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Disruption is far from the monster under the bed that it was once made out to be. Now, it's not seen so much as a nightmare scenario as an opportunity to realise what was once intangible. Disruption is an opportunity to change minds.

In the Asset Servicing Times Technology Handbook, innovators across the back office outline how rapid technological change is being directed towards specific tasks, rather than unhelpfully upending what has already been tried and tested.

Jean Devambez of BNP Paribas Securities outlines how collaboration between large-scale firms and small innovators can breed the best solutions (p10), while Mark John of BNY Mellon's Pershing warns against staff being too trusting of new technologies (p16).

New technologies, including blockchain (p12), a cost transparency dashboard (p22), cyber security (p34), crypto-investment (p46) and more, are also discussed in-depth.

Mark Dugdale
Group Editor

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Things that disrupt in the night

It's sneaking up on settlement and creeping into custody, but is the big bad beast of technology disruption really something to be feared? Stephanie Palmer looks for its softer side

An ever-present threat to the asset servicing industry, technology disruption is considered by some to be lurking just around the corner, while others deem it a myth akin to the millennium bug. Others, however, are of the opinion that, while disruption is indeed on its way, it's nothing to be afraid of. Rather, it may be something to be embraced, and that can bring good things to the industry as a whole.

The word itself may have negative connotations, but Graham Ray, managing director and global head of investor services product management at Deutsche Bank, suggests that digital technology is merely the next step in the evolution of the industry.

He says: "We've seen the industry evolve, and we may even refer to things like certain infrastructure changes as disruption, but actually it's not about disrupting, it's about changing the way we're thinking."

"We're challenging what we do, using new technologies. Historically, we would look at a platform, but now we're looking at ways to de-componentise products, finding ways to use technology to achieve the task that we need and re-engineer processes."

A Deloitte report released in May, titled The Future of Asset Servicing, highlighted potential disruptors to the industry and the effects they could have in the short, medium and long term.

The report began by suggesting that automation alone has the potential to reduce the workforce in asset servicing by as much as 60 to 70 percent. It noted that there are 200,000 people currently working in the industry, a number that is so high simply because of the number of inefficiencies that have accumulated over the years.

Providers are constrained by "the legacy of acquisitions, poor integration, multiple technology platforms, and a high level of customised manual activity", the report said, adding: "Many of the full-time employees in asset servicing perform manual, repeatable tasks that automated technology can now cost-effectively replace."

The effect of disruptive technology on the workforce is a sensitive topic, but according to Ray, what is required is a culture change in the business, and people should be at the centre of any debate around disruption.

The workforce may be different in the future, but it will be social and network-oriented, connecting different people who want to make positive change, and creating an environment of trust.

Ray says: “Previously, when we have dealt with disruption or change, we’ve done it over very long periods of time, but today, the ‘people’ element of the industry means that we don’t have the luxury, or the desire, to let that time prevail.”

“Both clients and employees understand that we’re operating in a new world. They use technology differently, they buy products and services differently, and they want to bring that culture into the financial industry.”

The Deloitte report highlights three technologies that the firm anticipates will have a significant effect on the asset servicing space. In the short term, it highlights robotic process automation (RPA) as posing the biggest threat. In the medium term, it names blockchain, or distributed ledger technology, while in the long-term, the report names cognitive technology as the biggest disruptor.

Robotic process automation

According to Deloitte, robotics software is particularly suited to business processes that span several unconnected IT solutions, or for processes that are particularly time-consuming when completed manually. Such solutions could feasibly replace post-settlement tasks such as trade processing, reconciliation and reporting, both for clients and regulators, and the technology is already “suitable for enterprise-scale deployment, and can be rolled out quickly and at a low cost”.

While there are financial benefits to robotic processes, they are also likely to be more predictable and more consistent than their human counterparts and, by definition, less prone to human error. Speaking when the report was released, Sridhar Rajan, a principal with Deloitte in New York, said: “The core idea of automation in asset servicing is to replace a large amount of manual work to solve post-settlement challenges such as trade processing, reconciliation, reporting, and tax. Automation holds tremendous potential to clean up a massive amount of the chain.”

While Deloitte estimates that cost savings of 30 to 40 percent are “achievable”, the report warns that error rates will remain, and checks will be required. Organisations should work on developing an automation strategy, completing proof-of-concept studies and pilot programmes, while taking the time to understand the critical success factors of their projects, it said.

Blockchain

In citing its biggest medium-term concern, Deloitte echoed much industry commentary,

calling blockchain "one of the most widely hyped technologies right now", which could "result in a completely redesigned value chain".

Blockchain has the potential to remove the need for multiple reconciliations. If funds can sell directly to investors, and all transactions are recorded on the blockchain, they there is potentially no need for transfer agents to monitor subscriptions or to keep a share register.

Eric Piscini, a principal at Deloitte in the US and global blockchain leader at the firm, also suggests that custodians could be at risk. He says: "Tomorrow, if that relationship is in the blockchain and is immutable, and all the transactions are in the blockchain, then that gives you the same value that a custodian bank provides today from an ownership point of view. That piece of their business can be replaced by a blockchain solution."

Among the areas it expects to be highly affected by blockchain, Deloitte names trade and cash management, transfer agency, global custody and fund distribution. Risk and performance, fund accounting and depository services are also in the firing line, albeit less imminently.

However, the report also noted that, while RPA solutions can be 'bolted on' to existing solutions, blockchain will require more fundamental change to the IT infrastructures of service providers.

The report notes that the actual readiness of blockchain solutions to come into the market and disrupt solutions is under question, because this will require collaboration between banks, "which takes time and patience", it said.

Cognitive technology

Finally, Deloitte's report pointed to cognitive technologies, including natural language processing, computer vision, speech recognition and more developed robotics, calling these the biggest disruptive threat to asset servicing in the long term.

Intelligent automation uses technology to mimic and interpret human judgement, using machine learning to develop capability over time.

According to Deloitte, some firms are using RPA hand-in-hand with cognitive technologies to extend the potential of automation to "processes that require perception or judgement". This can be used for reviewing and analysing portfolio data, determining metrics, and generating natural-language reports for customers on the performance of each fund. The report said: "The uses of AI are potentially limitless, but the tools are also more expensive to deploy than RPA tools and they take months, rather than weeks, to implement."

Further, Rajan described RPA as: "Taking functions that are automated by using software as if it was a human interacting with a machine, and joining the dots."

He added: "Cognitive systems take their place at the more complex side of the journey. It has some drawbacks: whereas [with RPA] it's possible to walk back through a process to track an error, that's not so easy to achieve with cognitive systems."

The report noted that cognitive solutions are likely to be deployed enterprise-wide, rather than to address specific areas of asset servicing. It also suggested that institutions are focused on cognitive solutions to improve the efficiency and effectiveness of their workforce, rather than to reduce headcounts.

It said: "Interestingly, with more advanced and complex automation comes not only increased efficiency but also an increased dependency on the accuracy and skill of the human operators involved."

Sharing the love

This sense of an enterprise-wide shift resonates with Ray, who suggests that, to make sustainable change, the disruption has to be horizontal, spanning all activities across the front to back office and encouraging "collaboration and partnership".

He says: "There's an element of connecting all the parts—and there are still some missing parts. There are big changes and proposed changes coming in, but they only apply to one or two components."

"We have not yet seen a shift of services via new technologies that can bring all the front-to back-office elements together to effect a substantial and sustainable change."

This also stretches to collaboration between firms, he says. "You need that change to be across the spectrum—you can't think only about self-preservation, you have to be open to finding different ways to find solutions to common problems."

The questions for Ray is how to make this collaboration happen. The will and the desire is there, as is the conversation within the industry, he says, but getting things moving is another issue altogether.

"We have identified common problems, and we need common platforms—common platforms that can help us to mobilise front to back change. We need more of a network of people to figure out what are the priorities of what we're solving for and how best as an industry to solve it. If we don't do that, we will still be talking about this for a long time to come."

While Ray argues that this collaborative action won't come about in the industry until there is "an action that drives this", such as a regulatory mandate, the Deloitte paper suggests that technology itself will be the primary driver of change for the next five years.

If firms don't embrace these 'disruptive' technologies, they are putting themselves at risk, just as they would have been if they hadn't made changes in line with the new regulations.

Cary Stier, global leader of Deloitte's investment management group, warned that if firms don't embrace change, they could find themselves obsolete. He said: "Asset servicers have to view themselves as a technology company, not just as an asset servicer that might be part of a broader bank. They need to make changes to their infrastructure or else they will struggle."

The Deloitte report concluded with the prediction that the asset servicing value chain will be disrupted by new technologies, but not destroyed entirely.

Costs will be reduced through automation, the report said, and new entrants will start to create a more varied and disrupted industry.

"We anticipate a domino effect whereby asset servicers will begin implementing RPA to tackle low-level, repeatable, process-based tasks," the report said. "Service providers will follow this with blockchain as this technology matures. As RPA becomes embedded, it will pave the way for introducing cognitive technology and AI that applies rules and human-like judgement to asset servicing roles."

Improvements must not apply merely to what Ray calls the "low-hanging fruit", achievable through automation and robotics, but must also have the potential to transform the end to end process within the technology infrastructure of a firm or industry. To achieve this, Ray says: "We need to find a sustainable model, and that's where we need to create a framework in which to collaborate across the industry."

Best of both worlds

Jean Devambez of BNP Paribas Securities speaks to Stephanie Palmer about how collaboration between large-scale firms and small innovators can breed the best solutions

How is BNP Paribas approaching digital innovation?

Innovation is a very broad topic, and even if we aim to do as much as possible in house, we believed from the start that when it comes to digital innovation and new services, we should also leverage the external ecosystem. That's why we decided to connect with a strong network of financial technology and regulatory technology companies, in order to collaborate and partner with them.

For example, we are partnering with a fintech called Fortia, which has developed a platform for trustee and depository business processes, covering nearly the full workflow of compliance checks, based on artificial intelligence and machine learning.

The platform reads and analyses prospectuses to detect compliance rules and match them with existing formulas, cutting out a lot of the manual processes. It also provides automated business management, covering the full process up to identification and reporting of breaches, and following up on the audit trails.

We were particularly interested in the startup because it combines a good level of expertise in the technology with a strong focus on a specific process. This focus is a key success factor.

How do you connect with startups?

We can trace our history on this back to the foundation of L'Atelier—or The Workshop—in 1978. L'Atelier, which became a fully-owned subsidiary of the BNP Paribas Group in 2003, specialises in prospective research, business transformation consulting services and business acceleration programmes, providing us with an incubation framework for external startups. Startups are supported through design and acceleration stages, and then we couple a startup with a BNP Paribas business and help them to work together.

L'Atelier helps us scan the market for new businesses with potential, and a four-month programme tests the solution and identifies what we need to add in order to develop it as a fully-fledged, fully-equipped platform that meets our own business standards.

With Fortia, this process went very well, and BNP Paribas now has a minority stake in the company and a long-term vision to develop it for other platforms. We intend to deliver the solution for our own business and to the rest of the market by mid-2018.

This example shows how much value fintech startups can bring. We never would have been able to develop that platform, using new technologies, in such a short space of time.

Equally, Fortia would not have been able to mature its platform and deliver what it has without the expertise from BNP Paribas. It's a win-win situation.

The combination of the start-up spirit and the big-company culture works well. Obviously

there are points of contention occasionally, and both parties have to adjust and compromise, but we can each find new ways of doing things.

How do you manage the scaling up of new solutions?

This can be interesting, because we have no choice but to ask the startups to adapt the lower layers of their solutions to support a banking infrastructure like ours, and to support volumes like ours.

For Fortia, the target market is the global depository business, which, for us, means more than 8,000 funds in 14 to 16 countries. They have to deliver on that, and we have to help them to do so. But, this can be very beneficial for them. Once we have scaled the solution up, then the platform will be ready to go to the market, becoming available to new clients.

Scalability was one of the big challenges in this case, and I think it was one of the main reasons Fortia was interested in partnering with a group like us. When you're in the B2B space, partnering with a group is one of the fastest and easiest ways to get that scale.

What kind of technologies are emerging as important in the securities services space?

At BNP Paribas Securities Services, we work mainly on blockchain, artificial intelligence and big data. Our digital transformation teams are supporting the entire organisation on those technologies whether it is to adapt existing platforms or to innovate and develop new business models.

But, even if technologies are key we don't want to develop technology for technology's sake. We are business-driven, trying to use the technology available to address business issues. Because of this, we don't have projects using only blockchain, or only artificial intelligence—they will generally use up to four different technologies. For example, in distribution, we have an initiative that is primarily using blockchain, but also makes use of big data and artificial intelligence.

The solution, Fund Link, is designed to support the full lifecycle of fund distribution transactions, from investor onboarding and all the know-your-client (KYC) and anti-money laundering processes, to providing data and information on funds, managing transactions using a blockchain infrastructure, and extracting analytics.

Here, blockchain plays a big part—it's a very promising technology in terms of fund distribution and managing transactions—but we don't want to put all of the KYC data on the blockchain, as that would lead to too much complexity at this stage.

We can't try to address everything with any one technology. Innovation has to start with a business purpose, such as client onboarding, which is a big pain point in the industry. If you can't see a problem, don't try to innovate. If you can, then consider what new technologies can bring in order to solve the problem.

Technology is important, but it's not the mission of the initiative, it's just part of the solution.

Jean Devambez
Global head of product and client solutions for asset and fund services
BNP Paribas Securities Services

All aboard the blockchain

As the blockchain concept continues to develop, all sectors are considering how to put it to good use, including transfer agency, says Ghassan Hakim of Riva Financial Systems

To blockchain or not to blockchain a transfer agency system? That is the question being discussed and debated by technology staff supporting transfer agency solutions in many parts of the globe.

When participating in industry conferences, we meet colleagues on both ends of the spectrum and probably many more in the middle still trying to grasp what blockchain is all about and how the technology can be applied in their transfer agency business.

On one hand, there are industry professionals that are convinced the distributed ledger technology (DLT) of blockchain is the ultimate disrupter of the transfer agency model we've known for decades. At the other end are those that are not only skeptical, but believe it is a waste of time to be even discussing the topic.

At Riva Financial Systems, we believe blockchain and DLT are not to be ignored. Are they going to completely overhaul the transfer agency model as we know it today? Not so soon. However, there are certain components that are likely to be affected in the short term, like the process supporting the know-your-customer (KYC) rules. In the longer term, we do see the potential for a completely 'blockchained' transfer agency model that will be precipitated by events outside the transfer agent, which may seem unlikely to happen today. So, it is not a question of whether it will happen, but of when.

Let's first consider the transfer agency model of today. While technology advancements over the years have introduced many efficiencies and high levels of straight-through processing (STP), the model remains highly dependent on human capital with, at its heart, the concept of centralised control, oversight and reporting, amid a sea of ongoing regulatory changes. With more STP and self-servicing, transfer agents still remain a costly proposition for asset managers, whether done in-house or outsourced. Letting go of that key oversight role in today's regulatory regimes will be the main challenge to any attempt of introducing DLT solutions that connect the end investor directly to the fund manufacturer, and in essence eliminating the role of the transfer agent.

What is blockchain?

It is now well established via the flurry of articles, initiatives, committees and the like that a blockchain is, in the simplest terms, a ledger shared between participants, which can only ever be added to, and which can only be updated with agreement from all participants through some form of consensus.

On a slightly lower level, the ledger works by grouping changes into blocks, with each block given a unique signature and appended to the ledger. This signature prevents past blocks from being tampered with, as this would make future blocks invalid. This is because the cryptographic signature of new blocks is dependent on that of each past block.

A full copy of the ledger is held by every member participating in the blockchain, serving two main purposes. Firstly, it allows anyone participating to verify the integrity of data in the blockchain, and that it has not been tampered with.

Secondly, it provides resilience. In order for data to be lost, every participant would have to lose their copy. These features serve to differentiate a blockchain from a traditional database.There is a marked difference between public and private blockchains. In a public blockchain, such as Bitcoin's, anyone can view the entire contents, and anyone can submit a transaction, provided they hold the key to the funds they want to send.

This contrasts with a private blockchain, which is able to impose restrictions upon who may participate in the network, who can access data in the network, and who may act as a validator of transactions. In a private blockchain, there may only be a small subset of trusted validators. Furthermore, in order to secure a public or private blockchain, cryptographic keys are used to prove the ability to submit transactions and ownership of assets.

What can blockchain bring to the table?

Many forecast that there is an enormous amount of potential that can be enabled with blockchain technology. The underlying concept of the DLT has several key features that can surpass existing technologies.

First, smart contracts allow for the pre-agreed conditions of a trade or transaction to be put onto the blockchain in code, which can automatically execute the relevant clauses when certain conditions are met.

As well as allowing processes to become automated, they can reduce ambiguity, as the contract is broken down into 'if-then' logic statements. As a result of such standardisation and alignment of processes, the overall reconciliation cost is reduced.

Second, a blockchain acts as a universal source of truth. In order to be stored in the blockchain, data has to have been accepted and validated by the rest of the network.

> *Blockchain, as a potential disrupter to financial services, is not to be taken lightly*

This, in terms of the financial industry, eliminates the need for constant reconciliation.

Blockchain technology could also sharply reduce settlement and transaction times by eliminating time-delayed factors imposed by the various layers in the transaction, including multiple systems and databases, human oversight, controls, and reconciliation.

Various intermediaries, from the distributors and clearing organisations to the custodians, paying agents and transfer agencies, could eventually be eliminated, becoming less relevant as blockchain technology becomes more prevalent by introducing more direct transactions between the end investor and the fund manufacturer. This could also reduce fraud, duplications, reconciliation errors and time-to-market.

Finally, due to their immutable nature, blockchains provide the perfect mechanism for auditing and traceability.

Transactions recorded on the blockchain cannot be deleted. They can be referenced as cancelled or reversed in a later block, but the original transaction will always be preserved. This append-only design prevents tampering with any records, and provides a full transaction history to auditors and regulators.

So what happens now?

While this article is not meant to be a detailed technology article on blockchains, we want to establish that this new technology has the potential of being disruptive and, as stated earlier, cannot be ignored.

Going back to our existing transfer agency models across the globe, it is easy to see why many industry veterans, with years of experience, challenge the notion of a full disruption of our models and the elimination of such key cornerstones of our industry with distributors, clearing organisations, custodians, back-office shareholder recordkeeping and fund accounting. This is not to mention the most important factor that stands to impede such a disruption, namely, all the regulatory regimes.

To their credit, we should note that various regulatory agencies have hired more technology staff with blockchain expertise and some have even allowed for fintech-friendly incubator and innovation structures. These efforts clearly show that that blockchain, as a potential disrupter to financial services, is not to be taken lightly.

So what we do see today is large gatherings of industry players discussing blockchain in industry conferences and committees as well as internally in their own organisations. However,

they tend to have a limited focus on specific processes that could be lifted from our model and supported in a blockchain infrastructure. One of the most prominent such topics is KYC.

It is very conceivable that KYC could benefit from all that blockchain has to offer in terms of privacy, reduced risk, transaction speed, accuracy, audit trail and lower cost. The end investor could provide all of their documentation to a central utility, which, when authenticated, would provide the investor with a unique key or ID to be used when purchasing fund shares, removing the KYC burden on the fund manufacturer. Such a solution will require approval from the regulators for the technology solution and the concept of an authorised central utility, but also for removing the oversight responsibility from the fund manufacturer, otherwise redundancies would make this concept too costly and burdensome. Utilities could be formed within jurisdictions and allowed to share information across utilities, using the blockchain infrastructure, and therefore providing a more global benefit across markets.

However, here, we are discussing the possibility of a fully disrupted model in the future that will come from factors external to the current model. The key factor in our mind is global demographics. The technology is here, and the new generation of today is already very receptive to new technologies, faster time-to-market, independence, instant communication, and information. Whether it is this generation or one or two after it, ultimately, the fund industry will be led by a younger, technology-savvy, borderless generation. These energetic resources will populate all facets of our industry from portfolio management to technology, and they will also be the regulators of the future.

Putting aside the geopolitics of today, the new generation will want to open borders, standardise regulations and eliminate any middle-man structure. They will want a Luxembourg resident to be able to buy funds registered in the US, an Indian investor to invest in Canadian funds, and so on.

They will want to use their mobile digital devices, whatever shape they will take in the future, choose a fund in any jurisdiction, maybe guided by robotics, artificial intelligence for financial planning or social media, and then receive instant confirmation from the fund manufacturer acknowledging the purchase. Maybe they will even have a net asset value published for each transaction, also instantaneously. Is this far-fetched? Maybe. Is it conceivable? Probably.

At Riva Financial Systems, we have already explored how our global transfer agency system, Riva TA, which supports multiple product types across all jurisdictions, could co-exist in a blockchain infrastructure. We have worked on an initial proof of concept that allows a distributed ledger to effectively communicate with Riva TA, and found that our newer, state-of-the-art technology, has made developing such interfaces a relatively straightforward undertaking. Further use cases are being planned and developed, and will build on our accumulated knowledge. For now, we continue to support our global deployment of Riva TA, investing in enhanced functionality, while welcoming and engaging with the fintechs of this world that are interested in 'blockchaining' the transfer agency world.

Ghassan Hakim
CEO
Riva Financial Systems

Mind the gap

As the back office embraces new technologies, the next generation of staff should be mindful of becoming too trusting. Stephanie Palmer speaks to Mark John of BNY Mellon's Pershing about the many changes approaching

What are the major issues around financial technology today?

There's a lot of excitement around blockchain and its transition from an over-hyped phase a few years ago into something that has started to build some real and credible traction over the last 12 months, being considered as a solution that can solve real problems. There are now a number of test cases and initiatives out there.

Distributed ledger technology (DLT) is a means to take the industry to the next wave of straight-through processing, and that brings automation, governance and control into the conversation.These solutions are often the result of collaboration with financial technology firms, but this in itself can raise some questions.

There is a concern that there are so many fintech firms out there at the moment—how are they all being funded? How are they differentiating themselves? How are they competing with those that have very solid funding, or are a part of consortia such as R3, or those that already have bank alliances? Equally, for institutions, it's hard to know which fintech to partner with, and to tell what they will offer over an alternative.

The approach that a lot of banks are taking is to publicise what they're doing and engage with fintech firms to see how they can collaborate. It's a big step that no one is going to be taking lightly, and that means the pace of change is slow. We talk about glacial change. We have seen stepping stones before, with globalisation and materialisation, but nothing has moved very quickly. The technology is now available to allow faster movement to new solutions, but that process is still going to be very thorough, because it's all so new.

Another point to consider is that all these innovations need to run in parallel or on top of existing legacy technology. We have built and built upon old technologies, and unpicking all of that is going to be a challenge

for everyone. The technology is there to address a solution, but you have to have a starting point. How do you bridge the gap between the old and new? Integration is going to have to be very sensitive.

On the buy side, what are the major changes you see happening in the next five to 10 years?

Over the next 10 years, I would like to see a fully interoperable solution that all of the capital markets can share. The glimpses of success we see at the moment tend to be in areas where the infrastructure allows for the sharing of technology cross-border from one institution to the next.

That's not happening yet, and that knitting of interoperability is something that we need to focus our minds on. The technology is there in the DLT innovations. We have discussed the safety aspects involved, and the immutability of records, but we don't really talk about how banks can share that platform. That's going to be a big challenge and, again, it's going to take time.

If institutions each build their own DLTs, does that defeat the object?

Yes and no. Central counterparties were built as silos, but to create an efficient landscape they must interoperate. Those who do that will increase competition, which leads to more efficient markets.

DLTs can also be built in silos, demonstrating that they have all the safety features, the speed and the efficiency that the market wants. However, the market requires them to be efficient, and to do so, the same interoperability is required. It means the market needs to operate on common standards. Some of the DLTs won't make it, and there will be a bit of experimental development going on. This is where the regulators can get involved with their sandboxes, making sure that technologies can have the freedom to develop under the regulatory landscape.

> *There is a generational gap between current technology and future technology, and the same generational gap exists between the current support teams and their successors*

The focus is on getting something working, getting it working quickly, and doing it in the right environment. This is going to be important for the industry in terms of efficiency and safety, so they want to make it regulated and they want to make sure it works.

What role does automation play in asset servicing?

I see automation coming out of things like corporate action processing. That's an area of the back office where error-related losses can be significant. If DLT can be applied to that, by demonstrating ownership at any given time, that would be important.

There's also the financial investment insurance space—credit default swaps and other structured instruments, for example. I can see DLT being used to identify who has risk at any given time.

Beyond settlement, these are the areas where there is really a problem to be solved. Corporate actions require a very intensive manual process, and therefore carry a lot of risk. From the notification to the voting to the end result, there is a lot of interaction on a significant amount of data in any back office, increasing scope for human error.

Anything that can plug those gaps that is efficient, that can save money and that can speed up processes, is going to reduce costs in the long run.

What about the human element of these processes?

Until we can crack machine learning and artificial intelligence, humans will still play a big part. This issue really divides people. Some think human resource in the financial services industry is going to massively shrink over the next five to 10 years, while others think they have guaranteed careers for life. The latter would argue that, while technology is going to have a big impact, there is going to have to be a check-and-measure system

in place, and that is going to have to come from a human. I can see the argument for both viewpoints. However, if any responsible industry participant—whatever industry they're in—is going to replace an integral human process with a robotic, automated process, they're going to have to run a series of tandem processes, testing enough scenarios to make sure the automated process works just as effectively.

There is a generational gap between current technology and future technology, and the same generational gap exists between the current support teams and their successors. The generation of IT staff that developed the technology and operated it have been in the organisation for 20 to 30 years, and they know all of the background information. The danger is that some of these people are now coming up to retirement age. Firms need to be able to close that knowledge gap if they want to be able to successfully implement new technologies that will be running alongside existing systems.

That is going to lead to an interesting change in human capital, by which technology specialists will be the new expensive hire, becoming more desirable than the risk and compliance specialist hires we have seen in recent years. Any change to the technology infrastructure will need stability in its management, and that comes from years of human experience.

Is there a risk of too much reliance on technologies such as AI and machine learning?

We should be very mindful of one very basic thing. We can put a lot of pressure on technology, but we can't totally give up control. We will always need human input into the machine learning process. In a generation or two, people should not just accept the machines' authority, and must have the ability to challenge it. If people do not have appropriate controls they might see an error and not recognise it. Even if they have the luxury of making a decision, that decision will be heavily influenced by the machine, so the balance of responsibility and control needs to be right. It will take a lot of proof of concept, proof of work and proof of enhancement to get to a point where inorganic intelligence can occur.

There's a very small window of time in which to address this. We will very quickly shift from those in the current environment, whose opinion is that a machine needs to convince humans it can do their job, to a generation more accepting of technological capabilities. This is the time to really challenge machine learning and AI so that the proper due diligence and testing can be done while the expert resource is available.

The window is tight and it is closing. What we're doing today is for the future generations, and we have a responsibility to make sure we give them the best possible solutions. We have started thinking about how it could be developed. We might have started to collect the data that will be required to do it. But do we know how to use it?

Banks want to make money, financial services providers want to make money, and clients want value for their fees. But you can't ignore safety. That's essential to successful development, and I don't see enough evidence of that.

Mark John
Head of product and business development for Pershing and broker-dealer services for Europe, the Middle East and Africa
BNY Mellon

Quick and nimble

Managers who nimbly adapt to will be well positioned to take advantage of the opportunities presented by the changing investment landscape, says Broadridge's Stephanie Clarke

On the surface, the barometer for today's global fund management industry is far from set fair. In every year post-crisis, net inflows have failed to reach 2007 levels, investors have failed to demonstrate prolonged confidence, and downward fee pressures have continued to mount.

But, despite these storm clouds, there is reason for optimism. Only measuring net flows fails to recognise the velocity of money within the industry. Global 2016 net inflows totalled a positive but meagre €500 billion. But, summing the funds that had net positive inflow in 2016 gives a record total of €6 trillion. To put this figure into perspective, it is almost equal to the total fund assets of the two industry giants of BlackRock and Vanguard combined. To put it another way, almost a fifth of the fund industry's assets changed hands in 2016.

This churn of money between funds represents significant opportunity (and on the flip side, threat) to asset managers. So, what puts managers on the right side of this churn? Data from Broadridge's Global Market Intelligence platform, which has tracked 80,000 exchange-traded funds (ETFs) and mutual funds globally for more than a decade, points to key three factors.

Firstly, and unsurprising to most, the great switch from actively managed mutual funds to passive mutual funds and ETFs has continued at an unrelenting pace. There has been a great structural change in the industry, with more than 20 percent of funds now managed on a passive basis today, compared to less than 10 percent a decade ago. To achieve this fundamental shift, ETFs have expanded at an incredible average growth rate of 17 percent per annum over the past decade, with index mutual funds also posting double-digit growth. On the flip side, active funds are lagging at just 2 percent.

Secondly, the rise of mixed-asset funds has been notable. With uncharacteristic correlation

Devolving the investment decision to the new wave of mixed-asset funds that promise stability, diversification and dynamic asset allocation has had great appeal

between asset classes, yields remaining stubbornly at all-time lows, and general investor confidence ebbing, mixed assets seem to answer investors' question of 'what should I do with my money?'. Devolving the investment decision to the new wave of mixed-asset funds that promise stability, diversification and dynamic asset allocation has had great appeal. Demand for these mixed-asset products really took off after 2010, with assets increasing from €1.2 trillion in 2010 to €3.1 trillion in 2017, and net inflows of almost €1 trillion over that period.

Finally, despite the drive to passive, there are bright spots to be found in the actively-managed fund market. While the mediocre, benchmark huggers of the active world have struggled, managers with a clear value proposition, a strong investment story and an outcome that resonates with investors have managed to attract strong inflows. In the past year alone in the actively managed space, 261 active funds have seen inflows of more than €1 billion.

An enduring theme in the active space is income, which plays out across asset classes—with bond income funds showing enduring strength and dividend and equity income funds remaining a bright spot in the active equity outflow bloodbath.

Managers who nimbly adapt to play to these three factors will be well positioned to take advantage of the opportunities presented by the changing investment landscape.

Stephanie Clarke
Senior vice president of global market intelligence and mutual fund and retirement solutions
Broadridge Financial Solutions

Fee finding mission

KAS BANK's new dashboard promises to clarify costs for UK defined-benefit pension schemes. Mark Dugdale takes a look

KAS BANK's cost transparency dashboard for defined-benefit pension schemes is aimed at solving an issue that has long existed in the UK, but has so far lacked an appropriate solution.

The UK Financial Conduct Authority (FCA) expects to publish its own solution to the issue of transaction cost disclosure in workplace pensions in Q3 2017, meaning UK schemes do not have long until they have a regulatory requirement on their hands. Unsurprisingly, the FCA's standard way in which transaction costs and administration charges should be disclosed, as laid out in its consultation document, prompted a flurry of responses.

Consultancy firm Hymans Robertson argued in its response to the consultation that "the time fund managers and platform providers need to set up efficient reporting processes should not be underestimated", while there is concern that "the cost of doing so will be passed on to members".

Asset management firm BlackRock claimed that the prescribed method for disclosure "risks unintended consequences including incentivising changes to execution workflows simply to achieve an objective of low perceived costs rather than focusing on the best outcome for investors".

Despite concerns such as these, workplace pension scheme The People's Pension emphasised the need for transaction cost disclosure: "Standardised disclosure is necessary in order to ensure that purchasers of asset managers' services are able to compare the true costs of different providers. It also reduces the costs of compliance, which ultimately come from those contributing into pensions."

To aid this cost transparency drive in the UK, KAS BANK launched its transparency dashboard for the country's defined-benefit pension schemes in early 2017, as the UK FCA considered consultation responses and trustees and governance bodies prepared to be inundated with information they desired but, perhaps, were not ready for.

Stewart Bevan, product manager at KAS BANK, says: "UK financial services are on a journey to greater transparency and pensions are at the heart of that. One of the areas that we've identified is that costs are not fully understood. Governance is important, but the true cost of ownership is something that many trustees and governance bodies still find confusing, difficult to obtain and hard to conceptualise."

Bevan continued: "The problem is they don't know where to look, they don't know what to ask their service providers, and they struggle to pull all of this together in the correct format. They have been trying, there have been some significant efforts in this area, but truly capturing this information and understanding it is still a struggle."

> *The key requirement for UK pension schemes is enhancing communication with their service providers, whose interest it is in to talk about costs*

The KAS BANK cost transparency dashboard was built on the securities services provider's experience in the Netherlands, where cost disclosure is almost a decade ahead of the UK, according to Bevan.

He says: "KAS BANK has been through this journey before. As a seasoned Dutch custodian and fund accountant, KAS BANK services approximately 40 percent of the pension market in the Netherlands, which has had a regulatory requirement for cost transparency for approximately seven years. That requirement naturally falls to a custodian and fund accountant, because they see everything. It's easy for us to capture, aggregate and present back all of this data. We know how it works and where the challenges lay in cost reporting."

Bevan adds that "it's not a perfect model in the Netherlands", but the country has been on a kind of "evolutionary journey" to achieve useful cost transparency.

He says: "They started seven years ago with costs, with a simple template, and they tried to get as much information from their service providers as they could. Every year they review the template, refine and improve the process. That's one reason why the Netherlands is considered to be an industry leader in cost transparency. Now, we're taking that model and dropping it into a UK setting. We're not starting from scratch."

The key requirement for UK pension schemes is enhancing communication with their service providers, whose interest it is in to talk about costs.

"They want to talk about these costs," Bevan says. "The service provider will take an action, and governance boards and trustees need to understand what that action was and why it was taken. The best way to do that is to have tangible evidence in front of them."

The KAS BANK cost transparency dashboard enables this by taking charge of the underlying data, says Bevan. "That's what a specialist data provider needs to do. Governance boards and trustees need to have clear, concise granular levels of data that are accurate. Independent specialists need to perform all of the validation checks, assessment and analysis of that data to ensure that it's fit for purpose. That goes on behind the scenes—we don't need to burden a pension scheme with how it all works, we just need provide reliable data and make it meaningful."

"The KAS BANK app takes all of that granular information, pulls it together, and displays it in clear graphics. We try to break down that data and present in forms that users can easily understand. They can also define exactly what they want to see."

"We don't prescribe anything. We provide all of the underlying data and let users decide what they want to do with it."

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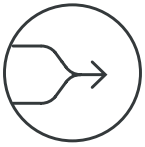

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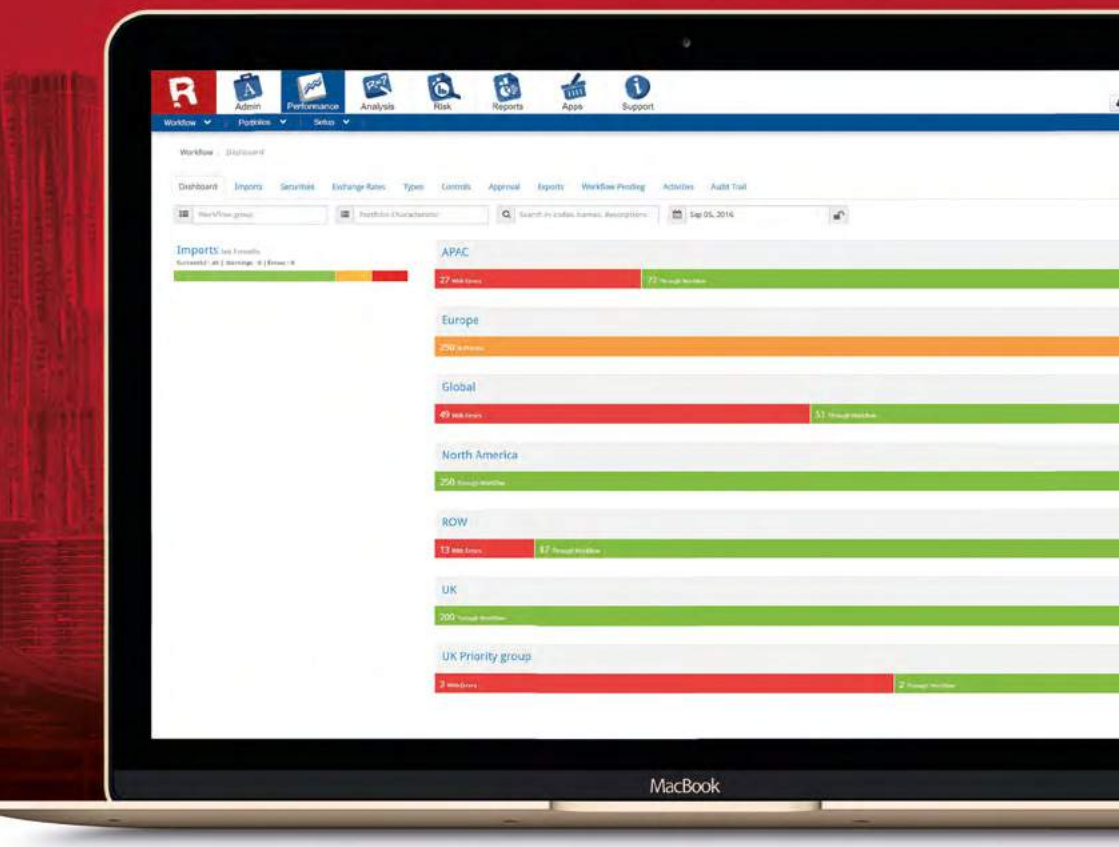

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Playing fair

As the UK FCA welcomes a third cohort of participants to its 'safe space' for fintech testing, Sam Pearse of Pillsbury questions whether it's still fun and games in the sandbox

In November 2015, the UK's Financial Conduct Authority (FCA) published a report on its intention to launch a regulatory sandbox. A key component of Project Innovate, the sandbox was described as "a 'safe space' in which businesses can test innovative products, services, business models and delivery mechanisms without immediately incurring all the normal regulatory consequences of engaging in the activity in question".

The FCA then moved with commendable speed. The first two-month application window closed on 8 July 2016. On 7 November 2016, appropriately, the second anniversary of Project Innovate, the successful applicants to the sandbox were revealed. The FCA had received 69 applications and 24 were successful in meeting its admission criteria. One of those criteria was that the firms must be ready to begin testing—the sandbox is not an incubator. This has enabled the FCA to maintain the pace, with the first cohort of firms completing testing by the end of April 2017.

The FCA closed applications for the second sandbox cohort on 19 January 2017 and it has since published the names of the 31 successful applicants, having received 77 applications. There is no standing still—the window for applications to participate in the third cohort shut on 31 July 2017. Although the outcome of the first cohort is not yet known, that the enthusiasm remains high is very much a positive.

There are some notable inclusions and absences in this second cohort.

Distributed ledger technology (DLT) features, with at least eight firms basing their offerings on the technology. This is consistent with the FCA's declared interest in the possible role that DLT may play in regulated areas, having launched a discussion paper on the topic in April. This

The application of DLT to financial services has been explored for some time and firms are now offering well considered consumer-facing platforms

is encouraging. The application of DLT to financial services has been explored for some time and firms such as Otonomos, a first-cohort firm, are now offering well considered consumer-facing platforms.

There are three artificial intelligence firms in the cohort, with the interest in how artificial intelligence can improve the tailoring of financial products and choices for consumers. Again, this is leading-edge technology and its inclusion is commendable. Insurance firms are also prominent, perhaps in recognition that this traditional sector is ripe for disruption.

Another positive is the geographic diversification. Whereas the first cohort was skewed towards London, the second has a greater number of regional firms included, particularly along the Edinburgh-Glasgow and Leeds-Manchester corridors. The London and regional split has evened out.

There is considerable talent all across the UK and a London-centric regulator would have been very damaging for promoting the UK as a place for the development of fintech.

The first cohort contained a number of banks, whereas the second does not. Again, the sandbox should not be exclusive, and the money invested by large financial institutions in developing fintech offerings and moving the regulatory conversation along is valuable. However, the sandbox is intended, in part, to assist those businesses who need to test their products before spending the not insignificant sums on obtaining permissions. Large banks do not seem to be the most natural candidates for such accommodation.

It is hoped that the sandbox can live up to its stated aim of helping disruptors through the highly complex world of financial regulation, both protecting consumers and increasing

competition. Participants in the first cohort are now compiling their final reports, and the expectation is that most of them will take their products forward. We await the results with great interest.

For example, will the companies themselves have found the experience a positive one, with the FCA providing the guidance they required in order to appropriately deliver their products? A first-cohort firm has provided very positive feedback about the experience, even stating that the supportive environment exceeded expectations. Through weekly consultations, the FCA provided the firm with guidance through the process, to the extent that the guidance accelerated the development of the product to an earlier launch than would otherwise have been possible.

Ahead of those consultations, the firms would provide weekly metrics, which would also be discussed. This generated a sense that the FCA was onside and invested in the process, a perhaps unexpected feeling described as "liking your mother-in-law".

Overbearing or poorly-conceived regulation emerging from the sandbox may stifle the appetite for innovation in the sector. Applicants to the sandbox are guided towards regulation in the application form itself. The expectation is that all of the sandbox firms will become regulated. Given that some cohort firms do not fall neatly within existing categories of permission, it will be no surprise to see newer regulations emerging with the benefit of the understanding gained from the sandbox collaboration.

Commentators have called for certain areas to be off limits to the FCA's purview, arguing that the presence of the FCA, even as an interested observer, may stifle innovation. On the other hand, Christopher Woolard, executive director of strategy and competition at the FCA, is more concerned about protecting consumers and also ensuring that the FCA is far savvier that it has been in the past. Woolard argues that greater understanding of technology and processes used in financial services will enable it to be nimbler and more likely to prevent the fragile post-2008 financial sector from taking more body blows.

Both views have merit. It is true that the FCA should not be straying into other sectors. However, given the pace at which developments happen, it seems futile to try now to identify areas that should be left to their own devices. Technological developments have impacted sectors that might never have been contemplated when the technology was first conceived. Tech companies pivot, after all. The regulator must be agile enough to know when to step in, when to step out and when to stay away altogether. It is a minefield where the mines keep moving.

Instead, a balance must be struck. Regulation itself is not bad. It is bad regulation that is the problem. If the FCA is able to tread carefully and considerately, it may find more firms willingly applying for regulation rather than spending time and money with lawyers devising platforms and strategies that avoid regulation. It is a virtuous circle, a progressive regulator providing proportionate oversight and inspiring consumer confidence will encourage firms to work with them. It is also a utopian dream, but if you don't aim for the stars you'll never clear the trees.

Sam Pearse
Partner in the corporate and securities practice
Pillsbury Winthrop Shaw Pittman

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Balancing the scale

As investment in private equity has increased, traditional solutions sometimes struggle to manage the workload. Paul Whapham of Framework Software explains

How does Framework address the data challenge for private equity investment management?

Framework is an investment data management solution for the global private equity sector, designed to manage financial information, helping institutions and asset servicing providers to manage and report their investment data. The private equity industry has become more sophisticated than having one accounting system to capture historic transactions. There are more different sources of data now. Our clients may well subscribe to data vendors, using that data for benchmarking or deal flow planning. They will have a customer relationship management (CRM) system, a treasury or banking system, an investment monitoring process, and so on, but we would want to capture that data and run it alongside accounting data.

Framework gives firms the wherewithal to manage the data they need. Most of this is self-generated, perhaps captured through our accounting and administration systems, and some of it will be third-party data. What we do is offer a platform to bring investment data together in one place, instead of having multiple systems which do not talk to each other.

What has led to the need for the solution?

We only work with the private equity market, in all its guises, including real estate, infrastructure, debt funds, and so on. Private equity has seen a huge influx of allocations over the last 10 years, and with the amount of money pouring in, we see a challenge of scale. The big funds are getting bigger, with tens of billions as the new normal, and many are facing issues in managing the data around those funds.

Part of the reason is that, over the years, they have bought best-of-breed systems, having one solution for portfolio administration, one for valuations, one for investment monitoring, and so on, ending up with a whole cluster of bespoke or customised systems for each specific functional need. The problem is that they now want to use the data coming out of these systems more widely, at enterprise level, and more flexibly, to meet changing investor

Best-of-breed single-function systems work well at a certain level of operation, but once you expand past that you find you have to join the dots

and regulatory demands. These best-of-breed single-function systems work well at a certain level of operation, but once you expand past that you find you have to join the dots. Scale is the name of the game.

We offer a data hub, giving firms the opportunity to pull all of the investment-related data from the different systems into one place.

That gives them the opportunity to do more in the way of analytics, understanding exactly what is going on in the portfolio, helping with managing allocations, and improving the flexibility of reporting.

Equally, more and more larger investors are going to private equity houses with mandates. In the past, they may have simply wanted returns, and wouldn't have asked too many questions.

Now, the market is maturing, and big investors want their money deployed in a particular way, whether that's co-investment, exposure to debt versus equity, or by deal-type or size. Investment managers have to monitor and report on that mandate.

These organisations might have really clever guys with spreadsheets, who are prepared to work around the clock to manage those allocations, but it doesn't have to be like that. If you have a centralised system that is catching and holding all the data, then that data pool will support mandate management.

Have you seen an increased interest in data analytics in the current market environment?

It is becoming increasingly important and, again, it is an issue of scale. The bigger a portfolio is, the more difficult it is to keep track of what its exposures are, where its money is, and what is and isn't performing.

We are not just looking at time series data retrospectively. We want to be able to see where trends are changing. If you're succeeding in one area, why is that? Is it currency? Or simply a case of the fashion of a particular sub-sector? You can look at the many factors at play in your investment activity and build forecasts or model scenarios for changes in your portfolio.

Previously, there have been people making efforts to put together data warehousing projects, with mixed results. One of the reasons for that is that the biggest players have often been hybrid investment institutions, with less than 10 percent allocated to the private equity sector. So, whatever they have developed for data analytics has not been particularly well crafted to support private equity.

Now, private equity can represent a larger proportion of people's overall investment portfolios, and so more attention is being focused on it. Our aim is to provide a 'data-mart' solution, rather than a data warehouse, specifically for investment managers, investors and asset servicers in private equity.

Investment managers want to focus on investment activity, not on the back office. They want to free up more time so they can look into the numbers, look ahead, see the trends and correspond their actions to that.

What differentiates private equity from other asset classes?

The issue is one of complexity, jurisdictional demands and investment lifecycle. Deal structures can be pretty complex. Even in a limited partnership, partners are not always equal. There can be side-letter agreements and things like that, and you have to understand the impact of that on distributions and on draw-downs. You have to get that right—there is a lot of opportunity for operational error.

Another issue is that big private equity investment houses require asset servicers that can cope with their global operations, and providers have to have systems that can cope with multiple jurisdictions and accounting standards. They also want a servicer that can cope with the diversity of their activity. There are so many different fund types, and different instrument types within them, all of which are esoteric and particular to private equity. For a lot of providers, this has been managed as a workaround on more generic investment management platforms, but that is not a scalable option.

The issue of scale means these companies can't cope with the workarounds any more—they need a specific system to handle the specific private equity sector activity.

Then there is the issue of investment lifecycle management. An allocation to private equity is made with a five- to 10-year outlook, as opposed to a trade, which may last a millisecond. The monitoring of that allocation over the period relies on processes that are particular to private equity. Critically, it relies on data that is not widely available.

Private equity is maturing. It is attracting larger allocations because it is better regulated today and offers attractive long-term returns. With maturity comes issues of scale. Systems that may have worked on a small scale in the past will not cope with larger volumes or increased complexity.

Success in the private equity and real estate sector will come to those who invest in a technology infrastructure that meets the particular needs of the asset class. That starts with data management.

Paul Whapham
Managing director
Framework Software

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Detect, contain, respond

Luke Moranda of OCC delves into cyber risk to explain why, with the threat increasing, fortune favours the prepared

Cyber risk is a top concern for most companies across all industries, and it is a hot topic for senior management and boards of directors. Threat actors are becoming more sophisticated, and the frequency of these attacks is increasing. According to the 2016 PwC Global State of Information Security Survey, the number of security incidents across all industries rose in 2015 by 38 percent, the largest increase in the 12-year history of this study. In addition to attacks that are targeted at stealing sensitive data, attacks also focus on disrupting the availability of key systems, or the integrity of the data in those systems.

At OCC, we take our role in providing a secure and stable foundation for the markets we serve very seriously. Our main priority is assuring and delivering world-class risk management, clearance and settlement services, so it is critical that we ensure the confidentiality, availability, and integrity of our systems on behalf of market participants in our role as a systemically important financial market utility. Even with a well thought out and implemented set of layered defenses, most firms recognise that it is virtually impossible to repel all cyber attacks.Therefore, focus must be given to how to detect, contain, and respond to an attack that has breached one or more levels of defence.

Firms have been investing in these capabilities for some time now, and the convergence of cyber risk and business continuity has been an ongoing and natural evolution. For example, increasingly, as part of their business continuity plan, many firms have a cyber response plan that addresses key cyber security scenarios and how the firm would respond in a timely fashion. As firms develop these response plans, the complexity of the scenarios, and therefore the responses, increase.

The time it takes to detect a cyber breach is a significant complicating factor for certain types of events. The average security breach went undetected for 146 days in 2015 (down from 205 days in 2014, according to Mandiant M-Trends reports). This means that the cyber-response plan must consider that systems or data have been compromised for a significant period of time.

For example, consider an advanced persistent threat (APT) scenario where the threat actors have been in a company's systems for months and then activate an attack against the company's data and systems. The traditional recovery mechanisms for business continuity scenarios, such as real-time replication of data to a disaster recovery (DR) site work against the company, as these technologies will replicate the same issue or breach to the recovery site. Furthermore, code could have been compromised months in advance with a delayed trigger, so rolling back to a recent previous version of code may not resolve the issue.

Therefore, companies must start planning and investing in recovery strategies for this type of attack well in advance to ensure they have the proper data and tools available to recover in a timely manner. For instance, in previous examples, having multiple copies of data and code available is critical for both forensics and

recovery. This allows the team to trace back to when the compromise happened, and to restore to a known good state as quickly as possible. Furthermore, it is critical that these back-ups are protected from corruption by such an attack through strict segmentation from the rest of the network and/or through the use of read-only storage media.

Delving further into the concept of back-ups raises several thorny questions, such as: what to back up, how often to back up, how to protect these back-ups, how long to retain the back-ups, how to find the last good back-up in case of a breach, and how quickly and efficiently the back-ups can be restored.

For complex cyber events, there are myriad different combinations and permutations of variables to consider, and each may require a somewhat different recovery approach. This can be very different to a traditional disaster scenario, where often there is a binary option: fix the current production system, or switch the entire system (or even the whole production environment) over to the disaster recovery site. Therefore, the cyber response playbook will be much less prescriptive, and will need to contain a variety of tools that knowledgeable personnel can use to respond to the specifics of the particular event.

It is also important that the business understands that not every scenario can be recovered in the typical two-hour recovery window for a disaster recovery event, and that they plan accordingly to manage the risk and attempt to limit the business impact in other ways where possible.

Cyber recovery planning is not a one-time event. The cyber threat landscape is constantly evolving, and the responses need to evolve as well. At OCC, we have access to federal-level resources that provide us with valuable insights into emerging methods of attack. It is imperative that we continue taking the new and emerging information on attacks and integrate it into our processes. Sometimes this also requires development of new tools, infrastructure improvements, and development of expertise to strengthen our ability to respond quickly and efficiently. It is always issue number one for a central counterparty like OCC to make sure that market confidence remains high, that issues are addressed, and that business continues.

As we continue to work to fulfil OCC's mission, which is to promote stability and market integrity through effective and efficient clearing, settlement and risk management services, addressing all risks, including cyber, is a top priority if we are to serve market participants at the high level of service they expect from us.

Luke Moranda
Senior vice president and senior information technology advisor
OCC

Vive la Révolution

The needs of asset managers and the role of the fund administrator are both changing, but StatPro has just the Revolution in mind, as Justin Wheatley explains

StatPro believes software should be simple. Simple to implement, simple to operate and providing a simple way to achieve your business goals. This drive to 'make it simple' hides the underlying sophistication of the company's flagship product, StatPro Revolution. The cloud-based portfolio analytics platform helps asset managers and fund managers across the global investment industry to analyse the performance and risk of their investments with a huge variety of visual analysis.

It comes complete with analytics, multiple models of analysis for performance, attribution and risk, stress testing, compliance reporting, data management, data extraction and off-the-shelf coverage of millions of assets of all kinds, along with market benchmarks and index data.

Technology is the strategy

We believe the market is trending towards a situation where asset managers will increasingly want to outsource their data management processes to fund administrators. The fund administrators will then supply clean data back to their asset manager clients who will perform whatever analysis they need with it. Fund administrators will also offer more and more services to produce anything that is standardised, such as regulatory reporting or even client reporting.

The reason fund administrators have not taken a bigger market share already is simply because the systems they currently use hinder them from providing the service they would like to. They lack flexibility, responsiveness and sophistication. The result is that some asset managers have taken some outsourced performance and risk processes back in house.

StatPro Revolution offers an infrastructure that allows fund administrators to provide a superior service. We have several fund administration clients that are using StatPro Revolution to manage the data cleaning part of the process. Their clients then use Revolution's web interface to access the analytics they want. Data management benefits from economies of scale, so the more asset managers that are on a fund administrator's platform, the better. On the other hand, analysis is often very personal. Each fund manager might want to assess the analytics in their own way. This need for uniqueness requires flexibility, which Revolution can provide.

A major cause of inefficiency within any asset manager is multiple calculations of performance for the same portfolio by different systems. However, because most systems have been created over the years to be self-sufficient, they each duplicate the other. Older systems tend to be poor at sharing information so the only way for data to be extracted is via a basic report. This

> *No platform will ever provide everything, but by being open with a web API, they don't have to*

is a very inefficient method of communicating between systems. It is prone to error and hard to control, and it also results in the proliferation of multiple sources for the same data.

The way forward is to use web application programming interfaces (APIs), allowing one application to ask another for specific data that is needed as and when it wants it. We have a successful tie-up with a fund administrator that supplies a risk solution but does not offer performance. The company uses the web API in Revolution to get performance results, which it then displays in its interface. From the perspective of the clients, they see just one system that now combines risk and performance. This fund administrator client has saved a huge amount of work by just making a simple API request.

Most asset managers, especially the larger ones, require this same efficiency. For instance, every asset manager needs to build a website and ensure that it can have up-to-date performance and risk data. However, most asset managers have torturous processes to achieve this, the result being that the data on their websites is usually stale and of limited use. If they could control all their portfolios on one system and then use a web API to distribute this information wherever they wanted to send it, they would solve the problem of data control and hugely improve their efficiency.

No platform will ever provide everything, but by being open with a web API, we don't have to. However, we do aim to provide as much as we possibly can. This is where our recent acquisition of UBS Delta fits in, as does our acquisition last year of Investor Analytics. Each of these services does something special and unique, but each required its clients to feed the service with their data. By combining all these services, we are offering our clients far more value and greater convenience. By integrating these other services into our technology, we will also make it easier for our clients to access and integrate our output with their own infrastructure via the web API.

Acquiring new capabilities

On 7 April 2017, StatPro announced the acquisition of UBS Delta, a risk and performance service offered by UBS. The combination of UBS Delta and StatPro Revolution will result in a comprehensive portfolio analytics platforms on the market. StatPro Revolution already offers a broad range of performance and risk services, but it is largely focused on the middle office of asset managers, providing reporting, monitoring and sales support. On the other hand, UBS Delta has grown out of the front-office needs of asset managers, supplying decision support and highly accurate risk analysis, especially for fixed income assets. Both systems are fully multi-asset and there is some overlap of

functions, but the specific capabilities of each hugely complements the other.

As UBS Delta, like StatPro Revolution, is a multi-tenant solution, there is just one installation of each system. This makes the migration of clients from UBS Delta to StatPro Revolution relatively straightforward. The biggest issue for any client is providing their data to a given platform. Because of our commonalities, we will be able to reuse the files the clients currently supply to UBS Delta for StatPro Revolution. Indeed, during the transition phase, clients of UBS Delta will be able to start using StatPro Revolution, if they wish, without having to rewrite anything. We can take the input files and add them to StatPro Revolution as they are. When we are ready to start migrations, the clients will log in and instead of being on the UBS Delta website, they will be on the StatPro Revolution website—it's that simple.

Future focus

StatPro Revolution has been built with the future needs of asset managers in mind. For a start, everyone always wants things to be done faster. Then, as asset managers merge and merge again, they are also developing huge scale, so they need a service that has the scale to handle their data volumes. Greater precision is essential as a combination of increased regulation and more demanding clients push the boundaries of the calculations required. So, the challenge for a service provider like StatPro has been to imagine a platform with the technology to handle this need for speed, scale and precision.

StatPro's vision for the smooth production of analytics is that there are three fundamental parts to the process, and each can be managed separately. The first is to check the input data to ensure accuracy and completeness. Data checking is the bane of performance measurers around the world. Getting it right is incredibly complicated because of the sheer volumes of information. StatPro Revolution has hundreds of configurable data controls, plus scalable computing power to automate this process in a way that has never been possible before.

Once you have your data right, the next step is to produce as many types of calculations as you want to satisfy everyone's needs. That might be simple performance measurement, elaborate attribution analysis or complex ex-ante risk. There are always more analytics that asset managers want to produce.

Finally, each user needs information presented in a way that is useful for them. A fund manager analysing a portfolio has different needs to someone monitoring risk across many portfolios or producing client reports or complying with a new regulation. Thus, the flexibility of the interface and web APIs are essential.

StatPro has been on a long journey to completely reinvent all of its technology so that we can offer our clients all our savoir-faire in the most convenient way possible. We believe that we have now largely completed that journey of transformation, but the next stage is to expand the range of services we offer so that our clients can make their businesses even more efficient.

The world does not stand still and the Revolution will continue.

Justin Wheatley
CEO
StatPro

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Tech control

At this stage, technology is the only way to address the regulatory challenge, says Anthony Pereira of Percentile

What are the major technology challenges that asset managers are facing at the moment?

They're very similar to what has been faced by other industry sectors, in that there is a lack of cohesive technology within firms, and not enough investment in connected technology. There has been a focus on a best-of-breed approach to solving front-office trading and asset management functions, but there's nothing connecting that to the second line of defence, so we end up with what I call operational spaghetti. There are a lot of manual workarounds, and if one thing doesn't work properly, we see a domino effect.

The volume of regulations has increased, and the requirements have changed so much that this approach is just not suitable any more. Asset managers require data, processing and automation just to get the basic information out to the regulators consistently. Firms are finally realising that technology is the solution to this problem.

We do have a regulatory burden, but it's a burden because we have made it one through lack of investment.

How connected are the technology and regulatory challenges?

Regulatory compliance should be a byproduct of what a business is doing anyway. Where firms have invested in processes and automation, they will be able to handle regulatory demands. Of course, more regulation means more work, but it shouldn't be inordinate amounts more.

The fact of the matter is that, actually, most firms do not work like that, and so there is now a very clear link between the two. Regulation can only be managed through technology. Technology has always been used in the front office, but sometimes this has been at the expense of the back office. Now, the behind-the-scenes operations need to be improved as well, and that investment is understood to be mandatory.

All this regulation has finally given those teams the clout to go to management and demand investment, because otherwise they may as well shut up shop. The regulatory issues are front and centre of board meetings now.

We are now seeing regulations that make individual people accountable. If you don't have the right processes in place then certain

people could go to jail, and that's the kind of ramification that really focuses the mind.

The regulators themselves are also improving their processes in assessing how firms are adhering to the spirit of the regulation, not just ticking boxes, and technology plays a part in that as well.

Every regulatory report has to be backed up by evidence, and firms have to show how they made their decisions, where the data came from, and who has the capability to change it. That data lineage and governance has been in banking for a while already, but it's now moving to the asset management world as well.

With so much data around, how important is it to have something in place that can manage it?

It is important, but it's more important to manage the data in a way that's sustainable and useful. Regulators are asking for a lot of data that is difficult to put together, and that will always be the case. When they're asking questions, whether around capital submissions or transaction submissions, they want to know the answers are correct and accurate. When firms audit their processes, they have to show that the right change control processes and data lineage and governance processes are in place, too. It's not just about capturing data. Firms also have to manage it and show they're using it correctly, with the right processes in place. That's the difficult part of data management, and in our experience that's what firms tend to struggle with most.

Is the problem that there is simply so much data?

There is a volume issue, but the bigger issue is around quality and understanding what the data is saying at any given point. What needs to be fixed? Who has ownership of the data? Who is in charge of maintaining that data?

We work in the world of risk, and we see central hubs with data coming in from all areas of the organisation. The risk team doesn't necessarily own that data, but it needs to know who does. If they don't know who owns it, or if it doesn't have a set owner, then you know there are going to be issues with the data before you've even looked at it. Data ownership is a key part of data quality. Without transparency and governance you cannot have the required levels of data quality.

It's also important to have confidence in the output of whatever you're using the data for. You have to know that everything upstream of the final result is trustworthy, correct, and well managed.

How does the RiskMine product help with this?

RiskMine is designed to cleanse and manage all sorts of input data for risk management. It puts the data through a cleansing process, making sure that that pipeline is robust. It entirely manages the sourcing of all the inputs and outputs of risk data, whether it comes from front-office systems, third-party vendors, or anywhere else.

It provides tools for visualising data quality checks, highlighting and handling exceptions, automating a lot of the work that was previously done manually. That means humans can work on the results of the analysis and on improving processes further—working on risk management rather than on data management.

That's the groundwork. RiskMine then automates risk computation for portfolio simulations and stress testing, both for the day-to-day risk management as well as for regulatory capital and regulatory risk reporting. If we use the same system for both requirements, then you only have to deal with one set of model validations and one set of reconciliations, and you're not duplicating efforts or data. That improves the entire risk landscape tremendously.

Since Percentile launched three years ago, what changes have you seen in the fintech space? Was regtech an inevitability?

We saw fintech come about almost as a result of the financial crisis. Trust in the financial system had diminished to such an extent that people were looking for a completely different approach to the whole problem. Payments solutions and cryptocurrencies focused on disintermediating traditional financial institutions as much as possible, but that ecosystem leaned towards the retail side of banking.

In the last couple of years, the focus has moved more towards the regulatory side of things, particularly in capital markets, where regulations such as the second Markets in Financial Instruments Directive have focused clients' minds on getting things done ahead of looming deadlines. Legacy vendors have been around for decades and are used to charging seven-figure sums for any regulatory project. That was just not going to be viable anymore. There's an acceptance now that new firms, using new technologies and delivering services in a different way, are the right way to go. The mindset of the industry has changed for the better, and there's a lot more understanding that, in order to solve some of these problems, you have to collaborate, communicate, break down barriers and use the technology available. We see the largest institutions working with smaller firms in order to get things in place much more quickly, and a lot of those firms fall under the regtech banner.

Regtech providers need to understand what the large institutions are going through, what their pain-points are, and how they can solve those problems. There's a lot of legacy in these big firms; some good, some bad. They can't just change the way they do things overnight. You can't just tout pipe-dream technology, you have to address the challenges that exist today.

Anthony Pereira
CEO
Percentile

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Learning from the leaders

Firms need to invest, create partnerships and get the right team on board in order to develop digitally, according to State Street Global Exchange's JR Lowry

To succeed in today's markets requires investment firms to act upon and digitise their businesses. Being agile and willing to experiment with new digital concepts—even if it ends in failure—will become par for the course for many firms.

Adapting to fast-moving digital change requires an effective customer strategy, regular and meaningful investment, a deep talent pool, and thoughtful risk management.

Investing in technology will be key

Investing in new technologies will be important if firms are to develop. Some 41 percent of digital leaders surveyed by State Street concurred, stating that investing in new technology such as cloud technology and artificial intelligence was critical to future growth.

This may entail building powerful digital platforms that integrate vast volumes of data in real time, or operating off of a cloud-based system. Integrating siloed data streams can be transformational for businesses operating models.

A migration to a cloud-based system allows firms to achieve scale at a reduced cost, enabling them to focus on product development and service delivery. Cloud deployment can also make re-engineering technology a simpler process.

For example, upgrading an inflexible software system can be a long-term, costly project. Individuals need to identify whether any upgrades could have downstream or upstream consequences, and this would, no doubt, delay proceedings. Cloud-based architecture allows firms to break software down into a series of connected modules or microservices, which can be rapidly improved and updated without affecting the overall system.

Harnessing a talent and customer strategy

An organisation looking to expand its capabilities in any field needs to hire quality individuals with proven and necessary skill sets. If an investment firm seeks to build up its digital strategy, it needs to hire the appropriate talent and provide opportunities for tech-savvy finance employees.

If an investment firm seeks to build up its digital strategy, it needs to hire the appropriate talent and provide opportunities for tech-savvy finance employees

Mining the talent pool for younger professionals who have grown up with technology is also important. Hiring younger people and educating them about capital markets in a structured environment will help firms deliver a quality service.

Creating a digital environment from scratch is not an easy undertaking, and will consume significant internal resources. Some question whether it makes more sense for established financial institutions to engage in strategic partnerships or to simply acquire financial technology firms.

Fintechs have the individuals with the skillsets to innovate, and merging with a financial institution could help bring about positive disruption and wide-reaching cultural change in the latter. However, banks and large investment firms are subject to stringent regulation, and this can at times be an impediment to innovation.

Having talent in harmony with customer strategy is key. Approximately 31 percent of respondents in the State Street study highlighted the importance of having the right talent in place in combination with a strong customer-centric focus.

Research by State Street's Center for Applied Research proposes that organisations create opportunities for investment professionals to understand how their actions affect their clients' lives.

By demonstrating how digitisation and customer-centricity go hand-in-hand, firms can offer more meaningful and desirable careers, while attracting a broader range of high-calibre talent.

JR Lowry
Head of the global exchange for North America and the global exchange innovation and advisory solutions team
State Street

Brave new business

A world of crypto-investment requires a new data vending business model, says Santiment CEO Maksim Balashevich

The market data market of 2017 is gargantuan in size. At more than $27 billion in confirmed spending per year (according to 2016 reports), demand continues to grow with no end in sight. This is the business that launched ThomsonReuters to a market capitalisation of $44 billion and Bloomberg LP to a colossal $8 billion in revenue per year, for market data alone. The true demand for market data is likely several times these figures. Consider that most hedge funds and large investment trusts are spending fortunes building custom data feeds. And that's before factoring the cost of information changing hands.

When you consider the above numbers, you'll conclude that the world's most sophisticated traders and investors are willing to pay whatever it takes to create an information advantage that leads to profitable trading. It's on this desire that businesses like Bloomberg made their name. But are they the future of the crypto-asset markets?

At Santiment, we took a hard look at the data vendor business models and concluded that they're on their way out. What wasn't clear was what would come next. So, we made it ourselves. Santiment aims to be the next generation of market data vendors, though we're focused exclusively on the crypto-markets.

Take, for example, the business model of a very large market data corporation, Bloomberg LP. Bloomberg generates revenues of about $8 billion per year, a colossal figure that continues to grow each year. Over 80 percent of these revenues come through subscriptions to the Bloomberg Professional Service, also known as the Bloomberg terminal. The terminal provides access to data feeds for the entire global economy, and is arguably the most advanced trading terminal in existence. These terminals have the 'low price' of just $20,000 per year, per user, which many professional traders and investors have no problem paying for. After all, they are gaining access to a sophisticated data-feeds platform. It makes sense.

Numbers drive trading and investing success. And, because money scales, that makes data the ultimate financial commodity. But there is a price to pay. The subscription fee is one-size-fits-all. You pay the price and get everything Bloomberg has to offer. Most traders use only a fraction of those feeds for the specific markets they trade, while de facto subsidising the rest of the platform. Not to mention that $20,000 per year prices out independent traders, leaving Bloomberg with a core clientele of high-net worth hedge funds and investment banks, and little else.

While the crypto-markets are just getting started, they foretell the distribution and democratisation of finance, trading, and investment. Crypto represents the passing of increasing value to consumers throughout finance, and market data is no exception. Santiment will ensure that. While the one-size-fits-all terminal model may work well for traditional finance, it could never work for the crypto-markets. The advantages of the Bloomberg terminal that hook traders are meaningless in the crypto-economy, and the price point is unacceptable.

Santiment data feeds will be available via an on-demand, tiered subscription service, where

you can purchase your feeds a la carte. Crypto-traders and investors will have the option of paying for data feeds individually or as packages, giving them full control over their spending. There will be no need for them to subsidise the entire data feed library, they will be able to customise their feeds to serve their specific needs whenever they want. They'll also be able to access a limited number of feeds by staking Santiment Network Tokens, or SAN. Staking tokens allows investors to try and sample a wide set of feeds with minimal barriers and no cost. If a crypto-trader wants to see if Santiment is right for him, he only needs to buy and stake enough SAN to cover his trial tests. If he decides the service is unnecessary, he's free to sell his SAN and recoup his investment. If he sees that Santiment provides value, he can subscribe to his desired feeds and continue testing new ones with the remaining SAN stake. Additionally, our third-party partners such as exchanges and asset management platforms will be able to stake tokens on behalf of their user bases at preferential rates, allowing users on partnered services to test even more feeds at an even lower cost.

There are some data feeds and content, particularly crowd sentiment related types, whose value diminishes in proportion to the number of users who have access. These exclusive data feeds and content will be available strictly by auction, ensuring their utility and keeping them premium.

Finally, we will provide some information for free as a public service, most notably the Santiment database, or SANbase. The SANbase will serve as an anti-scam tool in the space by giving traders and investors a single place to gather all the information they might need about a project. By providing the SANbase for free, we'll have a clear and useful way of introducing Santiment to the entire crypto-community.

We've thought carefully about how to bring data vending and market data to the crypto-markets. The business model we designed combines the best features of traditional data vending (a wide library of data feeds and a subscription model) with the incentive mechanisms of cryptocurrency (staking and auction models). Through this model, we will drive value to the hands of consumers, which will lead Santiment to market dominance. We also believe that by passing savings on directly to the consumers from the very start, Santiment will be able to pre-empt forays by traditional data vendors into the crypto-markets.

By designing the Santiment business model this way, Santiment can establish itself as the market data infrastructure of the crypto-economy, in addition to marking itself as a next generation data vendor.

Maksim Balashevich
CEO and founder
Santiment

Broadridge Financial Systems

Broadridge Financial Solutions is the leading provider of investor communications and technology-driven solutions for broker-dealers, banks, mutual funds and corporate issuers globally.

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www.rivafs.com

StatPro

StatPro is a global provider of award-winning portfolio analytics solutions for the investment community. The Group's cloud-based platform, StatPro Revolution, provides vital measurement and analysis of portfolio performance, attribution, risk and compliance. This multi-asset class analytics solution helps StatPro's clients increase assets under management, improve client service, meet tough regulations and reduce costs.

The Group's integrated and global data coverage includes over 3.2 million securities such as equities, bonds, mutual funds, FX rates, futures, options, OTCs, sector classifications and much else besides. StatPro also covers most families of benchmarks including MSCI, FTSE, Russell, NASDAQ and the open source Freedom Index.

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