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To receive *Waters* 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

Waters (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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Performance Anxiety

I've said it before, but it's worth saying again: An asset manager's *raison d'être* is to make returns for its investors. If it cannot produce positive returns and outperform the various benchmarks against which it measures itself, it will ultimately cease to exist. It might have a small army of quants and analysts in its ranks, the best technology money can buy, offices that are the envy of the money management industry, and principals with peerless pedigrees and exemplary track records, but the fact remains that if it makes consistently poor investment decisions—and by so doing cannot produce returns—it will fail. Period.

To my mind, the ability to objectively and systematically measure performance and attribute it to specific parts of a portfolio is the next most crucial function asset managers need to master. It is no secret that in the wake of a period of poor returns, end-investors are more likely to maintain allocations with managers that have the ability to explain how and why the poor performance came about, and what specific parts of their portfolios were responsible for that performance, than those that simply produce performance numbers and very little else. Poor performance, underpinned by transparency and granularity, will be tolerated (for a time, at least), but poor performance accompanied by opacity will not.

A decade ago, it was common for asset managers to produce quarterly performance reports, primarily for two reasons. First, investors were used to the quarterly timeframe and hadn't (yet) developed an appetite for more frequent updates, and second, the sheer volumes of the calculations required to produce such reports meant that asset managers simply didn't have the capacity to produce more frequent reports due to their underlying technology. They quickly learned that throwing more hardware at the problem was expensive and produced diminishing returns, which meant that even if they wanted to perform end-of-month or end-of-week calculations, they couldn't.

But thankfully that has now changed and the game has moved on, thanks to cloud-based performance platforms, which allow buy-side firms to specify the timeframes for the production of their performance reports and the platforms will scale seamlessly to meet that demand. Now, for example, performance personnel can specify that they want to calculate the returns of 50 portfolios in a half-hour time window and the cloud host will spin up a virtual cluster of computers in a matter of minutes to ensure the deadline is met. Yes, it'll cost them more due to increased consumption of cloud-based hardware, but at least they now have that option.

It turns out that after pure performance metrics, transparency trumps pretty much everything else across the buy side. But it's astonishing just how many buy-side firms struggle to grasp this reality. **W**

Victor Anderson
Editor-in-Chief

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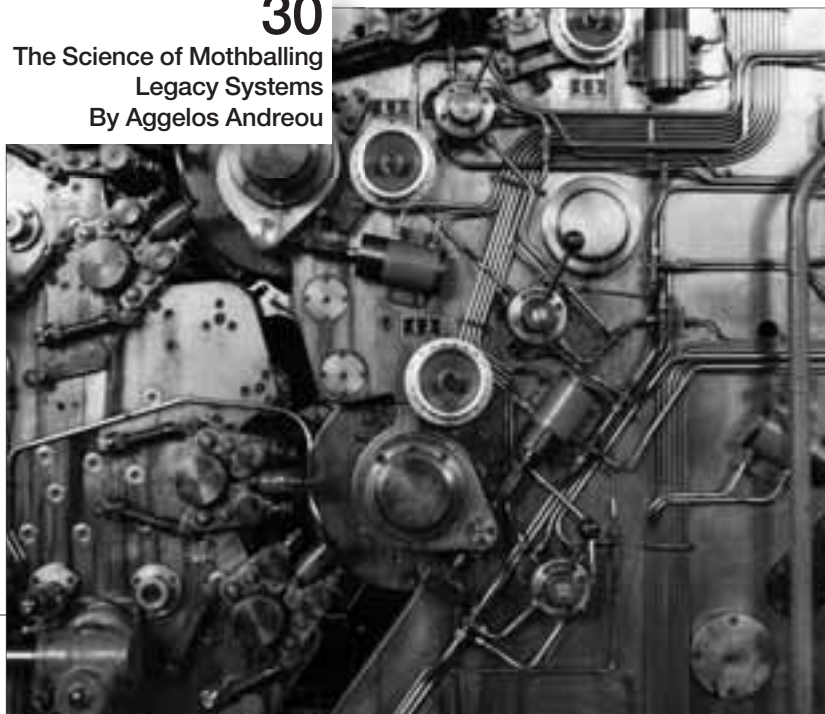
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Compliance Chiefs Turn to Cognitive Tech for Surveillance

Stitching together information by using cognitive tech could yield significant advantages for compliance.

By James Rundle

In the modern world of financial markets, the machine may know a crime is about to be committed before its perpetrator does.

Combining cognitive computing with compliance know-how could enable surveillance officers to spot warning signs in staff behavior, potentially indicating future problems by reading patterns in data that would otherwise be invisible. It sounds like something out of *Minority Report*, but chief compliance officers are adamant that this is the future of their craft.

“Coming from a surveillance point of view, I believe that, in the right circumstances, anyone can do something really bad,” said Joe Lodato, global head of compliance technology and surveillance at Guggenheim Securities. “By keying on some of the emotional things that the systems can tell us, that may be an early indicator that we have someone who is about to go off the rails.”

Such information could include, as an example, an employee’s financial health. A bankruptcy or ongoing financial issues could indicate that a member of staff is prone to making mistakes at work, on the lower end of the scale, or gearing up to commit fraud at the extreme end. Using cognitive technology, surveillance officers can now read these early warning signs and engage in enhanced oversight if they feel it is warranted. “Compliance tends to want to have all of this data at their fingertips. Now they’re starting to get that data, and get it downloaded so that we can see these patterns and maybe intercede when necessary,” Lodato continued.

The people quoted in this article spoke on a recent panel at RegTech America, held in New York on June 14.



Joe Lodato
Guggenheim
Securities

Analyzing unstructured data has been a part of sophisticated surveillance platforms for some time, and in the past was often achieved via dedicated complex-event processing platforms. NICE Actimize, for instance, has combined this type of data analysis with its Proactive Surveillance platform for years, while Nasdaq recently partnered with cognitive computing provider Digital Reasoning to enhance its Smarts surveillance platform’s capabilities.

But the breadth of information now available means that surveillance officers have more at their fingertips than just email and chat messages, card swipes into the building and vacation time utilization to flag up problems, and with cognitive technology, the computing power to analyze this information is available. This development has become necessary in part due to the sheer level of data that individuals—and society more broadly—produces on a global scale. Information that might not have been available to watchdogs in the past is now out there.

“We’re doubling the amount of data that we produce and store every two years,” said Chris Vickey, COO for the Americas at Nomura. “Think about what that means and it’s incredible—it

means that in the past two years we’ve produced more data than in the rest of recorded history.”

This information can also have real-world consequences. Abel Picardi, chief compliance officer at Bank of China, recalled an incident where the bank ran a background check on a group of interns who had been offered positions at the bank a few years ago. One intern had an offer rescinded over an offensive Facebook post that was published three years before that point.

But it also has benefits. Information that, in isolation, may appear unremarkable to human officers may fit into a pattern that only machines can determine, given the sheer quantity of data that enters and leaves a bank at any time. Scandals related to conduct, in particular, can be effectively tracked by cognitive technology.

“[IBM’s cognitive platform] Watson probably would have picked up Wells Fargo’s problems—based on that data. I’m sure somewhere, someone was complaining about the accounts, and it would have picked up on it,” Guggenheim’s Lodato said.

No Privacy

While such analysis has been the norm for many years in the defense and intelligence industries, it is still developing in financial services. “We started seeing interesting things coming out of the intelligence space within the compliance area four or five years ago—much more advanced surveillance techniques. They’re used to using big troves of data and have been for some time. I think we’re at an evolutionary stage—we’re certainly not mature yet, and there’s a lot more to do,” said Vickery. **W**

THE BOTTOM LINE

- Cognitive technology allows compliance specialists to identify patterns in data that may not be possible for humans to pick up.
- Such technology has been in use for years in defense and intelligence settings, but is making its way to the trading floor.
- Vendors have dabbled in this for years, but initiatives like IBM’s Watson are proving the power of cognitive technology—and its potential to avoid disasters in the making.

Alliance Bernstein, Algomi Partner on ALFA for Fixed-Income Market Liquidity

Algomi is set to acquire and distribute the Alliance Bernstein-developed ALFA solution to aggregate bond market liquidity venues into a single source. [John Brazier](#) looks into how the fixed-income market as a whole is set to benefit from the partnership.

The electronification of fixed-income trading has seen a plethora of venues come to the market over the last few years, fragmenting bond liquidity further and increasing the importance of accessing critical information for traders.

In response, US-based asset manager Alliance Bernstein developed the Automated Liquidity Filtering and Analytics (ALFA) solution to aggregate the market landscape onto a single screen and provide its bond traders with signals to where and when liquidity events occur across a number of electronic trading venues.

“When we saw this developing we had two choices: We could either hire a bunch of traders that would have to watch and maintain all of the different potential opportunities in the market, or we could invest in technology,” says Tim Morbelli, vice president of credit trading at Alliance Bernstein, who was heavily involved in the development of the ALFA product.

Now the firm is sending the solution out to the rest of the market through a new partnership with UK-based fixed-income technology vendor Algomi, which will acquire and distribute the solution. Alliance Bernstein has also taken a minority stake in the vendor and plans to work in collaboration with Algomi to develop ALFA beyond its current capabilities.

“Ultimately, we plan on taking ALFA to where it becomes an EMS, where it is not only consuming data but pushing out information as well,” Morbelli explains. “Whether it be responding to an inquiry or pushing out levels on alternate trading systems, we

don’t have the tech capability to build it that way, so we decided to partner with Algomi.”

Morbelli says a solution such as ALFA provides benefit to the entire bond market, which was part of the reason why it decided against holding on to it. “A solution like ALFA is relevant for the marketplace,” he says. “We felt that ultimately a product like this would be built, so why not be a thought leader and help build out the marketplace?”

The firm, alongside T. Rowe Price, BlueBay Asset Management and Brown Brothers Harriman, will be an early adopter of the ALFA solution under Algomi’s stewardship. The solution also furthers the trend of buy-side firms positioning themselves as price makers in the bond market as dealer balance sheets have shrunk in size.

“The buy side generally doesn’t have the toolkit required to do this sort of opportunistic price-making effectively,” says Stu Taylor, CEO of Algomi. “Alliance Bernstein had a very mature way of thinking about this by putting this product out into the market, because the whole market will function better as a result.”

Alliance Bernstein began development of ALFA in March 2015, running

through a number of live-beta test iterations across multiple sprints, before rolling it out across its bond trading desks in October that year. Morbelli says the firm identified a “bifurcation of opportunities” and designed the solution to bring those liquidity events into a central location that provides a single review of the market.

ALFA is currently connected to seven of the most prominent electronic bond trading platforms, with an eighth waiting to be confirmed, pulling in and updating information in real time on an agnostic basis, as well as historical information, analyst commentary, historic trades, and a Trace chart.

“The unique thing about ALFA is the range of electronic trading platforms that they have integrated,” says Taylor. “There is no other tool that can aggregate all the dominant platforms in the fixed-income market. I think it took a major buy-side firm to get that done.”

Global Aspirations

For Algomi, the acquisition of the ALFA product is an ideal way to increase its presence in the fixed-income market, particularly when it comes to electronic bond trading, as the firm has historically specialized in solutions for voice-based trading through its Honeycomb network for the buy side and information-matching platform Synchronicity for the sell side.

The deal will also further propel Algomi into the US bond market, according to Taylor, who says an acquisition of this kind was within the company’s roadmap, although probably further down the line. **W**

THE BOTTOM LINE

- The ALFA solution aims to increase access to liquidity information for buy-side fixed-income traders and by utilizing the technology resources of Algomi, Alliance

Bernstein will benefit as an early adopter of the solution and work toward developing the solution into an execution management system (EMS).

AI and Alt Data: A Burgeoning Arms Race

Investment in alternative datasets could exceed \$7 billion by 2020. At the same time, machine learning and other AI techniques are quickly evolving. This combination will be significant. [By Anthony Malakian](#)

Herd mentality has long driven investing. From the 1600s and Tulip Mania to the dotcom boom of the 1990s to the US housing bubble that crippled the global economy this century, irrational exuberance tends to lead to adverse effects.

But what happens when algorithms are leading the herd? Some argue that flash crashes happen. And some believe that regulators need to step in to lessen the risk of chaos. But what if this is more of a data issue, and less of a technology and regulatory issue?

“Algos all depended on market data, which means they reacted to the same type of information or event, which reinforced trends in the market and that’s why you ended up with the Flash Crash,” says Axel Pierron, co-founder and managing director of consultancy Opimas. “Very quickly we’ve realized that the vast majority of the industry is using similar algos that reinforced the herd mentality.”

Alternative Instincts

One phrase entering the lexicon of finance is “alternative data.” At its core, it’s all the data that goes beyond traditional prices and technical analytics. This information has always existed, but now there are more sources available, and it’s easier to get, store and run through software that makes consuming unstructured data more efficient.

In recent years, investing in social media signals and sentiment analysis has grown, with some success. On the horizon, drone/satellite imagery, coupled with cellphone and credit card usage, will continue to grow. Opimas predicts that spending in alternative datasets will exceed \$7 billion by 2020.

But despite advancements, this is rough terrain. In an article titled, *Alternative Data’s Hard Labor*, Waters’ sib-



Axel Pierron
Opimas

ling publication *Inside Data Management* looked at quantitative funds’ attempts to sift through the torrent of datasets populating the market. Wesley Chan of Acadian Asset Management—which manages \$77 billion in assets and has about two dozen researchers dedicated to finding new signals in alternative datasets—says this is a challenging space to navigate for managers.

“You’re going to have to investigate 90 different things to get 10 that are good,” says Chan, director of stock selection research at Acadian. “A lot of people who aren’t used to those odds will walk away in disappointment, thinking the whole thing is a failure—it’s going to be a lot of waste.”

Another problem facing the sector is that there is already crowding that’s making some firms rethink their strategies. From that *IDM* story: “The intraday foreign currencies trader has already abandoned the use of weather and agricultural data due to crowding, while the location and load of an oil tanker—used to generate prices by being able to predict supply—is now regarded as a ‘normal’ input of futures and options traders’ oil price or gas price predictions, according to Ernest Chan, managing member of quantitative investment management at Canada’s QTS Capital Management. “Any known information is being exploited by more and more people, so we always constantly have to look for new sources of information to maintain the edge,” says Chan.”

There are, and will continue to be, limiting factors facing the use of alternative datasets, not to mention that these qualitative datasets produce only a handful of data points when compared to quantitative datasets—hence the need for heavy investment in data scientists to extract value from outputs.

But looking forward, advancements in artificial intelligence (AI) and machine learning will help to augment what a data scientist can do with this information. It can also—potentially—cut down on some of the herd mentality created via the widespread use of similar algos. As deep-learning techniques improve and neural networks become more elegant, Opimas’ Pierron says he believes that differentiation will become more easily achieved because, like a brain, no two neural networks will be the same and the information being fed into those networks—and how the machines are trained—will be similar in some ways, but vastly different in others.

“With AI, you have a very different situation because data sources are much broader,” Pierron says. “The AI you’re using probably won’t react to the same event as someone using other sources of data. With AI, it’s a very different situation because, first of all, data sources are much broader. This means the AI you’re using probably won’t react to the same event as someone else using other sources of data. After that, you have the whole machine-learning process to train the AI, which will be different from one another. So you have different sources of data and a trading strategy that’s implemented differently as well. So I think AI will diversify the trading strategies that are going out into the market, rather than have the herd mentality that existed in the past.” **W**

THE BOTTOM LINE

- The case can be made that the wider adoption of algorithmic trading has led to a greater risk of flash crashes. As machine learning techniques advance and alternative datasets become more readily available, the algo-driven herds might be culled.

IBM Takes Aim at Regtech Using Cognitive Technology

IBM's Alistair Rennie talks with *Waters* about the company's entrance into the regtech space and what's ahead. [By Anthony Malakian](#)

When IBM bought Promontory Financial Group last fall, it was a clear signal that the software behemoth was taking aim at the financial regulatory space in the same way it did with the healthcare and cybersecurity sectors: by pairing its Watson cognitive computing capabilities with industry experts.

On June 14, IBM announced the launch of three first-generation cognitive solutions trained by Promontory professionals: Watson Regulatory Compliance, which looks to help banks to better understand and address changes in the regulatory environment; IBM Financial Crimes Insight with Watson, which helps—among other things—firms to better manage anti-money-laundering (AML) and know-your-customer (KYC) alerts generated by monitoring systems; and IBM Algo One Big Data Foundation, which offers a new architectural approach to achieve the performance that's necessary to address regulatory compliance.

Alistair Rennie, general manager of IBM Watson Financial Services Solutions, tells *Waters* that the key to the launch was Promontory training Watson by feeding it 60,000 regulatory citations and 200 different classes of mandates and jurisdictions.

“When we started down this path of trying to solve these problems from a regtech perspective, we were confident that the technology was highly suitable [to handle the large amounts of unstructured data], but we also knew that the systems would only be as valuable as, essentially, who was teaching them and who was guiding the journey of how to put them into place for a regulated

workflow,” he says. “As we’ve developed these solutions, we’ve worked closely with Promontory on where they see the biggest areas of client challenge, how to think about how to put these solutions into that workflow, and, of course, how to train the models.”

The AML/KYC Burden

According to IBM, financial institutions spend \$18 billion to \$21 billion on AML, \$16 billion to \$19 billion on KYC requirements, and \$11 billion to \$15 billion on conduct surveillance.

To alleviate some of that pain, the Financial Crimes Insight tool combines cognitive computing, intelligent robotic process automation, identity resolution, network analysis and machine learning to help compliance professionals more efficiently process alerts, says Rennie, noting that typically between 80 and 90 percent of alerts coming from legacy monitoring systems are false positives. A team of humans has to go through each alert, examine the surrounding information and make a decision as to whether further attention is needed or whether it can be dismissed.

“With cognitive technology, we’re automating how we assist that person with that secondary-alert triage. We can provide them with an augmented view of that alert,” Rennie says. “We’ve trained the system to look for that alert and look at the surrounding data—what did we do in comparable cases and is there outside data that can help fill in a hole?—and then based on the pattern, it can provide a dashboard and a proposed recommendation to the person who is going to make that ultimate decision. So it lays out its evidence and its hypothesis and then the person responsible for making that determination can complete the triage of the alert.”

IBM also aims to help financial firms scale their systems to meet new requirements such as the Fundamental Review of the Trading Book (FRTB), Valuation Adjustments (XVA) measures, and liquidity analysis rules.

Rennie says there are many quantitative models that people use to manage financial risk, but they tend to be only as good as the data that’s being used and are relatively static in their assumptions. But when you efficiently incorporate other sources of information to augment those models, they are better positioned to provide early warnings by bringing in large amounts of unstructured data.

“When you look at a broader set of data and are able to put it into context, we think those models can start to get better. You can better understand, for example, what your overall risk for a particular industry or to an individual company is, what the interconnectedness of those companies is, and what degree of risk or variability that adds to a well-known and approved purely-quantitative mode,” Rennie says. **W**

THE BOTTOM LINE

- Managing risk and compliance currently accounts for 10 percent of operational spending budgets at major banks, with annual spending estimated at \$270 billion per year for financial services organizations, according to McKinsey & Co. The consultancy expects 300 million pages of regulations to flood the market by 2020.
- Financial institutions spend \$18 billion to \$21 billion on AML, \$16 billion to \$19 billion on KYC requirements, and \$11 billion to \$15 billion on conduct surveillance.
- The combination of cognitive tools and blockchain technologies could be the next breakthrough in the regtech space.

Blockchain Standards Will Bring Widespread Adoption in Capital Markets

With blockchain approaching the latter stages of the hype cycle, standards around interoperability and smart contracts could lead to greater adoption. [By Emilia David](#)

Developing standards for interoperability and making sure smart contracts are robust may be the key to widespread adoption of blockchain, panelists at a recent conference said.

Blockchain—seen as a new way to trade assets and an avenue to provide better record-keeping—is now on the production end of the hype cycle and it is up to the financial industry, developers and regulators to work together and determine minimum standards, according to speakers at this year's Sifma Fintech Conference in New York.

Clemens Wang, a director with blockchain consortium R3 CEV, said one of the keys to bringing blockchain out of pilot programs is to show its ability to stand up to the rigors of a transaction cycle.

"There are five P's that we talk about in R3: proof of concept, prototype, pilot programs, permission and then production. The permission aspect is working with the regulators and the right parties to get the right standards under way," Wang said. "You can't really adopt something if everybody's going to build their own distributed-ledger solution or you'll have the same fragmented market."

Regulators are not currently involved in any blockchain ventures, although the Securities and Exchange Commission (SEC) and the Commodities Futures Trading Commission (CFTC) have mentioned the technology in recent programs surrounding innovation and financial technology. Banks and consortia are working to encourage education around blockchain including reaching out to regulators.

Smart contracts are the lifeblood of distributed-ledger technologies as these contracts form the basis of the golden record that blockchain can bring to financial institutions. James O'Neill, vice president of operations risk at Fidelity Investments, said standards in smart contracts create an impetus for firms to take on blockchain, even if they were previously skeptical about it.

"We have made a lot of progress on agreements on standardization from a regulatory perspective. You see regulatory bodies, infrastructure bodies, and the Depository Trust and Clearing Corp. (DTCC) doing quite a bit of work now and all in the essence of creating standards of interoperability and scalability that we can really move forward," O'Neill said. "It's become more real; it's not a shiny object anymore."

He said that once regulatory support is there for the final schema, which he said may be done in a phased approach depending on geography or asset class, production may accelerate.

Hit All Asset Classes

Panelists said standards and other building blocks of the technology provide assurance to potential users that it can be scaled and robust. Knowing there are strict measures to compare a smart con-

tract, or any other part of blockchain, to a benchmark allows for confidence in the technology beyond a controlled setting like a pilot program.

These standards, however, should hit many different asset classes that may use distributed ledgers, to cut down on future costs, said Accenture senior manager Nikhil Nayab.

"I think we need to have standards that are cut across different asset classes so you don't create more vertical stacks, which means there are going to be more operations groups," Nayab said. "The standards discussion needs to happen in a horizontal fashion as well. Otherwise you won't recover the cost you're putting into the platform; you will do one more build."

Wang said R3 is working with lawyers to ensure smart contracts generated in the R3 blockchain fall within regulatory standards, including the creation of templates. The panelists see blockchain moving down the hype cycle and the technology is now becoming more than just fantasy, but more as a network rather than a means to trade. Nayab said the industry has seen that the best way to use distributed-ledger technology is to fix the broken record-keeping prevalent in many banks.

"This technology has come a long way from a variety of different angles. This is an ecosystem and an industry-wide platform that needs to be deployed for adoption," he said. "It's actually the network, the record-keeping system, that's broken, and we're now maturing in the way we approach the technology with that perspective saying, 'Let's start looking at that as a record-keeping system rather than a crypto asset we would all transact in.'" **W**

THE BOTTOM LINE

- Widespread blockchain adoption hinges upon industry standards for interoperability and smart contracts
- Bringing in the perspective of regulators may help accelerate development
- Blockchain may succeed more as a way to keep records through a network than it will as a transactional technology

Market **Cops** Dust for Fingerprints in Modern Spoofing Cases

A quick glance at regulatory enforcement actions shows the breadth of attempted market manipulation, but experts say they have developed a way to track the ‘signatures’ of individual spoofers—and the technology is now being rolled out to trading desks. **By James Rundle**

In the middle of 2011, Alan Jukes had a problem. As a market surveillance analyst at the Intercontinental Exchange’s (ICE’s) European trading venue, he was responsible for ensuring that all market participants played by the rules. But Jukes, a former pit trader himself, had the feeling that someone was clearly trying to stack the market in their favor.

One trader in particular was generating hundreds of alerts per day in crude oil futures contracts, detected thanks to a tool Jukes had developed that aimed to make the identification of “spoofing” easier for surveillance officers. Now, the early form of that offering has been developed and evolved into an order-book visualization tool within Nasdaq’s Smarts surveillance platform, where he now works.

“The key consideration was to ensure that the most egregious behavior was easily identifiable, even when looking at a full day’s worth of trading,” says Jukes. “Given that events can happen in milliseconds, it was important that the visualization [tool] was able to alert the analysts to potentially suspicious pattern behavior, without creating too much noise. Through the use of brightness and color, we were able to produce a ‘signature’ indicator that could be seen very easily.”

Broadly speaking, someone looking to spoof the market will stack a large number of sell orders on one side of the market, for example, to drive the price of a contract down and trick algorithms at rival traders into believing an event is occurring that has triggered a sell-off. Then, the spoofer will quickly cancel

those orders and take the other side of the deal, buying at a knock-down price and pocketing the profit.

Jukes was able to use the tool he developed to identify a pattern of behavior from that particular trader—he declines to confirm their identity—and that evidence was later used in a successful prosecution by regulators, including the US Commodity Futures Trading Commission (CFTC).

A New Look

Now a lead product manager focusing on alerts and alert logic for Smarts, Jukes says he believes the methods he developed to catch abusive behavior in the past can be used by market surveillance officers to identify the specific “signatures” of potential market abusers in the order book. This is being rolled out in June to Smarts customers.

“Once an alert has been triggered, the view allows the user to isolate just that alerting entity within the visualization,” he explains. “This removes all the potential noise, enabling the user to look for the signature. It has proven to be extremely consistent when tested against multiple real-life spoofing cases. Even more importantly, it enables users

to identify behavior that is actually benign, but may have triggered an alert. The ability to easily rule out spoofing is almost as important as being able to identify it.”

The tool could prove crucial to the front office, which has come under increasing scrutiny as a first line of defense against market manipulation. Some newer rules, including Europe’s Market Abuse Regulation, have even codified this responsibility.

But the task is not for the faint-hearted. Market abuse investigations generally involve combing through datasets to identify patterns of behavior, and the data in question can run into millions of rows, particularly for highly liquid contracts such as crude oil futures. This visualization tool allows surveillance officers to see activity as it happens, identifying patterns for further observation.

“Given that the tool can work in real time, it would be able to identify suspicious behavior in real time,” Jukes says. “However, in reality, this would most likely be a tool to aid in the investigation of alerts, and as evidence of repeat behavior and possible intent. It can also be used to identify ‘attempted’ manipulation that can be difficult to identify using alerts.”

The visualization tool, named Depth, will work alongside Smarts’ Spread offering. But the company is also planning to expand on capabilities in this area through a further development called Lens. This will, Jukes says, enable surveillance officers to engage in “very detailed drilling into an entity’s order statistics and performance.” **W**

THE BOTTOM LINE

- Nasdaq’s Smarts platform got an upgrade in June—Depth—that lets surveillance officers visualize order-book activity.
- The firm will support the release further with new tools designed to work in conjunction with Depth.
- The upgrades will potentially allow watchdogs to track unique trading patterns that may be manipulative.

Tech Challenges Loom as Europe Eyes London's Clearinghouses

European authorities have fired their first volley over Brexit by suggesting that some derivatives clearinghouses may need to relocate to the European Union—potentially resulting in technological upheaval for those that are affected. *By James Rundle & Aggelos Andreou*

The European Commission's (EC's) proposal suggests splitting non-European Union (EU)—or third-country—central counterparties (CCPs) into two camps: The first would consist of smaller CCPs and be able to use existing equivalence arrangements, while the second would comprise systemically important CCPs. These will be subjected to enhanced supervision owing to their importance, and the EC further suggests that such entities may need to relocate within the EU to continue to offer clearing services in euro-denominated instruments.

A clearing specialist at a major US bank says the new rules would have a major effect on clearinghouses—in terms of technology lift—if CCPs are required to relocate to the continent, describing it as a “Herculean” task with “massive potential for disruption.” Clearinghouses handle trillions of dollars in trades on a daily basis, and are heavily dependent on technology to complete tasks such as netting, compression and reporting. Even a day's disruption could have severe consequences if handled incorrectly.

Others point to worries that the new rules would do more harm than good. “On the back of the political debate and negotiations, there are of course very practical questions of mutual recognition and licensing, access rules, the potential risk of fragmentation of liquidity, as transactions are distributed among



“On the back of the political debate and negotiations, there are of course very practical questions of mutual recognition and licensing, access rules, the potential risk of fragmentation of liquidity, as transactions are distributed among CCPs, and the allowance for market competition for clearing.” Roger Storm, SIX Group

CCPs, and the allowance for market competition for clearing,” says Roger Storm, head of clearing services at Zurich-headquartered SIX Group.

The move is a blow to the UK, which is home to some of the largest global CCPs. This includes LCH, which historically stood for London Clearing House, and the Intercontinental Exchange (ICE) Group's ICE Clear Europe, although LCH does have a Paris-based CCP already. ICE declined to comment.

“Regulatory cooperation, which the UK currently enjoys with the US, supports financial stability across the entire market, and provides substantial economic efficiencies for customers, and hence for the real economy, as well,” says a spokesperson for the London Stock Exchange Group (LSEG), which owns LCH. “A location policy does the opposite—it increases, not decreases, risk

and costs for customers. Given these facts, European and global customers have overwhelmingly expressed a clear preference for shared regulation between the EU, the UK and the US.”

The decision to potentially force a relocation of clearing to Europe has been met with marked opposition from the industry. The International Swaps and Derivatives Association (ISDA) said on Monday, June 12, that such a move could increase initial margin costs by 15 to 20 percent, while LSE CEO Xavier Rolet has warned that it could cost up to €100 billion (\$112 billion).

There are also legal complexities involved that would require a vast amount of effort to remedy, which become pertinent given the nature of CCPs as middlemen in the derivatives market. CCPs act as a seller to every buyer and a buyer to every seller, guaranteeing the trade in the

event that one party defaults. This is accomplished by a process called novation, where the original trade is torn up once it is submitted to the CCP, and two equal and offsetting contracts are then entered into directly with the clearinghouse on each side of the trade.

“Besides the people, infrastructure and technology issues, there are other practical realities,” says Steve Grob, director of group strategy at Fidessa. “What language will the contracts be printed in, and will they be enforceable under German or French legal regimes, which have different bankruptcy laws? This will all take time to sort out.”

However, it is likely to benefit Frankfurt-based Eurex Clearing, part of the Deutsche Börse Group, which recently abandoned a proposed merger with the LSE after the EC blocked it on antitrust grounds. Eurex competes with both ICE and LCH for market share in derivatives clearing, albeit in slightly different areas.

“We understand the concerns of European regulators, central banks and politicians who want to ensure effective supervision and access to the full set of recovery and resolution tools for systemically relevant market infrastructures within the EU,” Eurex Clearing CEO Erik Müller tells *Waters*.

Carrots and Sticks

The European Securities and Markets Authority (Esma) will be responsible for determining which tier CCPs fall into, and thus whether they are in scope for the enhanced supervisory requirements. A dedicated committee for all CCP matters will also be formed within Esma, which can make a recommendation to the EC that a systemically important CCP should

“Besides the people, infrastructure and technology issues, there are other practical realities. What language will the contracts be printed in, and will they be enforceable under German or French legal regimes, which have different bankruptcy laws? This will all take time to sort out.” **Steve Grob, Fidessa**



be established within the EU—rather than outside it—if financial stability concerns warrant such an approach.

“Overall, we support the EC reviewing how CCPs are supervised in the EU, given their importance for the markets,” says an Esma spokesperson. “In particular, we welcome the proposed strengthening of the third-country framework for CCPs.”

The Commission’s proposal, which would amend both the European Market Infrastructure Regulation and the Esma Regulation, has yet to be approved by the European Parliament and Council, and some lawmakers in the powerful Economic and Monetary Affairs Committee have said they would have preferred a harder line, including vice-chair Markus Ferber.

“The Commission has lost its courage when it comes to euro clearing. We do not need a case-by-case analysis, but one clear rule. The rule must be that euro clearing must be done under EU jurisdiction—no ifs or buts,” he says.

The EU may yet face legal challenges on the issue, also. In 2015, the UK successfully argued against a previous attempt to force the clearing of euro-denominated derivatives to take place within the eurozone in the European Court of Justice.

“History has shown that carrots are better than sticks in changing peoples’ behavior. If you really want an industry to move wholesale to a different country then you have to give those people some pretty compelling incentives,” says Fidessa’s Grob. “None of those seem to be in evidence at the moment.” **W**

THE BOTTOM LINE

- The European Commission has unveiled new plans for supervising non-EU CCPs after Brexit, including the possibility that UK-based clearinghouses may be forced to relocate to the eurozone.
- The rules would only apply to systemically important clearinghouses, but would pose major

legal, operational and technological challenges.

- Despite this, some MEPs believe that the Commission should have taken a harder line.
- European Supervisory Agencies will be tasked with determining a CCP’s systemic importance—and whether it should relocate.



THE BRUXELLIAN JOB:

Europe Targets London Clearinghouses

European authorities may be preparing to pull off one of the boldest heists in financial-markets history—a forced relocation of London’s clearinghouses to the eurozone. But market participants are strongly opposed, and the technology hurdles are high. *By James Rundle, with additional reporting by Aggelos Andreou*

Nobody expected Brexit’s initial exchange of fire to take place in a quiet, arcane corner of the financial markets. Yet on June 13, that’s precisely where European authorities launched their first broadside. Their target was London’s powerful clearinghouses, and the impact sent a shockwave of unease through the industry.

That afternoon, during a short press conference in the European Union’s (EU’s) Strasbourg buildings, vice-president Valdis Dombrovskis of the European Commission (EC) outlined proposals for how third-country—European legalese for “non-EU”—central counterparty (CCP) clearinghouses should be supervised. Important CCPs

would be subjected to dual supervision between the EU and their home regulators, owing to their importance in the financial system, he said.

But the most important clearinghouses, he continued, faced the possibility of extraordinary measures. “In some specific circumstances, and as a last resort, authorities may require individual CCPs to be established within the EU,” he said, reading from prepared notes.

Traders and risk managers at major dealers were blunt in their assessment. One clearing specialist at a US bank, contacted by *Waters* for comment as the news broke, was silent for a few moments, before

letting out a long breath. “So they actually did it?” the source asked. “Jesus Christ.”

Tech Tangles

The possibility of a clearinghouse having to up sticks and move from London to Paris, Frankfurt or another European financial capital has tremendous technology implications, at least in the short term. Aside from the need to replicate the infrastructure in use at each location, CCPs are responsible for daily activities crucial to the efficient running of derivatives markets on a global scale. “The safety and soundness of CCPs matters for central banks, and it matters a lot,” says Benoît Cœuré, a member of the executive board of the European Central Bank (ECB). “What concerns us today in the context of Brexit is that the current EU regime regarding third-country CCPs was never designed to cope with major systemic CCPs operating from outside the EU. Indeed, this regime relies to a large extent on local supervision, and provides EU authorities with very limited tools for obtaining information and taking action in the event of a crisis.”

But despite these concerns, moving the location of a clearinghouse’s systems, and resetting those connections, would be what the US bank’s clearing specialist describes as a “Herculean” task in the short term, one fraught with the potential for mishap.

Clearinghouses are best known as risk managers within the financial markets, entities that stand between buyers and sellers of derivatives, that guarantee the trade in the event that one party defaults. This is largely accomplished through the collection of collateral, or margin, from counterparties, but the technical clout needed to calculate and distribute margin on such a scale is immense—the largest CCPs handle trades collectively worth trillions of dollars on a daily basis.

Then there are the ancillary services offered by CCPs, which rely heavily on technology to accomplish their



“It is inconceivable that supervision of euro clearing is done by a third-country authority, but the eurozone would be asked to step in with emergency liquidity assistance during a crisis. That would create the kind of moral hazard we always wanted to avoid, as being too lenient, and for creating uncertainty by determining CCP status on a case-by-case basis rather than through one clear rule.”
Markus Ferber, European Parliament

tasks. The netting of trades, in which a financial institution’s long and short positions are compared and aggregated so as to arrive at an overall margin call, rather than duplicative individual calls, is performed on a daily basis. So too is compression, where similar trades are reconstituted into single transactions with the same economics.

More recently, CCPs have begun to explore portfolio margining, where a firm’s listed and over-the-counter (OTC) trades are examined for correlations and offsets so as to further reduce margin requirements. Plugging in to all of these processes are third-party systems, such as collateral management platforms and inventory management systems, not to mention reporting software and trade ledgers.

A Delicate Balance

All of this exists in a fine balance, where systems are subjected to rigorous standards and uptime guarantees. Moving that infrastructure seamlessly is possible, but it would be no mean feat, says Steve Grob, director of group strategy at technology vendor, Fidessa.

“It seems pretty clear to me and a whole bunch of other people that the concept of relocating clearing was a great thing to say, and a great thing to get lathered up about in a Brexit context, but is actually pretty meaningless because you can’t just pick something

physically up and move it,” Grob says. “It’s like saying ‘I’m going to pick up Silicon Valley and put it in Detroit.’ Easy words, but what does that actually mean?”

Then there are further challenges that relate back to technology, but stem from more prosaic concerns, such as which legal jurisdictions the CCP’s contracts fall under once it has moved. Indeed, there are questions over whether moving a clearinghouse is even a practical exercise, or just political posturing. “Truth be told, one of the reasons people do their euro clearing in London is that they like the way it’s set up,” says Grob. “They want contracts in English, they want things subject to UK law, and they feel that it’s the safest place to do it—otherwise they just wouldn’t. So the idea that you can pick it up and change it, unless you can offer some massive carrot to participants, was always going to be a problem.”

The proposals represent a sea change in how the EU interacts with foreign nations from a regulatory perspective. Up until this point, Europe had used a system of “equivalence” to assess supervisory compatibility for CCPs, a determination that a foreign host-country’s legal and regulatory system was at least as strong as that which is currently in place within the EU, says Roger Storm, head of



clearing services at Zurich, Switzerland-headquartered SIX Group.

“The system of mutual recognition of third-country legal regimes and oversight functioning has worked well for many years, and I haven’t heard arguments why this could not continue to be used. I hope common sense and pragmatism will prevail,” he says.

New Landscape

European incumbents would likely be the prime beneficiaries of the proposals, not least of all Deutsche Börse-owned Eurex Clearing, which has long competed with ICE and LCH’s UK clearinghouses. “We understand the concerns of European regulators, central banks and politicians who want to ensure effective supervision and access to the full set of recovery and resolution tools for systemically relevant market infrastructures within the EU,” says Erik Müller, CEO of Eurex



Roger Storm
SIX Group

Clearing. “Eurex Clearing fulfils all CCP rules defined by the European Market Infrastructure Regulation, as well as relevant EU banking rules, in light of Eurex Clearing’s full banking license for secured and permanent access to the ECB.”

In a broad sense, most market participants agree that the operational challenges involved with relocating a CCP are problematic at best, and at worst, introduce the possibility of creating systemic instability—the very consequence that the proposals are meant to avoid.

“Fragmentation is in no one’s economic interest,” said BoE governor Mark Carney, in his annual Mansion House speech on June 20. “Nor is it necessary for financial stability. Indeed it can damage it. Fragmenting clearing would lead to smaller liquidity pools in CCPs, reducing the ability to diversify risks and diminishing resilience.”

The clearinghouse LCH, majority owned by the London Stock Exchange Group (LSEG), is also a proponent of this belief. “Regulatory cooperation, which the UK currently enjoys with the US, supports financial stability across the entire market, as well as providing very substantial economic efficiencies for customers, and hence for the real economy as well,” says a spokesperson for the LSE. “A location policy does the opposite—it increases, not decreases, risk and costs for customers.”

Officials at the LSE point out that LCH already has a European presence through its LCH.Clearnet SA CCP, based in Paris, which handles clearing for listed and credit derivatives, as well as its ownership of Italian clearing house CC&G. But the proposals could also affect CCPs such as ICE Clear Europe, a London-based CCP dominant in credit and energy derivatives clearing. “The devil is in the detail, and we don’t have that as yet,” says an ICE spokesperson, declining to comment further.

LCH, which did not answer specific questions from *Waters* on how it would handle any relocation, has an extraordinary amount of skin in the game. Based in London, its SwapClear service handles over 90 percent of the cleared interest-rate swaps market, with contract lengths as long as 50 years in duration. It also clears the bulk of swaps denominated in euros, a fact that made European supervisors uneasy long before the UK voted to leave the European Union in June 2016.

Indeed, the wider EU has long envied London’s pre-eminent position in financial markets, and coveted its dominance in clearing. In 2015, the UK successfully fought off a bid by the European Central Bank (ECB) to force CCPs that cleared euro-denominated instruments to relocate to the Eurozone, and thus under its purview. The European Court of Justice had ruled that the ECB lacked the authority to oversee such businesses. But it would eventually be a small regulator with a bureaucratic-sounding name—

the European Securities and Markets Authority, or Esma—that would prove to be the key to Europe’s second stab at repatriating euro clearing to the continent.

Unreliable Narrators

While it’s true that equivalence has mostly worked well, those with knowledge of the EU’s thinking say that Brexit has created stark uncertainty within the halls of power. “On the one hand, you have the UK as we’ve historically known it—financially literate, competent in supervision and solidly reliable,” says a Brussels-based lobbyist. “But then you have Brexit, you have talk of grand repeal bills, and looking ahead, potential divergence from the EU. That’s not a comfortable position to be in, and agencies like Esma have been quite adept at dropping hints here and there that maybe it would be better if everything were kept in the family, so to speak.”

Esma is not widely known outside of financial circles. The pan-European regulator is perpetually underfunded and thinly staffed—its budget of just over €40 million (\$45 million) for 2017 and its 150-strong headcount is dwarfed by many of the national regulators that it is supposed to oversee—but it packs an outsize punch, having written the bulk of the technical standards for most major pieces of European regulation after the financial crisis.

Since 2012, it has also directly overseen European clearinghouses, giving it the supervisory competencies the ECB lacked, and which cost it the initial court battle over CCP location policies. With the EC’s proposal, Esma’s powers will be extended further, with new responsibilities for ensuring CCPs don’t collapse, and, critically, the ability to make a recommendation to the EC that a systemically-important CCP should be forced to move to the eurozone. The criteria under which Esma assesses the systemic importance of a CCP should be defined in further legislative acts, the proposal states. Once such a deter-



**Steve Grob
Fidessa**

mination is made and accepted, the EC states, clearinghouses would have 12 to 18 months to move their operations.

The proposals mark a culmination of months of campaigning on Esma chief Steven Maijoor’s part. The chairman of the regulator has frequently mentioned the fact that Esma does not consider current third-country arrangements to be sufficient for CCP oversight in speeches and in Parliamentary hearings since the UK voted to leave the EU, both indirectly and with specific reference to Brexit.

An Esma spokesperson says that the regulator welcomes “the proposed strengthening of the third-country framework for CCPs,” but that it is still studying the specific proposals put forward by the EC, and does not have further comment at this stage. However, the spokesperson adds that, in a general sense, Maijoor has said in the past that any new tasks for the regulator should include proposals for specific funding. The EC proposal mentions that the new responsibilities could be paid for primarily by supervisory fees extracted from CCPs, but does not promise additional EU funding.

It is unclear how Esma would manage these tasks without further resources. The regulator has been so cash-strapped in the past that it has had to cut back on internal technology projects, staff travel and even stationery costs in order to prioritize its major tasks, such as a centralized reference data utility, enhanced data and risk analytics technologies, or rulemaking requirements for incoming regulations.

Cost Control

The proposal still has to be adopted and approved by both the European Parliament and Council under EU rules, but might still face some opposition—for not being harder on London. “It is inconceivable that supervision of euro clearing is done by a third-country authority, but the eurozone would be asked to step in with emergency liquidity assistance during a crisis. That would create the kind of moral hazard we always wanted to avoid,” says Markus Ferber, a German Member of the European Parliament who sits on the powerful Economic and Monetary Affairs Committee. Ferber criticizes the EC proposal as being too lenient, and for creating uncertainty by determining CCP status on a “case-by-case basis” rather than through “one clear rule.”

“The Commission has lost its courage when it comes to euro clearing,” he says.

Although the EU insists that these powers will only be used as a “last resort,” the mere possibility of a forced relocation has been enough to unsettle market observers, leading to broader concerns about how other key battlegrounds in Brexit will emerge in the years to come. For now, however, institutions that have become the nervous system of markets since 2008 have been placed squarely in the crosshairs.

“It is too early to say how this all will play out,” says SIX Group’s Storm. “But the swords seem to have been drawn between the EU and the UK regarding control, oversight and domiciliation of these central financial-market risk management entities.” **W**

SALIENT POINTS

- European authorities have put forward proposals that could require the very largest UK-based CCPs to relocate within the eurozone.
- EU officials argue that this is necessary for proper supervision, but industry groups have lobbied fiercely against it, arguing that it will drive up costs.
- There are also questions over whether CCPs, faced with relocating to the continent might choose to move to the US instead where most have an existing infrastructural base.
- The proposals still have to be approved by European lawmakers, and EU officials say that relocation will only be used as a last resort.

BRING YOUR OWN THREAT:

Securing IT in the Age of IoT



As internet-enabled devices explode in popularity, firms can look to lessons from smartphones and tablets to secure their data. But the threat from the Internet of Things may be far more insidious—and harder to defend against—than bring-your-own-device policies. *By Emilia David*

Maintaining a firm's digital defenses is the top priority for information security officers, but that job becomes difficult when the walls can, quite literally, have ears. Today, it isn't an employee's smart phone that cybersecurity experts are worried about—it's the Wi-Fi-connected refrigerator in the kitchen, the digital cappuccino maker and the smart photo frame on an employee's desk. Any of these could be compromised if left unsecured, and anyone could be listening in.

The Internet of Things (IoT) is the new bring-your-own-device (BYOD), and the lessons learned

from that debate are laying the groundwork for securing these new internet-enabled devices. But experts warn that IoT requires a higher level of surveillance and employee awareness to ensure it doesn't compromise the firm.

"IoT is different from smart phones, because smart phones are made for communication," says Sheldon Cuffie, chief information security officer (CISO) at life insurance firm Northwestern Mutual. "The BYOD debate doesn't really compare to IoT because that was more software-based, where I can secure it from within—this is mostly embedded in the system."



“Visibility is really important because IoT attracts all kinds of unknown attacks, and clients often don’t know how many devices are connected to their networks.” **Nicole Eagan, Darktrace**

Most people associate IoT with popular consumer products like Amazon Echo, Tile, Nest or Google Home, but it has an infrastructural flavor, too. Industrial IoT is less well known, but it can be everywhere—heating, ventilation and air conditioning systems that connect to networks, security cameras and automated fire detection systems are all IoT-enabled. Both the industrial and consumer versions can be infiltrated and used to seek out important data, or to plant code designed to operate within a bank or buy-side firm’s own systems.

“One of our clients installed vending machines that let employees swipe their IDs to pay for snacks and this can be dangerous because if it’s hacked, information about the employees can be released,” says Nicole Eagan, CEO of cybersecurity specialist, Darktrace. “Visibility is really important because IoT attracts all kinds of unknown attacks, and clients often don’t know how many devices are connected to their networks.”

Battle Hardened

In general, industrial IoT tends to be much easier to manage than consumer devices, because these

systems are crucial for the business to function, and as such, tend to be hardened against attack with robust, built-in security. They also tend to run on different networks because of the volume and importance of data that flows through them, and there is also no reliance on a manufacturer to secure the device—an organization can usually put its own security programs into industrial IoT devices. “Industrial IoT has higher stakes for safety so the security there is more straightforward. But the trouble with IoT is that it’s still vulnerable,” says Tyson Macaulay, CTO of cyber at BAE Systems Applied Intelligence.

Consumer devices that staff bring into the building are the ones that keep CISOs awake at night, particularly given the fact that the security pedigree of these technologies often leaves much to be desired.

With BYOD, smart phones and tablets had the advantage of offering third-party app development. Security experts could therefore build apps around encryption into these devices, such as two-factor authentication platforms that require verification in order to access email on phones. But because IoT devices are often

self-contained and don’t have an application platform to write security programs, the reliance on a manufacturer to update security increases. Consumer IoT products are also released with a frequency that is difficult to match in terms of developing security protocols. “The majority of IoT manufacturers are small firms or companies that don’t really need to think about security. These are not just the Amazons or Googles of the world but appliance companies that have to hire a third party to put in the internet capability,” Macaulay continues. “We need to ask manufacturers questions around the security of their devices and maybe even set certifications so that these firms follow them. But until then, we have to manage the risks these devices carry.”

Threat Vectors

Put simply, once a device is connected to the internet, it creates an opening for a would-be attacker to enter an organization’s system. The stakes involved in such intrusions can be extremely high—in some cases, life and death. IoT devices can provide a ready-made network of devices slaved to malicious tasks, such as launching distributed denial-of-service attacks that shut down public or private infrastructure. Security researchers have posited that the recent WannaCry ransomware attacks on the UK’s National Health Service and other medical facilities around the world were able to spread so quickly, in part, by infecting IoT-enabled devices connected to hospital networks. In January 2017, the New York City Department of Health issued a warning that even IoT devices such as baby monitors were being hacked.

These and other events underscore the vulnerability of IoT devices



as machines mainly made for utility and convenience, with only basic—if any—protections against cyber threats. In financial services companies, these defense gaps could have severe consequences. Yet organizations have been slow to react, and worse, often ignore the problem until it directly affects them. “Until a law exists requiring standards or even certification for network safety, companies won’t do it because it rarely offers a competitive advantage,” says BAE’s Macaulay. “Regulators have a role in IoT and certification bodies like the International Standardization Organization are looking at it, and studying how they can participate. I’d say we might be two to five years away from getting standards around IoT safety.”

Focus

Until that point, the focus at many firms is on keeping the business as safe as possible from these threat vectors. That involves protections that sound simple when taken at face value, but can be difficult to implement in practice. One of these solutions is establishing a guest network, which employee-owned devices are forced to connect to and on which IoT devices can be segregated. Josh Stabiner, CISO and head of technology infrastructure for asset manager Pine River Capital, says the key to this strategy is understanding which IT assets within the company can be effectively managed by security professionals. “You have to separate what you can control versus what the vendor can control, and what I can control is the network.



Josh Stabiner
Pine River
Capital

I can set up a separate network from my corporate one that allows these devices to connect to the internet,” he says. “As long as I’m smart about it, keep it air-gapped and not let it flow from one to the other, I can have some relative comfort that these devices can connect to the internet safely.”

But the problems don’t simply stop with where these devices are connected. Stabiner adds that even if IoT devices are on separate, hard-wired networks, they still must be monitored so that they don’t “talk” to other products with wireless chips, which may not be on the segregated lines. Even then, if security upgrades are not up to date, these protections could be circumvented. “Separate networks, working with vendors for patches and educating your users are

good practices,” he continues. “I also want my users to keep their devices up to date—it’s better for me when all my employees are safe at home so we include that in our security training twice a year.”

This strategy might not be for everyone, of course. Smaller firms with over-burdened servers may have a harder time designating different networks for smart devices and IoT. John Popolizio, chief security officer at advisory firm Riverdale Group, and a former enterprise chief security officer at New York Life, says companies need to understand whether their infrastructure can handle further segmentation. “Ideally, you would be able to segment out IoT devices, but some infrastructure might prohibit that or the design precludes firms from doing that,” he says. “That’s when other techniques need to come in.”

People Power

The best defense comes from what is arguably the biggest weakness in a firm’s security—its employees. Pine River’s Stabner says education is important, so users know at least the basics of protecting their data, and perhaps more importantly, understand the implications of not protecting it. “I think there’s education that needs to be done, so that people know what security features are available to them,” he says. “There are some organizations that say it’s the consumer’s responsibility to protect themselves, especially if they have these devices in their homes. But that’s absurd because you can’t expect the average consumer to implement firewalls at home if they’re not aware of the danger.”

However, employees have to take some responsibility for what they bring into their work environments. For example, while new phones and tablets generally have to be registered with technology



“Regulators have a role in IoT and certification bodies like the International Standardization Organization are looking at it, and studying how they can participate. I’d say we might be two-to-five years away from getting standards around IoT safety.” Tyson Macaulay, BAE Systems Applied Intelligence

staff before they’re allowed access to internal systems, it’s fairly easy for an employee to bring in an IoT device like a fitness tracker without the cybersecurity team noticing for a while, unless that firm is diligent about monitoring its networks. A good cybersecurity program includes culture change, in terms of getting employees to proactively protect their data and their devices and understanding the dangers of connecting unsecured devices onto sensitive networks. Most firms have had these policies in place since the emergence of BYOD arrangements, and it has become ever more important as the range of outside devices entering the business increases.

Secure

But if all else fails, IoT devices can be made secure if they’re just not allowed to be connected to company networks in the first place. Northwestern

Mutual’s Cuffie says he takes the no-nonsense approach of simply not allowing unknown devices to connect to his company’s wireless network, and takes great pains in identifying which ones are on the guest server. “In my organization, we don’t allow non-corporate-sanctioned devices to connect to our network. We monitor that network, as well as our guest network, for personal devices,” he says. “It’s just too risky to allow these kinds of devices on the corporate network.”

Or, as one chief information security officer at a New York-based asset management firm says, just don’t allow them to access anything at all. That might involve uncomfortable conversations, such as telling the CEO that bringing in an IoT device is too risky. “If you let employees bring their devices in, you have much bigger problems,” he says. “As the security guys, you can just say no.” **W**

SALIENT POINTS

- BYOD offers lessons that can be adapted for IoT, like designating separate networks, employee education and increased systems monitoring.
- Visibility into networks allows security professionals to identify the devices that can be a potential entry point for hackers.
- IoT devices are becoming more prominent in offices and are more difficult to protect without the ability to write security programs onto the platform, as is possible with smartphones.
- As such, new techniques and approaches to security are required, and firms cannot rely on the status quo.

Alternative asset management firms can be tricky beasts to comprehend with their portfolios of esoteric products that require specialized technologies in today's marketplace. Cheyne Capital's Josh Jacobson talks to **John Brazier** about how he is focusing on improving investment performance at the firm, the significant influences of behavioral biases, and how it all started with a golf club. Photos by Jonathon Goldberg

The moments that come

to define a career can originate anywhere, at any time. For some, it's the result of years of hard work and dedication paying off, for others it might be the result of sheer luck, while for a small group of people it will be born from a moment of destruction.

For Josh Jacobson, COO for equities at London-based alternative asset manager Cheyne Capital, that moment came during his tenure with former US investment bank Salomon Brothers, where he began his career in finance.

"One day I watched one of the proprietary traders put a golf club through one of the trading desk monitors," Jacobson recalls. "He'd clearly had a trade that had gone badly against him. He was very frustrated and was trying to smash the screen with a phone handset, which didn't work very well, so instead he grabbed a colleague's golf club and just put it through the screen. At that point, I thought: You know what, these people in the marketplace of listed liquid securities aren't necessarily rational, because that was definitely irrational behavior."

While many people in the investment banking community will have similar stories of trading frustrations boiling over, Arizona-born Jacobson comes from what he describes as a traditional macroeconomics background, one that hadn't entailed irate traders destroying company property with a nine iron.

That golf club incident sparked a fascination with how factors other than rational thinking can drive investment behavior and how, in turn, that can impact performance and traders' skills levels. The discovery of behavioral economics—the study of psychological, social, cognitive and emotional factors that can determine, or at least influence, economic-related decisions of both individuals and institutions—provided a further focus for the direction of Jacobson's



A portrait of Josh Jacobson, a middle-aged man with short brown hair and light skin, wearing a dark blue suit, white shirt, and a patterned tie. He is looking directly at the camera with a slight smile. The background is a blurred office environment with shelves and equipment.

Improving Performance

Josh Jacobson
Cheyne Capital

career in finance. “Behavioral analytics gave me another lens through which I could look at investment behavior and not only the behavior of my colleagues and people who I have worked with in the past, but also my own,” Jacobson explains. “It allowed me to hold up the mirror and review myself as well. I became interested in the role that the behavioral side of things plays in investing and how you can improve.”

Support Role

Now in his second stint with Cheyne Capital after working with JPMorgan and Trafalgar Capital Management, Jacobson is taking that desire to improve performance to the next level through the use of qualitative technology and methodologies, in tandem with his work with consultancy Salomon Partners. Jacobson established the consultancy in 2012 alongside fellow Salomon Brothers alumnus Lawrence Evans, and continues to act as an advisor to the business. The work is specifically aimed at coaching asset managers to develop skills to enhance performance through better decision making. Jacobson also had the opportunity to work with the late sports and trading psychiatrist Ari Kiev, whose work on analyzing psychological barriers faced by professional athletes and asset managers was groundbreaking in the 1990s.

He says his time spent coaching fund managers has given him a much deeper insight into how emotions and ego can influence trading behavior and patterns, from the cultural level at the larger financial organizations down to the personal issues faced by individuals running their own shops.

“The consulting work was probably one of the biggest eye-openers for me because I had the opportunity to work with a lot of different, really talented fund managers across a broad array of strategies and firms, from institutions with thousands of people globally to the one-guy-with-his-name-on-the-door hedge fund types trying to get better,” he says.



The primary objective, at least for now, of Jacobson’s role at the hedge fund is to enhance investment skill through analyzing trading decision data, creating a support role that he says is largely missing from the industry, a peculiar fact given that investing is, at heart, a performance industry. “One of the reasons I think this is so important now is the active vs. passive argument, and how in order to justify fees for actively managed funds, be it long-only or long-short, etc., you should be able to exhibit skill, demonstrate how well you invest and provide returns above an index or versus your peers, and also how you were able to do that,” he says.

Heart of Data

At the heart of Jacobson’s efforts to improve trading and decision performance at Cheyne is the firm’s skill-based performance analytics platform, the lifeblood of which is data. “This sort of mild obsession with data is pervasive in my life,” he explains. “I am really into cycling and all the data involved around that is very interesting. I think it fits in

well in terms of my role here, as I get a kick out of it, both here and outside. Cycling is a sport that is rife with data, so there’s a lot to optimize for a ride. It’s all about improving performance.”

Much like cycling, investment activity generates a huge amount of data, in three distinct categories, according to Jacobson: input data, such as market information, company reports, pricing and news; output data, derived from returns; and investment decision data. “In our industry, there is a lot of time spent processing and digesting market information and data, crunching numbers and valuing companies,” Jacobson says. “There is a great deal of time spent analyzing the output, but there is very little time spent looking at the middle bit—the investment process and data around investment decisions.”

One of the main tools Jacobson and Cheyne employ to fill in the gaps of investment decision data and draw analysis on performance is from portfolio intelligence provider, Novus. Jacobson says he was familiar with the technology from his consultancy work and in March last year, Novus and Cheyne collaborated on a project to analyze investment-grade bond data that focused specifically on individual securities rather than the overall portfolio.

Now, the two firms are working together on developing a new fixed-income platform for both fund managers and asset allocators to gain a better insight into factor investing, which will ultimately be productized and made available to other fixed-income asset managers. According to Jacobson, it’s all about pulling together the capabilities offered by both people and machines, instead of taking a fully algorithmic path. The platform, currently in the early stages of gestation, will aim to bring greater clarity to the more complex nuances of bond trading and investment decision-making by dissecting portfolios in a far more granular fashion than is currently available in the market. “The question is, what can we do with that data? Firstly,



“The question is, what can we do with that data? Firstly, we can identify skill, quantify it, and enhance active portfolio managers with that output. We can then enhance the overall portfolio management risk, as well as justify our fees, further develop skills and look for areas where we are making persistent, recurring mistakes.”

we can identify skill, quantify it, and enhance active portfolio managers with that output,” Jacobson says. “We can then enhance the overall portfolio management risk, as well as justify our fees, further develop skills and look for areas where we are making persistent, recurring mistakes.”

Behavioral Bias

Working with the Novus platform and utilizing behavioral economics has allowed Jacobson to take situations where fund managers are unable to demonstrate why they took particular actions or decisions and drill down into the available data to a granular level.

He says that while there are still a number of things that cannot easily be quantified, behavioral bias will almost always be involved in the fund management industry, pointing to instances where he has seen trading behavior influenced by a manager’s personal preference for a particular security or the desire to be a known name in the asset management community. “What you can quantify and examine are certain behavioral biases, such as loss aversion, for example,” he explains. “How that manifests itself in fund management is that you will take far more risk on your losing positions than you will on your winners, because you don’t want to lock in that loss. When you can identify loss aversion in someone’s investment decisions and quantify that, you have a real opportunity to potentially make some significant gains.”

Loss aversion is one area that Cheyne has zeroed in on, currently working on a project with academics to study the subject in greater detail and potentially identify if there is a level where loss aversion kicks in for individual investors throughout the process. The firm is also taking a closer look at the implementation of stop-losses, a factor that Jacobson often encountered when coaching managers who were unable to identify if it was being used or not.

“One of the things that we have been doing at Cheyne is working on stop-loss and profit-taking optimizations on a per-investor, per-strategy basis, because one doesn’t apply the same across the board,” Jacobson says. “Everybody has different levels of comfort with a loss or someone’s investment time-horizon might be longer than others, so you have to take that into account.”

However, altering the investment behavior of a portfolio manager is a tricky business and one that Jacobson likens to a doctor taking the Hippocratic Oath. “The first rule is ‘Do no harm,’” he says. “What you really don’t want to do—what you can’t do—is mess up a good investment process.”

Jacobson explains that the key to successfully coaching and ultimately bettering fund managers’ performance is to ideally have as little noticeable impact as possible: “If you have identified something, you really want the portfolio manager to take it on board, assess it themselves, and come to a realization on their own,” he says.



Alternative Options

Cheyne’s strategy as an alternative asset manager active in a number of complex asset classes often means approaching new technology requirements from a proprietary perspective. The firm is in the midst of developing a new in-house order management system (OMS) to handle its more esoteric products. One of the reasons the firm decided against an off-the-shelf OMS was the lack of a single, good system to handle all of the firm’s requirements, according to Jacobson: “For the equities side there are some. Novus is a good case in point and Bloomberg does a good job for some of our strategies, but for the more complex products—real estate, social property, converts—there is not a lot out there,” he says.

The benefits of implementing a unique OMS for a firm like Cheyne are obvious: Tailored tools for execution can be married with the skill-based analytics that Jacobson is currently developing. He says that since his return to the firm, the challenges he has faced have been of an overall positive nature, a far cry from



the days of the global financial crisis that Jacobson and Cheyne weathered particularly well.

Cheyne now manages \$16.4 billion and is setting itself for expansion, although not through the traditional pathways, instead choosing to focus on its alternative approach to investment strategies and technology. This tack seems to suit Cheyne well, in terms of its technology stack and culture. Even the company's London headquarters at Stornoway House, situated on the edge of Green Park and a stone's throw from Buckingham Palace, provide evidence of the fund's purpose and its sense of uniqueness, having been rebuilt in 2002 specifically to accommodate the firm.

Having first arrived in London in 1997 with Salomon Brothers, Jacobson now considers himself at home in the capital, having taken UK citizenship and settled with his family. He jokes that coming from Arizona, where he had grown fed-up of the constant sunshine, London provides a nice relief, but confirms that he is definitely here for the long run.

New staff joining the firm aren't exempt from the kind of analysis Jacobson specializes in. A recent hire at Cheyne, for example, had his portfolio and position-level data analyzed by the Novus platform, which, according to Jacobson, provides both the firm and manager with a positive start to work from, and identifies key skillsets before the job has even begun.

"Cheyne is a niche asset manager and I think this is a niche approach as well, so I do think the technology feeds into our culture," he says.

Evolution

Jacobson returned to Cheyne in October 2015 after a six-year absence establishing Salomon Partners and a three-year stint with Trafalgar Capital Management, as a fund manager and partner. He says he returned to a firm that was evolving alongside the demands of the asset allocator community, investor requirements and advancements in technology. "The infrastructure development took a huge leap forward here, as well as the rate at which trades get matched up,

and clearing is getting faster, so there are rarely any trade breaks anymore," he says. "In terms of the risk analytics, there are huge advancements here and I think we have really made some big gains in that space."

While the development and application of Cheyne's skill-based platform occupies the majority of Jacobson's time, he keeps an eye on market developments, including increased focus on factor analysis, and in particular the growing importance of demonstrating environmental, social and governance (ESG) credentials within portfolios, which he says will already be the first cut for some allocators.

"They will want to see an ESG rating on their overall portfolio and that's a capability we can now provide, from either negative or positive aspects," he states. "For example, if someone wants certain criteria such as environmental credentials or a certain percentage of women on the board, we can create a portfolio based on that. It's going to take us that step further in enriching the layers of service we can provide for allocators." **W**

JOSH JACOBSON

FUNDAMENTAL DATA

Name: Josh Jacobson

Title: COO, equities, Cheyne Capital

Age: 46

Hometown: Tempe, Arizona

Education: BS in Economics from Arizona State University

Hobbies/Interests: Cycling, mountain biking, skiing

Greatest Career Challenge:

"Throughout my entire tenure with Cheyne, it was around the global financial crisis and managing that whole period. As a portfolio manager it was an extremely volatile time, but in the equity business we managed to do fairly well out of it."

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The HTML World Grows ...

SLOWLY



There was a time when it seemed that HTML5 was set to become the de facto language for web development in the financial services industry. But we're not there yet ... and in fact, we might never get to that state. But as [Anthony Malakian](#) reports, there's reason to believe that Wall Street is evolving with the language.

A little over three years, I spoke with technologists from across the financial services industry to better understand how they were improving the client experience through the use of HTML5. Microsoft had a year prior to that announced that it would end its support of Silverlight by 2021. Adobe Flash was already out the door by that point after Apple chose to make it incompatible with iOS.

The growth and adoption of HTML5 seems to be a story of fits and starts. It was poised to take over in 2012 and then Facebook's CEO, Mark Zuckerberg, was quoted as saying that using HTML5 was the company's "biggest mistake." HTML5 is still

very much prevalent on Wall Street, but it is by no means a dominant force just yet. It is used as a hybrid tool for web development alongside JavaScript and Cascading Style Sheets (CSS).

The next HTML evolution is one of collaboration. It is one of standardization. To be sure, advancements have been rapid in the web development space, specifically when it comes to HTML5. But that story is also likely to be vastly different three years from now.

Uncontained

In April, trading platform provider Trading Technologies unveiled TT Desktop, a platform designed to allow 18 monitors to run in unison. Prior to

the release, the TT software-as-a-service (SaaS) delivered trading platform was only available through a single-browser window. While most found it to be usable, sophisticated users felt it was cumbersome. TT Desktop was created in partnership with OpenFin using HTML5 technology. Since it does not require a browser because it uses OpenFin's container technology, clients can better utilize multi-core processors and graphics cards, which allows traders to use over a dozen monitors.

Rick Lane, CEO of Trading Technologies, says advancements in HTML5 uses are allowing for more sophisticated trading environments. "Over the years, there have been lots of rational and irrational ideas around HTML5 and SaaS and how we deliver technology," Lane says. "The world of HTML5 is advancing at such a rapid pace that it was growing up as we were."

Lane is a bit of an HTML evangelist, and says many of the language's limitations have been overcome thanks to containerization. For example, a browser tends to lock down what a user can do. This is a good thing in many cases because users don't want the websites they visit to download something onto their machines without their explicit permission. A container—which utilizes HTML5—allows the bypassing of the browser.

"Going forward, there will be no other way of building front-end technology other than HTML5 because the benefits of doing so are so great and the limitations that used to exist don't exist anymore," Lane says. "I don't see anyone going down a different technology path, at least for the foreseeable future."

Lane says tech giants like Google and Facebook—which have hundreds of developers working to optimize the language—have it in their interest to see that five years from now,



"JavaScript and CSS are great for separating code and formatting from HTML primitives. It makes things easier to debug and helps portability between projects in terms of common functionality and a common look and feel. Media queries in CSS give a lot of flexibility to change the look and feel for handheld and browser views." Elliot Noma, Garrett Asset Management

software is built using HTML versus any Windows technology or Java front-end technology because that will provide some semblance of standardization.

"If you tried to build even a single-window trading screen five years ago and tried to compare it with a native-built app, like we have with X_Trader [Trading Technologies' legacy trading platform before switching to the TT SaaS platform], you simply couldn't push the same number of updates to the screen because the renderer wasn't as advanced as it is today—all of that is gone now," he says, pointing the improved rendering times and performance, which are on par with native-built apps.

Opening the Door

In the capital markets, OpenFin has established itself as the HTML5 containerization platform of choice in the US, though there are others, such as German vendor Xinfinit. OpenFin, in addition to working with numerous third-party providers, counts the likes of Citadel, JPMorgan, RSRCHXchange, and Tradition as clients. And in February, the company raised \$15 million in Series B funding, led by JPMorgan, Bain Capital Ventures, Euclid Opportunities, as well



as Nyca Partners, Pivot Investment Partners and DRW Venture Capital.

Mazy Dar, CEO of OpenFin, says that opinions of HTML are changing, albeit slowly. "Even today, if you tell an engineer or architect at a bank or hedge fund that an HTML5 application can provide the same performance as a C++ application, they wouldn't believe you. That is changing," he says.

Traditionally, high-performance meant having to write in C++, .NET, or Java. HTML, which can run on Apple, Windows or Linux systems, can prove to be a cheaper alternative and allows firms to be more nimble, Dar says.

"The deployment is absolutely critical," he says. "The ability to do a three-week sprint and have your application instantly updated for everybody at the same time and be able to get immediate user feedback and do another three-week sprint and provide more functionality—that's how Silicon Valley works; that's how areas outside finance work nowadays and why innovation is accelerated."

Dan Schleifer, co-founder and CEO of ChartistIQ, says partnerships have helped to change how firms look at development. Since companies like Google have teams



**Keith Lubell
Berkery Noyes**



of developers focused specifically on HTML5, those improvements get passed down to the vendor community, which then get passed along to the banks and asset managers themselves, who make improvements based on their specific needs in finance. It's a self-sustaining ecosystem, in many ways.

Glue

In May, ChartIQ rolled out Finsemble, an HTML5 desktop application framework. Schleifer says Finsemble provides the “glue” to allow a firm to piece together its own trading terminal. At its core, Finsemble provides window and workspace management, snapping and docking, component linking, event routing, storage sharing and authentication, and data feed management. Schleifer says the web world—and the open-source community is proof of this—has created

a sense that each person builds on top of the last and—as long as it is not the firms' secret sauce—users share the information back.

“The past five, 10 years, we've been seeing in fintech all of these best-of-breed point solutions come about but they had a hard time gaining traction because they only do one thing. We make the best charts around, but we only make charts; we don't make the other stuff,” he says. “A Bloomberg terminal gives you charts and chat and trade execution and everything, and it all works seamlessly together. What's happening here and what we're trying to do with Finsemble is allow people to pick exactly which components they want—they can build it themselves, use a third party. You can do whatever you want and have them all work as one.” HTML5 and containerization advancements make this strategy possible.



Rick Lane
Trading
Technologies

New York-based investment bank Berkery Noyes uses HTML5 exclusively for web development. The firm's CTO, Keith Lubell, says one of the top reasons for the bank's usage of HTML5 is its canvas element, which “allows for really beautiful visualizations for data,” he says. He also says new input types make it easier to leverage native features for mobile development.

And WebRTC—an initiative that supports browser-to-browser applications for voice calling, video chat and peer-to-peer file sharing, among other usages, comprising three HTML5 application programming interfaces (APIs) that are built into Chrome and Firefox—“allows for very interactive audio and video communications with zero plugins, whereas before there was a dependence on applets and installing additional software on the development,” says Lubell.

Warren Master, CTO and chief information security officer at Rohatyn Group, which manages \$4.5 billion in assets, says that the hedge fund is starting to look at HTML5 to help as “a migration path” for some older web-based and desktop-based user interfaces, “which have served us well over the years but are in need of a facelift and some more user-friendly behaviors.”



Mazy Dar
OpenFin

Not So Smooth

Even as HTML5 usage has progressed on Wall Street, there are still limitations that have spurred technologists to turn to other options. Considering some of the high-tech implementations we’re seeing in the industry—machine learning, high-speed data compression and augmented reality, for example—something as simple as updating a web browser can still hinder a firm’s innovative ethos. A director of software development at one of the largest endowments in the US says the firm has limited its usage of HTML due to the fact that it’s currently using an older version of Internet Explorer. “We are currently limited to Internet Explorer 11 on the desktop, so unfortunately we cannot exploit the full power of HTML5 for our intranet applications,” says the director.

Elliot Noma, managing director of Garrett Asset Management and a lecturer at Columbia University’s School of Professional Studies, who uses HTML5 for web development, notes that the language is still missing strong typing and that its flexibility has both advantages and disadvantages.

“JavaScript and CSS are great for separating code and formatting from HTML primitives,” Noma says. “It makes things easier to debug and helps portability between projects in terms of common functionality and a common look and feel. Media queries in CSS give a lot of flexibility to

change the look and feel for handheld and browser views.”

The endowment software development director is more invested in JavaScript and CSS. “What’s mattered most to us is browser support. For us, JavaScript and CSS are an indispensable part of web development. In addition to adding functionality to pages and making markup cleaner, they also provide us with ways to work around limited and inconsistent HTML support,” he says.

As firms increasingly turn to interactive web for everything from client interaction to research and internal presentations, it won’t be possible to look at development issues as being HTML5 versus JavaScript versus CSS versus anything else. The best solutions are going to use elements of all of the above, according to William Murphy, CTO at Blackstone. The bigger story, Murphy says, will be the standardization of these frameworks.

For example, he says the private equity firm is starting to standardize on React.js, a JavaScript library for building user interfaces, but it has tried a variety of JavaScript frameworks in the last few years. “The market is moving fast on this and it is uncomfortable for enterprises,” Murphy says. “We want a single, easy answer and it hasn’t been that way for a long time.”

In terms of standardization, Rohatyn Group’s Master would also like to see greater coalescence in the scripting world because everyone

mixes and matches based on what’s needed. “We do use CSS and JS extensively; I think scripting will never go away in any form as this is what allows developers to ‘free flow,’ differentiate themselves, and build behavior above and beyond what HTML5 effectively has baked in from common JavaScript use-cases.”

Berkery Noyes’ Lubell wonders if the next version of HTML will offer some additional standardization. “Everyone uses JavaScript and CSS; it is not controversial,” he says. “The question is whether all the innovations in JavaScript with jQuery and the MVVM (Model-View-ViewModel) frameworks like React, Backbone, Angular, Knockout and Ember can be rolled into a standard for the next version of HTML.”

Unclear

When I wrote about HTML5 three years ago, a bank CTO said browser limitations and the capability to render that kind of language quickly were the main hurdles to HTML5 adoption. Those obstacles still exist, even if they’ve been lessened and made more manageable. But the idea of collaboration has created advancements that will only progress as open-source ideals continue to take hold on Wall Street.

As the rise of HTML5 continues, the next leaps will happen because of partnerships. The language will be the unspoken shibboleth that allows for evolution. **W**

SALIENT POINTS

- SaaS and open source have made web-based deployments more manageable. As a result, HTML5—in combination with JavaScript and CSS—has become a key component for writing new platforms.
- Browser challenges and certain performance issues still encumber

HTML5 development, although those deficiencies have been greatly reduced.

- As more platforms are delivered on the web, HTML5—and its eventual successor—will take on greater importance as there are few options for web development.



THE SCIENCE OF Mothballing Legacy Systems

It seems that despite realizing the value and sometimes the necessity of decommissioning legacy systems, capital markets firms can become so attached to their old infrastructures that they find it hard to even start developing a feasible strategy around mothballing them. [Aggelos Andreou](#) speaks with buy-side and sell-side firms about their decommissioning dilemmas.

“Historically, our sector has seen technology as cost and control, rather than a competitive advantage,” says Stuart Warner, head of technology at Fidelity International. While Warner says that in recent years there has been a gradual mentality shift and that firms are now starting to realize how vital it is for the business to invest in their technology stacks, they are still unable to figure out viable and efficient plans to leverage new technology advancements.

Their biggest challenge, according to Warner, is that they are still heavily invested in their legacy technologies

due to financial and practical constraints that every institution has to overcome.

Joerg Guenther, CTO for EMEA at Northern Trust, explains that old technologies are still connecting disparate parts of firms’ technology estates, including data, applications and interfaces. “Unless you are a startup or have the opportunity to take a greenfield approach, you usually carry on with the legacy,” he says. Guenther points out that small or midsize firms are unable to decommission their systems for a number of reasons. “To implement a new architecture, you need to have certain skillsets, a number of

resources, and critical mass, so often they are somewhat stuck on their legacy,” he says.

This challenge doesn't only apply to the buy side. A source from one of the UK's largest banks tells *Waters* that it has been grappling with its own decommissioning issues for the past 20 years and that it's an ongoing process. “Largely, they have all failed; the entire banking sector has found it particularly difficult to turn off legacy systems,” he says. “Indeed, more often than not, we increase our dependencies on old systems when we build new ones developed specifically to replace them.”

A Vicious Circle

To be fair, the banking sector is traditionally more open to implementing new technologies than the buy side. To this point, there are different categories of banks differentiated by how capable they are at implementing or developing new solutions and mothballing legacy ones.

Jennifer Hansen, head of institutional business at Saxo Bank, identifies three categories: the challengers, the aggressors and the hedgers. “There are the challenger banks that want to disrupt the system, and there are also the banks that are aggressively taking a stand and make it a corporate priority,” she explains. “And thirdly, there are the banks that are reluctantly hedging—they look into it, but it's not part of their business.”

But how banks go about addressing the decommissioning process is a painful story, apparently played out over a two-year cycle. According to the head of technology for a London-based sell-side firm, each time banks want to turn off legacy platforms, the story follows the same route. They decide to use a “hot, new” technology, they fly to Silicon Valley to check it out, and then they decide to do the deal. “Then they start working on it, do some proofs-of-concept, spin up an effort to do it at an enter-

“There are the challenger banks that want to disrupt the system, and there are also the banks that are aggressively taking a stand and make it a corporate priority. And thirdly, there are the banks that are reluctantly hedging—they look into it, but it's not part of their business.” **Jennifer Hansen, Saxo Bank**

prise level, but they only get halfway through it,” the source says. “And that's because they discover it's harder than they thought and they don't have the skills they need. Subsequently, the board of directors or senior management says that it costs too much, so they reduce the headcount, fire the smart people, and it all goes down the drain. And an unfortunate side effect is that the corporate memory is lost when the top developers get their walking papers.”

Viable Strategies

The questions then remain: How do financial services firms develop viable strategies that not only help them get through the process of mothballing outdated technology without spending time, energy and resources only to ditch the projects mid-stage, but also, how do they overcome the psychological impact of having to get rid of platforms they've been using for such extended periods?

Fidelity International has a clear roadmap of where it wants to be, even though it admits that it is difficult to follow through to the endpoint, as technology constantly evolves. “We have a periodic review process that associates a target disposition for each application,” Warner explains. “We put a buy-sell rating against all our applications to determine whether we



transition to a new one, whether we turn it off, or whether we keep it as a legacy book. It is a continuous cycle that drives our multi-year strategy and funding.”

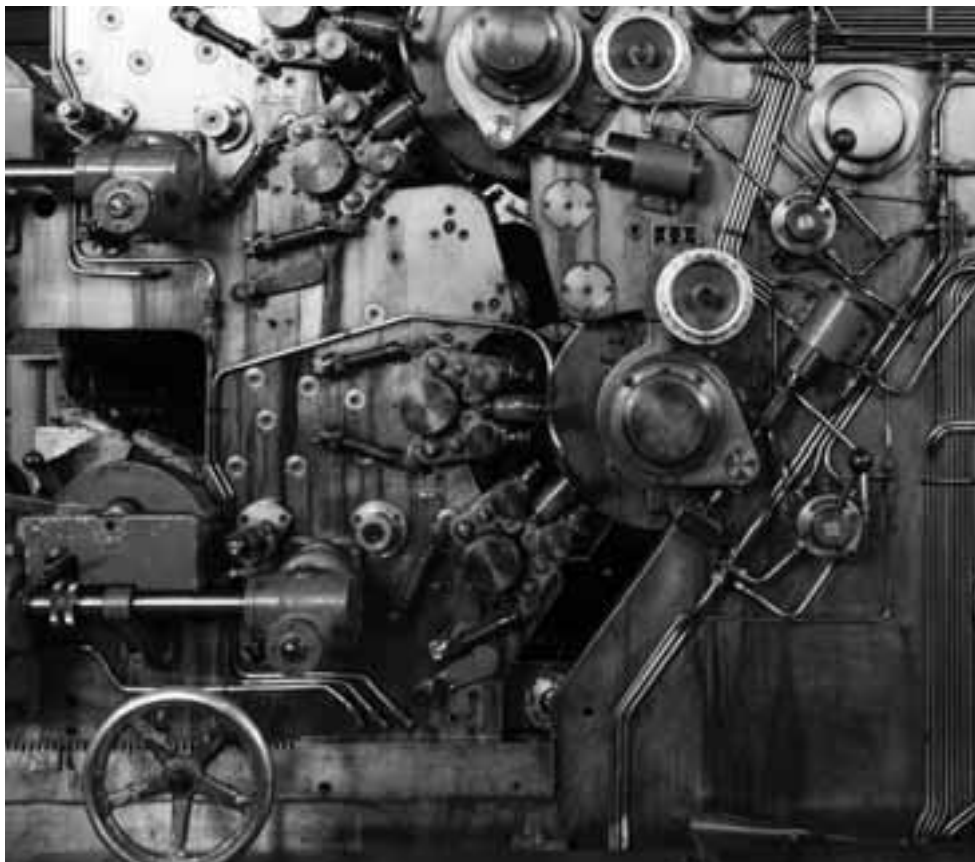
This review process values each application against a set of criteria. Warner says that if they can't find the right skillset to support a legacy system, or it is nearing the end of its life from a license perspective, they make a clear path to wean themselves off that technology.

“However, if it is deemed legacy just because it happens to be older but it still supports [the business] and is current, cost effective and simple from a functional perspective, then we keep it running,” he says. “We have ways of managing some of the legacy applications and we make sure that we can still build other customer interactions and propositions on top of it.”

On a similar note, Sergey Baranov, deputy CIO and senior vice president VTB Bank, one of Russia's largest sell-side institutions, says it is important to consider a number of issues before a meaningful decommissioning decision can be made. “The most important ones are whether there is source code for the application, the architecture of the existing system, the availability of integration adaptors or applica-



Furio Pietribiasi
Mediolanum



tion programming interfaces (APIs), and the support provided by the vendor,” he explains. “All of these are taken into account, and we also look at the financial implications of migration. It may be the case that a legacy system remains in use for the entirety of our IT roadmap, which is currently operating on a five-year horizon.”

Semi-Decommissioning

What firms can do to tackle the inevitable challenges around the decommissioning process is view it as part of an ongoing program that doesn't have to be concluded overnight. There are several ways to decommission technology without ripping and replacing it all at once, instead managing the process step-by-step. But one aspect to bear in mind that rears its head during all decommissioning projects is data.



Joerg Guenther
Northern Trust

Furio Pietribiasi, managing director of Mediolanum, a Dublin-based €35 billion (\$44 billion) asset manager, says that for any decommissioning project to stand a chance of success, the data feeding the system needs to be fully understood. “You have to spend the time to understand the data you're decommissioning before moving onto a new platform,” he says. “Understanding at a granular level what that data has been used for and how it is going to be used is absolutely critical. Then you have to measure the quality of the data and have a data governance process because the goal is to drive value in the new system.”

Only then can firms apply a hybrid strategy that will allow them to gradually turn off their legacy software. Step one of Northern Trust's decommissioning strategy entails the insulation of the firm's legacy

platforms, according to Guenther. “Insulation is key and is done in the form of a wrapper adaptor that allows you to externally call in to legacy [platforms],” he says. “You can take a much more organic approach in the sense that you're not going to do it on a legacy platform—you're going to build something on a server-based architecture that provides that functionality and you gradually move away from legacy components.”

Northern Trust has developed what it calls a “wrapper” service around its architecture framework, allowing old and new technology to co-exist side-by-side. “The idea is to build service wrappers around the legacy technology so that you can access functionality and data that is stored and offered by these legacy components, which you expose into a server framework,” Guenther says. “That allows you to build new technology solutions that can integrate with legacy.”

The alternative, he says, is to replace all of these point-to-point interfaces in a “big bang” approach. “That can be extremely complicated and usually requires a lot of capital in a compressed timeframe,” he says. “Nobody wants to do that from a risk perspective,” he adds.

Not Standalone

Similar to Northern Trust, Fidelity believes that in an integrated environment, it is difficult to treat a legacy technology as standalone. “If we had a piece of legacy technology, we'd write some wrappers around that piece of legacy and we'd expose those APIs,” Werner says. “Then we can build on top of those and expose the functionality and hook it into other processes as we see fit.”

Werner explains that Fidelity also creates its own user interfaces. “Where we use a vendor or a legacy application, we write our own web front over the top of the APIs and we communicate with the vendor

application that way,” he says. “If you couple the API wrappers plus our own user interface and have sources of data internally, the combination of those things means that there is a clear and easy path to switch out an application and put a new one in place because they tend to be more decoupled.”

From a bank’s perspective, Sergey Baranov says VTB’s decommissioning strategy has a staged approach. “It might take more than six months to replace a system, in which case we take a staged approach, first replacing the front-end application with a new, innovative solution,” he says. “We can then make and implement decisions on the back-end later.”

The Outsourcing Way

An alternative strategy is to move the legacy platform to a managed service. As Guenther suggests, firms can work with an external vendor that maintains and supports the application. In that way, capital markets firms can use the functionality to a certain point until whatever is built to replace it has been bedded down. “It’s a sensible alternative because it doesn’t require you to maintain and keep the legacy skillset,” he says. “By outsourcing it, you allow yourself to de-risk staff turnover and free up capacity to focus on new technology.”

VTB’s Baranov agrees: “Outsourcing technology is certainly an option when considering legacy systems,” he says. “These can take the form of bringing in software-as-a-service (SaaS) or platform-as-a-service (PaaS) solutions, as well as even transferring outdated applications to outsourced resources to be supported and further developed.”

But what if decommissioning could be achieved through collaboration with fintech firms and startups? Some of the industry’s largest financial services firms, especially banks, are looking in that direction, hoping to solve the legacy conundrum. Nordea, for example, the largest financial



Stuart Warner
Fidelity
International

institution in Scandinavia, has formed a digital team that works alongside many Danish fintech startups in the recently established Copenhagen FinTech hub, an initiative funded partly by the Danish government. The team’s strategy is to develop solutions and benefit from millennials’ agile methodology, with the aim of breaking down technology acceleration barriers.

Saxo Bank’s Hansen says banks now realize that confronting fintech firms as opposed to partnering with them is a thing of the past. “We are now at the point where most banks are thinking of what they want their digital strategy to be,” she explains. “The second wave of fintech is all about collaboration because that’s one way you can accelerate development and it’s one way you can outsource spend.”

She says that for banks to keep a competitive advantage, they need fintech firms’ help to get rid of their old technology applications. “People realize that the speed and cost of innovation are key metrics,” she says. “Because it’s not that you’re going to do one project and then you’re done—it’s a series of projects.”

From a buy-side perspective, things are not that different. Werner admits that fintech firms, as disruptive as they might be, can provide a necessary hand to large financial services firms. Fidelity, for example, runs its own fintech hub in Asia, which he

admits, was an eye-opening experience for the company. “We’re taking a relatively sensible approach when it comes to collaborating with fintechs,” he says. “We’re not going to start our [own] fintech company, but we have an accelerator in Asia in which we’re working with fintechs, and we’re learning lots of things from these companies about the way that they do things.”

Why Decommission?

So far, the big question of why financial services firms need to decommission older systems remains. Mediolanum’s Pietribiasi explains that from a business perspective, legacy technologies tend to be more expensive to maintain, but even more costly are the developers to support it. “The coding behind this technology is a bit old-fashioned and the new workforce is not specialized in certain coding language, so you have a shortage,” he says.

Northern Trust’s Guenther adds that switching out a legacy system provides firms with more flexibility around functional change and evolution so that they can be more nimble and agile. “We’re no longer in a world where you go from annual release to annual release—products have to evolve with the changing requirements our clients have,” he says. “That agility is driving the need for decommissioning.” **W**

SALIENT POINTS

- Legacy system decommissioning is a critical issue for both the buy side and the sell side, as firms need to adapt to an increasingly digital environment and become more agile and nimble.
- It is not easy for capital markets firms to disengage from their legacy platforms, and the shift to seeing technology as a competitive advantage is yet to be fully embraced across the industry.
- There are different strategies financial services firms can use to decommission legacy systems. The most popular is to create API wrappers and connect them with legacy platforms.
- Outsourcing and collaborating with fintech firms can also be a good strategy for firms that don’t want to bear the cost and time of decommissioning their outdated systems themselves.



Sergey Baranov
VTB Bank

Regtech May be the New Fintech But Will the Momentum Last?

The traction around regulation-focused technology, or regtech as it's now known, has increased markedly as the January 2018 Mifid II deadline draws nearer, although John questions whether the momentum can last, particularly for the smaller vendors in this space.



At what point does something cease to be a unique entity and either naturally evolve into something distinctly separate, or create an amalgam of itself and a number of other elements? Does it truly matter as long as the evolution or metamorphosis serves a purpose that the entity could not fulfil previously? Does the process begin anew once that purpose has been fulfilled?

Perhaps these questions are an attempt to categorize the way in which technology solutions and startups that are entirely focused on regulatory matters—regtech to you and me—have crawled out from under the all-encompassing fintech umbrella to stand on their own, blinking into the harsh light of the onrushing Mifid II deadline.

To say that the impending changes to the regulatory landscape across Europe, with the knock-on effects that the rest of the world's financial and technology markets will also feel, will be underestimated by some is not surprising. Vendors in this space are hyping up new technologies, expecting an imminent boom in business.

Launches

Hardly a week goes by in this industry without the launch of a new regtech solution, collaboration or initiative. The International RegTech Association (IRTA) was established at the end of May to foster an ecosystem in which regulatory technology solutions can be successfully developed, heading off obstacles surrounding multi-jurisdictional growth for startups, as well

as developing international regtech standards. The UK's Financial Conduct Authority (FCA) has also been working to meet the mandate handed down by the UK government to foster more regtech development through its regulatory sandbox program, which recently announced its second cohort of startups, within which blockchain and artificial intelligence feature heavily. Other regulatory bodies worldwide

Crucially, the vendor is not just focused on the challenges presented by Mifid II. Alistair Rennie, general manager of IBM Watson financial services solutions, when speaking to *Waters*, pointed to the upcoming Fundamental Review of the Trading Book (FRTB), the new market risk capital regime, which the industry is set to begin testing in 2019, while revisions to the Capital Requirements Directive (CRD IV) and Capital Requirements Regulation (CRR) will also be of paramount importance to investment banks in coming years.

There are few big names among the sell side that have escaped without significant fines, or at the very least a slap on the wrist, from regulators in recent years due to failings relating to their technology operations and non-compliance with existing rules, the totals of which run into billions of dollars in the US alone. As such, it's a safe bet that many of those institutions will be seeking to avoid history repeating itself by investing in regulation-specific technologies, regardless of size, location, or which products they are involved in. I'm sure those firms know which of the two costs they would prefer to bear, but the question then becomes what kind of provider they seek to utilize against the oncoming tide of regulatory change.

As with almost every facet of financial technology, there must be a strategic approach involved, keeping an eye on the long-term future rather than seeking a quick fix to meet the bare requirements of the rules that have hamstrung the industry in recent years. **W**



Hardly a week goes by in this industry without the launch of a new regtech solution, collaboration or initiative.

have not been slow to build out similar projects, particularly in Asia-Pacific where regtech and fintech hubs have merged to work in tandem toward a common goal.

There is a great impetus to the regtech movement, which has come to mean more than just another subset of the fintech community. The most obvious indication recently came from IBM, which launched a trio of new regtech solutions based on its Watson cognitive computing resources and the acquisition of risk management and consultancy firm Promontory Financial Group back in September last year. IBM's swaggering entry into the regtech space follows similar moves into the healthcare and cybersecurity domains, and will put significant pressure on its smaller competitors that may already have some market share to boast of but cannot hope to match IBM's scale and reach.

Will regtech replace fintech?
For more information and readers' feedback please join the discussion at waterstechnology.com/buy-side-technology

Progress for the Sake of Progress

The push toward technology seems inexorable, but James wonders if sometimes, the price of that progress is a cost worth paying.

How is progress defined?

For more information and readers' feedback please join the discussion

waterstechnology.com/sell-side-technology

There were three stories published on WatersTechnology.com this month that made me think about the nature of market structure, and whether a single-minded focus on technology can be both a good and a bad thing in equal measure.

In traditional asset classes, not least of all equities, fixed income, foreign exchange (FX), and even derivatives in the futures and options spaces, markets are highly developed in an electronic sense. Central-limit order books (CLOBs), stock exchanges, swap execution facilities (SEFs), and both inter-dealer and dealer-to-client platforms are well established, and trading is at the very least on the way to being conducted in a majority electronic fashion, which has brought its own challenges.

Waters has been at the forefront of covering these challenges over the years—the growth and decline of high-frequency trading (HFT) and the fury from some sections that accompanied its rise, algorithmic trading and the individual problems that has posed to financial stability, and of course, the particular issues in FX markets that have arisen from market manipulation.

But there is value in also considering the human part of the equation. Some areas of the market are seeing huge, foundational shifts in how their business is conducted. Take the municipal bond markets, for example, where the growth in electronic platforms has tightened spreads, but it's also put pressure on the revenues of experienced sales traders, who are often paid by commission and struggle to keep up with the lower fees

generated by electronic trades. Stories of salespeople going months without any take-home pay are not uncommon.

For the buy side, this has been a tremendous development on many levels. Liquidity has never been easier to source, while trade costs have come down sharply. But there are questions about how the loss of experience in

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Evolution, after all, is a process whereby creatures adapt according to their needs and those of their environments.

these markets, which comes as long-time specialists are forced out, will affect them in the future.

Structural Concerns

Two other stories piqued my interest in this regard. One is the continuing digital-currencies saga, where a number of businesses are attempting to move bitcoin trading and activity in similar instruments to a more regulated, traditional market model. There are benefits to be had from this—the current structure of digital currency markets is, as Paul Gordon of Quantave explained to me, flawed. Too often, the central points of the market wear too many different hats, and this engenders problems when things go awry, particularly if exchanges are also acting as brokers or custodians of client assets. Regulated intermediaries would seem to have a part to play here, but it's hard to attract institutional

interest without this scaffolding, thus creating a chicken-and-egg scenario.

Along the same lines, a recent report on European credit repo markets by the International Capital Market Association (ICMA) highlighted the lack of technology penetration in everyday practices there. Information is still widely circulated through relatively primitive means, trades are largely conducted by phone or a limited number of dealer-to-dealer platforms, and in general, the market is pretty old-school.

Andy Hill, senior director of market practice and regulatory policy at the ICMA, who authored the report, posits that these traders are likely “the busiest people in the financial markets.”

The thing is, despite being labor-intensive and highly manual, the system kind of works. It sounds like a mess, sure, but outside of any widespread catastrophes it ticks along on a day-by-day basis, issues of supply and bank dependency notwithstanding.

Technology will make inroads, and some automation is inevitable, thanks to regulations around data collection and the like, but progress shouldn't be made just for the sake of progress. Evolution, after all, is a process: Creatures adapt according to their needs and those of their environments. Tinkering too much with that formula may well create problems rather than solve them. **W**



IoT's Infancy and What It Means for Capital Markets Firms



The internet of things is fast becoming ubiquitous, but people are still trying to figure out how it fits into a firm and what it might mean for the future. And, as Emilia explains, there are real security concerns.

Like many people using Internet of Things (IoT) devices, I all too often forget that they are vulnerable to cyber threats. In fact, I did not realize how many internet-enabled gadgets I own. As more of these devices enter the workplace, it is worth investigating what firms can do to protect themselves from cyber-attacks.

One basic step companies can take is to set up a separate Wi-Fi network where IoT devices can connect without touching the corporate network—and therefore, its sensitive data. Guest Wi-Fi networks were developed during the bring-your-own-device (BYOD) debate of several years ago. But IoT may still seek out similar devices to “talk” to that may be on the protected network, and, more worryingly, these still provide computing power for attackers.

As I reported in my feature this month, at first blush, controls around IoT seem like an easy extension of BYOD policies, although these also offer an interesting challenge to security professionals, particularly since there is very little in-built protection, according to William Beer, a principal at consultancy EY.

“These devices don’t necessarily have the same level of security built in as some other systems, so it requires a considerable mind shift in the security industry, especially now that they are struggling to support organizations,” Beer says. “They’re struggling to offer services to firms with existing technology and now you’re going to add in IoT, so there needs to be a wakeup call to the industry not to repeat the same mistakes

many years ago when internet security was starting out.”

Joshua Satten from Sapient says one of the questions around IoT is its growth, since the technology is still in its infancy. “IoT is emerging as a new technology and that’s where it becomes very difficult for companies,” Satten says. “It’s hard to adapt new technologies and create protections around them if it’s still being developed.”



These devices are already in the workplace, so it’s important to begin awareness programs as soon as possible.

Satten notes that there are still many issues around privacy and data collection that need to be hashed out as well as determining which appliances really need to be IoT-enabled. What is important from both experts’ perspectives is that businesses shouldn’t repeat the same mistakes from years ago, by believing these new technologies will not be brought into offices until they are fully developed or secure. These devices are already in the workplace, so it’s important to begin awareness programs as soon as possible.

Whether firms like it or not, many of their employees have already brought IoT devices to the office. Many have their own IoT-enabled technologies at home that can communicate with their home laptops, illustrating how pervasive the technology can become. As an example, how many employees have internet-enabled security systems

or door cameras that transmit live footage to smartphones?

Likewise, keeping track of just how connected you are is important from a security perspective. If you’re carrying an iPhone, an iPad, a Tile key, a Kindle, a laptop, a smartwatch, a Fitbit, or a handheld videogames console in your bag, that’s at least seven connections to the company network that need to be monitored. Factor in the external connections these create to home IoT devices, and that number expands enormously. It’s these awareness programs, more than anything else, that will really start protecting the company.

Moving Beyond

The challenge for IoT devices with respect to their widespread use by capital markets firms is how they go about moving beyond just helping people learn how to spell or find their missing car keys. “There are two strands within IoT,” says EY’s Beer. “The first is how it can be used by employees, and the second is how banks can potentially use these kinds of technologies to help create innovative services for clients.”

According to Beer, a good business case has to be developed for why IoT devices—particularly personal speakers and personal trackers—should be in the workplace before they are fully vetted. Other devices like personal trackers can provide important health information for employees with serious conditions, but like all IoT devices, they must also be robust enough to protect that personal information and ensure that it isn’t compromised or stolen. **W**

Should firms have IoT policies?
For more information and readers’ feedback please join the discussion at waterstechnology.com/buy-side-technology

Denmark Unveils its Fintech Hygge*

As a former resident of the “hyggeland” that is Denmark, Aggelos remembers the country as a blend of a well-structured and efficient state and its citizens’ progressive mindset, which made his recent return to explore Copenhagen’s fintech landscape all the more exciting.

Denmark a fintech leader?

For more information and readers’ feedback please join the discussion

waterstechnology.com/sell-side-technology

Denmark has had a digital culture for years. It is practically a cashless country where people never stop picking up new technologies to simplify their already simple and uncluttered lives. It is therefore not that hard to get a grip on what is going on fintech-wise. The Danish obsession with innovation is well-known, but what I found on my recent visit to the capital left me in awe. I have never encountered such a massive and collaborative effort to grow the fintech sector.

Since November last year, the national government has been supporting the development of the country’s startups via a hub called Copenhagen FinTech in which the Danish state funds, up to a certain extent, a program aimed at advancing the private sector.

In Copenhagen FinTech, banks, asset management firms and startups work together and experiment in developing or improving services across all stages of the financial services industry. From wealth management to cybersecurity and data analytics, the hub has been actively promoting and working on multiple projects that deal with a range of new technologies, including machine learning and blockchain.

Located close to Christiania, a suburb of Copenhagen, the hub hosts a number of the country’s brightest minds in programming and engineering—it’s the “home of the geeks,” one of its residents told me when I first visited it.

The hub’s CEO, Thomas Krogh Jensen, has worked most of his professional life in the technology departments of some of the country’s

largest financial institutions. He told me that Copenhagen FinTech has the potential to become a global power in innovation. “That is one of our four primary goals,” he said. “The other three are to connect the corporates with the startups, create new jobs, and put the academic world onto the innovation map.”

Jensen says the initiative is still in its infancy, but has been operating as an established organization since day one. “We are constantly working with our partners to improve what we think is not going well,” he said. “We try to be a fast-paced hub open to suggestions and further collaborations.”

So far, it seems that at least one of the hub’s four goals has already been achieved. For example, Nordea, the largest bank in the Nordics, has appointed a special “pioneer” team to work there, in the hope of producing measurable results and learn as much as it can from the world of startups. Jakob Hedegaard, Nordea’s team leader, declined to reveal the specific projects he and his teammates are working on, but he did share his enthusiasm for this project. “What is happening here is remarkable,” he says. “I think you’ll see great things coming out from here in the future.”

Mentality

Hedegaard says all of this happens because the banks’ mentality toward technology has shifted recently. “They know now that they have to be nimble and invest in innovation,” he says. “And startups have shown them the way.”

One of these startups is BotSupply, which uses artificial intelligence (AI) to automate customer services for banks. BotSupply co-founder Francesco Stasi found in Denmark’s open and digitized society a field to nurture and develop a niche idea along with his partners.

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The national government has been supporting the development of the country’s startups via a hub called Copenhagen FinTech.

“Copenhagen is the ideal place for us,” he says. “Danes are extremely comfortable with technology, while the city offers a more agile and relaxed environment to unfold your creativity compared to, say, London.”

At the hub, Stasi has the opportunity to not only pitch his company’s ideas to potential partners but also to work in close cooperation with traditional banks and make the offering more relatable and attractive for them. “We don’t have to guess what they want—we just go to the next room and ask them,” he joked. “It is as if we’re living in a fintech hygge.” **W**

*“Hygge” translates roughly to “coziness.” More than a lifestyle choice, hygge is often regarded as the nation’s “secret recipe for happiness.”



Human Capital



Accern Taps Chmiel for Capital Markets Expertise

Richard Chmiel, former CEO of satellite imagery analysis provider RS Metrics, has joined media analytics vendor Accern as chief revenue officer, responsible for business development and managing the company's existing client base.

Chmiel remains an investor in and advisor to RS Metrics, where he was CEO from October 2016 until earlier this year, prior to which he spent seven years at OneMarketData as senior vice president of global sales and marketing. Before that, he was vice president of global sales at complex event processing startup Skyler Technology, prior to which he ran US sales at LatentZero, was a senior managing director at SunGard Trading Systems, and held various



Paul Domjan

sales, marketing, and product management roles at BrokerTec, which he joined in 1999 after serving as sales manager at Bloomberg, where he spent 12 years.

In his new role, Chmiel will work directly alongside Accern co-founders Kumesh Aroomoogan and Anshul Vikram Pandey, who serve as CEO and CTO, respectively.

Exotix Hires Ex-Roubini CEO to Lead New Research, Analytics and Data Division

Emerging markets investment firm Exotix, part-owned by Michael Spencer, founder of interdealer broker Icap, has hired Paul Domjan to lead its newly formed research, analytics and data (RAD) division.

RAD will operate as a standalone unit helping European clients prepare for changes in how research will be procured and consumed under the impending Mifid II rules.

Prior to joining Exotix, Domjan was CEO of 4CAST-RGE, formed after private investment firm Fin-Ex acquired the core subscription business of Roubini Global Economics (RGE) and merged it with 4CAST, providers of macro-economic, foreign exchange (FX) and fixed-income analysis in May 2016. As CEO, Domjan led the post-merger integration, including launching new integrated products.

Before that, Domjan was managing director at Roubini, responsible for the business in EMEA, product, systematic research, and custom research. Domjan joined the firm after it acquired his own firm, Country Insights, which built a systematic tool to analyze and benchmark the risk and investment

opportunity of developed and emerging markets.

Based in London, Domjan reports to Exotix CEO Duncan Wales.

Red Deer Adds to Herd

London-based financial technology and data discovery provider Red Deer Systems has named Stefano Vaccino chief product officer, and Henry Price chief commercial officer.

Vaccino, who will be responsible for product strategy and managing development, was previously chief product officer at fixed-income technology vendor Algomi, prior to which he spent six years as an executive director at Goldman Sachs, and also worked in equity derivatives at JPMorgan.

Price was most recently head of product, credit and risk at post-trade and risk management technology provider Traiana, prior to which he was senior director of corporate and business development at Advent Software, and was head of product and business development at Syncova Solutions, acquired by Advent. He also held engineering roles at City Index and Thomson Financial.

At Red Deer, he will be responsible for commercial strategy, partnerships and client on-boarding.

Net Vet Cubbon Saddles Up at Colt

Veteran network technology executive Greg Cubbon has joined UK-based network provider Colt as product manager for its PrizmNet capital markets extranet and ultra-low-latency services.

At Colt, he will be responsible for extending the reach of its network



Richard Chmiel

Ex-Goldman Tech Co-Head Walker Joins OpenFin Board



Paul Walker

and low-latency services to capital markets clients. Cubbon previously spent six years at Hibernia Networks, acquired last year by GTT Communications for \$590 million, including roles as infrastructure product manager and product manager for its global financial network.

He joined Hibernia following eight years at BT as low-latency product and strategy manager for the vendor's Radianz network, prior to which he was an IP design engineer at Global Crossing/IXNet, and also held engineering, pre- and post-sales and consulting roles at Cisco, Networks First, CapGemini and Eicon Networks.

At Colt, he reports to Tim Williams, director of the vendor's capital markets portfolio.

Boylan Leaves Goldman Sachs for Biz Dev Role at Dash Financial

New York-based Dash Financial Technologies, a provider of multi-asset trading technology to the institutional trading community, has appointed Robert Boylan as the firm's managing director of business development. He will be responsible for extending the vendor's business among its buy-side and sell-side client bases.

Boylan arrives at Dash with over 25 years' experience in the capital markets. He joins the firm from Goldman Sachs, where he most recently led its electronic trading hedge fund sales team, following several years leading the broker-dealer and international electronic institutional sales group.

Prior to that, Boylan spent five years at Credit Suisse, working ini-

OpenFin, which provides a common operating layer for financial desktop applications, has announced that Paul Walker has joined its board of directors. Walker became one of the more well-known technologists in the industry, serving as co-head of Goldman Sachs' technology division—alongside Don Duet—from 2013 to 2016. He joined the investment bank from JPMorgan in 2001, as a vice president in fixed income, currencies and commodities strategies, was named managing director in 2004, and then made partner in 2008. He remained at Goldman until his retirement as co-head of technol-

ogy in February 2016, though he stayed on as an advisor until this year.

In a statement, Mazy Dar, CEO of OpenFin, said Walker will be able to provide valuable insight into the needs of finance firms as they look to build out their risk and analytics systems.

tially in its commission management sales group and later co-heading the bank's Advanced Execution Services (AES) sales team for broker-dealers. Before that he worked in various product management roles at Bloomberg, managing its Sell-Side Execution and Order Management Solutions (SSEOMS), fixed-income trading, and equities order-routing platforms.

Sentio Snares Carreras, Gore to Drive Data Desktop Development

Startup financial data terminal provider Sentio has hired Nicolas Carreras and Jed Gore as product managers to help drive the future direction and development of its platform.

Carreras was previously director of research at Soulor Research, which he founded in 2015. Before that, he held investment analyst roles at United First Partners and at HSBC, prior to which he was an analyst and investment banking associate covering technology, media and telecoms at JPMorgan.



Nicolas Carreras

Gore was most recently a managing director at Alpenglow Capital, where he performed financial modeling for specialty finance, and financial technology functions. Prior to Alpenglow, he was an assistant portfolio manager at Fifth Street Asset Management, served as an analyst at Millennium Partners, was a portfolio manager at Diamondback Capital, and a partner at SuNova Capital, as well as holding other partner and analyst positions at trading and asset management firms since starting his career as a programmer in Chemical Bank's private banking arm in 1993.

Carreras and Gore joined Sentio as consultants in February, before joining full time in April and May, respectively, and report to co-founder and CEO Alap Shah.

Davie Returns to LCH in Rates Role

London-based clearinghouse LCH Group has announced that Michael Davie will take over as its global head of rates, 18 months after he left the clearinghouse to join a new futures exchange.



Michael Davie

In his new role, Davie reports to Daniel Maguire, group COO and global head of rates and foreign-exchange (FX) derivatives. Paddy Boyle remains global head of ForexClear, LCH's central counterparty (CCP) for FX derivatives.

Davie will take over leadership of SwapClear, LCH's interest-rate swaps CCP, as well as LCH's listed rates business, and will also be tasked with further developing areas including compression, portfolio margining and other initiatives within uncleared over-the-counter (OTC) derivatives.

These initiatives include SwapAgent, launched in November 2016, which provides trade processing and margining services for uncleared derivatives markets. Since March 2017, regulators have mandated that counterparties in these trades—which are conducted bilaterally and as the name suggests, do not pass through CCPs—should calculate and exchange variation margin through the course of a trade's lifespan.

Previously the COO at LCH, Davie joined CurveGlobal in October 2015 as its chairman. The venue, owned by the London Stock

Exchange Group (LSEG), which also holds a majority stake in LCH, and a consortium of dealer banks, aims to challenge dominant US rivals in derivatives trading. It went live in September 2016 and is led by Andy Ross, formerly a senior derivatives executive at Morgan Stanley.

The LSEG is currently refocusing its strategy as an independent entity, after a proposed merger with Frankfurt-based rival Deutsche Börse was blocked by the European Commission on competition grounds. That deal would have created a giant in fixed income and derivatives trading, combining LCH with Deutsche Börse's Eurex Clearing, but the LSEG was unwilling to divest significant elements of its Italian operations to remedy anti-trust concerns.

A spokesperson for LCH confirmed that Davie started his new role on June 12. He will continue to serve as chairman of CurveGlobal, along with his position at the clearinghouse.

LiquidityBook Installs Thompson to Drive Euro Growth

LiquidityBook, which provides buy-side and sell-side trading technology on a software-as-a-service (SaaS) basis, has appointed Nicholas Thompson as manager of its Client Services operations for EMEA, in response to the Manhattan-based vendor experiencing increased demand for its flagship Poems (portfolio, order and execution management system) platform among European buy-side firms.

Thompson will be responsible for leading the vendor's London team and overseeing all services and implementations in the region. The



Nicholas Thompson

appointment comes just a month after LiquidityBook appointed Les Vital to lead its Technical Sales team.

Thompson joins LiquidityBook from Boston-based buy-side technology vendor Eze Software Group, where he was senior client engagement manager for EMEA and was responsible for product implementations across the region. Prior to his time at Eze, Thomson served as a senior portfolio services analyst for Fidelity Worldwide Investments, and before that he was a trader at Thurleigh Investment Managers in London. He is a graduate of the University of Warwick in the UK.

Former Omgeo, DTCC Data Head Arthus Lands New DTCC Role

Paula Arthus, former head of Omgeo and data services at the Depository Trust & Clearing Corp. (DTCC), has become chief of staff and head of corporate strategy in the office of the DTCC's CEO Michael Bodson.

Arthus joined the DTCC in 2005 and served as managing director of relationship management and a member of Omgeo's management board, before being named president and CEO of Omgeo in 2014.

Before joining the DTCC, Arthus spent more than 25 years in technology and product management roles at JPMorgan, including roles as global technology executive for investor services, and head of the bank's asset management solutions group.

Part of Arthus' prior role has been taken on by Matthew Stauffer, former CEO of Clariant Global, who was recently appointed managing director and head of institutional trade processing, following Clariant's sale to Thomson Reuters. **W**

Inside Market Data

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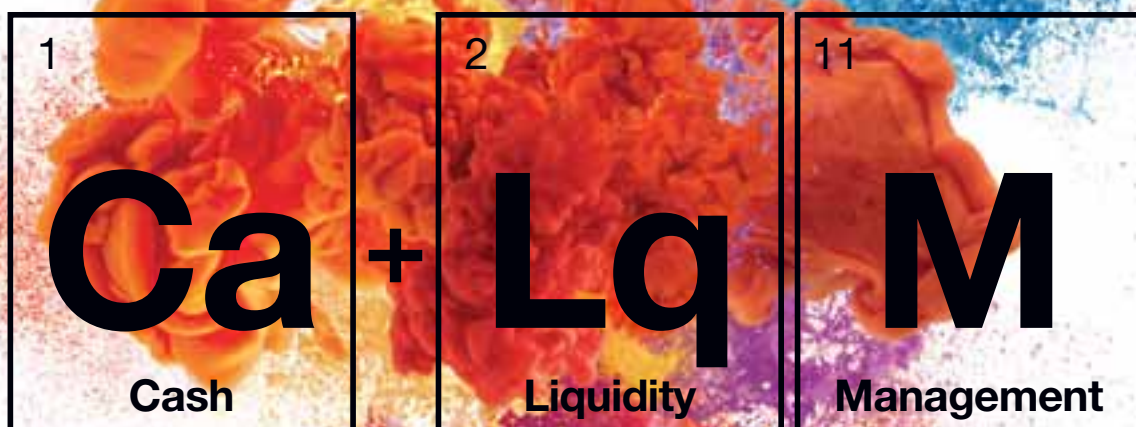
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