, non-deterministic systems—and we use different approaches to assist us in testing," she says.

Exactpro already performs unsupervised machine learning on log messages from clients' environments, obtaining clusters of data that can be monitored for behavioral changes. But it is also looking at how to test the software of artificial intelligence (AI)-based systems. Treshcheva says this is where BERT will provide insight, as these are classic NLP applications like chatbots.

"We are now looking at AI-based conversational agents (chatbots in banking and portfolio management services) and machine-readable news. These systems are very often built using machine-learning models, and we are now designing the approach to the verification and validation of such systems," she says.

Future of BERT

BERT's applications will extend beyond chatbots, however, Treshcheva says. Current research is looking at applying pre-trained transformer models (FinBERT) to financial sentiment analysis. AIG Investments researchers published a paper last year on using BERT for processing noisy financial text. More obviously, there are applications that are already being explored—the processing of regulatory data files and financial contracts, predictive models for



Tim Nugent
Refinitiv

systematic trading and fraud detection, new methods for portfolio optimization and risk management, Treshcheva says.

Stent says, however, that transformer models have their limitations, and these will begin to emerge the more they are used. Researchers are already looking to the next step: grounding language models in broader contexts, as a human's language is grounded in all the background knowledge of the world around them.

In the case of Bloomberg, this would mean grounding the transformer model in market data. "By having a model of the market, we gain an understanding of the world in which we can ground our language," Stent says. "So for our products and our solutions, it's not just a big language model. The model knows about what companies exist, what asset classes they are in, what products they trade, who runs them, and how they are related to government affairs. This kind of model doesn't really exist yet, but it's one of the things that researchers across the industry are working on."

Researchers are also looking to make the models smaller. Transformer models are "over-parameterized," Stent says: They have more parameters than can be properly estimated from the data. "They have more knobs in them than there is data to tune the knobs, and that is kind of an insane scenario for machine learning. That means if you could figure out how, you could make the model 10 or 100 times smaller and still get the same performance. But we don't know how to do that squishing yet," Stent says. DistilBERT is one such attempt at squishing.

These models also use substantial amounts of computing power, a problem in this carbon-conscious age. "We are now very aware of the environmental impact and the cost of what we are building," Stent says. Another ethical consideration is that models can chew up huge amounts of data from humans who are biased, and the models then reflect those biases—be it gender or race or something else.

Whatever the hurdles, with BERT, NLP has made another leap in evolution, promising improved tasks and tools in a range of use cases. Perhaps one day, the bots will even make good jokes. [wt](#)



Elena Treshcheva
Exactpro

Fuzzy Data Stalls ESG Alpha Hunt

Quants searching for ESG signals have reached very different conclusions. Mostly they blame the data. By **Rob Mannix**



Quant investors who wield powerful but hard-to-understand models are used to dealing with sticky questions about cause and effect. It's no different with environmental, social and governance (ESG) investing.

Experts are divided about whether screening investments by ESG criteria influences returns. And if they see a link, they can't always tell whether it's coincidental or contributory.

Axa Investment Managers has found a "direct link" between board diversity and a "sustainable competitive advantage," says Lise Renelleau, the firm's director for sustainable investment solutions, and is using the signal and others relating to carbon emissions in its models.

Man Numeric says it has identified a set of signals unrelated to other quant factors that are predictive of positive returns, though the firm won't disclose how powerful its ESG signals are.

Others are more doubtful about the connection.

Quants at Societe Generale, for example, found "no strong performance implication" when they looked at 10 years of ESG data, according to Giorgios Oikonomou, a quant with the firm.

BNP Paribas Asset Management, which runs multifactor funds that aim to lift ESG scores above their benchmarks, treats the ESG element of its investment process as an overlay, not a factor.

Academics are equally split. Some papers argue that companies with superior ESG practices attract and keep better staff and can access capital more cheaply—leading to outperformance. Others say so-called sin stocks are more profitable because they pay a premium to attract unwilling investors.

"No serious scholar at this point in time will say we have enough consistent evidence on whether ESG investing

can relate to superior performance," says Gianfranco Gianfrate, a professor of finance at Edhec Business School.

Quants do, however, agree on what's to blame for the divergence in outlook. Data to rate and rank the ESG credentials of targets is patchy, covers too short a period and is plagued by bias. Quants also struggle to pin down what turns out to be a slippery target. The popularity of ESG investing is changing the power of ESG signals even as quants seek to measure them.

"Backtesting is challenging," says Gerben de Zwart, managing director of quant strategies for Dutch pension fund APG. "ESG data providers have been around for many years but some have changed their definitions over time. Also, ESG might have been priced differently by the market a few years ago."

Guesswork and Gaps

ESG ratings from providers such as MSCI and Sustainalytics have existed for two decades and might be expected to provide consensus on measuring the effect of responsible corporate actions. But practitioners say the piles of data have turned out to be frustratingly hard to use.

A proliferation of data providers creates a sense that information is abundant, says Jennifer Bender, head of equity index research at State Street Global Advisors. “But the data is at least 50% estimated, meaning it’s not real data reported by the companies. There are a lot of gaps.”

In particular, the granular data required by quants and datasets covering a wide enough universe of stocks goes back only about 10 years. That’s a special problem in quant investing where convention is to backtest potential strategies over at least that period and to use a further two years of data for “out of sample” testing—i.e., with data unused in the construction and calibration of the strategy.

Quant models can only allow for about 5% of data fields to be empty before they break down, says Mike Hunstad, head of quantitative research at Northern Trust Asset Management.

Quants have found that raters’ different ways of refining the raw data they gather adds further to the confusion. Leading providers concur on only about half the companies they rate according to data from State Street Global Advisors. Some score companies by picking out the best and worst performers overall. Others pick out the best and worst by industry. “You can come up with an oil company that has a huge carbon footprint but good sustainability ratings,” says Gianfrate. Some raters score missed reporting fields as neutral; others penalize them.

Some quants think data vendors could be falling prey to a form of overfitting, by selecting data to gather and make available that appears to have a positive link to returns in the past—when the patterns in those data points may in fact have arisen by chance.

When one quant examined several commercially available datasets, he found the performance of backtested strategies to be “too good to be true,” he says, attributing the finding to this overfitting effect.

The volume of data points on offer—which include everything from water use efficiency to human rights concerns—makes it perilously easy for users to be misled by fluke patterns.

Elsewhere, practitioners have found that scores imply different things for different types of companies. Some quant funds have turned to machine learning to try and pin down which individual ESG characteristics are material for certain industries and in what macroeconomic conditions.

Then there are what quants call structural challenges—in simple terms, different forms of bias.

In an ideal world, analysts would be able to compare two companies identical in every respect except for ESG, to verify the validity of criteria. In the real world, practitioners have discovered that financially sound companies tend also to have good ESG ratings and vice versa, robbing the analysts of many candidates for statistical cross-checking.

It’s also hard to gauge the effect of ESG signals in isolation because they tend to overlap with already-known quant factors such as quality or low volatility, which can explain some of the positive performance in ESG-tilted portfolios, says Raul Leote de Carvalho, deputy head of quantitative research at BNP Paribas Asset Management.

At the same time, the growing popularity of ESG investing has made the data harder to interpret and muddled the picture of likely performance going forward. To win and keep business from millennial investors, investment firms are having to “ESG-proof their portfolios,” in the words of Oikonomou. The resulting flows push up the price for good ESG stocks. Meanwhile, virtuous but neglected companies may become more attractive from a valuation point of view.

In simple terms, weak ESG stocks now may recover when bargain-hunting buyers start to pick them up.

Such widespread enthusiasm for ESG investing is a recent trend, which means quants also have labored to find evidence in the historical data of signals that could work well today. “They’re looking back 10 years and ESG was irrelevant then,” Oikonomou says.

Not Perfect, But Good Enough

Where does this leave investors? Mostly it leaves them waiting.

Some see value in persevering with ESG even though such strategies can’t reliably offer the same level of returns as other factors.


“We do as well as we can with the data we have,” says Tomas Morsing, head of quantitative strategies at AP2. The fund’s ESG-tilted strategies deliver about half the premium of more conventional quant strategies, he says, but that is good enough. AP2 plans to apply ESG signals in its fixed income portfolios later this year.

A few, such as APG, have sought to address the shortcomings of ESG data by collating their own. The firm uses machine learning to classify companies by compliance with UN sustainable development goals. And from January 1, it has released these sustainable classifications to other asset owners through a third-party data distributor, to encourage wider adoption. The second largest pension fund in the Netherlands, PGGM, has committed to using the classifications in its reporting.

For some investors, ESG scores contain too much in-built subjectivity to present a unified picture of companies’ strengths and weaknesses. But for others, this isn’t a deal-breaker. Leote de Carvalho likens ESG ratings to factor strategies where there are multiple ways to define a given factor and investors can choose based on their preferences.

BNPP AM found its strategies performed consistently in testing regardless of which ESG scores the team started with, he says, because the raw information underlying the scores is the same.

For the most part, though, quants say a resolution of the ESG data muddle is possible, but believe it will take time. How long? Kasper Lorenzen, chief investment officer at Danish pension fund PFA, thinks it could be five to 10 years before firms will be able to say for certain what ESG has to offer.

“Then we’ll get a sign of whether there’s true return predictability in the scores,” Lorenzen says. 

Infrastructure and Data: Convergence Is a Smart, if Challenging, Move

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

In our January Big Bets feature, we explored the five themes we believe will shape the RiskTech marketplace in 2020. This month we take a deep dive into one of those themes—the convergence of infrastructure and data¹.

A Growing Trend

In summer 2019, the London Stock Exchange Group (LSEG) bought data provider Refinitiv in a \$27 billion deal². LSEG's strategic move into the burgeoning market for data highlights an important evolution. For some market infrastructure entities, acquiring firms that provide data services is an attractive way to diversify their trade operations and expand their offerings into the software and data business. Some infrastructure players are even becoming software providers in their own right (Nasdaq, for example, purchased the clearing software provider Cinnober in 2019). The development also underlines a wider growing trend whereby two key elements of the market—infrastructure and data—are converging.

The consolidation of trading services is nothing new. One of its drivers over the years has been the desire to create geographically specific 'one-stop shops'. In the new trading climate of the 1990s, exchanges embarked on large strategic deals in a move to diversify their offerings away from their core trading business. These diversified exchanges now dominate and define the trading space (see Figure 1 for several examples of mergers and acquisitions in the market).

The move to diversify is notably illustrated by the development of the CME Group. The Group formed after the Chicago Mercantile Exchange and the Chicago Board of Trade merged their respective derivatives markets to create the largest international market for financial derivatives. Following the merger, the Group acquired the New York Mercantile Exchange, integrating commodity services into the business. Later acquisitions included the Dow Jones Indices and the Kansas City Board of Trade. Most recently, in 2019, the Group bought NEX Group, and expanded further into the derivatives market.

In a data-led world, a move to combine infrastructure and data under one roof is a smart one, with undoubted business benefits (ownership of Refinitiv's Eikon platform, for example, should ensure that LSEG is well-placed to claim a generous share of market data distribution).

Not Without Challenges

More broadly, however, Chartis believes that consolidation and convergence are not without challenges. Any consolidation comes with some risk, of course, and a firm diversifying its business can face operational, technological and legal hurdles. And integrating newly acquired services does not automatically succeed.

Looking ahead, market infrastructure entities could face their own unique issues as they expand into software and data businesses—around integration, competition, and regulation.

Integration Complexity

Firms moving into the software and data business could find that integration is more complex than for traditional mergers between exchanges. Acquiring new

services, such as market data or an FX electronic communications network, can release a business anchored in traditional trading services—but there's no guarantee that these services will translate immediately into big returns. And from a technology perspective, integrating data and software services into an existing business ecosystem can take time.

For entrenched and expansive entities like infrastructure companies, adopting a 'bolt-on' approach could create issues, unless the merged entities can bring complementary strengths to deals. And while varying the types of asset a firm can support can expand the scope of the business, sourcing the expertise to leverage them as a whole can be a challenge.

Competition Intensity

The data market is a crowded one, and converged infrastructure/data firms are likely to face competition from established market players (Notable among these is Bloomberg, which many finance professionals see as a core data provider.) That said, as data has become all-pervasive, even established players have faced threats from smaller, lower-cost software providers.

Regulatory Scrutiny

Any major deal involving infrastructure entities could also face lengthy scrutiny from regulators concerned that convergence in the market could create monopolies. (In 2017, EU regulators blocked LSEG's planned merger with Deutsche Börse, for example, partly because they felt that the combined entities would have unbalanced competitive control over the clearing of European bonds and fixed-income products³.) Although there are no clear obstacles

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Figure 1: Example mergers and acquisitions in the trading space

	Ice	NYSE Euronext	Nasdaq	Deutsche Börse	Hong Kong Exchanges and Clearing	LSEG	The CME Group
2020							
2019			Cinnober	Axioma		Refinitiv	
2018			Quandl				NEX Group
2017							
2016							
2015	Ice Interactive Data Corp	Ice		Stoxx (Remaining 49.9% of shares)			
2014						Frank Russell Company	
2013		Euronext (Demerged from Ice)	BWise (Sold to SAI Global in 2019)		Hong Kong Exchanges and Clearing London Metal Exchange	London Stock Exchange Group LCH Clearnet	
2012	NYSE Euronext						Kansas City Board of Trade
2011				Eurex			
2010							Dow Jones Indexes
2009				Stoxx			
2008	Ice Creditex		Nasdaq Philadelphia Stock Exchange Boston Stock Exchange OMX Nasdaq				
2007				Deutsche Börse International Securities Exchange		London Stock Exchange Group London Stock Exchange Borsa Italiana	Nymex Chicago Board of Trade Chicago Mercantile Exchange
2006		New York Stock Exchange New York Stock Exchange New York Stock Exchange NYSE Euronext	OMX OMX Iceland Stock Exchange				
2005							
2004							
2003			OMX OMX Hex			LCH Clearnet Clearnet SA London Clearing House	
2002							
2001	Ice Intercontinental Exchange International Petroleum Exchange						
2000		Euronext Brussels Stock Exchange Paris Bourse Amsterdam Stock Exchange Liffe					

to a deal succeeding, a potentially protracted approval process highlights how regulators' concerns could be piqued.

Balancing Benefits and Risks

Clearly, in today's data-led environment integrating bespoke data into trading services offers business benefits. But the margins and market-share possibilities on offer should be balanced against the regulatory risks surrounding data

(notably the General Data Protection Regulation [GDPR] and the California Consumer Privacy Act [CCPA]) and the organizational and bureaucratic challenges and potential risks involved.

Crucially, though, whatever the

challenges and potential risks, the convergence trend is here to stay. Infrastructure entities will continue to vie for ever more expansive offerings (in October 2019, the Hong Kong exchange failed in a bid to acquire LSEG for \$39 billion⁴). However, while the climate of acquisition and consolidation will continue to heat up, it could be some time before we see a definitive one-stop shop emerging from it.

Footnotes

- 1 Note that Chartis' analyses in its reports and articles consist of the opinions of its research analysts and should not be construed as statements of fact.
- 2 <https://www.reuters.com/article/us-lse-m-a-refinitiv/london-stock-exchange-shareholders-bless-27-billion-refinitiv-deal-idUSKBN1Y01DD>
- 3 See, for example, https://ec.europa.eu/commission/presscorner/detail/en/IP_17_789
- 4 <https://www.reuters.com/article/us-lse-m-a-deutsche-boerse-eu-idUSKBN1700XG>

39-billion-play-for-london-stock-exchange-idUSKBN1WN010

TREP's 'Eye of the Tiger' Moment

For over 20 years, Refinitiv's market data platform has pumped the lifeblood of data around the body of market participants. But with it approaching a mid-life crisis, the vendor is giving the platform a facelift to keep it attractive in the face of younger competition.



For me, this year marks 20 years of reporting on the financial technology markets for *WatersTechnology* and its sibling titles. During that time, one constant in the market data industry has been the presence of Reuters and its market data platforms.

The Reuters name has gotten lost in the mix, kept—along with the Reuters News business—by Thomson Reuters after a Blackstone Group-led investment consortium acquired its Financial & Risk division and rebadged it Refinitiv. The vendor has gone from dominant market data provider to second fiddle, hampered by the rise of Bloomberg and the Thomson Reuters merger. But the data platform, which has evolved and been re-engineered over that time, has remained a mainstay of financial firms and their need to capture, process, and distribute to their staff and applications an increasingly diverse and complex array of market data.

In the early 2000s, Reuters ran two market data platforms: its Triarch platform, and the TIB platform, licensed from software vendor Tibco. By 2003, Reuters combined the best components of each to create RMDS, the Reuters Market Data System. Under Thomson Reuters, the platform was reengineered again to take advantage of the vendor's new Elektron global data infrastructure, and badged TREP (the Thomson Reuters Enterprise Platform).

With over 1,000 customer sites running TREP, the platform is an embedded part of the financial industry's collective data infrastructure,

and is extremely hard to unpick and replace. (See page 18 for a deep-dive analysis of TREP.) But there are other forces at work: Firms are wary of over-dependence on one vendor, particularly one whose ownership is in flux—Refinitiv is in the process of being sold to the London Stock Exchange Group (LSEG), and the future of certain product lines under new ownership is

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Rome wasn't built in a day, and nor was TREP—in fact, those 20-plus years of experience are some of the platform's advantages.

still unclear. They are keen to integrate other tools and datasets, while reducing infrastructure costs. These factors are driving some firms to investigate alternatives.

However, these alternatives don't offer the full functionality of TREP. Most augment an existing TREP environment and offer a stepping stone to whatever the next generation of data platforms will look like, using APIs and abstraction layers to enable users to stitch together a best-of-breed infrastructure to suit their needs. Few of these providers also offer content to populate these out of the box. But Rome wasn't built in a day, and nor was TREP—in fact, those 20-plus years of experience are some of the platform's advantages. Over that time, it has built a Roman Empire of capabilities, and its next stage of development will see

the vendor make it available in the cloud to keep pace with clients' cloud efforts, further taking advantage of its existing Elektron cloud infrastructure, and effectively offering TREP-as-a-service to firms that increasingly don't want to manage infrastructure elements on-site.

More than just a facelift—though a name-change will surely be in the works once the dust settles on the LSEG deal, reflecting its change of ownership—this is some serious structural surgery to give the aging body a new lease on life and enable it to compete with younger, leaner rivals. Think *Rocky III*, where Rocky Balboa (Sylvester Stallone) retrains to take on a new generation of boxer (Clubber Lang, played by Mr. T).

Of course, the LSEG deal represents a huge unknown factor. The exchange has been somewhat fickle toward being a data vendor over the years, selling its Topic display years ago (which, ironically now, ended up owned by Thomson Financial, which became the other half of Thomson Reuters), then buying UK-based data vendor Proquote in 2003, only to sell it again in 2015, deeming it not core to its strategy. The LSEG, which also owns the FTSE and Russell index businesses, appears to be on a quest for content. Where Refinitiv—and specifically TREP—sits within its ambitions is unclear. But, to return to the *Rocky III* analogy, Rocky only returns triumphant after teaming up with former rival Apollo Creed and adopting Creed's training routines. Perhaps the tie-up may help TREP flex its muscles again. [wt](#)

Swap Data Proposals Raise Existential Questions



Regulators around the world collect massive amounts of data, but Jo wonders if there's any point to these efforts if they can't use it?

How do regulators actually put to good use the vast amounts of data they collect from financial firms?

This is a perennial question in the post-crisis era. And it's a fair one considering how much money and human resources financial firms have invested into new systems to comply with the unprecedented demands of post-crisis frameworks like the Basel III standards, the Dodd-Frank Act and Mifid II.

The corollary of that question is: if regulators can't derive insight into systemic risk, what is the point of imposing onerous reporting requirements on firms, which often clash with other regulators' requirements? This is something the Commodities Futures Trading Commission (CFTC) should be pondering as it considers industry reaction to its latest proposals on swap data reporting.

The regulator published the proposals on February 20, and they should be welcomed by reporting entities, as the CFTC's intent seems to be to clarify and simplify its swap data reporting and recordkeeping rules, and harmonize requirements with the Securities Exchange Commission and the European Securities Markets Authority.

CFTC chairman Heath Tarbert said in a statement when the proposals were released that they "reflect a hard look at the data we are requesting and the data we really need. ... Clear rules are easier to follow, and market participants will no longer be subject to reporting obligations that raise the costs of compliance without improving the resilience and integrity of our derivatives markets."

If the proposed modifications become rules, the number of reportable fields would shrink to a standard set of 116 that have been identified as core to the CFTC's aims. Also, the Unique Transaction Identifier would be adopted in place of the Unique Swap Identifier, firms would report margin and collateral every business day, and they would extend the reporting deadline to T+1.

“If regulators can't derive insight into systemic risk, what is the point of imposing onerous reporting requirements on firms?”

There's a lot for market participants to chew on during the three-month consultation period, and some firms will probably have to invest in new technology. But what's all the effort for if regulators can't make heads or tails of the information they have accumulated?

Regulators must be explicit about the policy justifications for regulatory reporting, which is so costly and troublesome. CFTC commissioner Dan Berkovitz made this point on February 20. He supported the proposals and they were passed unanimously, though he took issue with certain specific requirements.

Berkovitz said swap data is fundamental to the CFTC's purpose: ensuring the financial integrity of all transactions, and thereby ensuring financial stability. For this, the regulator needs to be able to not only collect appropriate data, but also ensure that it's accurate and standardized so it can be aggregated and analyzed. But that's not enough—the Commission

must also develop the tools and resources to actually be able to perform those analyses.

The proposal doesn't address actual use-cases for which the data will be collected, or the analytical needs for swap risk management oversight, Berkovitz says, adding: "Regrettably, the Commission has yet to set forth with any specificity how it intends to use this swap data to evaluate or address systemic risk."

The Commission should make it a priority to build a risk monitoring system for swaps, Berkovitz added, as it has monitored futures and options for decades on a daily basis.

The extension of the reporting deadline to T+1 may increase data accuracy as reporting entities have more time to check their submissions, Berkovitz said, but it will constrain the CFTC's ability to perform real-time risk monitoring on the data in times of market stress. The point is moot, anyway, as he said that to date, such monitoring has not been possible due to the lack of a monitoring system.

Berkovitz also criticized the new requirement to report margin data, saying it's not clear whether the collateral data would be right for the Commission's purposes, and arguing the agency might be able to do analyses with the data it already collects.

The CFTC needs to better articulate its needs and how it will go about analyzing this data. The alternative is, in Berkovitz's words, nothing less than to fail in the CFTC's central mission of responding to systemic risk and ensuring financial stability. It is essentially to risk another full-blown financial crisis. [wt](#)

Humanity Is Sick (and Not Just From Coronavirus)

A key takeaway from the whole Coronavirus outbreak is humanity's innate desire to exploit others for the sake of a quick buck. Wei-Shen speaks her mind on the situation in Hong Kong.



It was the last week of January, and I was in the comfort of my family home in Kuala Lumpur, Malaysia, for the Chinese New Year festivities when news of the first Coronavirus (now called Covid-19) case in Hong Kong broke.

It fueled less-than-gentle warnings from relatives and friends for me to stay back in Malaysia, instead of returning to Hong Kong as initially scheduled.

I heeded those warnings and decided to extend my stay home for another week. At the same time, I continued to stay in touch with friends in Hong Kong. The situation they painted was dire. Surgical masks that Hongkongers usually wear whenever they feel unwell (to protect others from their germs) were low in stock and increasingly hard to find.

Hong Kong isn't the only country experiencing this. In Malaysia, as I went from one pharmacy to the next, and then to another, and a few more after that, many had hung notices at the entrance reading: "face masks and hand sanitizers out of stock."

Over in Hong Kong, some 10,000 people stood in line when trading company Luck Well International Holdings announced it would conduct an initial release of 6,000 boxes of surgical masks for sale in early February. Hongkongers stood in that line overnight, some queueing up for more than 20 hours before the masks went on sale.

The company initially planned to sell its entire stock of 11,000 boxes of masks over two days, but due to the growing crowd, it expected to sell the entire supply—not just 6,000—all in one day.

Essential items running low in stock on supermarket shelves include toilet paper, rice, noodles, and cleaning products like bleach. It's not every day you read of a bizarre (and somewhat comical) toilet paper

heist, but this is what Covid-19 panic-buying in Hong Kong has led to: Just before dawn on Monday, February 17, three armed robbers made off with HK\$1,600 (\$205) worth of toilet paper rolls from a local supermarket.

But it's not just criminals looking to make a quick buck. Before returning to Hong Kong, friends sent me many messages about stores selling face masks selling at ridiculous prices. Typically, a box of 50 masks would cost HK\$60 (\$7.70). But some small mom-and-pop grocery stores have been selling them at HK\$500 (\$64.19) per box. That's roughly 833% higher—a hefty profit margin over what they initially paid.

While I'm aware that Big Pharma and healthcare-related companies exploit illnesses and epidemics, seeing everyday people trying to get in on the profits makes me think really hard about the meaning of humanity. In such a time of need, it pains me to see how some are trying to make a buck from the situation, while on the other hand, others fight in supermarkets over the last pack of toilet paper on the shelf. Some have felt the need to hoard, stacking rolls of toilet paper up to the ceiling.

Have we gone back to the ages where such a necessary everyday item, like toilet paper, determines one's wealth? It sounds funny, doesn't it? It shows me that when tested in times of crises, many humans truly stick to the everyone-for-themselves mentality.

I pray that this Covid-19 outbreak ends soon, but even more, I pray for a return to basic humanity. On an ending note, I'll be celebrating my birthday this month. So now you know what to get me as a perfect gift. [wt](#)

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The robbers threatened supermarket staff with knives as they unloaded deliveries from a truck. Luckily, no one was hurt in the incident. After arresting two suspects, Hong Kong police have since caught a third suspect. Police believe that they stole the toilet paper rolls with the intent to resell them at an inflated price.

Human Capital



Cloud9 Announces New COO

Jim Miller will be promoted to the role of chief operating officer at cloud-based communications provider Cloud9 Technologies. Miller's key responsibilities will include guiding product realization and rollout, business and marketing strategies across the firm, and helping with efforts to facilitate the integration of voice data and activity into the trader workflow.

With over 30 years of experience in the fintech space, Cloud9 hopes to benefit from his extensive background in trading technologies.

Miller joined Cloud9 in 2018 as head of product and development. Prior to joining the firm, he was co-founder and chief technology officer at InterNex Capital. He also co-founded trueEX, where he was chief technology officer for four years.

Miller holds a BSc in computer science from Virginia Tech.

Transcend Recruits Former CloudMargin MD

Lis Hadingham is joining Transcend's sales team, led by BJ Marcoullier. Her appointment coincides with the company's growth strategy as a technology



Lis Hadingham



Michael Roche



Helena Fung

provider of real-time collateral and liquidity optimization.

With more than 20 years of experience in the securities finance industry and a background in collateral management and financial technology sales, Hadingham will assist Transcend as it supports a growing number of clients and products.

Her previous role was managing director and non-executive board member at CloudMargin, where she launched and led the company's sales and business development initiatives in the Americas. Prior to that, Hadingham held senior roles at FIS, Citibank's Capital Markets group, and spent 14 years at JP Morgan.

FTSE Russell Hires Head of Sustainable Investment APAC

Helena Fung is joining global index and data provider FTSE Russell as head of sustainable investment for Asia-Pacific. With this newly created role, FTSE Russell aims to strengthen its global sustainable investment team. Fung will be responsible for the firm's sustainable investment indexes and data services across the region.

As well as developing the firm's ESG product strategy and expansion, Fung will also engage with clients on a range of products and data to help them reach investment decisions. Since 2008, she has worked as an expert in ESG and sustainable investment.

Vela Adds Two New Management Hires

Vela, an independent provider of trading and market access technology, has announced two new hires in its global product and account management teams.

Cedric Rondeaux is joining Vela's London office as product manager.

He will report directly to the chief product officer, Ollie Cadman. Rondeaux will be responsible for setting product strategy, and managing the roadmap for Vela's market data business. He joins the firm from ICE Data Services, where he served for 13 years in product services, culminating in the role of senior product manager.

Ryan Hsu is joining Vela in New York as account manager. He will report directly to chief customer officer Keith Cacciola. Vela hopes Hsu's background as an oil derivatives broker will help him to support the firm's automated trading platform, Metro, and its market data products, while building and maintaining positive relationships with clients.

Prior to joining Vela, Hsu held roles at Starfuels, TP Icap and MF Global.

TruNarrative Appoints US General Manager

Michael Roche is joining regtech company TruNarrative. Roche will join the US Atlanta office as demand for the company's services moves from regulated to non-regulated sectors.

Roche's role entails working across international operations, leading experienced teams, and helping to guide TruNarrative's no-code platform.

In his latest role, Roche was vice president of global fraud product at payment processor Elavon. Prior to that, he worked at CardinalCommerce, a Visa digital authentication company, for 13 years.

Archax Hires ex-FCA Official as Compliance Chief

Archax, the new institutional digital securities exchange, has announced that Alex Royle will join the company as chief compliance officer. Royle has extensive experience in compliance



and regulation, having joined from the Financial Conduct Authority, where he worked in MTF/OTF trading venue supervision. Before that, he served as a second national expert in markets policy at the European Securities and Markets Authority.

Archax is based in London and plans to launch in mid-2020.

Clearwater Appoints Chief Client Officer

Clearwater Analytics, a global SaaS solution for automated investment data aggregation, reconciliation, accounting, and reporting, has hired Subi Sethi to lead its global operations team. Sethi will be responsible for global delivery, data reconciliation, client services, and strategic account management teams.

Sethi has previously held roles at United Health Group's Optum Global Solutions, where she led end-to-end operations for more than five years. She also spent nine years at Genpact in a variety of leadership roles.

LDX Hires New COO

London Derivatives Exchange Group has announced that Kiri Self is joining the exchange as chief operating officer. Self's role will include aiding the exchange's growth strategy to operate new market infrastructure efficiently.

Self has worked in the financial services industry for over 20 years, and has held senior roles in exchanges, as well as at Societe Generale and KPMG. Her experience spans the front, middle and back office, including large-scale technology implementations and digital asset creation.

Broadridge Picks Perry as President

Chris Perry is joining Broadridge Financial Solutions as president. Perry replaces Tim Gokey, who remains chief executive officer and director.

Having been at the company for five years, Perry will now play a stronger leadership role and coordinate

CITCO EXPANDS MIDDLE-OFFICE SOLUTIONS BUSINESS

The Citco Group of Companies has announced the appointment of Ryan Fitzgerald as head of middle-office solutions. Fitzgerald's hire is part of a strategic investment by Citco to grow its middle-office offering and further develop the business line.

Fitzgerald joins from Hazeltree Fund Services, a specialist treasury management solutions provider to the buy side, where he was managing director for six years. Prior to that, he started



Ryan Fitzgerald

his career as a manager at UBS, before going on to work in multiple operations roles at Axa Financial, Goldman Sachs, and JWM Partners.

Broadridge's overall growth strategy.

Before joining Broadridge in 2014, Perry spent over six years at Thomson Reuters in various roles, including global managing director, risk segment, financial and risk division and president of global sales.

Tourmaline Partners Adds Senior Trader

Trading solutions firm Tourmaline Partners has hired Joe Hodgkins as a senior trader in Sydney to help with the firm's Asia-Pacific growth plans.

With more than 18 years of experience in senior buy- and sell-side roles, he previously worked at Citigroup as head of Thai equities. Before that, he spent eight years at Janus Capital.

Hodgkins specialises in electronic and program trading, block trading and utilization of transaction cost analysis to develop and improve trade implementation strategies.

TickTrade Hires Europe Sales MD

James Cusack is joining TickTrade, a Canadian provider of SaaS trading, global payments and analytics solutions for financial institutions, as managing director of European sales. Founded in 2013, the company has operations in North America, Europe and Asia.

Cusack has 15 years of experience in financial markets sales. He built his career in London as an FX and money market dealer at HSBC. Most recently, he was local head of sales at Caplin Systems, based in London. Before that,

he held directorships at two ECNs—Integral, and FXall's Orderbook.

Two Non-Executive Directors Join FCA Board

Bernadette Conroy and Jeannette Lichner will both serve three-year terms as new non-executive directors on the UK Financial Conduct Authority's board. Lichner will begin her term on April 1, while Conroy joins on August 1.

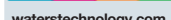
They replace Amelia Fletcher and Catherine Bradley, who have both completed their terms.

Lichner studied board governance at Harvard University. Conroy has a degree in Maths from the University of Cambridge. Both women have experience in leadership roles and as non-executive directors.

Qontigo Names New Chief Revenue Officer

Brian Rosenberg is joining financial intelligence provider Qontigo in the new role of chief revenue officer. Rosenberg will lead global teams in sales, marketing, applied research, and customer experience, and reports to chief executive officer Sebastian Ceria.

Rosenberg was previously a managing director for five years at FTSE Russell, where he oversaw Americas index sales, global strategic accounts, exchange-traded products, and derivatives. He also spent seven years as the head of asset management sales at RiskMetrics group. 


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