The RegTech Forum presents:

**Rise of the Machines: RegTech & AI**

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Contributions from:
Welcome to the RegTech Forum

The RegTech Forum is a vibrant community of regulators, regulated firms and their technology and service providers. Facilitating discussion, collaboration and insight on the challenges and opportunities within RegTech - and ultimately a marketplace to do business.

At events, initially across London – from Shoreditch to Canary Wharf and the Square Mile – we are an opportunity for all sides of the market to come together, listen to domain experts and discuss the trends that are enabling Regulatory Technology.

This month we are pleased to launch our first digital event – the ‘In Conversation’ conference calls – which build on this insight: enabling a curated audience to debate and discuss points that were raised at the physical event.

None of this would be possible without the help and support of established and forward-thinking sponsors, including Kx.

Visit www.regtechforum.co to join our thriving community, be notified with updates, and receive thought leadership assets like this white paper report. We look forward to welcoming you to our next event.
On March 7th the RegTech Forum welcomed over 80 Bankers, Technologists and Entrepreneurs to the second Meet Up. It was definitely a night of firsts: the announcement of Kx as Principal Partner to the RegTech Forum; being hosted at the Capco offices near Shoreditch; and the first time we examined two topics in the same event (Machine Learning and Litigation).

The two topics sit under the ‘umbrella’ of Artificial Intelligence in RegTech – but that term can be misleading. There is often confusion about exactly what AI can and cannot do. Something that often goes overlooked is the fact that AI solutions cannot simply sit on top of existing, legacy data and begin churning out value: for the majority of organisations, laying the appropriate groundwork will be a crucial first step. It’s only once firms have implemented an appropriate Data Architecture, and fed it with cleansed and normalised data from their various silos, that they can begin to build the decision models, machine learning algorithms, behaviour analysis and litigation preparation tools that you’ll read about in the pages of this white paper. The Kx Keynote on the next page provides particular clarity on this point.

Aside from technology trends and the business needs that drive them, the key takeaway from the March event was how quickly the community is growing and continues to grow. Thank you to everyone who attended, engaged with each speaker, and contributed to the moderated break-out sessions. To those of you who have yet to attend, the next event will be on April 4th. I look forward to meeting you there.

**Kx:** Kx’s singular goal is to provide its customers with the most efficient and flexible tools for ultra-high-speed processing of real-time, streaming and historical data.

**Capco:** Actively transforming the future of finance to create a resilient market of transparency, trust and capital strength.

**Actiance:** Developing the platforms required to enable the security, management and compliance of unified communications, Web 2.0 and social media channels.

**Enyo Law LLP:** A dynamic specialist disputes firm based in the heart of London – conflict free and one of the largest litigation-only firms in the City.

**Neurensic:** Artificial intelligence software for trading, compliance, surveillance and banking. Identifies risk, ensures compliance, anomaly detection.

**Neuroprofiler:** Based on the last advances of Behavioral Finance, Neuroprofiler is a MiFID II-compliant customer Risk Profiler for Financial Advisors.

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We are delighted to be Principal Partners to the RegTech Forum, and to be able to meet entrepreneurs, innovators and participants in this space. While this event and asset focus on Artificial Intelligence, we look forward to engaging with this growing community on a wide range of topics.

**AI – smart thinking**

Kx’s origins lie in enabling Front Office Algo and Quant traders with pattern recognition built on very fast access to historic data sets. Their models were then tested in ‘pseudo-production’ environments to ensure they were profitable and performed as expected. They could then be released into the markets – and we’re seeing that same approach now moving up from the trading floor to Compliance for our clients.

‘Decision Models’ can be crafted in response to Regulatory requirements, with the ability to adapt to specific scenarios. RegTech solutions cannot be static, built to do a single thing mindlessly. They will have to be sophisticated enough to respond to context and nuance: to protect the Institution from regulatory infraction, but with the lowest possible risk of obstructing a legal, profitable trade.

**Based on smart data**

In order to achieve this level of sophistication the algorithms and models need access to centralised, ‘clean’ data. This can be a significant challenge for firms, who have been capturing data ever since since the term ‘Big Data’ was coined. Massive data lakes were created because storage was cheap and the volumes of data were growing exponentially, but many firms remained unclear on what exactly to do with it, and how to derive value from it once it had been captured.

At Kx, we believe that we’re entering the ‘Second Big Data Wave’, moving beyond the shortcomings of traditional and Hadoop-based technologies of earlier approaches. The insights and experiences earned in the ‘first wave’ demonstrate that one size does not, and should not, fit all. The benefits of speed, time stamping and elegance coupled with powerful analytics and decision modelling over an single integrated platform are now being appreciated by the RegTech world – both for flexibility and for lower TCO.

That’s because the demand for actionable Business Intelligence and Insight in close-to-real time is ferocious – and extends beyond the financial markets into a wide range of industries, including Utilities, High Tech Manufacturing, Pharma and Retail. In-memory Computing and Time-based data sets – areas where Kx has dominated for over 20 years, are particularly applicable to the emerging RegTech market.

**Built on smart infrastructure**

A key point – central to how RegTech firms should be creating their solutions – is that Application architectures are no longer sufficient. Enterprise customers are embracing a Data Architecture approach: flexible, centralised storage for all of a firm’s data fed from multiple sources (structured and unstructured; Voice and IM; Social and Email, etc.) and presented in a consistent, unified way. Combined with a Time-series Database, firms can reconstruct a holistic, multi-channel view of activity for a specific point in time, for audit or investigation as required.

**Beyond financial markets**

The discussions that Kx are having with Banks and Regulators are being mirrored in multiple other industries across the world: a demand for colour, for insight into the customer experience, for merging structured and unstructured data, to examine moments in time, and to ultimately build analytics and access insights that perhaps were not available before.

This is an encouraging prospect for RegTech firms whose solutions could theoretically be extended beyond the capital markets.
Artificial Intelligence enabling regulatory compliance

RegTech offerings are viewed as critical components of Financial Institutions’ solution set, according to Capco Managing Principal Jack Beldon, whose clients demonstrate a constant desire to stay current with developments and companies that might keep them ahead of regulatory change.

It’s all personal for Julien Revelle, CTO at Neuroprofiler: his Machine Learning algorithms enable investment managers to comply with MiFID II by measuring clients’ psychological profile and risk appetite, scientifically. “We assess the specific quantities regulators are looking for with machine learning, through a game that learns the investment psychology of the client.”

In contrast, Neurensic CTO Cliff Click applies machine learning at an enterprise level – his algorithms can identify patterns of non-compliant behaviour from clients’ trading data. “We look for activity matching behaviours that have been investigated or deemed to be disruptive.”

Whether applied at a macro or individual level, machine learning within the RegTech field has the ability to deliver effective results quickly, efficiently, and accurately. As Jack explained, “There is zero tolerance for error with the new regulations. For MiFID II and other areas it’s clear that you’ve got to get it right on day one – I’m seeing firms pursue RegTech solutions that address that challenge.”

The value and possibilities of clean, ‘machine-learning-ready’ data

There is a clear consensus between all our contributors that the benefits of ‘cleaning up’ and preparing data extend beyond readying it for intelligent RegTech algorithms.

For Robin Smith, Technical Director EMEA at Actiance, siloed data is a “fundamental problem”: when extracting data from legacy archives, “firms currently have to perform the same search in multiple different places, because the data is stored separately.” He continued, “with modern technology and a single, centralised data store, now I can leverage big data to provide result sets much quicker than was possible previously, and present one consistent result set to the regulator – reducing time, inefficiencies and cost.” From a trader communication point of view, this approach also enables firms to build a clear picture of the multiple communication channels being used, the context and motivation behind ‘channel hopping’, and enables better understanding for regulators and internal investigations.
Panel Insights

Providing a Legal perspective, Edward Allen, Partner at Enyo Law LLP added that the use of technology and RegTech would cut down on the time and cost of preparing or responding to litigation. “It’s clearly going to be the case that AI, or some form of computer processing, will be used to cut through much of the leg work that is currently done manually by teams of lawyers or equivalents. If institutions have a central holistic data storage – so that data isn’t shipped offsite, automatically deleted after a period of time, or just held separately and lost – it will be easier to draw down and interrogate when the regulator comes knocking, a third party issues civil proceedings, or when the institution wants to do an internal investigation.”

Can AI predict undesirable behaviour?

Machine learning is an excellent tool for identifying patterns in close-to-real time – but will it ever progress to the point where non-compliant behaviour can be prevented before and/or at the point of execution?

For Cliff Click, the parameters of what machine learning can and cannot do still need to be better understood by the industry. “I can build fantastic tools, but I’m not a judge: machine learning is a tool – what you use the tool for and why you use it – that’s human. What ‘the system’ deems as a non-acceptable pattern changes. Wash Trades, Spoofing, historically both were acceptable until they weren’t, so machine learning will always need to have an understanding of what is and is not acceptable – then it can identify and, in some cases, eliminate that behaviour in close-to-real time.”

Julien Revelle agreed that definitions can and will continue to change: “For us and MiFID II, the main observation from the regulator is that self-assessment [for risk / loss aversion] is no longer sufficient. It’s about using technology to scientifically and objectively measure values that were previously measured subjectively – for example, by investment managers based on relationships with the client.”

Recent developments fuelling innovation

Machine learning and AI are terms that have gained traction across the financial industry in recent years – but what developments have occurred to turn science fiction into RegTech fact? For our panel, machine learning in RegTech currently sits at the eye of a ‘perfect storm’ of Regulatory incentives, computational capability and the skilled individuals required to put these ideas into practice.

For Robin Smith, European regulators are gradually adopting fines in line with the multi-billion dollar penalties being handed down by American bodies like the CFTC – while at the same time giving firms the time (within reason) to adopt appropriate solutions. “Regulators over here are saying, ‘we’ll give you some leeway because we know that [compliance] is quite a complicated thing to do – but the levels of fines are being increased, and you’ve got to pay it.”

Julien Revelle and Cliff Click, our two CTO contributors, shared the view that we are currently riding a ‘perfect storm’ of Machine Learning. As Cliff put it, “Today we have a combination of CPU power to run interesting data sets, enough domain experts to understand and analyse the results, and a regulatory environment that rewards this activity: applying math to real world data problems and solving real business challenges.” For Julien, this is why machine learning is on so many Financial Institutions’ radars: “Artificial Intelligence has always been relevant, but it has not always been accessible.”

As Edward Allen explained, these opportunities extend into the Legal environments where regulatory / non-compliance decisions are often made. Rather than having “junior associates spending weeks, potentially months glued to a computer screen”, intelligent programs can improve efficiency and reduce cost by elevating human involvement to reviewing sample sets, interrogating search results and analysing the end product. “If you can [perform preliminary data sorting] in an automated fashion, then it’s good for clients.”
Barriers to adoption

Despite the attraction and benefits of machine learning, the Financial Services industry is an inherently risk-averse market – so what are the barriers being faced by RegTech firms in this competitive environment?

For Robin Smith, there are obstacles on both sides of the market: innovative but relatively unproven RegTechs “lack experience executing from a Sales perspective to these big firms – it’s about getting the foot in the door.” On the client side, banks inevitably focus on the “cost, complexity and risk” of transformation. “The key is to break it down into more manageable projects.”

Providing further perspective into the Financial Institutions he works with, Jack Beldon pointed to the need for a cultural shift. “Senior leadership know what the end game is going to be – the margins, profits and revenues from pre-2008 simply aren’t there any more. But it’s a huge thing to be actually trusting someone from outside the bank to develop these solutions. It comes down to credibility: the first thing that my clients ask me about these companies is, ‘what other banks are using this solution?’ So RegTechs need to establish their credibility, and obviously the regulators are playing a much bigger role in that now.”

Giving the view from the courtroom, Edward Allen added that Machine Learning solutions need to be accurate enough to improve on the results of the processes they are replacing. “One recent case hinged upon a fragment of data stored as a temporary file that contained critical information, which was picked up in a review exercise and disclosed. You cannot afford to have a system in place that misses things like that. These cases can be hundreds of millions, or billions, of dollars: ultimately someone is very motivated to win, and someone if very motivated to successfully defend. You need to make sure that you can accurately get the key data, and if a program for some reason doesn’t do that, then it simply will not be used.”

Science fiction or RegTech fact – what’s next?

It can be tempting to blur fact with fiction when considering what lies ahead for machine learning in the capital markets – so what lies just beyond the horizon?

For Edward Allen, the clear and present value is in ‘intelligently’ structuring complex and fragmented data. “Pulling key data into chronological order with hyperlinks to underpinning documents is going to become easier, cheaper and more accurate. And that goes beyond Litigation to any big investigation or review. Whether I’m a lawyer, a compliance officer or an accountant conducting an investigation; the quicker we can get there, the better for all concerned.”

“Pulling together” chimes well with Jack Beldon’s perspective, which is that many RegTech firms are in danger of missing the big picture while focusing on solving a specific trading, operational or technology need. “Tier 1 investment banks, they manage hundreds of millions of dollars, they touch so many functions in the workflow, they are impacted by so many regulations. I see an opportunity for a single RegTech firm focussing on Eligibility for Trade Reporting, to start working together with other RegTechs, to come together into a more holistic stack or platform – so that the cost-efficiencies really start to make sense because they can impact multiple functions across the workflow.”

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Panel Insights

“We’ve only just scratched the surface” according to Cliff Click – but technology can always go faster. “Currently I’m looking at T+1 to prevent banks being the victim of a fraud, but what happens if I catch it in T+1-minute? What happens if I can send a notification to an Algo that it’s being Spoofed within minutes, so it can back out of the instrument? What happens if I can go beyond Futures to Equities, FX, Bonds, Options, Derivatives – AML, KYC?”

Speaking of customers, Julien Revelle sees a potential to improve AI’s ability to understand human input. “You might have a Financial Advisor engine or chatbot with which you discuss your objectives, your job, who you are – it could then generate a portfolio tailored to your profile. We’d need to improve natural language processing and combine it with a recommendation engine – but those calculations could eventually be very cheap and become available to anyone.”

For Robin Smith, algorithms’ ability to understand that linguistic nuance requires context and a ‘clean’, centralised data source: “Three people talking about rugby, one suggests Australia for the Championship, but another cuts across and says ‘No – it’s got to be the All Blacks’. That could go unnoticed by human review, until you understand that all three are Currency traders. If we can train an AI to see that context, it’s quite exciting.”

The RegTech Forum events and community will continue to grow, mature and build meaningful connections between innovators, entrepreneurs and venture capitalists in the space. To attend or to contribute towards the next event, please register your interest at www.regtechforum.co