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Intelligent middleware solves the fragmentation problem



COVER INTERVIEW

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Welcome to

e-FOREX
transforming global foreign exchange markets



July 2025

In this edition our regional perspective once again focuses on Singapore. A progressive regulatory environment which is not only business-friendly but actively encourages fintech innovation and which provides a conducive environment for technology companies to thrive continues to facilitate e-FX market development. The well-established FX ecosystem in the city state has also resulted in a strong talent pool which then creates a virtuous cycle powering further growth in electronic FX. Singapore also has a geographical advantage over many other trading centres which has coincided with the increased importance of the Asian time zone for global FX execution. All of these developments make Singapore a compelling value proposition for global electronic trading firms who can take advantage of an ecosystem where regulatory support, technological infrastructure, and market opportunity have converged in an extraordinary way.

Our digital assets article this month discusses some of the problems of crypto's fragmented market structure. From an institutional perspective this really matters as, apart from anything else, liquidity fragmentation makes global price discovery almost impossible. The solution to the issues could be intelligent middleware that makes fragmentation invisible to end-users while preserving the competitive and decentralised nature of the crypto ecosystem. We will be talking much more about this important topic over the coming months.

FX Credit Management is evolving rapidly so in this edition we explore some of the critical aspects associated with this important process along with the arrival and advantages of more integrated, automated, and comprehensive solutions. Dynamic credit management is a huge efficiency gain which promises to deliver significant benefits to market participants.

Collaboration between brokers and their liquidity providers varies significantly so we thought this month it would be interesting to examine the benefits of firms deepening and strengthening it. Although the shift to technology-driven liquidity provision has made interactions between brokers and LP's more data-led and focused on performance there is certainly room for deeper collaboration between them particularly in the areas of product development and technology integration. Stronger personal relationships benefit everyone and can unlock more tailored, responsive partnerships.

Next month we will be providing more information about the Who's Who in Electronic FX Handbook which we are publishing at the end of this year with the support of the ACI.

As usual I hope you enjoy reading this edition of the magazine.

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Design and Origination:
Matt Sanwell, DesignUNLTD
www.designunltd.co.uk

Printed by Headland Printers

e-Forex (ISSN 1472-3875) is published bi-monthly
www.e-forex.net

Membership enquiries
Access to the e-Forex website is free to all registered members. More information about how to register can be found at www.e-forex.net

To order hard copies of the publication or for more information about membership please call our subscription department.

Members hotline: +44 (0)1736 74 01 30

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SJB
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July 2025

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Citi announces the results of its fifth FX Vendor Review

Citi has announced the results of its fifth FX Vendor Review, based on insights from its vendor analysis and its annual client survey. The CitiFX Vendor Review reflects Citi's commitment to providing best-in-class FX solutions and fostering a collaborative ecosystem for clients and liquidity providers.

The CitiFX Vendor Review evaluates vendors across nine key criteria, including adherence to the FX global Code, functionality, connectivity, governance, stability, costs (direct and indirect), customer service and Volume distribution. The robust framework and transparent benchmarks help identify FX venues that meet client connectivity requirements and highlight areas for potential improvement. The review offers valuable insights into the dynamic FX landscape, leveraging extensive data analysis, annual client survey results and Citi's expertise.

"Our ultimate goal is to enhance connectivity, expand product offerings, bolster stability, and improve overall market operations to further benefit our clients, liquidity providers, and all other market participants," said Ayesa Latif, Global Head of Foreign Exchange Products at Citi.

CitiFX and its clients are aligned in this view, with 94% emphasizing the importance of vendor adherence to the FX Global Code and 85% highlighting the need for vendors to consider market impact when developing execution tools.



Ayesa Latif

The client survey results shows that client satisfaction with primary vendors remains high at 90% however, 85% of respondents have enhancement requests. These requests can be grouped into execution and workflow solutions, which are designed to mitigate against operational and settlement risk. This increasing demand for innovative FX solutions, especially in execution, connectivity, and workflow integration, combined with closer buy-side-vendor integrations, is

driving a decline in vendor switching, down from 51% in 2021 to 22% in 2025.

These results highlight a trend of FX vendors moving beyond the scope of a traditional Execution Management System and therefore becoming a critical component of Citi's clients' execution workflow. Venues have capital constraints due to rising maintenance costs and regulatory burdens. By examining vendor constraints on innovation, which range from increasing infrastructure upgrade costs to evolving regulatory burdens, the overall challenge for vendors is an allocation of sufficient capital expenditure towards client demands for enhancing integrations and automated solutions - therefore leaving room for competitors.

Additionally, it is critical for vendors to maintain client satisfaction levels to preserve revenue streams. This in turn hinders the ability to further innovate, potentially leading to a cycle of client attrition. A gradual loss of clients in a competitive FX landscape can have detrimental consequences, if not addressed proactively.

NCFX Options Cut included in Annex A of the 1998 FX and Currency Option Definitions

NCFX has announced that its Options Cut has been included in Annex A of the 1998 FX and Currency Option Definitions, co-published by ISDA and EMTA. This inclusion marks a major milestone in NCFX's mission to bring greater transparency, independence, and innovation to the FX markets. With this update to Annex A, banks and financial institutions can now reference the NCFX Options Cut as a defined



Paul Lambert

Spot Rate in FX options contracts. The cut is available via the NCFX Options Cut page. "This is a proud moment for our team and a testament to the trust our clients and partners place in our data," said Paul Lambert, CEO of NCFX. "Being included in Annex A reinforces our commitment to delivering transparent and reliable pricing that supports fairer and more efficient FX markets."

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Capitolis completes USD Swaptions LIBOR transition

Capitolis has successfully completed its run of multilateral exercises to transition legacy USD LIBOR-referenced swaptions to vanilla SOFR replacements for 17 global dealers. Through nine live executions, Capitolis, and Capitalab prior to its acquisition by Capitolis last year, facilitated the multilateral switching of over 17,000 legacy LIBOR swaptions across their dealer network. As a result, participants have eliminated the significant operational burden of expiry management associated

with legacy LIBOR swaptions. "This initiative demonstrates the strength of collaboration across the industry and the power of innovation to solve real-world problems," said Gavin Jackson, Co-Head of Portfolio Optimization, Capitolis. "The successful transition of such a large volume of trades reflects the trust our clients place in Capitolis as well as their commitment to progress and willingness to work with us to achieve it. We're incredibly grateful for their support, engagement, and partnership

to deliver this important solution at scale."



Gavin Jackson

Qubealgo partners with Quadra for algo execution of digital assets

Qubealgo which offers algorithmic execution and quantitative electronic trading software for clients across different asset classes has partnered with Quadra to develop best-in class algorithmic execution for their digital asset platform. Quadra is a leading institutional platform for digital assets, providing firms with comprehensive infrastructure for execution, and post-trade workflows. "We are excited about this partnership with Quadra where digital asset clients will be able to leverage highly customizable

algorithmic solutions previously only available to traditional asset clients," says Jeff Leal, co-founder



Jeff Leal

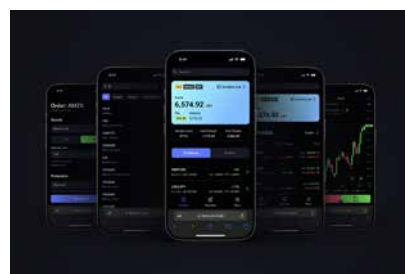
of Qubealgo. "Quadra's integrated digital asset platform provides institutions and professionals with comprehensive tools across the trade lifecycle and together we look forward to further expanding the platform's execution capabilities." Quadra is committed to empowering institutions with the tools they need to navigate the digital asset space with the same confidence and sophistication they expect in traditional markets. The partnership with Qubealgo is a significant step toward that vision.

Devexperts launches new mobile browser interface for DXtrade

Devexperts has announced the launch of a new mobile interface for its flagship out-of-the-box trading platform, Dxtrade. The new interface, which is designed especially to enhance traders' experience when using the platform on a mobile, features all basic trading functionalities. Jon Light, Head of OTC Platform at Devexperts, says: "At Devexperts we look to continuously improve our products

to ensure our clients are operating market-leading trading software. This includes ensuring our products are evolving to meet the changing needs of our brokers and the traders they serve. We know that traders like to be able to access their platform whether they're at their desk or on the move, ensuring effective portfolio management and, where appropriate, timely trade execution. This is the motivation behind our new DXtrade

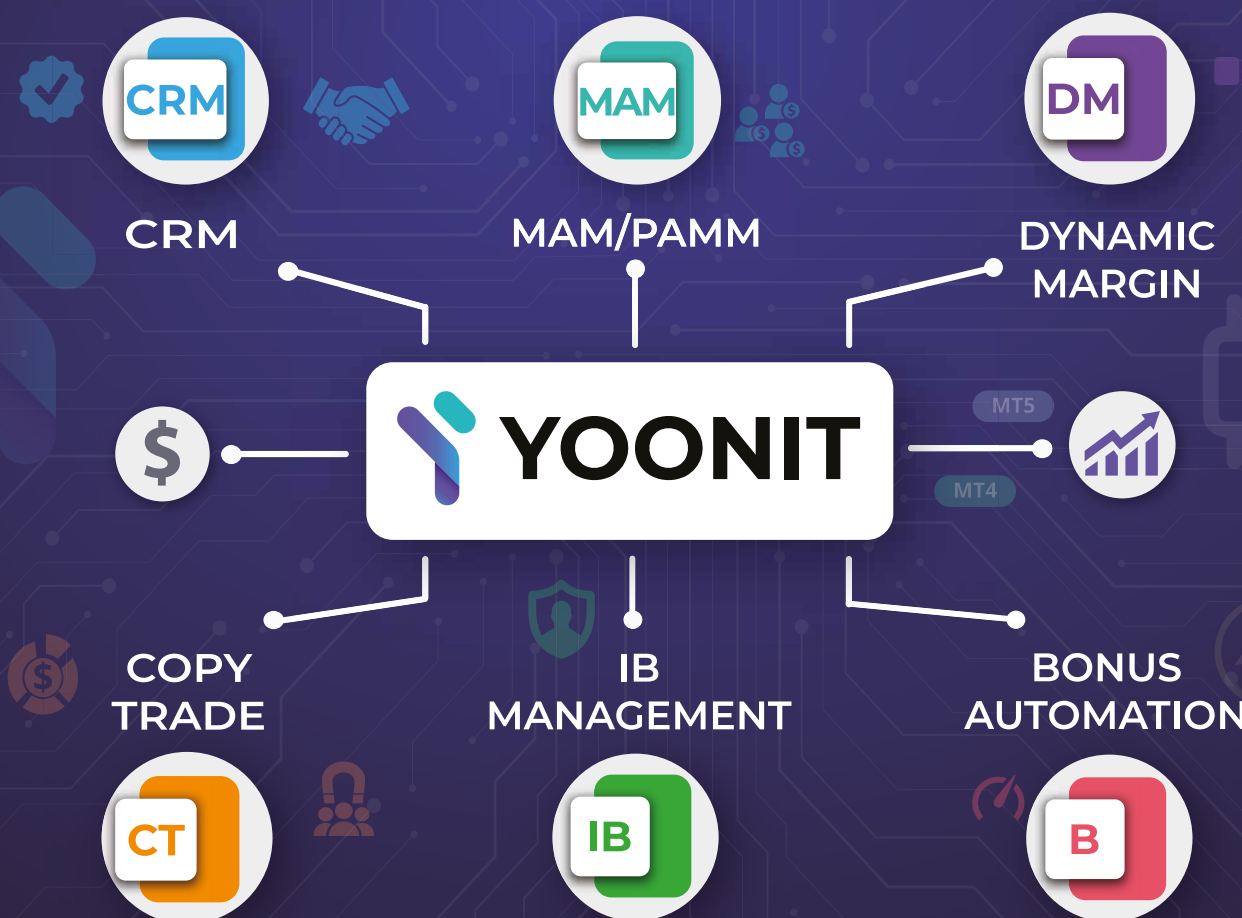
mobile interface, which gives traders even greater flexibility when it comes to accessing their platform, whenever and wherever they wish."



ATTENTION ALL BROKERS

What are you doing to grow your business?

PLUGIT



New developments at MAS Digital

MAS Digital is a specialist institutional digital asset trading and liquidity provider. We caught up with the firm's Head of Strategic Development, Rob Brown to learn more about the latest developments at the firm and its commitment to delivering secure, reliable, and scalable access to the growing digital asset market.



Rob Brown

Rob, there has been great deal going on so far this year at MAS Digital. Please summarise some of the key noteworthy developments for us.

Absolutely — it's been a very active and exciting year so far at MAS Digital, and we're keen to continue building on that momentum. Here are a few key highlights and what they mean for our clients:

- Secured partnerships with industry leaders such as Fidelity Digital and ICAP. These relationships not only strengthen our credibility but also enhance our crypto offering and market access.

- We are proud to have launched our new trading platform, designed with both usability and flexibility in mind. Clients can choose to trade directly via the platform, through our trading API's or direct chat function.
- Optimised Liquidity Access: We've carried out a comprehensive review of liquidity providers, separating those with genuine depth and consistent pricing and as a result, we can tailor the liquidity offering based on clients requirements with competitive pricing, reliable execution, and secure settlement.

Please remind us about the range of products and services you currently offer.

MAS Digital provides a comprehensive suite of digital asset services. These include:

- OTC Trading Desk for large on/off ramp transactions (\$50k+)
- Execution & Clearing Services providing either an aggregated pool of liquidity or clearing on well-known regulated venues.

- Margin Trading on 125+ Crypto Crosses for professional clients via MAS Markets our FCA regulated entity.

We work closely with our clients and as new products and services emerge in the digital asset space, we remain committed to evolving alongside the market - continuously introducing products and services that complement and enhance our existing suite.

What features does the MAS Digital trading platform have that makes it particularly attractive for financial institutions & professional traders.

Our trading platform is designed to be intuitive, visually clean, and highly functional. It features two distinct layouts to suit different user types, ideal for clients focused on on/off-ramp services and the other specifically for professional traders and financial institutions engaging in price speculation.

Clients can log in to view real-time pricing from multiple Tier 1 liquidity providers and access built-in reporting tools for seamless

account reconciliation — making it especially valuable from an operational standpoint.

The platform also supports a range of connectivity options, such as FIX API and WebSocket access giving clients the flexibility to integrate it into their existing infrastructure. (UAT and Demo environments available for testing).

How have you engineered your infrastructure to facilitate reliable low-latency trading for those firms where speed is paramount?

Unlike traditional finance, where connectivity is standardised through FIX connectivity, the Digital Asset space is fragmented - different venues and providers use different APIs, WebSockets, or proprietary protocols. This lack of uniformity makes integration more complex.

At MAS Digital, we simplify this by offering flexible connectivity - FIX, REST API, or GUI - and aggregating liquidity through a single platform. This allows firms to integrate Digital Assets into existing workflows for low-latency trading where speed is the primary concern.

MAS Digital also offers on/off ramp conversion services. In what way does this provide various financial institutions with seamless access to digital assets?

By simply onboarding with MAS Digital our clients get access to our full suite of Digital Asset products. They can enjoy seamless crypto<->fiat conversions safe with the knowledge that we've implemented various safety measures to ensure security of funds and speedy settlement times.

They're given access to stable coin rails along with 30+ other Digital Assets including BTC & ETH. They're also



Our trading platform is designed to be intuitive, visually clean, and highly functional

given direct access to trade on the Fusion Digital Asset exchange (ICAP) via FIXED / REST API or web socket. On this side, Custody is with Fidelity Digital Assets.

What's in the pipeline at MAS Digital regarding new products and services over the coming months?

MAS Digital continues to evolve as we enhance our infrastructure and expand our institutional reach. We're pleased to have recently onboarded Simon Halliday as our new Key Partnerships Adviser, bringing deep industry expertise to support our next phase of growth and to strengthen relationships across institutional channels.

We're also focused on building ancillary services around our core digital offering — enabling clients to scale effectively while benefiting from a more comprehensive and supportive ecosystem.

In parallel, we're preparing to launch new currency account capabilities, allowing us to serve a broader range of jurisdictions and provide more tailored, multi-currency solutions to meet the specific needs of our growing client base.

These enhancements reflect our commitment to continuous improvement and strategic innovation as we support clients through every stage of their journey with MAS Digital.

How can firms who are interested in partnering with MAS Digital learn more about the company?

We pride ourselves on being very approachable and are always looking for new opportunities to collaborate.

If you're interested in hearing more simply reach out to our institutional sales team via email / LinkedIn and we'd be more than happy to organise a call to discuss potential synergies! www.mas-digital.io

FX Credit Management:

New electronic tools and solutions to increase efficiency and reduce risk

Image by Shutterstock



Paul Golden

FX credit management is evolving rapidly as firms recognise the value of moving from inefficient legacy processes to platforms that offer a real-time, centralised view of their positions. Paul Golden investigates.

Management of credit documentation, relationships and limits is perhaps one of the last major issues in the FX market that has not yet been addressed. However, regulators are increasingly aware that there is an issue around overallocations, that the potential exposures are far greater than previously estimated and that there is a lack of control for many credit providers.

Historically - particularly in the spot FX market - banks have devolved their responsibilities to execution venues. There is a conflict of interest, however, because execution venues are paid for typically through brokerage and not credit administration.

"For those that really understand the problem, the issue of overallocation carve-outs is a problem because the aggregate of carve-out credit is significant," explains Andy Coyne, founder of CobaltFX. "What we are trying to do is put the banks back in control of their credit, which requires a combination of technology and design."

He defines design as the hard work of understanding how venues have basically set up their own version of credit modules that make it impossible for banks to be in control.

CREDIT AS A PROFIT DRIVER

It is vital that credit is not only a control but also helps profitability. "We've been very successful in redesigning the way the credit is distributed to market endpoints," says Coyne. "A lot of our clients now know and understand why our solution is better than previous technology solutions and it has also given us the insight to reimagine how credit for other products, such as FX derivatives, should be done. It is very important to have a real-time credit engine rather than something that is static in nature."

In the realm of FX prime brokerage and bilateral business, the fundamental mechanics - the parties involved, their operational methods and the underlying documentation - have remained largely consistent.

However, as firms increasingly scrutinise credit exposure and face tighter credit conditions, they are driven to explore innovative strategies for

"For those that really understand the problem, the issue of overallocation carve-outs is a problem because the aggregate of carve-out credit is significant."



Andy Coyne

ACCURATE ALLOCATION KEY TO SUCCESS

Another critical aspect of FX credit management revolves around over-allocation and under-allocation of credit. Under-allocation can restrict business opportunities, while over-allocation substantially increases a firm's risk exposure.

"The goal is to find a balance," Levy emphasises. "Through optimisation, we are striving to create a holistic view of credit and then allow it to be dynamically allocated, rather than simply increasing credit amounts where a client is trading more actively."

This means that if a client, trading directly with executing brokers or on ECNs, increases activity on a particular network, the technology can reallocate unused credit from less active ECNs to where the client is currently active. This is a far more efficient approach than simply raising the credit limit on that specific network.

The market is now seeking similar solutions for end limits, where tri-party agreement limits offer fungibility and the ability to reallocate or redistribute credit across executing brokers. This dynamic adjustment, whether over time or intraday, is based on real-time client trading activity, replacing the static allocation of credit for each relationship.

When assessing the advantages of more integrated, automated, and comprehensive services that offer dynamic credit management and enhanced process control, Levy highlights a significant benefit: "When a firm establishes a risk profile for a client, sets it up, and manages it by

exception, that client will consistently be able to trade within their pre-defined risk parameters."

Automated credit reallocation and management frees up operations teams to focus on other tasks, such as enabling sales teams to pursue additional clients, he adds.

"If you have a robust automated system for managing FX credit, only requiring intervention for exceptions, you can manage more clients with the same resources. Credit risk will naturally decrease due to the enhanced control, the ability to reallocate credit, or even automatically stop an account if necessary."

Dynamic credit management is a huge efficiency gain, because banks can do more trades with less credit with carve-outs eliminated. Carve-outs are often described as the bane of the FX industry because they create systemic issues that regulators are concerned about.

DYNAMIC APPROACH BOOSTS MARKET ACCESS

"The analytics we produce clearly and significantly prove that banks need less credit," says Coyne. "Market access for trading teams and PB clients is vastly improved, meaning clients see more prices and better liquidity. We know that there are trades clients don't see because venues can be limit-up for certain counterparties. So in terms of profitability, it's very important."

Derivatives markets - particularly FX outright and swaps - are much more credit and balance sheet intensive, which is why it is important that organisations know how to optimise credit in those markets.

"Client feedback has a major role to play in the development process - you need to build things that people really

business expansion. An example of such expansion is a surge of interest in exotic options, which, in turn, necessitates more sophisticated control mechanisms to ensure risk comfort.

"Innovation is significantly enhancing our ability to resolve credit management challenges and exercise tighter control," explains Haim Levy, director of product strategy at OSTTRA.

He also points to a significant shift in the market: "We are seeing a lot more non-bank liquidity providers and agency brokers entering this space, which introduces an entirely new set of challenges."

A key requirement related to risk control of agency brokers stems from the natural business model that typically remains 'flat' (i.e., not holding large open net positions).

"If you know that a certain client - such as an agency broker - doesn't typically hold large net positions, you strive to assign them a smaller credit limit," explains Levy. "Credit management innovations are intelligent enough to recognise and manage a short, temporary spike in credit usage until it flattens."



Dynamic Credit from CobaltFX

Full control of
credit management

Learn more



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"Credit management innovations are intelligent enough to recognise and manage a short, temporary spike in credit usage until it flattens."



Haim Levy

need and want help with," says Coyne. "We've had feedback from clients who were unaware of some of the credit management problems on the platforms they were using. We help them reconcile what they currently do to tidy up errors and get a clean data set before switching to dynamic management."

This clean data is really important because it makes organisations aware of existing problems that they just can't currently see. The dynamic process then gives them a huge amount of additional efficiency in the way it distributes credit in real time to market endpoints.

"In the derivative space you start to really unleash the power of it, which is important because credit is a significant constraint on execution," adds Coyne.

Another compelling aspect of FX credit management is the extent to which market participant demands are shaping its evolution towards minimising human errors, reducing operational risks, and increasing market access.

Levy identifies two key drivers for product development: "The first is the

analysis of long-term trends and we are always looking for ways to capture these. The second is client feedback, where a specific client or prime broker might have a particular operational trading preference that translates into specific requirements."

He uses the rising popularity of exotic options to illustrate how market trends influence solutions. "This has created a requirement to specify exactly what type of exotic option attributes are allowed for a specific client," adds Levy. "Simply stating that you allow 'digital options' in the trading agreement and in the credit monitoring system is too broad and risky."

RISK MANAGEMENT BECOMES INCREASINGLY SOPHISTICATED

Clients now demand the ability to specify higher resolution attributes such as payout timing, barrier type, exercise style and other restrictions to minimise risk. As the use of exotic options grows, risk management is moving beyond linear and delta models, bringing Vega calculations (measuring an option's sensitivity to changes in implied volatility) into play.

"These are just some of the cases where client requirements are now driving the enhancement and evolution of FX credit management products," says Levy.

Cobalt uses artificial intelligence to test what it has built and technology has moved on significantly such that banks are starting to recognise that, when there is no competitive advantage, a shared infrastructure is the way forward.

"Once clients fully understand what is possible, it reignites their imagination and

they come to us with suggestions," says Coyne. "Continual improvement is vital if you're open to listening to your clients."

From a client's perspective, what should they prioritise when selecting a credit management solutions provider? The first consideration, according to Levy, should be solutions that support a holistic view of utilisation across all trading avenues and diverse range of calculations.

"Many platforms, ECNs and executing brokers will have different measurement methodologies, so you need a solution that can support all of them," Levy explains. "The network is also extremely important. In order to achieve a complete view of risk, the credit system must capture the utilisation across all trading venues. Partnership with a firm with access to the complete set of trade data is critical."

Finally, he recommends partnering with providers that have a proven history of continuously innovating, enhancing and expanding their product ranges and working in partnership with their client base to help them empower their business by reducing risk and operational overhead.

Coyne refers to domain expertise as a key criteria when selecting a vendor, noting that his firm has people who have traded, run PB businesses and understand workflow in depth.

"The chosen solution should deliver a significant bang for their buck immediately with the subsequent stages of delivery adding more and more efficiency to the whole process," he concludes. "Understanding the journey that clients go on, making sure the technology delivers immediately and not having to take up a lot of the bank's time in technical integrations are all important."

FX CREDIT MANAGEMENT FOR EVERYONE IN POSTTRADE

The home of **MarkitServ, Traiana, TriOptima & Reset**

osttra.com/creditmanagement

Ideal:

Offering best in class trading analytics and insights to improve performance, risk management and profitability.

Ideal delivers decision intelligence for institutional trading firms, providing a unified view of businesses for all stakeholders (management, trading, sales, and operations). We talked to the firm’s CEO John Crouch and CTO Walter Bell to learn more about how they have put their expertise and unique combination of skills to work.



John Crouch

JC: Your team are experts in both trading and engineering. How have you leveraged that expertise and first-hand experience of life on the desk in helping you to conceive and build the Ideal solution for optimising performance?

Our team led trading and quant groups at proprietary trading firms, banks, and ECNs. We’ve sat in the same seats as the clients we serve, so we understand their needs and know the domain details. We start by building the systems we wanted in those roles and then constantly iterate using insightful client feedback.



Walter Bell

JC: Please tell us a little about Ideal’s services and clients.

We serve clients of all sizes, including some of the largest firms in finance. Some firms use us for a single asset class and others utilize us across many desks. Clients need turnkey services: they hand us raw data and we provide a suite of analytics 24/7. We provide client reporting, liquidity management, operational risk, pre-trade, and TCA for financial institutions. While there are specialized firms operating in those categories, we are the only company to bring all those into a unified service.

Ideal analytics are used across our clients’ organizations by:

- Managers to view their business KPIs in real-time.
- Liquidity Managers to monitor the quality of flow in streaming pools and make changes to matching relationships.
- Relationship Managers to address client questions with automated reporting and one-off, complex analysis.
- Ops Risk teams to identify potential system issues.

JC: What asset classes do you support?

Ideal started in FX and expanded into other asset classes including crypto, US rates and credit, often as the first in that asset class. This year we’re expanding into global credit/rates. Traders in each asset class have their own language and nuance. Our core platform gives us a great base that we tailor to the specifics of

each asset class in partnership with clients.

JC: Please give us some examples of the benefits that FX trading firms are getting from utilising your solutions.

We can identify the root causes of changes in profitability (\$/M or bps/\$M) and liquidity so trading firms can tune their systems to meet their goals each day. For one sell-side firm, we identified a software release that reduced their profitability. For a buy-side firm, we quantify algo performance and the value of the flow to their LPs, enabling them to have continuous discussions with their LPs about their expectations on pricing. For an ECN, we identified operational issues with a client sending short-lived orders.

The key value is efficiency and transparency. We deliver quant and tech team capabilities at a fraction of the cost. We boost productivity for clients with in-house quants as we take care of all the data maintenance, freeing up their time for more strategic work.

JC: Ideal also operationalises trading best practices and principles-based regulation as quantifiable checks, curated alerts, and clear action steps. How have risk managers responded to this powerful capability?

For risk managers, the win is getting answers quickly from a single system. They’ve historically had to piece together a single response from different systems owned by different groups. Having a third-party like Ideal do an independent evaluation gives clients confidence in audits that they’re not grading their own homework and cherry-picking the results. Ideal’s cross-asset experience helps clients prepare



Our unified dashboard view helps all teams — portfolio managers, sales, trading, risk, and operations — align their efforts

for how different markets will evolve from a regulatory and compliance perspective so they’re ahead of the curve.

WB: Please tell us more about the key features and functionality of the Ideal business intelligence platform.

Ideal is built to complement the execution infrastructure that the client already has and provide larger scale insights that don’t exist in other systems. A big piece of that is the ability to summarize partial data

intraday and revise it as more complete data becomes available. Clients need to know the best estimate of what’s going on in real-time and how that relates to the market and the past so that they can adapt. They don’t have the luxury of waiting for end of month reporting to course correct.

Interactive investigation is a critical differentiator of the Ideal platform. Clients want to be able to answer questions efficiently without relying on quant or tech teams to summarize data or put together a report. Ideal’s



We keep each client’s data segregated and have proprietary controls to further secure their sensitive data

Ideal: Offering best in class trading analytics and insights to improve performance, risk management and profitability



A BIG PIECE OF THE VALUE WE PROVIDE IS HAVING IDEAL MANAGE DATA FROM DIFFERENT SOURCES AND MAKE SURE IT IS UP-TO-DATE AND CORRECT AT ALL TIMES

UI allows the user to pull together the details and export or share the results in a professional way– no more screen grabbing and combining with reformatted Excel tables.

WB: How do you go about achieving seamless integration of your platform with existing systems?

A big piece of the value we provide is having Ideal manage data from different sources and make sure it is up-to-date and correct at all times. We have seen data in every form there is; from highly structured data to opaque binary formats with no

documentation. We meet the client where they are data wise. We can normalize a client's data and onboard them quickly, sometimes within days.

WB: Gathering and managing data has always been a problem in FX. How do you overcome many of the challenges involved with this to deliver your solutions?

Flexibility on data sources and calculations is key. We provide a library of standard calculations and third-party data that we are able to customize for an individual client. For example, for reference prices, we

recognized early on that firms want different references, e.g. for skew vs non-skewed mid calculations. Our platform works with all of these references and clients can change options over time as their needs change.

Another important requirement is data privacy. We keep each client's data segregated and have proprietary controls to further secure their sensitive data. Clients can feel confident that their data will not be aggregated or externalized in any way. Their data is their data.

JC: What's coming next for Ideal in terms of expanding the firm's client base and product mix?

Clients are taking us into global fixed income this year, which is exciting. We're the first in mortgages, EU/ APAC rates, and other asset classes. AI has a lot of potential for trading. We're using LLMs to streamline workflows, reducing one-off research in spreadsheets for clients and LPs.

The explanatory capabilities of modern models will bring insights and save people time, as long as firms can use these tools while keeping their data private. We're very excited about the new features coming out this year!



Clients need to know the best estimate of what's going on in real-time and how that relates to the market and the past so that they can adapt

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EMS platforms:

Helping traders solve the puzzles of an increasingly complex FX market



Execution Management System (EMS) platforms have become an integral tool for FX market participants in recent years, thanks to several developments, such as the need for best execution in a market of increasingly fragmented liquidity. But what are the properties that make a good EMS? What should market participants look for from a prospective provider and what will the next generation of EMS platforms look like? Nicholas Pratt explores the issues.



By Nicholas Pratt

As FX markets have shifted towards electronic channels, the expectations for trading platforms have risen accordingly, says Sebastian Hofmann-Werther, chief revenue officer FX and digital, Emea for 360T Group.

"A good EMS offers seamless access to liquidity, sophisticated order routing capabilities, and features with regulation in mind, such as best execution tracking and audit trails," says Hofmann-Werther. "In today's FX markets, increased compliance, especially in regions like the EU and UK, have made best execution not merely a requirement but a key competitive differentiator. EMS platforms help buy-side firms meet these standards by enabling execution transparency, aggregating fragmented liquidity, and providing pre- and post-trade analytics. With a growing need to demonstrate fiduciary responsibility and operational efficiency, buy-side desks are turning to EMS platforms as essential tools for navigating complex market environments."

EMS platforms have significantly evolved to align with modern trading workflows, says Hofmann-Werther. "One major development is improved interoperability, allowing seamless integration with Order Management Systems (OMS), portfolio tools, and third-party analytics providers. Additionally, EMS platforms now support a range of complex execution strategies, from algorithmic trading to auto-hedging and passive execution. The ability to automate routine processes like netting and aggregation not only enhances operational efficiency but also helps reduce execution costs. By offering a more connected and intelligent workflow, EMS platforms enable traders to make smarter, faster, and more informed execution decisions."

The platforms also deliver tailored benefits across different types of FX trading firms. "For corporates, they provide workflow automation and enhanced visibility, helping treasury teams manage exposures and execute hedges efficiently. Asset managers benefit from features like fund-level allocation, TCA integration, and streamlined compliance reporting, making it easier to meet regulatory obligations and optimize across multi-fund structures," says Hofmann-Werther.

"Hedge funds gain agility through low-latency execution, algorithmic support, and customisable routing logic. Banks and liquidity providers can use EMS platforms to better manage internal flows, optimize pricing, and reduce risk through automation. The

adaptability of an EMS ensures that it meets the unique needs of each trading entity."

Modern EMS platforms are increasingly rule-based, allowing for the automation of the full FX trade lifecycle, from order capture through execution to post-trade analysis, says Hofmann-Werther. "By leveraging advanced, configurable rule sets, traders can define workflows that trigger specific execution behaviours based on criteria such as order size, time of day, liquidity conditions, or counterparty constraints. This enables low-touch or no-touch handling of straightforward orders, allowing human traders to concentrate on more complex or high-value trades. Automation of this nature ensures consistency, reduces operational risk, and enhances scalability across trading operations."

As the EMS space matures, key differentiators are emerging around data integration, execution flexibility, and workflow capabilities, says Hofmann-Werther. "Leading platforms now offer native support for algo trading, benchmark fixing workflows, and advanced order types. All of these are crucial for managing the nuanced demands of modern FX trading. Netting and aggregation capabilities also distinguish top-tier solutions, allowing users to compress orders intelligently and reduce execution costs."

"Additionally, integration with external data providers—such as market data vendors and TCA engines—



"The most exciting avenue in the future will be the one EMS platforms take with AI and Machine Learning to drive smarter decision-making and predictive execution."



Sebastian Hofmann-Werther

is becoming a hallmark of best-in-class platforms, allowing traders to make more data-informed decisions within a single interface. And data-driven analytics, especially when embedded directly into the EMS interface, enable traders to make real-time, informed decisions without leaving the platform. That is a huge time saver. Integrated market data supports benchmarking and strategy calibration, while pre-trade analytics help determine the optimal execution path," says Hofmann-Werther.

"Post-trade tools, including Transaction Cost Analysis (TCA), close the feedback loop by measuring performance against benchmarks and uncovering execution inefficiencies. This holistic use of data empowers trading teams to continuously refine their approach, demonstrating accountability and improving outcomes over time."

When selecting an EMS provider, the foundations of the platform's resiliency and stability are absolutely critical regardless of the type of FX trading firm making the decision, says Hofmann-Werther. "After that, firms usually assess the platform's ability to deliver liquidity access,

workflow automation, and regulatory compliance in line with their specific needs. A leading platform offers seamless integration with existing infrastructure, custom rule-building for automation, access to a broad and deep liquidity pool, and robust analytics.

Flexibility in handling diverse trading strategies, from passive execution to complex algorithmic orders, is also a key factor. Moreover, a provider's commitment to client support, innovation, and global regulatory coverage should be weighed accordingly in the decision-making process."

Looking ahead, all the features that are crucial for traders will continue to be enhanced, says Hofmann-Werther. "This includes supporting more trading instruments and products, connecting to more pools of liquidity, introducing more advanced automation features and harnessing visualization tools for better user-friendliness. The most exciting avenue in the future will be the one EMS platforms take with Artificial Intelligence (AI) and Machine Learning (ML), to drive smarter decision-making and predictive execution. We can expect deeper personalization through adaptive algorithms that learn from trading patterns, as well as enhanced automation for exception handling and compliance monitoring."

FX BUYSIDE DEMAND

EMS platforms allow buy-side clients to bring together liquidity from multiple sources to give them a clear view of their available liquidity and allow users to establish and trade with the best value that is available to

them, says Alan Dweck, COO buy-side solutions, SGX FX. "To achieve what looks on the surface to be a simple task of aggregation involves much complexity and requires the EMS platform to handle complex and disparate workflows. On any given day, SGX FX will be handling many thousands of streams worldwide. These all need to be monitored, and orders need to arrive at their intended destination in milliseconds. On top of this, EMS platforms need to handle increasingly complex workflows which need to be customisable according to each customer's requirements. Furthermore, the platforms increasingly need to handle contingent executions and sophisticated trading strategies: providing automation, speed of execution, trade protection, compliance via both GUI and API interfaces," says Dweck. "From a buy-side client's perspective, it needs to just work. The complexity needs to be hidden from sight and interfaces must be simple, safe and reliable for all users."

EMS platforms are becoming increasingly important to buy-side firms due to the increase in volumes traded, speed of markets and increasing complexity of quant-based trading strategies. There is no way for a client to look at or use multiple platforms on their desk. The aggregation brings important efficiencies that go well beyond the obvious and much quoted Best Execution requirement that underpinned their creation in the first place.

The EMS platform landscape is witnessing the rise of several key differentiators, says Dweck. "Among them are the integration of algo hubs, advanced automation capabilities, along with the ability to manage complex orders, strategies and workflows. To do this efficiently it is

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"To achieve what looks on the surface to be a simple task of aggregation involves much complexity and requires the EMS platform to handle complex and disparate workflows."



Alan Dweck

also becoming increasingly apparent that robust cloud services are becoming essential for the efficient delivery of these services," he says. "Finally, a comprehensive product suite, including derivatives that rely on the underlying cash market, such as FX Options are distinguishing factors that set top-tier EMS platforms apart from the competition."

Enhanced data-driven analytics have also become a defining feature of cutting-edge EMS platforms. "State of-the-art EMS platforms offer Liquidity Provision Analytics (LPA) that analyse the liquidity being offered independently of trades executed. This allows users to make better comparative decisions prior to execution as well as using TCA to analyse costs and efficiencies post-trade. Such analysis must be based on trusted data sources: an essential requirement for decision making based on these analytics. When these elements are correctly brought together in a state-of-the-art EMS platform they enhance the validation of trading strategies and ensure transparency around liquidity, ultimately fostering a more reliable and efficient trading environment," says Dweck.

In addition, leading EMS providers are prioritising interoperability and seamless integration with legacy systems by adopting standards such as FPC3 and using platforms like OpenFin, says Dweck. "These measures ensure that EMS platforms can coexist and function harmoniously with existing systems, minimising disruptions and maximising efficiency. In older systems, multi-asset class platforms were often used because they offered a single integration interface.

However, such systems required a large degree of compromise to shoehorn all the features and requirements of different asset classes into a single system. This necessarily involved compromise in efficiencies, functionality and severely limits the platform's ability to be flexible and to service complex requirements - often specific to a given asset class. One size definitely does not fit all," says Dweck. "Interoperability offers the ability to use best-of-breed for each traded asset class, leading to increased trading and workflow efficiencies."

The future of EMS platforms promises exciting advancements driven by technology and innovation, says Dweck. "We anticipate the production of better-quality data that power advanced analytics - pre and post trade: LPA and TCA. AI tools can then assist in the interpretation of these real-time point-of-trade analytics, to offer traders choices that drive better execution. We can also expect further enhancements in interoperability which together with these actionable insights will further elevate the efficiency and effectiveness of EMS platforms."

INCREASED MARKET COMPLEXITY

"The need for best execution has grown tremendously and the increased market complexity requires buy-side firms to have access to a good EMS platform," agrees Siby Khader, director FX trading at FactSet. According to Khader, there are several factors to consider when assessing what makes a good EMS platform.

"Liquidity aggregation and the ability to make price comparisons are essential for best execution while trade automation creates efficiency for the trading desk. The platform should also provide some execution strategies that will minimise market impact for large trades. It should also be customisable with the flexibility to handle unique client workflows and the efficiency to handle trades easily in fast-moving markets. Lastly, you have to consider the analytics and how well the platform measures execution quality and optimises future execution strategies."

When it comes to the evolution of EMS platforms, the ability to meet the increasingly complex needs of trading desks and buy-side workflows have been integral, says Khader. "Do more with less has been the mantra at most of the trading desks and it was essential for EMS systems to meet those increasingly sophisticated needs and buy-side workflows as efficiently as possible."

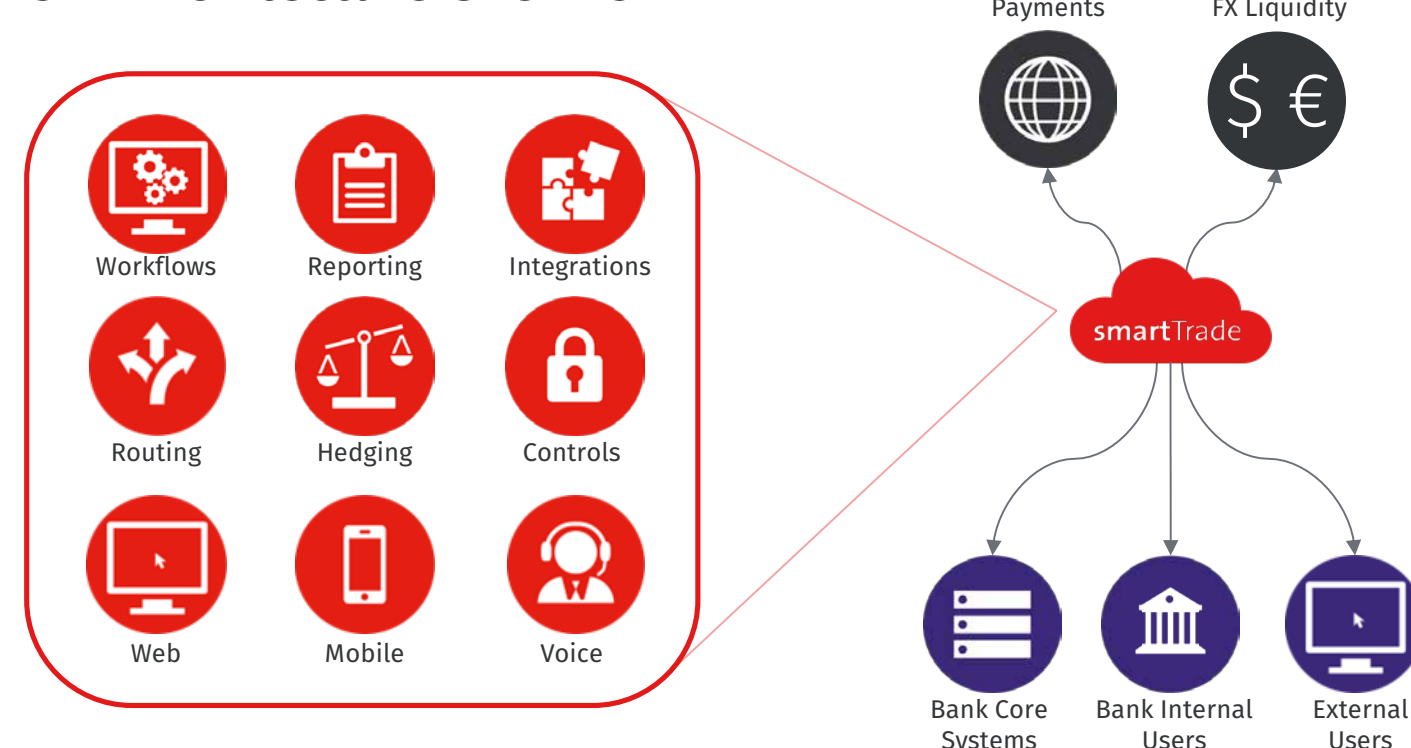
He highlights six key trends that have influenced this development. These include consolidating multi-asset trading on one platform; ability to work with various OMS platforms; and smart order routing for best execution and limit market impact. Other factors include cloud deployment and the use of APIs; pre and post-trade capability; and compliance via regulatory regimes like MiFID II or best execution mandates.

 smartTrade

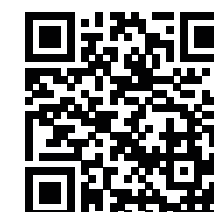
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"Access to actionable analytics is extremely important for a state-of-the-art EMS, to aid in a complex market with high volume, fragmented liquidity and intense competition."



Siby Khader

Workflow and allocation complexity can create data handling challenges that EMS platforms are now able to address, says Khader. "Due to the fragmented nature of the FX trade life cycle, it is important for an EMS platform to manage different data formats across counterparties across various stages and minimize the risk of data mismatches and delays."

This can be done in several ways - automating not only the trade, but the pre-trade or post-trade allocation and trade confirmations; using flexible workflows to suit client needs, integrations with OMSes,

pricing engines and TCA vendors; and consolidating all asset classes into one single system helps improve efficiency for the desk. In addition, the use of cloud-based deployment has made it increasingly easy to deploy new features and fixtures.

FX platforms are competing for market share and as competition intensifies for more sophisticated workflows and systems, there are several differentiators emerging, says Khader. For example, some are the aforementioned features such as liquidity aggregation and smart order routing; multi-asset capabilities; workflow automation and ability to support complex instruments; and trade analytics and real time TCA.

Other points of differentiation include API openness and ease of third-party integration; counterparty metrics and tiering of liquidity providers based on performance; and improved user experience and configurability, says Khader.

The use of data-driven analytics is also becoming a hallmark of the next

generation of FX EMS platforms, says Khader. "Access to actionable analytics is extremely important for a state-of-the-art EMS, to aid in a complex market with high volume, fragmented liquidity and intense competition. It helps with best execution, broker rotation, algorithmic trading and API-driven workflows for programmatic access to trading and analytics."

Meanwhile, interoperability and integration capabilities with third party systems and existing legacy systems have all become key to institutional adoption, whether its OMS platforms, TCA providers, bank liquidity providers or execution venues, says Khader.

"The FIX protocol is the de facto standard across trading systems for a while but API models like REST and WebSocket are being widely used as well to connect to legacy systems," he says. "EMS platforms also provide configurable workflows to handle legacy trade process and compliance checks and support translation layers to normalize different data formats especially for liquidity aggregation. OMS/vendor partnerships are also important, as are integration toolkits and universal adapter frameworks that can integrate broker algos relatively seamlessly," says Khader. So what can we expect to see next as technology and innovation within FX EMS platform space continues?

As the FX EMS space evolves, driven by trade sophistication and market demands, there are some key aspects that EMS platforms should focus on, says Khader. "Deeper Integration with multi-asset and LP ecosystem; enhanced transparency and reporting to all participants; API-based integrations; improved user experience; dashboards; data integration and analytics; expansion of algo trading, execution automation and increased use of AI/ML."



Modern EMS platforms are increasingly rule-based, allowing for the automation of the full FX trade lifecycle

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Rewiring FX Option distribution: The OptAxe Protocol

By Yorke O'Leary, Co-Founder of OptAxe.



Yorke O'Leary

The FX options market has long been a strategic but underserved corner of global finance. Despite its sophistication, the core mechanism for distributing axes, actionable expressions of interest, remains outdated, fragmented, and inefficient.

OptAxe was built to change that. We are a regulated Multilateral Trading Facility (MTF) purpose-built to help banks discreetly and efficiently distribute risk to the bilateral counterparties that matter, enhancing existing relationships rather than intermediating them.

At the heart of our model is the OptAxe Protocol, a new digital infrastructure for axe distribution that

combines precision with institutional scale. It's not just a platform, it's a new way to structure liquidity distribution across both D2D and D2C workflows, with total control for the bank.

This is a tool for banks, and a protocol for the future of OTC risk sharing.

WHY AXE DISTRIBUTION NEEDS A RETHINK

Today, most banks rely on a blend of chat, email, and voice to share axes with counterparties. Salespeople are left juggling spreadsheets, message threads, and shifting client preferences with no clear feedback loop on what gets seen, clicked, or ignored.

On the other end of the spectrum, most electronic options aggregators operate client-first RFQ models, with little transparency or control for the bank beyond offering the best price.

Neither model is well-suited to the evolving needs of institutional dealers. OptAxe offers precision distribution, delivered via modern infrastructure, with clear targeting, controlled footprint and better data.

Too often, an axe is shown into the void, and everyone's guessing what happened next.

THE OPTAXE PROTOCOL: HOSTED LIQUIDITY, BANK-CONTROLLED

The OptAxe Protocol redefines axe distribution as hosted liquidity, live tradeable intent, curated and controlled by the bank, while preserving and strengthening existing bilateral relationships.

Banks can define:

- Who sees each axe, and when
- Whether it's shown D2D, D2C, or both
- What happens when an axe is viewed, clicked, or copied
- How and when visibility is revoked or refreshed

This is not a price aggregator. It's not a CLOB. It's not all-all.

Instead, it's a precision routing tool that brings structure to the most high-touch and opaque part of the OTC workflow. Whether pushing axes internally to Sales, or externally to a select group of clients or dealers, the Protocol enables banks to distribute with intent, and get real-time data on performance.

And it's not just for banks. Asset managers and hedge funds can post axes back to dealers, using the same tools, permissions, and targeting logic, creating a healthier, more dynamic two-way market.

The Protocol does not route or intermediate trades — it empowers banks and clients to engage directly, on their own terms, with full control

over how axes are shared and acted upon.

FIX-FIRST INTEGRATION, ZERO DISRUPTION

We connect directly to banks' existing FIX infrastructure to receive pricing only when there's interest in their axe. This means banks continue pricing within their own systems, using their established risk logic, compliance monitoring, and infrastructure, with no need to duplicate or adapt pricing workflows.

For users who prefer direct access to the protocol, we also offer a flexible API suite over FIX or WebSocket, supporting Axe Creation, Visibility, and Consumption. These interfaces enable internal tools or front-end systems to access the Protocol directly or through our GUI.

Banks can integrate quickly, leverage familiar FIX-based channels, and retain full control over how pricing and visibility are managed with minimal disruption to existing workflows.

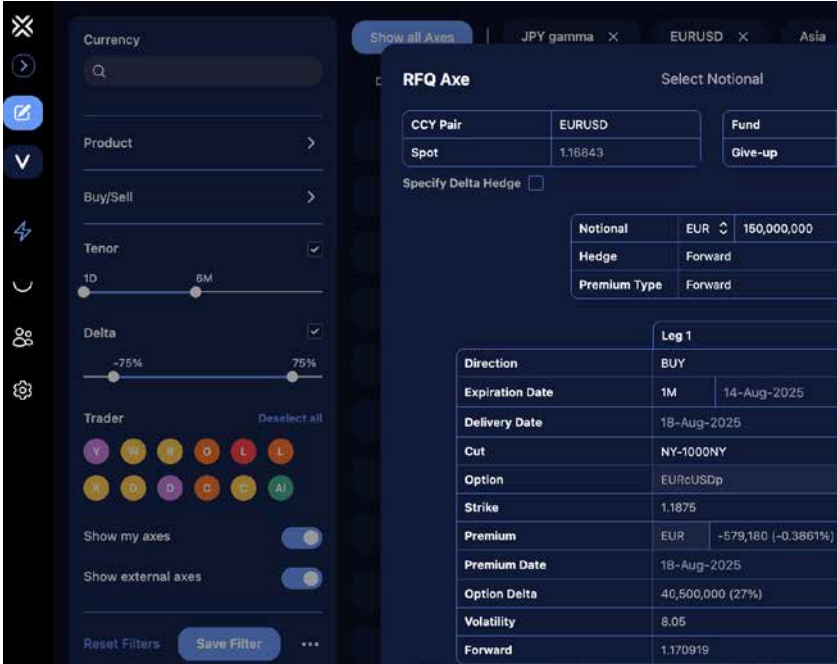
AN MTF BY DESIGN, NOT JUST A PLATFORM

OptAxe is a fully regulated Multilateral Trading Facility under the supervision of the UK's Financial Conduct Authority (FCA).

That means we:

- Onboard all participants as regulated venue members
- Operate under a published Rulebook
- Monitor for market abuse and suspicious activity
- Provide surveillance, audit trails, and post-trade reporting

Our regulatory structure gives banks the assurance they need that every trade, and every workflow, is captured, compliant, and auditable by design.



The Protocol does not route or intermediate trades — it empowers banks and clients to engage directly, on their own terms

We're not trying to disrupt regulation. We're here to support it.

PARTICIPANT ROLLOUT AND GROWING TRACTION

We are currently onboarding institutional participants, including major global banks, asset managers and hedge funds, with a phased go-live scheduled in the coming months.

Live FIX connectivity is in place, and participants are actively testing both internal axe workflows and selective external distribution to clients.

Our focus is simple: help participants move from message-based axe distribution to structured, data-rich routing, maintaining bilateral workflows with full control and a fraction of the cost of traditional models.

THE ROAD AHEAD

While we're launching with FX options, the same principles apply across the structured product landscape. The OptAxe Protocol will expand to support barrier options, structured forwards, and other flow and exotic derivatives.

We are also enriching our analytics layer to give participants visibility into who engages, what drives flow, and how to refine targeting.

Crucially, this isn't a one-way channel. Clients can post axes to banks, allowing asset managers and hedge funds to signal their own interest and receive targeted responses in return.

CONCLUSION

The fragmentation of axe distribution has gone on long enough. With too many chats, too little feedback, and no central control, it's time for a better way.

OptAxe isn't trying to replace human relationships, we're building the infrastructure to enhance them. We're centralising access to liquidity, giving participants a smart, compliant, and cost-effective way to show, receive, and act on axes, with none of the noise and all of the control.

If you're still searching through chats for axes or flooding inboxes with them, it's time to talk to us.

The OptAxe Protocol: Over-the-counter. Under-the-radar!

"OPTAXE OFFERS PRECISION DISTRIBUTION, DELIVERED VIA MODERN INFRASTRUCTURE, WITH CLEAR TARGETING, CONTROLLED FOOTPRINT AND BETTER DATA."

Peter Cruddas

Vision, hard work and persistence:

Turning a small private company into a global financial trading powerhouse

Lord Cruddas of Shoreditch (Peter Cruddas) who is CEO and Founder of CMC Markets Plc. can rightly be said to be one of the inventors of the online trading industry. e-Forex caught up with him and his firms head of institutional services, Richard Elston, to talk about the remarkable journey of CMC Markets and how its institutional offerings have become some of the best in the industry.

Peter, you founded CMC Markets in 1989 and launched Europe's first online retail trading platform in 1996. What keeps you going to work every day after such an extraordinary career?

That's a question I get asked all the time I guess because I do not need to work for financial reasons, and I always reply with the same answer. I love having my own company, I love the daily challenges and what is retirement anyway, who wants to play golf every day or sit on a beach. That might appeal to some people but not to me. I have been working since the age of 15, even doing the night shift on Christmas day when I was 16 at my first job Western Union, sending telegrams overseas.

I have a beautiful wife and family, married for 38 years, with successful children and grandchildren. My wife often travels with me on business trips, what's not to love. Why retire if you love what you are doing. If I live as long as Warren Buffet I will be working for another 25 years!

CMC is invigorating as the financial markets are changing so much. Remember when I launched Europe's first retail Forex platform back in October 1996, the world could never have imagined how the bulk of financial trading has moved online. We were definitely pioneers of financial trading.

Google didn't exist, Facebook was not around, even mobile phones were just beginning. The world wide web was

really a static page concept compared to now. The fun part of working is to see the changes and adapting to those changes.

Crypto currencies are only ten years old which is another example of how the world's financial markets are changing, and I love being part of all those changes.

I also love CMC and how we have become a global powerhouse not just in financial trading but also in financial technology. We have major technology partners with Revolut, ASB Bank New Zealand, Strike X and over 300 technology and financial trading partners all over the world. If you want an example of what a fintech company is then look no further than CMC Markets. Oh, by the way I will never retire!

It's well known that you are a self-made businessman who did it the hard way but do you still consider yourself a trader at heart and if so what impact has that had on your success?

Once a trader always a trader or so they say. Of course, I do not get involved in day to day hedging and trading for the company. But I do think it is important for any company involved in trading to have a leader or CEO with the relevant experience. I think I tick that box very well.

You saw the potential for online trading before many others but some people have said that you were also just in the right place at the right time because the arrival of the internet helped you so much. Do you agree with that?



CMC Markets has a comprehensive retail, professional and institutional offering

Vision, hard work and persistence: Turning a small private company into a global financial trading powerhouse



A ridiculous statement to be honest. I worked with many people in the city before I started CMC that were in the right place at the right time. The whole of the City of London was in the right place at the right time but not many started their own companies and built on the potential of the internet. I suppose

I was lucky that the Internet was invented and for that matter I was lucky that lap top computers were invented. I suppose I was lucky that Microsoft was invented and created DOS so that we could all use laptops.

But life is about seeing opportunities and monetising those opportunities. That's what I did.

How "hands on" are you in the day to running of the firm or is it more about strategy and the bigger picture issues nowadays?

I am very hands on. I am in the office every day before 7.30am, five days a week. I am on all the decision-making committees and teams. I am still driving the business forwards every day. I do have some really good people with me.

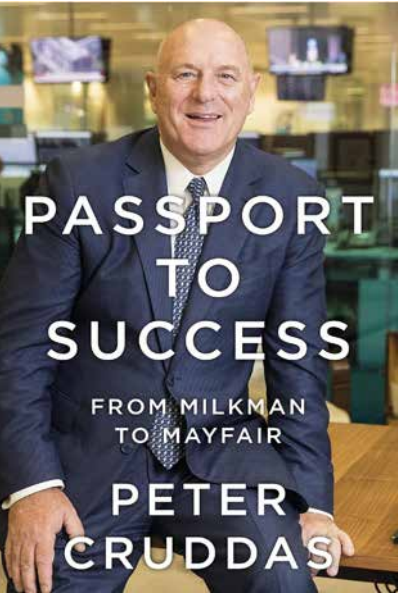
Contributing so much to the business and challenging me and themselves. It is an honest and healthy challenging environment,

that helps drive the business forwards. My door is always open and I encourage challenge amongst the executives of the business.

Another thing that sets you apart from many others in our industry is your long standing commitment to ensuring CMC employs the latest cutting edge technology and trading platforms. How important has that been in turning the firm from a UK-centric business to a global player?

The DNA for this is seeing how our first on-line platform launched in October 1996 changed the business. It turned us into a small boutique business into a global player.

If your readers would like more detail of this journey, then I encourage them to read my book Passport to Success which I would be happy to send any of your readers a free signed copy. I have felt compelled to keep investing in technology and it all stemmed back to 1996.



Please email Victoria Paling at v.paling@cmcmarkets.com for a free signed copy of Peter's book

CMC CONNECT: STANDING OUT FROM THE CROWD

Richard Elston, head of CMC Markets Connect Middle East has been with the trading and investment services provider for the last 10 years, having joined as group head of institutional in July 2015.

Many things have changed over that time, perhaps most notably the firm's evolution from a UK-centric business into a global player with a presence in Singapore, Toronto, Sydney and more recently Dubai.

Having spent more than two years in Dubai, his change of role from group head of Connect to head of Middle East to focus on the opportunity the region presents is further recognition of its growing importance.

CMC executed its first hedge cover trade as long ago as 1996, he explains. "We've been licensed here since 2019 but due to the pandemic we really started ramping up in 2022. As an independently regulated office it comes with all the obligations you would expect from a localised business, so my role covers everything from dealing with customers on a commercial basis to handling regulatory and compliance issues," says Elston.



Richard Elston

As the business has grown, the range of clients and instruments supported has also expanded. Dubai in particular has experienced a massive influx of wealth as demonstrated by the number of hedge funds and other international firms that have set up in the DIFC, with commensurate growth in booking volumes over the last five years.

"Our strategy in coming here was based on the potential for liquidity

provision," says Elston. "But if you are looking at liquidity in CFDs and FX you are limiting yourself – multi-asset class is the way to go as you can see from the way our business has adapted to provide investment-grade, exchange-traded assets not just here in the GCC but to a wider audience."

This enables CMC to provide (either via platform or API) execution in more than 20 different global markets. From a platform perspective, the firm sees enormous scope for growth in developing solutions that deliver transparency to the underlying clients of the institutions it deals with. "However, in order to achieve that you have to go in with what the market is demanding," acknowledges Elston. "People want to have cash equities, futures and options in their portfolio and I love the fact that we are able to develop platforms that can address that demand."



CMC Markets provide access to award-winning multi-asset class trading platforms including its own proprietary Connect platform and Iress

Vision, hard work and persistence: Turning a small private company into a global financial trading powerhouse



As the business has grown, the range of clients and instruments supported has also expanded

LIQUIDITY

Liquidity provision is an area where CMC excels, in part because it constructs its own pricing. “We have always been a constructor of our own pricing around CFD instruments and our clients tell us that our liquidity is amongst the best in the institutional spot FX space,” says Elston.

The secret to success here is not just providing a pricing and liquidity solution that meet the demands of the client – it’s also about ensuring you have the appropriate and compatible technology that allows you to get your price to the client and a trade back from them.

“Low latency price construction is one thing but it is also important that the API technology is inherently designed to provide the least amount of speed bumps by making sure the messaging layer used to build the API (as well as between it and other internal components such as risk engines) is optimised to be as fast as possible with a view to providing the best customer experience,” says Elston.

CMC has been asked in the past why it asks so many questions about

technology rather than just getting the deal done, adds Elston. “The reality is that it is very difficult to get a deal done if you can’t get what you need to deliver to the client in the first place because of the technology involved. That is the gap that we have always endeavoured to fill.”

CONNECTIVITY

CMC recognises that connectivity is a key consideration for institutions so focuses on constructing technology to fit the geographical market in which the demand is coming from.

“Latency around price construction is the first issue to resolve but there is also inherent latency in the systems used to either get the price out the door or get the execution back in,” says Elston. “Therefore, internal optimisation of electronic workflow is very important.”

CMC is not a HFT house so doesn’t feel under pressure to be the fastest show in town. The emphasis is instead on delivering services via a single interface – whether that is a front-end or an API - and

providing it to as many customers as possible.

In terms of using third party technology, the company seeks to work with as many of the popular platforms as possible.

Given that innovation has always been a hallmark of CMC Markets, we concluded by asking how much scope there is for further innovation in the company’s core institutional product offerings.

According to Elston, multi-asset class solutions are incredibly important - even in the retail aggregator space - and there is a gravitational pull towards cash equities and other investment-grade products.

“We want to solve the trading infrastructure challenges of institutions such as private banks,” he says. “We often come across scenarios where we feel the technology being used is suboptimal and because we have proven platform technology we are in a position to combine that with multi-asset classes to provide a solution to the bank, broker or wealth manager as well as their underlying client.”

There is also an acknowledgement that asking a client to rip up all its existing technology is unrealistic. “The fintech partnership we signed with Revolut last year is a good example,” concludes Elston. “It’s predominantly based on REST API technology, so if you can imagine all the good stuff (the account structure, the connectivity to markets with no front-end), instead of delivering a front-end we deliver Open API-style technology that interfaces that with the best of what other people do.”

How would you summarise the key reasons why CMC Markets continues to be the hugely successful business it now is?

We never stop investing, we never stop challenging ourselves and pushing the boundaries. I came from humble beginnings and CMC changed my life and I want to keep pushing it to make it the best company in our industry, if it is not already. I believe that it is.

Looking back at your life and career in the financial trading industry what are you most proud about achieving?

Just the fact that I was successful with my idea about starting my own company. Also, that I never rest on my laurels.

I keep pushing and every day I am proud of what CMC Markets has become, from one single small office, in serviced offices with no windows. Wow I still get a thrill from thinking about that.

In your book you say that over the years any business will face serious challenges. Do you feel you still have a lot to offer CMC Markets and that your experience can be helpful in helping it deal with any difficult issues that may arise as the industry navigates the economically unstable, technologically complex and increasingly volatile age we now live in?

This Company is amazing, and it is important that you enjoy the success but at the same time maintain standards. There will always be challenges in business as in life. The way to tackle those problems, is to face them head on, deal with them and move on quickly.



WE NEVER STOP INVESTING, WE NEVER STOP CHALLENGING OURSELVES AND PUSHING THE BOUNDARIES

Taking a look at Digital Vega's DV2.0

e-Forex spoke with Mark Suter, Executive Chairman at Digital Vega about developing next generation tools and services to enhance and augment its current range of products and services. Their new project named internally as DV 2.0, will significantly reduce manual interaction, use of clumsy execution via chat and information leakage whilst simultaneously improving targeted price discovery, execution and trade lifecycle management.



Mark Suter

What is the rationale behind DV2.0?

As in all industries, business models and client demands are constantly evolving, in many cases, utilising new technologies to improve outcomes for both supplier and consumer. The FX market, specifically the smaller but more complex FX Options ecosystem is no different. Due primarily to its smaller size and much greater levels of complexity, electronification and automation of the FX Options market has understandably emulated but lagged the core cash markets.

Given Digital Vega's unique focus on FX Options and its reputation as an innovator, it is now very close to launching the first fully electronic

interdealer FX Option CLOB. This new service has been actively supported by all the major bank players as it will reduce transaction costs by up to 80%, will implement a maker/taker brokerage model, will fully support pricing of specific interests and will be the first of its kind in the industry.

A new and unique component of this service will be the ability of participants to bilaterally negotiate and fine tune execution on specific interests using the dedicated Specifics negotiation module. This negotiation process is limited to a small group of participants and is fully hidden, audited and provides automated transaction completion, trade generation and STP messaging.

Recent feedback from both buy- and sell-side users clearly demonstrates support for a negotiation capability to supplement the existing Bank to Client RFQ protocol.

We are aware that many larger, more sensitive transactions currently take place using chat functions, so decided that enriching the RFQ protocol with a similar secure, automated and audited negotiation capability may provide significant benefits to both buy- and sell-side users - like speed,

ease of use, reduction of market impact and avoiding manual re-keying of transaction terms.

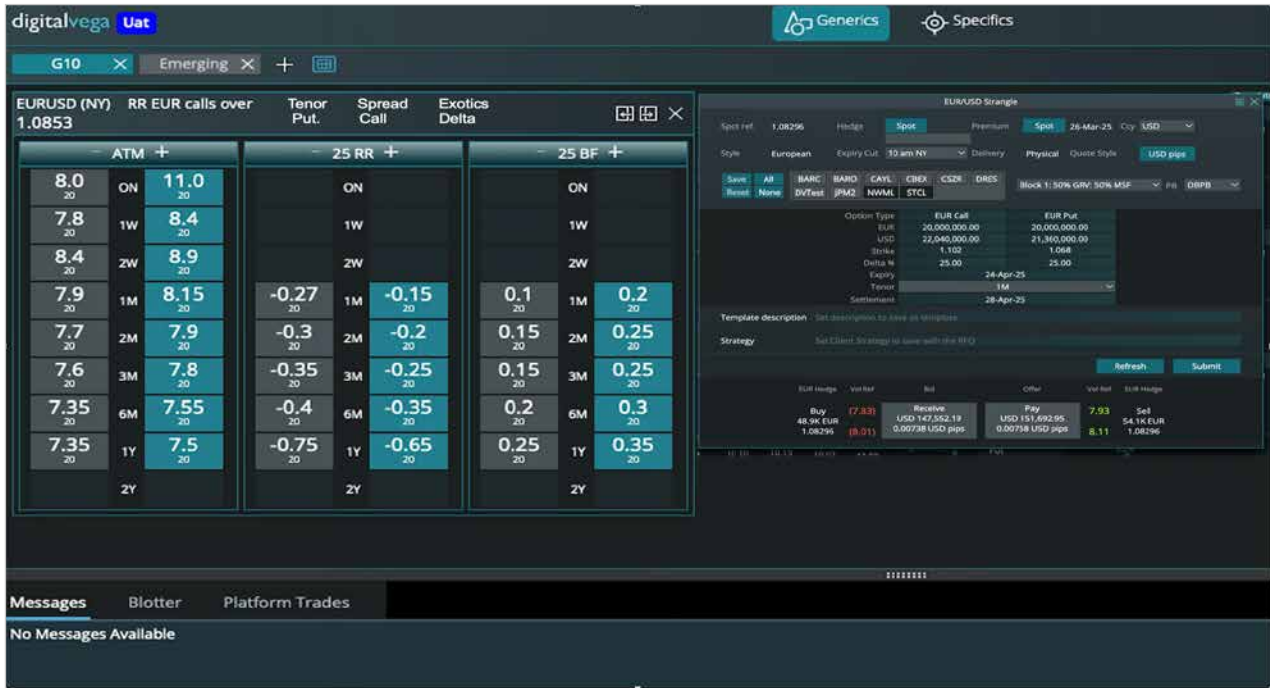
This negotiation logic has been fully tested and validated and will shortly be added to existing RFQ workflows on Medusa, our multidealer (MDP) platform. The Negotiation function is also ideally suited to managing the publishing and negotiation of bank Axes. Again, bank Axes have been historically distributed to potentially interested clients via voice sales or chat tools and the process is cumbersome, hugely manual and inefficient.

Digital Vega's new Axe tool will provide a range of controls on distribution groups, time to live, and market sensitivity triggers. It will limit market impact, remain fully audited, and will automatically generate transaction ticket details and feed into STP channels.

We will also generate a regular, detailed report covering all elements of client to bank Axe activity.

How will the negotiation service work?

Currently, clients use Digital Vega's TCA-based Liquidity Optimiser to identify



New front end displaying indicative Vols and where RFQ's can be launched

their optimal Provider Panel, using the Medusa MDP to ask a defined group of LPs to quote for an FX Option trade. If quotes are provided but the client decides not to trade based on the target rate not being achieved that is currently the end of the process.

With DV2.0 the RFQ process does not end there. It continues, with the client and best LP(s) negotiating in a private room to reduce information leakage. If the target rate can be agreed it is a simple click and trade, with the normal STP process followed.

Does price negotiation happen now?

Some clients do this now, but it happens using Chat which requires high levels of manual intervention and often falls outside compliance requirements.

What are the benefits of this new negotiation?

DV2.0 maximises FX Options liquidity, minimises trading footprint and automates large parts of the trade, meaning no re-keying and automatic STP. Importantly this moves negotiation away from Chat and onto Digital Vega's

regulated platforms. This provides a full audit trail from the initial RFQ to the final negotiated price.

It also allows LPs to capture more trading volume and clients to achieve their target rate more often.

Why did you introduce Axe management as part of DV2.0?

Recent discussions with key clients and LPs highlighted growing interest in automating Axe management, publication and execution protocols. We are now developing a full Axe management solution for the industry.

How will this work?

Axes are a good way for larger amounts to be executed and using DV2.0, participants will have the ability to publish a range of Axes to select clients or client groups automatically.

Why are you introducing this service now?

Firstly, advanced negotiation and Axe management have been identified as key requirements by both buy- and sell-

side firms to make FX Options trading workflows faster and more efficient.

Secondly, we have all the technology available already. We have our RFQ platform Medusa which has been operating for many years, and now also have the new technologies which will provide the advanced negotiation and Axe management capabilities.

And finally, now your CLOB has been built when will it go live?

We are in the process of connecting firms and hope to go live this summer. We have waited because we are convinced that when we go live there must be good liquidity from day one. We now have a growing list of firms that are connected and ready.

It took us 18 months to build the CLOB, but getting major bank API's integrated has been a challenge due to the compliance, legal and surveillance requirements imposed on the banking community as a whole. We have also opted to wait until we have a rich seam of continuous bank liquidity before pressing the "live trading" button.

Aeron: Tailor-made for high throughput, low latency, fault tolerant electronic FX trading systems

Bringing a mission-critical electronic trading system into production is a complex task which Aeron, the open-source technology from Adaptive is designed to address. We asked Matt Barrett, CEO and co-founder of Adaptive to tell us more about it.



Matt Barrett

What were you setting out to do when you engineered Aeron and what were the key guiding design principles that were involved?

Aeron was created over 10 years ago by Martin Thompson and Todd Montgomery with the goal of developing a tool that could meet the essential, non-negotiable quality attributes that every modern trading system needs:

- Performance [low latency coupled with high throughput]
- Resilience
- Consistency
- Scalability
- Security

Typically, firms have to compromise on at least one of these attributes. Aeron was designed to ensure all can be met, leveraging advanced technology principles (such as RAFT consensus-based state machine replication) to achieve this and deploy on-premises, in the cloud, or in a hybrid environment.

What are the main components of the Aeron software suite?

Aeron comprises three main components: Aeron Transport, Aeron Archive, and Aeron Cluster. Aeron Transport handles high-performance messaging with microsecond latency and extremely high throughput, Aeron Archive provides ultra-fast storage and replay ensuring zero message loss, and Aeron Cluster offers high availability and consensus-based resilience for distributed systems.

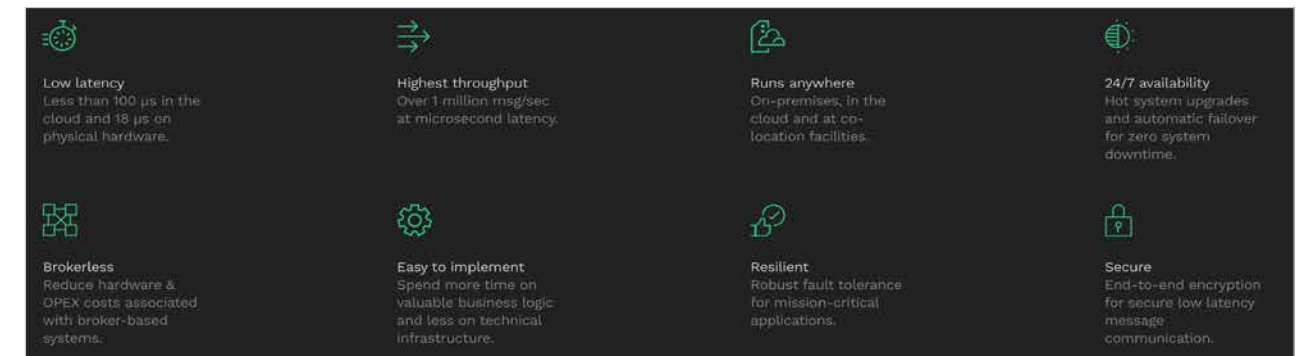
What types of firms are utilising Aeron to build highly available, mission-critical trading systems? (See MAN case study following this article)

A diverse range of firms within the financial sector utilize Aeron, including investment banks, hedge funds, crypto exchanges and proprietary trading firms.

These organizations rely on Aeron to build highly available, mission-critical trading systems that require robust performance and 99.999% uptime. (in real terms, this equates to 5 minutes of downtime per year). For example, MAN Group, a leading hedge fund, replaced its commercial messaging tool with Aeron to improve the latency of its FX execution system. The firm's technology team subsequently integrated it into an equities and futures trading platform for communicating signals to algo execution engines.

Please tell us a little about the key features and functionality of Aeron.

Aeron is engineered for very demanding front-office trading environments. It achieves ultra-low latency - less than 100 microseconds in the cloud and 18 microseconds on physical hardware. The system handles high throughput, processing over 1 million msg/sec while maintaining microsecond latency. It also ensures 24/7 availability through hot system upgrades and automatic failover, guaranteeing zero downtime. Its brokerless architecture reduces hardware and operational costs whilst end-to-end encryption ensures secure communications.



Aeron - key features

What direct benefits does Aeron deliver and how can it help trading firms to bring their projects to life faster and with greater confidence?

Using Aeron, firms can build a high-performance messaging layer that significantly improves latency statistics and predictability. Companies can ensure higher resilience to spikes in message volume and provide instant recovery in case of failures, which is crucial for mission-critical or 24/7 applications. The open-source nature of Aeron gives firms greater control over its functionality and roadmap, allowing for customization and future-proofing of their trading systems.

You also offer a premium version of Aeron. What does this provide?

The premium version of Aeron complements the open-source software and is for people who want to use Aeron at an enterprise level. It includes additional software components for advanced monitoring, enhanced security and performance, as well as tooling for accelerated development, architectural design consulting and complete support with enterprise-level SLAs.

There is also an open-source version of Aeron. Why is that increasingly attractive for many firms looking to build electronic trading systems?

Aeron, as all open-source technology, leverages the collective knowledge from a global community. This ultimately

enhances innovation and problem-solving capabilities. Open-source also offers significant cost benefits by eliminating licensing fees and reducing hardware and operational expenses. Additionally, firms can avoid vendor lock-in, gaining the freedom to customize and evolve their technology stack as needed. However, most importantly, access to the source code ensures transparency and allows firms to maintain control over their product roadmap, ensuring they can adapt quickly to market changes and regulatory requirements.

How has feedback from the community of Aeron users helped to influence the way you have been adding to the solution and improving it?

Aeron has 7500+ stars on Github with over 900 forks. The community is sizable and active, and has helped to significantly shape our roadmap. Community input has led to the introduction of new features, most recently the Aeron Insights tool, which provides actionable intelligence on cluster health, reducing the time to detect and respond to risks. Additionally, the community's involvement in early adopter programs, such as the SBE Domain Mapper, has been crucial in refining these tools before their general release. Further, regular community meetups provide a platform for people to share their experiences and challenges, which we use to develop better software and improve our product documentation.

What support is available to help firms take their Aeron implementation to the next level?

There are a multitude of resources available. Documentation and training materials cover Aeron Transport, Aeron Cluster, and high-performance application development in general. Firms can access expert assistance, including support SLAs, bug fixes, software releases, and developer advice. Additional developer resources, such as detailed benchmark results, help optimize Aeron use. Professional consulting and development services are available via Aeron's parent Adaptive, whilst Aeron Premium provides additional features such as real-time monitoring, simplified SBE handling, or disk usage management.

What plans do you have for the future development of Aeron?

We have a few things on our roadmap, such as enhanced tooling and documentation, to make Aeron easier to adopt. We are also looking to add scalability to the mix, allowing large firms that need high resilience to scale with confidence. And of course, we continue to work with our Cloud partners at AWS and Google to push the performance limits on the cloud.

How can trading firms get more information about Aeron?

You can visit Aeron.io, visit Github, or simply drop our engineers a note.

Man Group leverages Aeron to improve the latency of its FX execution system

By Oskar Wantola, CFA, Head of Execution Technology and Tim Raggatt, Staff Engineer, Execution Technology at Man Group.



Oskar Wantola

In this article we explore how MAN Group leveraged Aeron's Open-Source technology to improve the latency of our firms FX Execution System.

Man Group embarked on a project to enhance its FX execution system, aiming to reduce latency and achieve high levels of system reliability under heavy data loads, therefore improving execution quality for its clients.

Technology used: Aeron Transport and Aeron Archive

Technical challenges:

Navigating the existing infrastructure & shifting the system to a new host. Integrating Aeron, an open-source technology, within Man Group's tech stack ensuring improved performance without service interruptions.

The roll-out: Starting with a trial, Aeron was initially deployed in a 'production-like' simulation environment to ensure its performance



Tim Raggatt

over a range of different traffic profiles.

The test criteria:

Aeron needed to: Demonstrate its ability to handle short-lived bursts of intense quoting activity across multiple providers. Maintain minimal latency when quote streams were slow-moving and messages infrequent.

The outcome: Man Group deployed Aeron in production, fully replacing its legacy middleware solution. Aeron continues to provide high-performance messaging, outperforming the legacy solution by at least one order of magnitude across every percentile.

THE PROCESS

Industry challenge

In FX markets, speed is important. Liquidity conditions are dynamic and change in real-time, so orders must be sent promptly to minimise the risk of hitting stale quotes and being rejected. Execution systems are the engines through which investment firms access

and interact with markets, combining rich functionality with high performance. Hedge funds understand that having the right tools is beneficial – a system that lags peers is a strategic disadvantage.

The brief - from commercial to open source

FX execution systems are multi-layered, facilitating the entire FX trading lifecycle. Each element of the system communicates via Inter-Process Communication (IPC) to complete the trading flow. The bigger and more sophisticated the system, the greater the number of components and services to run simultaneously.

Man Group's use case centred around its multicast RFQ protocol. The system needed to be able to take orders from upstream and compare them in real time with the available liquidity streamed from multiple liquidity providers. The quotes are then aggregated and fed into an algorithm which decides when best to execute orders against which liquidity.

To achieve this, latency is key. The algo must be aware of the most up-to-date quote data in order to make informed trading decisions. Any delay between receiving data to execution can result in changes in price, impacting the cost of the trade or perhaps even missing out altogether.

Man Group was looking for fast and reliable technology to meet the

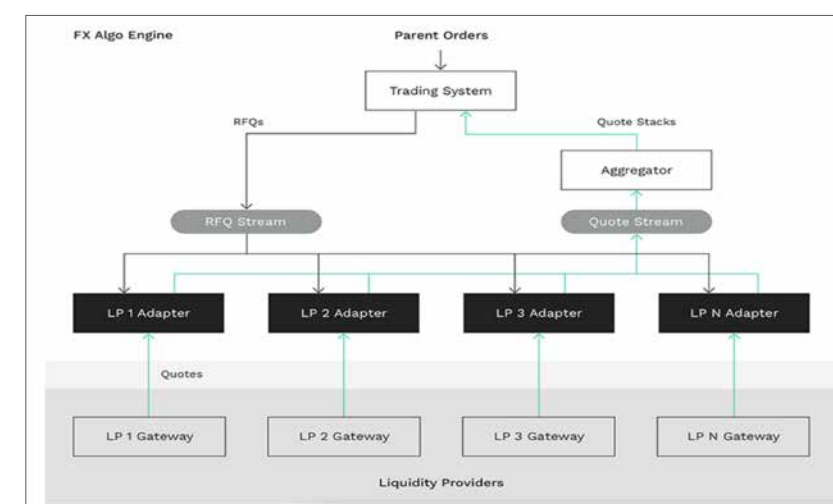


Figure 1: FX Algo Engine Architecture

following selection criteria:

- Open-source tech to give the firm greater control of its functionality and roadmap.
- Predictable, ultra-low latency.
- Reliability under the highest data loads.
- Proven industry use cases and references.

The goal was to build a fully fault-tolerant, low-latency messaging layer.

Technical challenges

When Man Group decided to move away from its legacy messaging tool and started to integrate Aeron, a key technical challenge was navigating the existing infrastructure and shifting the system to a new host. For example, the Linux kernel – which manages the interaction between software and hardware – caused issues with Aeron's idle strategy holding back immediate performance improvements.

These issues were overcome by creating a virtual environment, simulating the execution system, to test the new software under multiple loads and ease implementation. Parameterising variables such as the number of quotes, their rate of quoting, and idle strategy enabled the tech team to tune the deployment appropriately. The system showed how Aeron could support the low latency

messaging needs and helped the development team to productionise the technology.

Migration to Aeron

Man Group's technology team realised they would need to move the application to an alternative host to address the kernel idle strategy limitation. However, to avoid migrating the commercial IPC solution, Aeron had to be tuned to the existing host and rolled out there first. The simulator enabled them to do this with confidence.

The two-phase rollout strategy meant that the latency gains were achieved incrementally:

1. Aeron deployed alongside the application and IPC migrated. At this point the latency testing saw:
 - a. Small gains in lower percentiles, e.g. 10%
 - b. A slightly more stable median in a similar latency range.
 - c. Upper percentiles, e.g. 99%, remain similar due to the kernel idle strategy issue.

2. Application migrated to an alternative host, resolving the kernel incompatibility issue. At this point, latency benefits were seen across all percentiles, particularly the upper ones.

Aeron Roll-out

Over the course of the year-long project, Aeron was used to build two key components:

- **A new, low-latency messaging layer:** Aeron Transport became the vehicle for an updated IPC protocol capable of supporting multicast RFQ, trading instructions and system availability messages. As predicted, the new platform unlocked significant performance gains.
- **Message persistence:** Man Group later began using Aeron Archive for the recording and replay of inbound FIX messaging streams. The persisted streams may be used for real-time monitoring, offline analysis, and counterparty simulation in lower (pre-production) environments. Use of Archive gives confidence that messages can be relayed from latency-sensitive trading processes without blocking or backpressure.

Benefits of Aeron - in a nutshell

Man Group replaced its legacy technology with a state-of-the-art, open-source solution. Leveraging Aeron Transport and Archive technology, the firm was able to:

- Build a high-performance messaging layer.
- Improve its latency statistics and predictability.
- Ensure higher resilience to spikes of messages and instant recovery in case of failures.
- Future-proof its FX execution system.
- Build resiliency into the system so reporting processes do not interfere with trading activity.

THE FUTURE

Man Group has added Aeron to its toolkit of approved technologies for any projects with low-latency requirements. The firm's technology team subsequently integrated it into an equities and futures trading platform for communicating signals to algo execution engines.

Assessing the T+1 journey so far and its impact on FX

With Lisa Danino-Lewis, Chief Growth Officer at CLS



Lisa Danino-Lewis

The US and Canadian securities markets successfully moved to a T+1 settlement cycle in May 2024. Now Europe and the UK are set to follow in October 2027. What can we expect from this transition?

From an FX perspective, the European transition should be relatively straightforward. The biggest challenge in North America was the time zone difference. In Europe, custodians (CLS settlement members) managing payment instructions and funding for asset managers using CLSSettlement have cut-off times that closely align with CLS's timeline. CLS's initial pay-in schedule (IPIS) deadline for submitting FX payment instructions for settlement

is midnight CET on T+0. This timeline provides European market participants time to process FX transactions for next-day settlement under T+1.

Can you explain the time zone issue in North America and how CLS responded?

The US shift to T+1 in the securities space impacted the wider FX ecosystem, as around 20% of securities and 17% of equities are held outside the US. The compressed settlement timeline meant that investors and asset managers had less time to mobilize currency to fund US or Canadian securities trades.

Some market participants questioned whether the shift to T+1 for securities settlement could push FX to T+0 for some parts of the market and raised concerns about the usability of CLSSettlement. In response, CLS engaged extensively with the industry and conducted a thorough impact assessment ahead of the May 2024 transition.

The findings suggested that only around 1% of CLSSettlement's average daily settlement value (ADV) of approximately USD7 trillion could

potentially be impacted by the transition, representing business that may be linked to non-US investment funds trading US securities and settling FX on a T+1 basis. Thus, the scope of potential impact was limited compared to the ADV of CLS. It was also noted that any changes to CLS's operational timeline would be subject to any required approvals and a comprehensive risk assessment, and further would require significant modifications to systems and processes throughout the CLS ecosystem that likely could not be completed in a reasonable timeframe. In view of these factors, no changes were made.

CLS's post-transition analysis found no negative impact of the T+1 transition on CLS's business. In fact, CLSSettlement's ADV increased from USD7.0 trillion to USD7.6 trillion. The data monitored for impact suggests that both the sell and buy sides of the market adjusted their behavior ahead of the move where needed.

Are there any unique challenges for Europe?

Yes, but the focus is more on market participants' readiness rather than structural barriers. Some smaller

European institutions haven't been as involved in the industry working groups that supported the US and UK transitions.

To better equip the industry for T+1, we've had to clarify key distinctions — for example, the difference between CLS's IPIS submission deadline and the cut-off times set by custodians, which can be as early as 17:00 CET. Our impact analysis suggests that the percentage of CLSSettlement ADV that could be impacted by this transition should not exceed 0.4% in the EU and 0.1% in the UK.

There are also some concerns around trade confirmation workflows. Some asset managers may not confirm the underlying security trade until midnight, which can delay the FX leg. This means they might need to settle FX same-day, which creates additional pressure in a T+1 world. We saw a similar pattern in the US, exacerbated by time zone differences.

While the issue is less acute in Europe, the key to addressing it lies in adapting execution practices.

Has the T+1 transition fostered greater industry engagement and collaboration to facilitate post-trade efficiency?

Definitely. The North American transition to T+1 highlighted the need to automate back-office processes across the market. The back office has historically been underfunded as it doesn't drive revenue or investor returns. T+1 has driven a recognition that there's a need to invest in these operations.

After the North American move, we saw more demand from asset managers for our post-trade monitoring and reporting tool, CLSTradeMonitor, that provides a

single view of all trade instructions submitted to CLSSettlement and CLSNet.

The transition also gave CLS an opportunity to engage the market more deeply on how CLSSettlement works — its architecture, timelines and risk mitigation mechanisms.

CLS is co-leading the FX workstream of the EU's T+1 working group. How is that progressing?

We held intensive discussions with the industry to understand the issues and have provided our findings to the broader working group. We were able to leverage work already done in the US and the UK, which was very helpful as it gave us a framework to reference.

The FX workstream will continue to meet, albeit less frequently, as the focus shifts to implementation.

Why will CLS's role in maintaining the FX ecosystem become more important as the industry evolves?

As more markets move to T+1 — there's now talk of Asian markets shortening their settlement cycles — CLS's role in enabling safe and efficient FX settlement is only growing.

Asia is already somewhat accustomed to faster settlement time zone-related challenges. For instance, many asset managers typically pre-fund their FX transactions, and the volumes in CLSSettlement are comparatively lower.

As more regions explore same-day settlement, there will be increasing pressure on liquidity and post-trade infrastructure.

We already see same-day flows from the sell side in CLSNet, our bilateral payment netting calculation service.

We are onboarding buy-side firms and expect same-day values to rise. More generally, we have seen significant growth on the CLSNet platform, with eight of the top ten global banks having joined the platform.

The upcoming Bank for International Settlements Triennial Central Bank Survey of foreign exchange and over-the-counter (OTC) derivatives markets will provide further insights into FX trading volumes and other industry topics, such as settlement risk.

Do you believe that T+0 is the next logical step for securities?

T+0 may eventually become a reality, but it's still far off. The FX market convention is T+2, and many participants — especially smaller corporates and smaller asset managers — are not equipped to handle same-day settlement.

Instant or "atomic" settlement is often discussed in the context of central bank digital currencies or tokenised assets. Although those ideas are gaining traction, they often overlook the liquidity and efficiency benefits of multilateral netting, such as those offered by CLSSettlement. Our netting efficiency is on average over 99%, meaning that for every USD100 in gross value, less than USD1 actually needs to be settled. In an atomic settlement model, everything must be funded in full, and without the benefit of multilateral netting, this approach is likely to be less efficient and more expensive for market participants.

For this reason, we believe CLS continues to play a crucial role at the centre of the FX market, not only addressing the systemic risk challenges within the FX industry but also delivering tangible business benefits in the process.

Singapore:

Building Asia's electronic FX trading hub

Singapore's economy grew by 4.3 per cent on a year-on-year basis in the second quarter of 2025, extending the 4.1 per cent growth in the previous quarter. On a quarter-on-quarter seasonally-adjusted basis, the economy expanded by 1.4 per cent, a turnaround from the 0.5 per cent contraction in the first quarter of 2025. But this growth tells only part of the story as Vivek Shankar discovers.



Vivek Shankar

Behind the numbers, a fundamental rewiring of financial markets is taking place as algorithms replace human voices, milliseconds matter more than relationships, and digital assets emerge from experimental margins into institutional portfolios.

Christopher Johnson, Head of Asia at DIGITEC, has witnessed this transformation firsthand. "The Monetary Authority of Singapore (MAS) plays a key role in shaping this environment. They've outlined a very clear vision in their Financial Services Industry Transformation Map 2025, which positions Singapore as the global price discovery and liquidity hub for FX during Asian hours."

Meanwhile Kenneth Ho, Global Head of eFX Sales at MUFG, emphasizes how this regulatory environment has created a positive cycle for market development. "Singapore has always had a business-friendly regulatory environment that attracts global investment. Specific to FX, the regulators have been extremely supportive of developing this space," he explains.

The human capital benefits have been equally significant. "On the human capital front, the well-established FX ecosystem has resulted in a strong talent pool which then creates a

"On the human capital front, the well-established FX ecosystem has resulted in a strong talent pool which then creates a virtuous cycle for the development of e-FX markets in Singapore,"



Kenneth Ho

virtuous cycle for the development of e-FX markets in Singapore," Ho notes. This is a blueprint for capturing the future of finance while traditional financial centers struggle to adapt. The question isn't whether electronic trading and digital assets will reshape global markets, but whether other financial hubs can match Singapore's pace of innovation before it's too late.

THE REGULATORY FOUNDATION

Singapore's competitive advantage in building next-generation trading infrastructure stems from a regulatory philosophy that fosters innovation

rather than just managing risk. Johnson's observation about MAS's strategic vision reflects a broader regulatory approach that has fundamentally changed how financial innovation develops in Singapore. "MAS is also very FinTech-friendly," he says. "They've launched initiatives like the Global Finance and Technology Network to support growth and innovation in the FinTech space. Their balanced regulatory approach and support for FX and FinTechs is well regarded worldwide."

This regulatory philosophy has created measurable momentum in digital asset adoption among institutional players. Nick Strain, Director of Institutional Sales at LMAX Digital based in Singapore, explains: "Institutional traders and investors in Singapore have shown a much higher level of interest in the digital asset space over the past 12-18 months, moving from cautious exploration to active engagement."

The shift reflects regulatory developments that extend beyond

Singapore's borders. "This surge is driven from a few angles: firstly, the regulatory clarity that is emerging in the USA which is flowing into other jurisdictions. Secondly the success of the ETF product and global desire for portfolio diversification and finally, the acknowledgement that the potential efficiency gains offered by tokenisation of real-world assets is likely to be a net beneficiary to the financial industry in the APAC region"

In 2024, MAS issued licenses to 13 virtual asset service providers including exchanges Gemini, OKX, and South Korea's Upbit, demonstrating how clear frameworks translate into business opportunities.

However, the regulatory support extends equally to traditional FX market evolution, creating an integrated approach that enables firms to build capabilities across both asset classes.

The result is what Johnson describes as a trusted, flexible, and collaborative regulatory environment that actively welcomes FinTech providers. "For companies like DIGITEC, this means real opportunities to innovate, integrate, and scale FX and pricing solutions within one of the world's most advanced financial hubs," he says.

This regulatory foundation is just one pillar of Singapore's competitive positioning. Geography and infrastructure investment have created what Ho describes as a compelling value proposition for global electronic trading operations.

"From a geographical perspective, Singapore's location provides lower latency for users in Southeast Asia connecting to the rest of the world. Coupled with the initiatives to attract



Singapore's competitive advantage stems from a regulatory philosophy that fosters innovation rather than just managing risk

Your gateway to the global FX ecosystem, empowered with cutting-edge technology

SGX FX brings innovation to the global FX ecosystem - from accessing wide liquidity pools in both OTC and Futures markets, to customising cutting-edge workflow solutions for the buy and sell-side, our comprehensive offerings are designed to help you stay ahead of the curve.

Singapore Exchange

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"The increase in non-deliverable forward (NDF) trading in Singapore has been driven by a combination of regulatory support, technological advancements, and growing market participation,"



Brian Andreyko

infrastructure investment, Singapore has become a choice location for firms setting up their regional electronic trading hubs," Ho explains. This geographic advantage has coincided with a fundamental shift in global market dynamics. "We have seen increased relevance and importance of the Asian time zone for global FX execution over the past years with many global market moving events occurring during Asian hours," Ho observes.

The response from market participants has been substantial. "We've also seen increased interest to trade Asia markets from both Asian and non-Asian market participants. Liquidity providers have grown their eFX presence both in infrastructure capabilities and human resources during the Asian time zone to meet this demand. Singapore being one the main hubs for FX sees a lot of that investment and development, especially in the e-FX space," he notes.

THE NDF REVOLUTION

The regulatory foundation that attracted digital asset providers has simultaneously enabled a transformation in one of foreign exchange's most traditional segments: non-deliverable forwards. Brian Andreyko, Chief Product Officer at Edgewater, describes the convergence of factors driving this evolution. "The increase in non-deliverable forward (NDF) trading in Singapore has been driven by a combination of regulatory support, technological advancements, and growing market participation," he says.

The infrastructure development has been particularly strategic. "A significant contributor to this growth is the increased participation in SG1, Singapore's primary FX trading hub, where major liquidity providers and electronic trading platforms are co-located," Andreyko explains.

This co-location strategy has enabled what he describes as "enhanced

trading efficiency and attracted global market participants seeking lower latency and better price discovery during Asian trading hours."

Matt DellaRocca, Global Head of Liquidity at LMAX Exchange, has observed similar momentum from institutional buyers. "We are seeing growing interest from the buy side, and as liquidity pools deepen and algorithmic execution becomes more sophisticated, we expect to see even greater adoption of NDF trading," he notes.

The shift reflects a broader market maturation where "the ongoing evolution of technology will also play a vital role in driving efficiency which will continue to push demand for NDFs."

LMAX Group launched FX NDF trading in Singapore and London in June 2024, with global NDF trading almost doubling from \$134bn to \$266bn between 2016-2022. DellaRocca emphasizes the strategic importance of this expansion: "While the move toward electronification of NDF trading is slower than anticipated, we are addressing this by expanding liquidity offerings, particularly through initiatives like the launch of the LMAX Exchange Singapore (SG1) NDF matching pool."

Edgewater has taken an even more comprehensive approach to infrastructure development. "As one of the earliest firms to commit to the electronification of NDF markets, Edgewater established a low-latency pricing and matching engine in Equinix SG1, co-located with major FX venues and clients in Singapore," Andreyko explains.

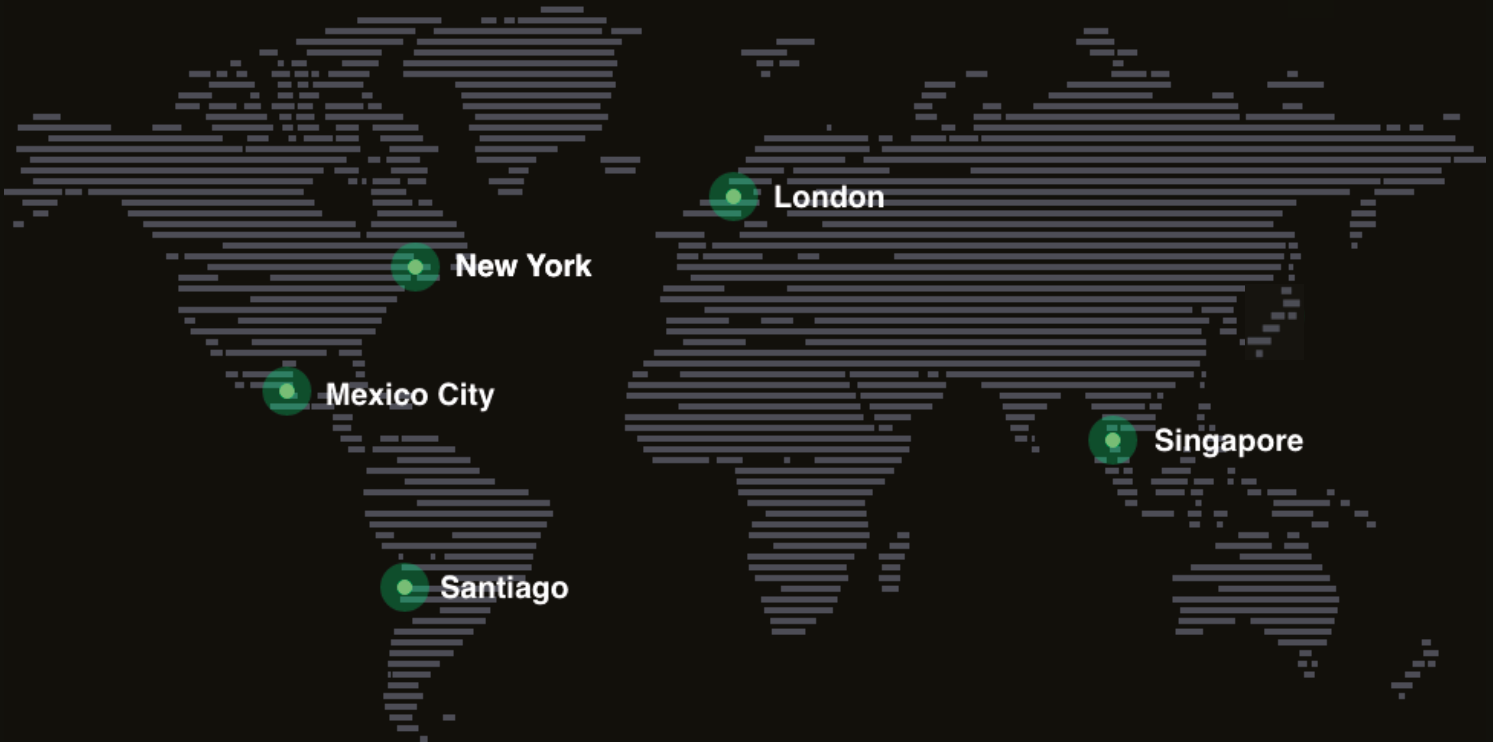
The firm has also expanded beyond Singapore's borders, establishing "AWS data centers in onshore markets like



Nick Strain

"Institutional traders and investors in Singapore have shown a much higher level of interest in the digital asset space over the past 12-18 months.."

EDGEWATER



Listed FX in Singapore: Where global uncertainty meets Asian liquidity

"The transparent, open, and deep liquidity of SGX's listed FX futures makes us a vital price discovery and formation venue, especially during periods of market stress and volatility,"



KC Lam

volumes have surged toward SGX's FX futures platform in ways that underscore Asia's growing centrality to global currency markets.

KC Lam, Global Head of FX and Rates at SGX Group, cites numbers that tell the story: total FX futures volume in FY 2025 has jumped to 48% year-on-year to a record \$4.9 trillion, positioning SGX as the world's largest and most liquid marketplace for Asian FX futures.

THE LIQUIDITY MAGNET EFFECT

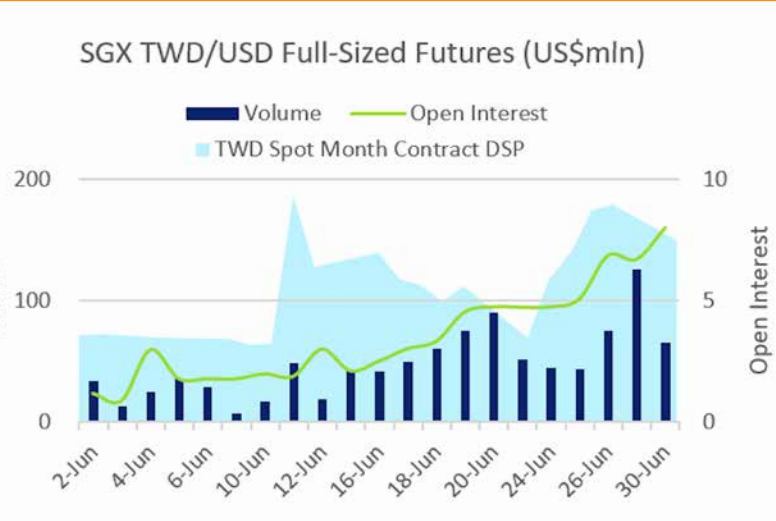
The surge demonstrates how modern currency markets concentrate around reliable

infrastructure during periods of stress. Lam describes the phenomenon driving SGX's growth: "As liquidity attracts more liquidity, we have seen strong and growing interest from a diverse range of new market participants, including buy-side firms, asset managers, hedge funds, banks and commodity trade advisors."

This participant diversification has created what Lam characterizes as a "reliable anchor for risk management" that becomes more valuable precisely when markets become unstable. "Deep liquidity with a broad and growing participant base means that, especially during periods of market stress and volatility, liquidity tends to concentrate—making SGX a safe harbour for global participants seeking stability, transparency, and efficient price discovery."

The global nature of this liquidity concentration is reflected in SGX's trading patterns. With about 40% of FX futures traded during U.S. and European hours, the platform has evolved into a true 24-hour infrastructure.

"Our near-24-hour trading venue across global time zones is critical—especially as market-moving events, such as Liberation Day tariffs, can occur at any time," Lam notes. The result is that SGX's flagship USD/CNH and INR/USD contracts now



Heightened market volatility-driven activity, together with SGX's timely tick size change has enhanced overall trading dynamics on SGX TWD/USD Full-sized Futures, pushing daily average volume to a record USD 48 Million



Singapore Exchange is the cornerstone of Asia's FX trading ecosystem

rank among the top 10 most-traded FX futures globally, cementing the exchange's role in global risk management infrastructure.

LISTED-OTC CONVERGENCE

The liquidity concentration at SGX shows how OTC FX markets are becoming increasingly integrated, creating new efficiencies that benefit both sides. "As SGX's FX futures are used as a source of price discovery, more market participants including banks and liquidity providers are increasingly incorporating market data of our USD/CNH and INR/USD futures into their pricing engine and trading strategies," Lam explains.

This convergence enables sophisticated risk management that wasn't possible when markets operated in isolation. "Access to deep liquidity and market depth in listed FX markets enables OTC participants to transfer risk anonymously, without information leakage," Lam notes. "For some exchange participants, this convergence also allows them to tap into OTC liquidity for some of the less liquid listed FX contracts, enhancing execution flexibility." SGX's approach to facilitating this integration shows how exchanges can actively drive market evolution

rather than merely respond to it. A key example emerged with the enhancement of CNH FX futures contracts.

"We transitioned the Final Settlement Price reference to Bloomberg's BFIX and aligned the publication time with OTC FX options expiry," Lam explains. "This significantly reduced basis risk and improved price certainty, enabling more effective hedging between listed and OTC markets."

The impact was immediate: CNH contract volumes and open interest surged, reaching a record \$22 billion in June 2024.

SINGAPORE'S STRATEGIC POSITION

These developments position SGX as critical infrastructure supporting Singapore's emergence as Asia's FX hub. The exchange's global rankings reflect this strategic importance: SGX's USD/CNH and INR/USD FX futures rank number two and number eight globally by daily average volume, while SGX FX ranks among the top five global exchange-backed OTC FX platforms.

"The transparent, open, and deep liquidity of SGX's listed FX futures

makes us a vital price discovery and formation venue, especially during periods of market stress and volatility," Lam observes. This price discovery function supports the broader development of Asian currency markets by providing reliable benchmarks for OTC participants.

The combination of Singapore's regulatory framework with SGX's market infrastructure creates what Lam describes as conditions where "continuous innovation ensures its offerings remain aligned with evolving market needs."

THE INFRASTRUCTURE ADVANTAGE

As macro uncertainty continues to drive demand for transparent price discovery and efficient risk transfer, exchanges like SGX – which is the largest regulated exchange for Asian currency futures – that can provide both deep liquidity and regulatory certainty gain significant influence.

"These efforts, combined with Singapore's strong legal and regulatory framework, strategic location, and globally diverse participant base, position SGX as the cornerstone of Asia's FX trading ecosystem," Lam says.

"The Financial Services Industry Transformation Map 2025, positions Singapore as the global price discovery and liquidity hub for FX during Asian hours."



Christopher Johnson

India and South Korea" to bridge offshore and onshore liquidity more effectively.

BEYOND VOICE TRADING IN FX SWAPS

While NDFs represent one side of the market's evolution, the developed currency FX swaps market tells a parallel story of electronic transformation driven by different but equally compelling forces. DIGITEC's Johnson has witnessed this evolution among regional banks looking to keep pace with electronic demands. "We're seeing growing demand for FX Swaps globally, and Singapore is at the heart of that trend. Wider interest rates differentials and a greater need to hedge long-dated FX exposure are key drivers," he observes.

The technological gap has become a competitive liability for many institutions. "This market evolution has led to banks of all sizes in Asia to look at whether their FX Swaps technology is fit for purpose. If a bank publishes an inaccurate price, it can lose money very quickly," Johnson explains.

The consequence has been a focus on better control of pricing along the forward curve "through the

implementation of more advanced and faster pricing engines."

The scale of manual processes still prevalent in the market represents both a risk and an opportunity. "Client demand has led many regional banks to support more currencies and in doing so they are looking to upgrade their current technology," Johnson notes.

"Historically, many of these regional banks used Excel supported by numerous manual steps. That is just not sustainable any more—especially when clients are quoting across multiple dealers and regularly measuring quote quality," he explains. What have the results of electronic adoption been? "Over the past year, we've seen a 15% increase in client adoption, largely thanks to regional banks modernising their approach and getting more competitive in the FX Swaps space," Johnson says.

This shift toward technology-driven execution reflects broader changes in client expectations that extend beyond infrastructure alone. Ho at MUFG has observed a fundamental evolution in how institutional clients evaluate their FX execution partners.

"Buyside firms are focusing a lot more on the quality of liquidity as opposed to just the quantity of liquidity. They are more selective of who they include on their panel as an e-FX liquidity provider and requirements go beyond just a competitive price," he explains. The demand for transparency has become particularly acute.

"Buyside firms want more transparency to understand how

their flow is being managed by their providers as that can impact the overall transaction cost. Topics like internalization ratio, liquidity venues and market impact are actively discussed," he notes. This focus on execution quality has driven interest in more sophisticated trading strategies.

"In addition, we have also seen a lot more interest in execution strategies such as algorithmic FX trading. Buyside firms are increasingly interested in managing their own execution risk to reduce transaction costs. By utilizing these algos, buyside firms can leverage e-FX providers' technology and connectivity to liquidity sources to access deeper pools of liquidity and reduce their overall market impact," Ho observes.

This transformation reflects broader market pressures where traditional relationship-based trading is giving way to technology-driven efficiency and transparency.

DIGITAL ASSETS ENTER THE INSTITUTIONAL MAINSTREAM

Electronic trading advances in traditional FX may have provided the infrastructure foundation for institutional digital asset adoption. However, the drivers behind crypto adoption represent a distinct shift in institutional investment philosophy. Strain has observed this transformation accelerate dramatically over the past 18 months. "Surveys indicate that a significant majority of institutional investors in Asia have increased their exposure to digital assets, with a strong intent for continued investment," he notes.

The institutional infrastructure required to support this adoption has materialized rapidly. "Major financial players like LMAX Digital, DBS, UBS Asset Management, and Sygnum Singapore are at the forefront, actively

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Building regional fintech dominance through global standards

Singapore's fintech ecosystem has produced an unexpected phenomenon: companies that achieve regional dominance while maintaining global capabilities. The city-state's unique combination of regulatory support, infrastructure investment, and strategic positioning has created conditions where financial technology firms can scale across Southeast Asia without sacrificing institutional-grade standards.

Devang Bhatia, Chief Revenue Officer of Spark Systems, has witnessed this evolution firsthand. "By design Spark was built to service global clients but with near to home opportunities over the last 7 years has become a regional force with global FX infrastructure and

capabilities," he explains.

The trajectory reflects Singapore's emergence as a fintech launchpad that enables global ambitions through regional strength.

REGULATORY PHILOSOPHY

Singapore's competitive advantage in fintech is rooted in a regulatory philosophy that actively encourages disruption. Bhatia credits the Monetary Authority of Singapore with a fundamentally different approach to innovation compared to other financial centers. "The Monetary Authority of Singapore has continuously backed innovative solutions, firms and entrepreneurs who challenge the status-quo," he observes.

This regulatory backing has created tangible business opportunities that extend beyond Singapore's borders. In the past 6-12 months, Bhatia notes that "regional venues and exchanges" have approached Spark specifically for their OTC FX infrastructure and electronic matching capabilities.

The validation from established market infrastructure providers signals that Singapore's regulatory

environment has enabled fintech firms to build institutional-grade capabilities that can compete directly with traditional fintech providers.

The city-state's regulatory framework provides what Bhatia describes as a "conducive environment for fintech companies to thrive," combining innovation support with the legal certainty that institutional clients require. This balance has proven particularly valuable for firms like Spark that serve sophisticated clients including regional banks, hedge funds, and corporate treasuries across Asia.

TECHNOLOGY ADOPTION AND INNOVATION

Singapore-based fintech firms have become technology laboratories for the broader Southeast Asian market. The region's appetite for next-generation solutions has created demand that extends far beyond basic digitization.

"There is significant interest in next-generation technologies such as AI, ML, and Blockchain among regional FX ecosystem participants," Bhatia explains. "These technologies are being increasingly adopted to enhance trading strategies, improve risk management, and streamline operations."

Bhatia's team has moved beyond pilot programs into production



Singapore-based fintech firms like Spark have become technology laboratories for the broader Southeast Asian market

deployment: "At Spark we see continuous product innovation through inhouse idea generation and client feedback loop. These ideas have been put in production using AI & ML for both pre-trade and post trade analysis for example at several clients."

Meanwhile, mature cloud technologies have become foundational infrastructure rather than competitive differentiators. This combination of established and emerging technologies positions Singapore fintech firms to offer sophisticated solutions while maintaining cost efficiency—a critical advantage when competing across price-sensitive regional markets.

MARKET OPPORTUNITY AND DEMOGRAPHICS

The technology capabilities developed in Singapore's supportive environment align perfectly with regional demographic trends that favor digital-first financial services. "Singapore and the Southeast Asia region present exciting growth

prospects for banking, trading, and emergent digital FX services due to their young and tech-savvy populations," Bhatia observes.

The region's digitally literate audience demands financial solutions that match their technological sophistication, creating a virtuous cycle where Singapore-based firms develop advanced capabilities for local markets that scale across the broader region.

The demand for automation has become particularly pronounced across FX operations. "We have seen more demand from local and regional clients for automation across FX operations," Bhatia explains. "With Spark advanced algorithms for execution and risk management we have helped design solutions to digitize their (client's) clients' experience and their internal processes."

This multi-layered digitization, serving clients who themselves serve increasingly digital-native customers, represents the kind of scalable

opportunity that Singapore's fintech ecosystem is uniquely positioned to capture.

FROM LOCAL HUB TO REGIONAL POWERHOUSE

Singapore's fintech success story boils down to building an ecosystem where regulatory support, technological infrastructure, and market opportunity converge to enable regional expansion at global standards.

Bhatia's experience reflects a broader pattern emerging across the city-state's financial technology sector: firms that leverage Singapore's advantages to build regional networks while maintaining institutional-grade capabilities.

"Our presence in the region allows us to tap into this dynamic market and drive growth through continuous innovation," he notes. As Southeast Asia's digital transformation accelerates, Singapore's fintech firms are positioned not just to serve this growth, but to shape it.



Devang Bhatia

"There is significant interest in next-generation technologies such as AI, ML, and Blockchain among regional FX ecosystem participants,"

Singapore: Building Asia's electronic FX trading hub

"We are expanding liquidity offerings, particularly through initiatives like the launch of the LMAX Exchange Singapore (SG1) NDF matching pool."



Matt DellaRocca

launching platforms to create a market structure that is regulated and of an institutional grade such that the industry can evolve from its retail roots," Strain explains.

This represents a fundamental shift from experimental pilot programs to operational trading infrastructure. MAS has been instrumental in enabling this transition through comprehensive regulatory frameworks. "MAS has been proactive in establishing a clear and robust regulatory framework under acts like the Payment Services Act and

Securities and Futures Act," Strain observes.

MAS also clarified in June 2025 that Digital Token Service Providers serving only offshore customers would require licensing from June 30, 2025, with the regulator setting the bar high for approvals.

This regulatory approach has created what Strain characterizes as "a comprehensive approach [that] has encouraged greater participation by institutions, positioning Singapore as a leading hub for institutional access to the rapidly evolving digital asset market."

This infrastructure development is serving as the foundation for integrating digital assets into mainstream institutional portfolios and trading operations.

THE TECHNOLOGY INFRASTRUCTURE RACE

The convergence of traditional FX electronification and digital asset adoption has created unprecedented

demands on trading infrastructure. Institutions have to rebuild technology stacks to handle both asset classes at an institutional scale. Johnson describes the sophistication now required: "The big focus is on automation and control. Firms want to streamline their workflows—reduce manual processes, improve accuracy, and ultimately deliver better pricing to their clients."

The technical requirements extend far beyond basic connectivity. "Many banks in the region are looking to establish more accurate and sophisticated pricing engines, which can price along the forward curve in multiple currencies, and update automatically as market data updates," Johnson explains.

The complexity stems from market velocity, he continues: "E-trading, automated workflows and the growth of matching platforms, combined with more electronic trading have led to enhanced access and transparency driving up volumes and P&L."

Edgewater has addressed these infrastructure challenges through what Andreyko describes as comprehensive technology rebuilding. "Edgewater has launched a suite of electronic trading



Singapore is becoming a leading hub for institutional access to the rapidly evolving digital asset market



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products and services tailored to meet the evolving needs of the market. These include EdgeFX RFQ, the first anonymous, credit-intermediated request-for-quote platform specifically designed for emerging market currencies," he explains.

The credit and connectivity solutions represent perhaps the most complex infrastructure challenge. "A key differentiator has been Edgewater's ability to bridge onshore and offshore liquidity through smart credit intermediation solutions. By centralizing counterparty credit via a single prime broker relationship, the firm removes the need for complex bilateral ISDA agreements," Andreyko notes.

DellaRocca notes that better infrastructure and initiatives like the ones underway at LMAX translate to market efficiency: "By providing a trading environment that offers greater transparency and efficiency, liquidity improves, driving tighter bid-offer spreads, reducing trading costs and therefore attracting more participants to the market."

THE INTEGRATED FUTURE

The transformation Singapore has orchestrated across both traditional FX and digital assets points toward a future where the distinction between asset classes becomes less relevant than operational excellence.

Andreyko at Edgewater sees this convergence accelerating: "The future of electronic NDF trading looks increasingly dynamic, with several key trends set to accelerate its growth. One of the most significant shifts is the market's gradual move toward Deliverable Forwards, particularly in emerging markets where regulations are evolving to allow more onshore currency access."

Johnson's team at DIGITEC has built technology specifically for integrated workflows. "In response to client demand—especially from Singapore and the Asia-Pacific region—we built D3 Channels, which is designed for banks where traders and eFX businesses are responsible for distributing prices to clients," he explains. The platform "allows traders

to establish easily maintainable, rule- and scenario-based logic that automates pricing decisions based on tier, volume band, and destination." This automation is the foundation for scaling operations and increasing efficiency. "By providing greater control and visibility, the service enables trading desks to scale their operations, moving higher volumes to electronic trading channels," Johnson notes.

Andreyko summarizes the broader implication: "Providers that offer integrated execution, credit, and clearing services—like Edgewater Markets—will play a central role in enabling this evolution and supporting the market's shift from voice to screen across both onshore and offshore flows."

Ho at MUFG sees significant room for continued expansion. "With traditional FX execution, we will see more development in execution quality and transparency. We will see more focus on algo execution, transaction cost analysis, data analytics and unique liquidity sources," he explains.

The evolution goes beyond pure execution to comprehensive workflow solutions. "In addition, there is also a focus on connectivity and workflow solutions, especially with the growth of cross border payment. There is a strong demand for e-FX solutions that addresses not only the execution of foreign exchange but the entire front-to-back workflow of the transaction," he notes.

Given all of these developments, Singapore hasn't just built a better trading infrastructure. It has created the template for how modern financial markets operate in an increasingly digital world.



Singapore's digitally literate audience demands financial solutions that match their technological sophistication



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From aggregation to customisation: The next chapter in e-FX

By Andrea Sanna, Head of Execution & Liquidity Management at Alp Financial



Andrea Sanna

The e-FX market has entered a new era of sophistication, where once traders relied on simple liquidity aggregation. Today's most advanced players demand execution tailored to their specific needs, this shift from standardized workflows to customised solutions represents the next frontier in electronic trading. One where flexibility, transparency and strategic liquidity access separate the leaders from the pack.

THE LIMITATIONS OF TRADITIONAL AGGREGATION

For years aggregation technology served as the backbone of e-FX trading, consolidating prices from multiple liquidity providers into a single stream. While this approach brought efficiency gains it also created new challenges. Generic aggregated feeds often failed to account for crucial differences in execution requirements, for instance a high-frequency trading firm needing millisecond response times and an asset manager executing billion-dollar hedges.

The market gradually recognized that true execution quality depends on more than just accessing multiple price sources. It requires aligning those sources with specific trading objectives. This realization sparked the customisation revolution transforming e-FX execution workflows.

The need for more advanced aggregation logic created pressure towards solutions that have taken into consideration four main factors:

- Slippage
- Fill ratio
- Response time
- Market impact

With the arrival of tick-by-tick historical databases, execution algorithms analyzing incoming liquidity became capable of taking decisions on where to route an order based on the above parameters. In this respect the advent of live pre-TCA metrics offered traders the possibility to evaluate the potential costs of execution before using a specific source. The introduction of concepts like "cost of a reject" and "market impact of a liquidity source" opened the door to automation and smarter selection of providers. Allowing smart order routing and aggregation routines to not only have as a target beating the average cost of execution but also optimizing other aspects that do impact the overall cost of trading on the medium to long run.

These advancements at first saw their implementations into the most advanced logics of tier 1 banks and funds. But then, with time, these solutions became available to a larger audience of users, including Brokers and smaller non-bank liquidity providers and consumers.

THE CUSTOMISATION ADVANTAGE

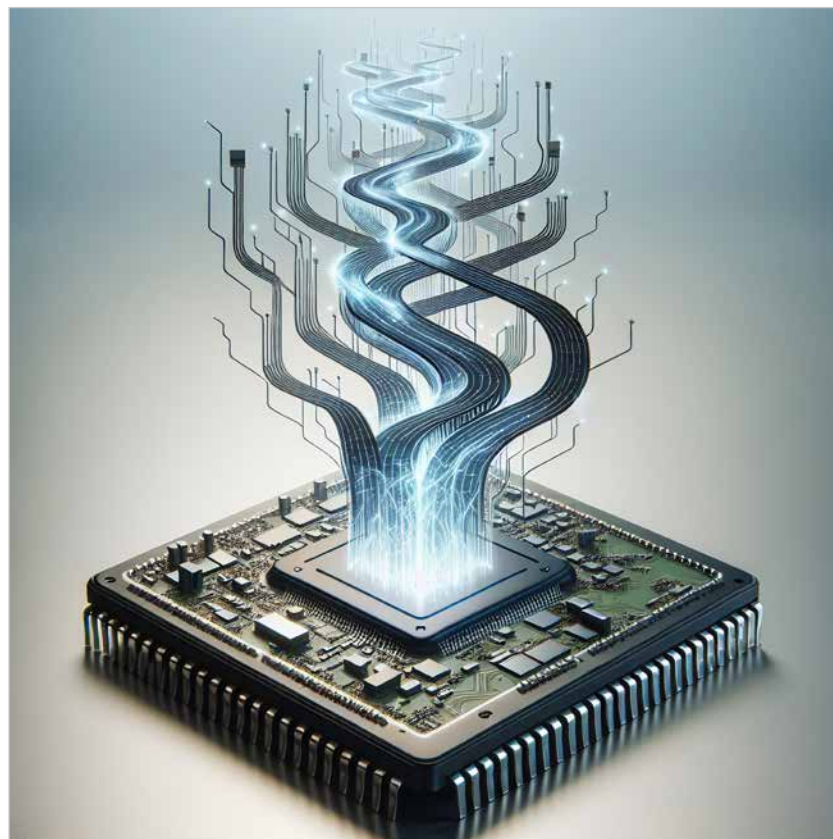
Modern customised e-FX solutions address aggregation's shortcomings through several key innovations. Adaptive smart order routing systems now incorporate machine learning to analyse historical fill rates, liquidity patterns, and market impact, adjusting execution strategies in real time based on both market conditions and client-specific benchmarks.

The introduction of dynamic and machine learning based logics to optimize execution parameters opened a new world in terms of customisation. If in the past it was the trader who put together a model that through a certain logic would monitor and execute within certain parameters, nowadays with the advent of artificial intelligence we are able to build routines that can learn from the past whilst having the capability of taking a decision in real time.

Customisation for an execution trader means more freedom in deciding how and where to execute, always having under control the overall cost of trading. With respect to this point, we do think that artificial intelligence and more advanced use of datasets at high frequency will optimize market efficiency by reducing at minimum the risk of information asymmetries.

The current tendency in the latest execution logic techniques is steering towards freeing more time for traders to allow them to focus on the big picture and key metrics. Leaving automated logics the freedom to dynamically balance execution and flag to the trading desk only situations that require their attention. In these terms the latest advancements are moving towards transitioning actions that in the past were considered "high-touch" to "low-touch" ones allowing Quant and e-FX Traders to draw their attention towards the overall trend and the efficiency and efficacy of their strategies.

In our view the future of e-FX Traders and Quants will be strongly focused on engineering how all these logics work together and collaborate. To allow on-the-fly dynamic reactions of trading engines to unpredictable situations, always leaving the door open to a high degree of customisation.



The exponential growth in computational power and the advent of much more powerful CPUs allow us to execute billions of small calculations in a fraction of a second

THE TECHNOLOGY BEHIND THE TRANSFORMATION

The shift to tailored e-FX execution rests on several technological pillars. Cloud-native architecture provides the scalability to support complex execution logic without latency penalties. Machine learning algorithms process vast datasets to identify liquidity patterns invisible to traditional systems. Advanced order types allow precise control over execution timing and market impact.

To be able to implement the above and support the exponential growth in the usage of large datasets technology had to make significant improvements. What we have seen in the last 10 to 15 years in the Information Technology field has no equals in any other field. Of course, at the backbone of the sharp increase in the quantity and quality of market data exchanged between peers is the quantum leap achieved in network performance. If we only think at what was possible

in terms of bandwidth and number of bits / second exchanged between two servers in the 90s compared to what we can do today this will give a clear picture of the magnitude of the improvements.

Second but not secondary, the exponential growth in computational power and the advent of much more powerful CPUs and memories together with smart hardware solutions allow us to execute billions of small calculations in a fraction of a second (see for example the large use of GPUs in HFTs between 2010 and 2018 and the evolution towards customised arrays of SOCs / FPGAs nowadays). The third significant factor is the evolution and improvement of databases in terms of their size but also of their speed. If we just think about the early 2000s where disk-based memories were the backbone of database storages whilst today all fast datacenters support tick-by-tick data backups that leverage the usage

of SSDs (solid state memories) this will give the sense of the improvement in terms of performance and speed of access to data. Finally, the advent of natural language processing allows data scientists to write a code that is capable, in low latency, to process large datasets and draw from those significant metrics and conclusions, allowing them to focus more on the data analysis and nature of the data instead of using their precious time on the complexities of coding.

The technology prevailing in the e-FX market nowadays reached its results not only thanks to the pressure within the electronic market itself but also from the progress brought by the large wave of adoption of fast processing protocols coming from Crypto trading and thanks to the development of large databases frameworks dedicated to the most different fields, like social networks and live streaming services (let's think for example at the ESP / streaming protocol or the TCP / IP vs the UDP network protocols).

BALANCING CUSTOMISATION WITH ROBUSTNESS

While the benefits are clear, effective customisation requires careful implementation. Over-optimization can create fragility during market stress events. Excessive personalization might limit access to natural liquidity.

The advent of automated and auto-correction logics based on AI are key today too, as mentioned above, allowing traders to look only at the full picture. We do think that the robustness of modern models if put in comparison to the early implementations of automated execution techniques excels in its capability of "self-correction" and dynamic recalibration. To make a comparison you can think of the early days, excel based, market making models (still in use in some



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THE ADVENT OF AUTOMATED AND AUTO-CORRECTION LOGICS BASED ON AI ARE KEY TODAY TOO

voice traded markets) where the optimization was continuously done manually by the trader, running some routines to “recalibrate” and obtain the products fair value. The market, after 2008, took a significant shift towards validated, database-based models where the trader is allowed to fully focus on the market monitoring and pricing whilst the underneath models optimize themselves and recalibrate automatically.

Today we are assisting at the latest evolution of this process where not only Quants together with e-FX traders develop underlying models but also make sure that these models are capable of fully complying with all the most challenging scenarios. Something that in the past was fully left in the hands of voice traders, where in difficult / choppy market conditions they would simply take over from the automated execution switching from auto-pricing (streaming) to either RFQ or voice pricing. Nowadays, instead the technology, at least for e-FX trading, is so advanced that the cases where manual intervention is needed are rare and generally require additional internal compliance justifications when they occur. In fact the robustness and trackability of the automated trading systems reached a point where manual

intervention is considered an outlier to standard business activity, this is observable extensively on the Buy Side where the adoption of Algos is becoming crucial for their day-to-day execution and fund allocation rebalancing.

HOW DO PRE-TRADE ANALYTICS SUPPORT SMARTER CUSTOMISATION?

In the context of the e-FX market, pre-trade analytics enable smarter customisation. By providing detailed insights into currency pair correlations, liquidity, volatility, and macroeconomic factors before a trade is executed. These analytics allow traders to assess market conditions, historical price trends, and potential risk exposures in real-time, helping to fine-tune trading strategies to specific currency pairs and market environments.

By leveraging advanced algorithms, traders can simulate different scenarios, optimize entry and exit points, and tailor trade sizes and risk management tactics based on individual preferences. This enables more personalized and informed decision-making, reducing slippage and improving overall trade performance in the highly dynamic and liquid FX market.

HOW ARE LIQUIDITY PROVIDERS ADAPTING TO THE NEED FOR BESPOKE CLIENT CONFIGURATIONS?

Liquidity providers are increasingly adapting to the demand for bespoke client configurations, by leveraging advanced technology and flexible infrastructure. They are investing in customizable APIs, modular trading platforms, and data-driven execution strategies that allow for tailored pricing, risk management, and settlement solutions to meet specific client requirements. This shift is driven by growing expectations from institutional clients for personalized services that align with their trading strategies, regulatory obligations, and operational workflows. Many liquidity providers are enhancing their client onboarding processes and analytics capabilities to better understand and respond to individual needs in real time, ensuring they remain competitive in an ever evolving, client focused market.

THE ROAD AHEAD

The future of e-FX lies in even more granular customisation. We're already seeing early adoption of predictive liquidity provisioning: systems that forecast liquidity shortages before they occur. Cross-asset optimization is another frontier, where FX execution automatically adjusts to portfolio-level requirements.

As the market continues to evolve, one truth becomes increasingly clear: in the era of customised e-FX, competitive advantage goes to those who are knowledgeable enough to precisely match their execution framework to their strategic objectives.

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Achieving exponential growth and success:

Examining the benefits of undertaking a more collaborative approach between FX brokers and their liquidity providers

As the relationship between FX brokers and their liquidity providers has evolved, the benefits of closer collaboration have become ever more clear. The good news for these key market participants, as Paul Golden discovers is that there is much more to come.



The purpose of the relationship between FX brokers and their liquidity providers is primarily for the latter to understand the broker's business and how the two parties can work together. This can be understanding the profile of flow the broker sends so that the liquidity provider can tailor their liquidity offering accordingly and determine whether there are other opportunities to work together. The liquidity provider can also deliver feedback on where the relationship is and isn't working and where it could be improved so that in time it can improve its offering, which in turn strengthens the offering a broker can provide.

"Human interaction between brokers and LPs is of paramount importance," says James Gavin, head of trading Europe at iSAM Securities. "With so much of the business as usual being electronic, close interaction on how technology-driven operations are evolving is key. The relationship between LPs and brokers is geared towards informing their respective technology driven offerings to maximise the success of the relationship," he says.

Traditionally, the relationship between brokers and liquidity providers was largely transactional. Liquidity providers streamed prices, brokers passed them on and spreads were the primary commercial lever.

A MORE STRATEGIC PARTNERSHIP

But that model has evolved. Now the relationship is more strategic, with brokers actively managing their downstream flow and aligning client types with the right liquidity providers to ensure flow quality. In return, liquidity providers offer more tailored pricing and improved execution. This mutual alignment benefits both sides: brokers gain more competitive

pricing and liquidity providers receive cleaner, more predictable flow explains Andrea Michael, director of institutional sales at StoneX Pro.

"Scale still matters - brokers need sufficient volume to aggregate meaningfully - but quality of flow is just as critical," she says. "Occasional misalignments between client, broker and LP interests still arise but they are manageable with the right structure." The relationship between FX brokers and liquidity providers is commercially driven and mutually beneficial. Brokers depend on liquidity providers for deep liquidity, competitive pricing and reliable execution, enabling them to serve clients efficiently.

In return, liquidity providers benefit from steady client flow, which allows them to generate revenue through transaction cost analysis - capturing value from spreads, financing and commissions, while also supporting effective risk management through flow internalisation and portfolio balancing.

Paul Jackson, head of sales at Finalto observes that the shift to technology-driven liquidity provision has made interactions between brokers and liquidity providers more data-led and focused on performance.

"Brokers now use tools like TCA, smart order routing and real-time analytics to monitor LP performance and optimise execution," he says. "At the same time, retail clients have become more sophisticated, often using automated trading models. This has increased the risk of toxic or predatory flow, which can damage relationships with LPs and negatively impact pricing."

GOING WITH THE FLOW

As a result, brokers can no longer rely solely on liquidity providers to manage flow quality. They must act as the

"The relationship between LPs and brokers is geared towards informing their respective technology driven offerings to maximise the success of the relationship."



James Gavin

first line of defence by implementing robust analytical and surveillance tools to protect their liquidity and maintain healthy execution conditions.

Liquidity provision in FX brokerage operations has evolved into a more complex and technology-driven operation. So how has this impacted brokers' interaction with liquidity providers?

"Technology has transformed liquidity provision from a reactive process into a



Andrea Michael

"Brokers now use advanced analytics and aggregation platforms to better understand their flow and match it with the most appropriate LPs."

strategic, data-led discipline," observes Michael. "Brokers now use advanced analytics and aggregation platforms to better understand their flow and match it with the most appropriate LPs. This has improved execution quality, pricing, and transparency." Internally, brokers are also working to consolidate FX risk across desks and business lines - a task that was once hindered by data silos.

With enterprise-level infrastructure this is becoming more achievable, says Michael. "Technology also helps brokers identify problematic flow before it reaches LPs, preserving pricing integrity and relationships. We have embraced this shift, leveraging outsourced technology and analytics to enhance our liquidity management and deepen collaboration with our Tier 1 LP network."

Liquidity providers are central to the FX market's structure. Their primary role is to quote two-way prices and absorb client flow, which supports price discovery and market stability, especially during periods of volatility. Liquidity providers manage their own risk through internalisation, hedging and inventory control, tailoring pricing based on client type and flow quality. As the market has matured, they have become more sophisticated and now compete not just on price but also on responsiveness, technology and service.

As Michael notes, they offer customised streams for brokers, tighter

spreads for institutional clients and execution certainty for corporates. Market information highly valuable One of the key functions of a liquidity provider in the FX market is providing a relevant liquidity offering to its client that is mutually beneficial. Keeping clients up to date on important market developments and informing them of their direction and how they can help their clients evolve is also important. "As trading and business models evolve it is crucial to stay in close collaboration with LPs to ensure that the model is evolving in a beneficial manner to both parties," says James Gavin. "As one changes a model it often will have downstream impacts on the LP and this is where an LP can work with the broker to help make this evolution a success for both parties."

A higher number of touch points between a liquidity provider and broker deepens the relationship and allows the former to place a greater value on the business from the broker and offer a more competitive service. "When a broker has a closer relationship with its LPs, it will receive a more competitive offering," explains James Gavin. "This allows the brokerage to provide a more competitive offering in turn to its own clients and a better service."

Collaboration between brokers and liquidity providers varies significantly depending on where the broker operates on the agency-to-principal spectrum. Agency brokers - who pass orders directly to liquidity providers - require high levels of transparency and flow segmentation. In this model, liquidity providers focus on pricing precision and stream customisation. "Principal brokers, on the other hand, may warehouse risk and internalise flow, which introduces additional complexity," says Michael. "Their collaboration with LPs often involves broader pricing agreements and

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“While service should remain consistently high regardless of volume, increased volumes often lead to more advantageous commercial terms.”



Paul Jackson

deeper discussions around hedging and inventory management. LPs adjust their engagement accordingly, demanding detailed analytics from agency brokers and focusing on execution quality and risk alignment with principal desks.”

When asked to assess the benefits to brokers of forming closer, ‘one-stop-shop’ partnerships with liquidity providers in terms of access to capital, more competitive pricing and improved risk management, Michael observes that closer partnerships with liquidity providers offer brokers significant operational and commercial advantages.

“ These relationships can provide access to credit lines, clearing, and customised liquidity, all through a single account,” she explains. “ Brokers also benefit from access to multiple Tier 1 LPs and a wide range of currencies, which smaller firms may struggle to secure independently. Operationally, these partnerships reduce complexity.”

OUTSOURCING SIMPLIFIES BROKERAGE OPERATIONS

Brokers can outsource liquidity curation, technology infrastructure and the management of multiple banking and prime broker relationships. This streamlines onboarding, simplifies reporting, and consolidates margin requirements, improving capital efficiency.

The benefit to clients when their broker adopts this approach is a more efficient, cost-effective trading experience.

“ With a single relationship to manage, onboarding is faster and operational complexity is reduced,” says Michael. “ Margin is held in one place,

improving capital efficiency. Clients also gain access to deeper liquidity, tighter spreads and a broader range of currencies and asset classes - all through one platform. Execution quality improves as brokers can better curate liquidity and manage risk centrally.” She agrees that there is scope for liquidity providers and their FX brokerage clients to collaborate even more closely, an approach that has a number of implications for the FX market.

“ There is still room for deeper collaboration between brokers and LPs, particularly in the areas of product development, liquidity customisation and technology integration,” she says. “As brokers become more sophisticated and LPs more agile, the opportunity to co-create solutions that serve both sides is growing.”

Technology will be the enabler, but it is not just about systems – it is about understanding. “ Stronger personal relationships and clearer communication between brokers and LPs can unlock more tailored, responsive partnerships,” adds Michael. “ This kind of collaboration could reshape the FX market, driving more efficient pricing, tighter spreads and smarter segmentation.”

BESPOKE COLLABORATIVE APPROACH REQUIRED

The collaboration between brokers and their liquidity providers varies significantly depending on the trading and business model.

Dealing desk brokers don’t require consistent large scale liquidity but often need customised liquidity solutions to help manage and offset their risk. In contrast, brokers using STP or ECN models rely heavily on close, ongoing collaboration with liquidity providers, as liquidity provision is central to their operations.



Liquidity provision in FX brokerage operations has evolved into a more complex and technology-driven operation



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"Many brokers operate hybrid models that combine elements of both approaches," says Jackson. "Additionally, a broker's model can evolve over time due to shifts in business strategy, market conditions or regulatory pressures. In these situations, it is crucial for the LP to support the broker's ability to remain agile and adapt. This relationship is fundamentally a partnership built on trust."

With a close, durable relationship in place, the liquidity provider is likely to be able to offer enhanced credit terms, as well as bespoke liquidity designed to match the broker's business model and trading patterns, which ultimately can mean better pricing and tighter spreads.

"Indeed, while service should remain consistently high regardless of volume, increased volumes often lead to more advantageous commercial terms," suggests Jackson. "This is mutually beneficial, helping both parties strategically plan with estimated costs and returns. It also reduces duplication of costs, such as overnight financing, margin funding or operational risk management across LPs."

These are fundamental benefits. More broadly, a liquidity provider may be

able to offer an integrated 'one-stop-shop' partnership giving brokers access to advanced risk management tools and services, rich market data and solutions needed for greater transparency and compliance.

When brokers adopt this kind of one-stop-shop approach with their liquidity providers, clients may benefit in different ways says Jackson.

"Sometimes it's direct, tighter spreads and more reliable execution – in other cases, brokers will be able to pass cost saving efficiencies onto their clients. Access to a wider array of assets also benefits brokers and their clients. For brokers, this can help them stand out in a competitive market and for their clients, a richer and more flexible trading experience."

POTENTIAL TO GET CLOSER

When asked if there is scope for liquidity providers and their FX brokerage clients to collaborate even more closely - and how that would impact the FX market – Jackson reiterates that the broker's relationship with its liquidity provider often depends on the former's business model.

Beyond that, brokers also need greater awareness of the variety and flexibility of services available to them. Liquidity providers should work hard to articulate the value they bring, whether to established brokers or new businesses.

"Services such as white labelling, automation and tailored liquidity solutions can help brokers scale efficiently, diversify their strategies and manage rapid growth more efficiently and affordably," says Jackson. "Brokers should also be encouraged to take advantage of the enormous intellectual capital that their LPs can offer."

For instance, if brokers have a close relationship with their liquidity provider, they can leverage the latter's expertise in risk management. This may take the form of information sharing or even working together to develop more resilient and suitable risk management strategies.

"At the same time, LPs need to be sensitive to the evolving needs of their clients," he adds. "When I attend expos, I take the opportunity to listen closely to current and prospective clients. What challenges are they facing? What opportunities are they exploring? LPs need to be adaptable and responsive."

James Gavin recommends liquidity providers and FX brokerage clients engage as a partnership with a limited number of liquidity providers.

"Brokerages require more than one LP to create an efficient pricing stack and reduce reliance on operational issues but keeping this set up selective empowers LPs to deliver an improved offering," he concludes. "Only having a sole LP would require an incredibly stable set up and would be complex to achieve."

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The great crypto liquidity fragmentation problem and the path forward

By Chris Soriano, Chief Commercial Officer of Bridgeport.

DIGITAL ASSETS



Chris Soriano

Crypto's explosive growth is often painted as an unqualified success story. But as the ecosystem has matured across hundreds of chains and trading venues it has created what may be the most fragmented market structure in financial history. This fragmentation is not only becoming a structural drag on the efficiency gains digital assets were meant to deliver, it's a head scratching dilemma for TradFi firms looking to enter the space.

Existing market makers and institutional traders are increasingly vocal about this challenge. Unlike traditional markets, where liquidity tends to concentrate on a few primary venues, crypto liquidity is scattered across centralized exchanges, DEXs on multiple chains, and layer-2 networks. The result is a market in which finding optimal execution requires surveying an overwhelming number of jurisdictions - each with inconsistent depth, fees, rules and infrastructure. At this stage of crypto maturation, not only is liquidity hard to find, even something as simple as volumes for the bilateral OTC market are difficult to estimate because of the opacity. Anecdotal volumes are migrating to OTC, away from central marketplaces, to mitigate price impact for larger sized executions. If there are any lessons to take from the FX and fixed income markets, it's that bilateral trading is inevitable once the market

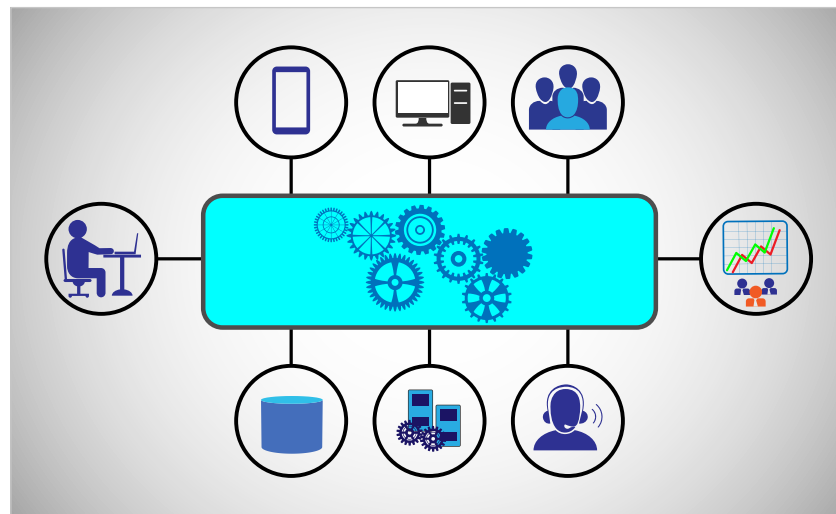
data is robust enough to serve as the price of reference.

THE INVISIBLE TAX ON EVERY TRADE

Liquidity fragmentation makes global price discovery almost impossible. It introduces persistent arbitrage opportunities that signal fundamental inefficiencies, and while this structure may benefit a small segment of clients (e.g. HFTs) it creates a broader problem from a market structure vantage point. Whereas in traditional forex markets, spreads are often measured in fractions of a basis point. In crypto, spreads can be significantly wider - due to spikes in volatility, but also because liquidity is so thinly spread across platforms that no single venue offers meaningful depth.

Consider what happens when an institution tries to execute a large Solana trade. SOL trades across dozens of venues - Binance, Coinbase, Kraken, Jupiter on Solana's native DEX ecosystem, Raydium, Orca, plus wrapped versions on Ethereum DEXs and other chains. The choice is between accepting poor execution on a single venue or attempting to manually coordinate execution across dozens of platforms. That process isn't just costly, it's operationally complex, prone to information leakage, and often results in delays. It's like trying to fill a swimming pool with water from across a hundred different buckets.

While OEMS arrangements solve for operational complexity, this dynamic forces participants to fragment their capital across numerous venues, resulting in thinner order books everywhere. Traders face wider spreads and thinner top of book inventory. This has a direct impact on price discovery. The only consistent winners are those willing to take on credit risk exposure from prefunding at exchanges profiting from this inefficiency. Essentially, the playbook is to bring a big balance



The path forward isn't further fragmentation or forced consolidation - it's intelligent middleware

sheet, take huge, unchecked risks, and capitalize.

THE INTEROPERABILITY TRAP

The industry's primary response has focused on interoperability performance theater: on the DeFi side; cross-chain bridges, asset wrapping protocols, and mechanisms to move tokens between blockchains. On the CeFi side, the jerry-rigged contraptions of custodial walled gardens with a couple of exchanges hitched were supposed to stand in for interoperability. These solutions addressed asset mobility but exacerbated liquidity fragmentation by multiplying the number of places where identical economic value can trade. Take USDC, which is now active across dozens of chains, each with its own set of DEXs, while also maintaining listings on centralized exchanges. Rather than consolidating liquidity, interoperability has resulted in the proliferation of isolated markets. We've solved for movement, but not for market depth.

Research on decentralized exchanges confirms what many already observe anecdotally: fragmentation undermines economic logic. Low-volatility pairs should naturally gravitate toward low-fee pools. Speculative trading should consolidate around deeper, faster venues. But scattered liquidity blocks prevent these natural dynamics from

playing out. The result is a market that defies its own incentives.

THE MIDDLEWARE SOLUTION

The path forward isn't further fragmentation or forced consolidation - it's intelligent middleware that makes fragmentation invisible to end-users while preserving the competitive and decentralized nature of the crypto ecosystem. Having been part of the institutional trading infrastructure evolution at CME's EBS platform, I've seen how proper market structure design can transform efficiency. The solution requires three core capabilities:

- Smart Order Routing: Advanced algorithms that evaluate pricing, liquidity depth, and execution probability across venues in real-time. This goes beyond price comparison to include slippage, settlement risk, and timing - delivering institutional-grade execution across fragmented markets.
- Unified Liquidity Aggregation: Virtual order books that combine depth from multiple sources, presenting traders with consolidated market views while maintaining competitive dynamics across individual venues.
- Cross-Venue Risk Management: Infrastructure enabling participants to provide liquidity across multiple venues while managing inventory and risk holistically rather than in isolated silos.

These tools don't eliminate fragmentation - they abstract it away. Done right, they allow traders to interact with a unified experience, even as liquidity continues to be distributed across chains, venues, and layers. Beyond crypto: The Future of all markets

This problem isn't unique to crypto. As traditional assets inevitably move on-chain through tokenized securities, stablecoins, or real-world assets the same challenges will emerge. Institutions expect efficient price discovery and predictable execution - if you've been around the markets a while then the word deterministic means something to you. If institutions encounter markets where identical assets trade at different prices across venues for no apparent reason other than poor infrastructure, they will understandably look elsewhere.

Crypto now has an opportunity to shape the market infrastructure for all assets. Traditional financial markets teach us that liquidity begets liquidity. The most liquid and deterministic markets attract the most participants, creating virtuous cycles. Crypto's fragmented structure breaks this cycle, potentially capping the ecosystem's growth at a fraction of its potential.

The companies solving this challenge today will define the plumbing that underpins tomorrow's markets. As the ecosystem continues expanding across new chains and asset classes, sophisticated aggregation becomes not just valuable but table stakes.

The choice is clear: accept permanent fragmentation as the price of decentralization or build infrastructure that delivers the best of both worlds - competitive, innovative markets with efficient, unified liquidity. The future of crypto trading depends on getting this right.



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