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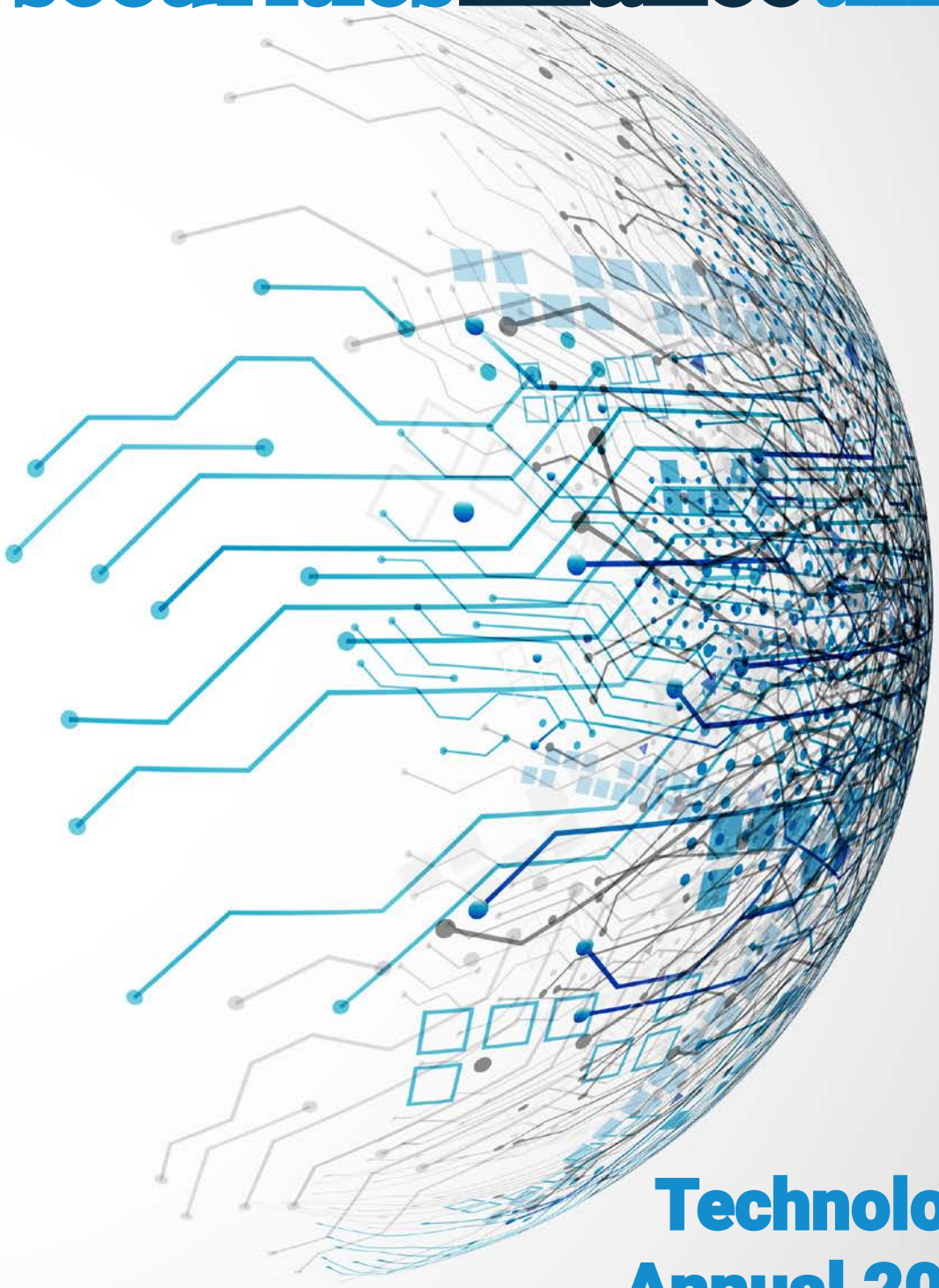

Technology Annual 2021

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Along came COVID

In 2019, the industry was unanimous in the belief that embracing new technology was the best route to remaining competitive and relevant in an increasingly global and heavily regulated market — and then along came COVID-19.

The pandemic disrupted everything from where and how trades were executed to client engagement and even the weekly team meeting. Almost overnight cloud systems were put to the ultimate test, while VPN networks and video conferencing accounts were hastily created to accommodate the latest 'new normal'.

More than a year since the western world began the great social experiment of remote working en masse, many readers will still be ensconced at make-shift desks, with many not due to be reunited with colleagues for several more months, at least.

Much like at the onset of previous market-shaking events, modern technology built the digital ark that allowed the securities finance industry to rise above much of the melee of trading volume spikes, margin calls, and managing a global financing programme from the dining room table.

As a result, several contributors to this annual focused on how remote working presents an opportunity to review long-ignored inefficiencies in internal processes and investments (or lack thereof) in digitisation and automation in order to continue to function.

2020 was meant to be a year dominated by several major regulatory roll-outs, and to an extent it still was. Contributors to this annual focused on how their teams and the industry are taking on the challenges posed by new regimes such as UMR, SRD II, SFTR and CSDR.

Pandemic or not, no technology annual worth its salt can ignore the increasing role of emerging technologies including artificial intelligence, machine learning and DLT — if indeed they can still be seen as 'emerging' — and this journal does not disappoint.

We present the latest insights from firms at the cutting edge of all these technologies to review the past year's developments and also look ahead at what's to come.

Regardless of your place in the market and your areas of interest, if it relates to technology in securities finance, we've got you covered.

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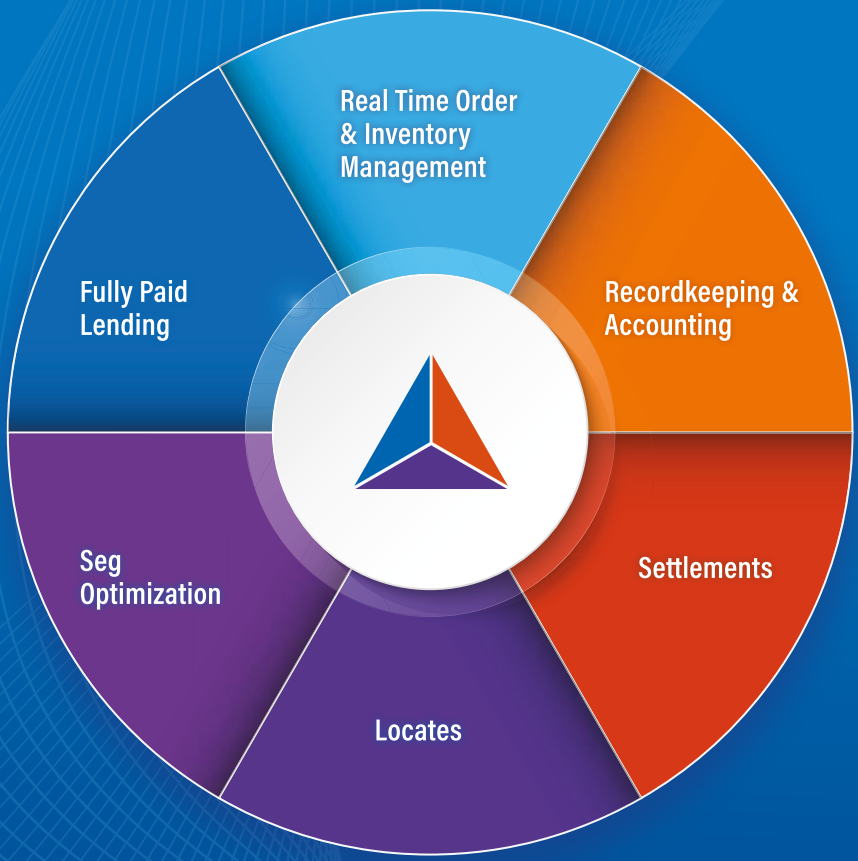

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Accelerating Collateral Mobility

Frictionless ownership transfers of assets

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Capital cost savings

(BNY Mellon Triparty, BNP Paribas Securities Services, Citi - Custodian connecting in 2021)

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ConneXXion Markets goes live

December 2020

ConneXXion Markets, a new cloud-based electronic secured finance solution aimed initially at asset managers, has now gone live and settled its first trades.

The platform aims to offer secured finance market participants enhanced connectivity and consequently improve market liquidity and client performance. It also aims to remove overall complexity in trading and help futureproof compliance requirements.

The UK-based platform is the brainchild of Co-founders and securities finance market specialists Rob Verrillo, Tim McCall and Gareth Mitchell who serve as ConneXXion's CEO, COO, and head of client relations and technology, respectively.

Verrillo previously ran trading desks at Nomura, Royal Bank of Scotland, Lehman Brothers and UBS, while McCall brings over 20 years' experience of interacting with the buy-side. Prior to co-founding ConneXXion, Mitchell was global trading head and product head for Citibank NA's agency securities lending business covering Europe, the Middle East and Africa.

Also in the team is Dan James, Chairman, and Peter Joos, who also sits on the sales desk.

James was previously with Aviva Investors for just over a decade as CIO of the global fixed income team, covering £280 billion in assets under management across six locations and managing global budgets, including distribution.

Meanwhile, Joos boasts a 30-year career in the securities industry working with global investors in the US, UK and Russia where he developed cash and financing strategies.

According to Mitchell, the ConneXXion Markets' solution is the result of market specialists identifying

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and developing new ways to release pools of liquidity, previously closed to many participants. He adds that ConneXXion's platform framework and legal structures go beyond other similar digital marketplace offerings, allowing users to conduct trade types that they cannot do today.

Whilst the global secured finance markets continue to grow in both importance and size, participants face the challenge of increased regulation and diminishing liquidity pools.

Developed and delivered by market specialists, ConneXXion Markets is a secure cloud-based electronic platform that meets these challenges head-on to deliver tangible benefits.

Driven by the challenges facing our customers, ConneXXion Markets delivers the insight, solutions and expertise needed to electronify transactions and provide access to deeper, more diverse pools of liquidity.

J.P. Morgan executes intraday repo transaction using blockchain

December 2020

J.P. Morgan has completed a live blockchain-based intraday repo transaction, conducted between its broker-dealer and banking entity, using an in-house developed blockchain application.

This supported instantaneous settlement and maturity of the transaction in hours, as opposed to days, says the bank.

The offering will be made available in production to external counterparties in the US – some of which have already simulated transactions on the new application.

J.P. Morgan developed the solution and tested its viability by conducting trades between two of its affiliates, alongside successful simulations of trades with Goldman Sachs and other entities, with BNY Mellon as the triparty agent.

"This is an exciting project which vividly highlights where enterprise blockchain can address a real-world problem in the financial system and we look forward to going live in early 2021," says Mathew McDermott, global head of digital assets at Goldman Sachs.

Scott Lucas, head of markets, distributed ledger technology (DLT) at J.P. Morgan, adds: "The current repo market has some technical inefficiencies, and we identified blockchain technology as a way to reduce our clients' intraday risk profile."

"By deploying blockchain, we created new opportunities to streamline operational processes and accelerate settlement for repo," he adds. "Our new solution will help unlock trapped pockets of liquidity for intraday use and allow for reduced risk profiles for our clients and J.P. Morgan."

Clearstream and FundsDLT complete first blockchain fund transaction

January 2021

Zürcher Kantonalbank (ZKB) and Deutsche Boerse's post-trade services provider Clearstream processed their first live blockchain-based end-to-end fund transactions, using FundsDLT, a decentralised platform for fund transaction processing.

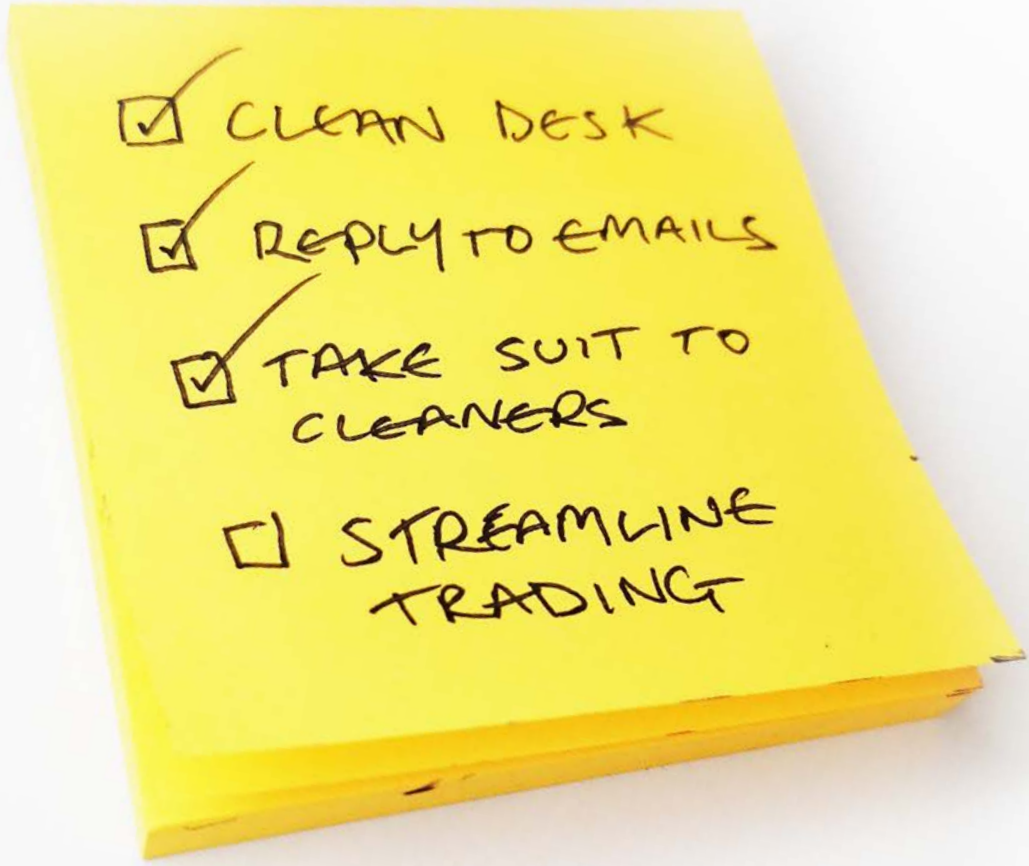
ZKB was the first to leverage the joint FundsDLT and Clearstream solution, with an end investor placing a fund transaction request via a mobile app directly on the private blockchain.

The order was captured and delivered to Clearstream's fund processing platform Vestima via the blockchain.

The overall processing time for an investor order was reduced from several hours to only a few minutes, according to Clearstream.

The order was captured and delivered to Clearstream's fund processing platform Vestima via the blockchain.

ZKB's client received real-time updates and, after a few minutes, the transaction confirmation on the app – a process that could commonly take several hours before.



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Peter Hubli, head of digital asset solutions at ZKB, says: "With FundsDLT we convinced ourselves of the potential for the entire value chain in the fund business, including the improvement of customer experience, efficiency in the settlement process and the reduction of costs.

"The proof of value allowed us to have a sneak peek into the future of the fund industry, its potential and impact not only for ZKB, but also for our clients and partners. By leveraging blockchain technology, we get both an overview of the entire flow of assets and money and can also identify and understand investor's needs."

This particular cross-border distribution of an investment fund between Switzerland and Luxembourg showed that distributed ledger technology (DLT) can foster more efficient, scalable and faster fund investing for all market participants, says Clearstream.

ZKB states it exploited its existing connection to Vestima and triggered the blockchain-based fund transactions via APIs delivered by FundsDLT, allowing ZKB to access all 48 connected fund markets without the need for additional onboarding processes.

Bernard Tancré, head of investment fund services product at Clearstream, says: "Integration with FundsDLT was very efficient and straight-forward. It is important that our customers can leverage the advantages of blockchain starting today, with access to a large investment funds portfolio via proven, regulation-compliant and safe fund processing environments.

"This initiative significantly increases operational efficiency for investors, distributors and transfer agents, and we are only at the beginning of this most promising journey."

Delta Capita deploy Luminance's AI platform

January 2021

Delta Capita has adopted the technology of Luminance, an artificial intelligence platform used by accounting firms, to assist with its London Inter-bank Offered Rate (LIBOR), Inter-bank Offered Rate (IBOR) and the Euro Interbank Offered Rate (EURIBOR) transition projects.

LIBOR, which is estimated to be embedded in up to $340 trillion worth of financial contracts worldwide, is the most widely used benchmark for short-term interest rates.

Delta Capita says it is using Luminance's machine learning technology to better understand risk exposure across contracts and thus mitigate the impact of the transition.

The financial services firm will be able to instantly reveal critical LIBOR-related provisions such as LIBOR definition, interest rate definition, LIBOR fallback and changes in law. Luminance is then able to learn from the interaction of the reviewer to generate additional insight.

Luminance says its unique synchronisation with Microsoft Word ensures that reviewers can then easily apply this insight in order to amend and remediate contracts, all from within the Luminance platform.

It claims to be the only platform on the market that uses supervised and unsupervised machine learning to read and form an understanding of legal data.

Ben Pugh, head of business development at Delta Capita's structured products business, says: "The effort and cost of reviewing financial contracts using manual methods is unfeasible for many of our clients with less than a year to go before transitions should be complete.

"Using Luminance's revolutionary technology, we can help clients ensure a seamless transition away from the LIBOR, IBOR and EURIBOR benchmarks. Luminance's game-changing technology provides real value out-of-the-box, exposing LIBOR-related risk across often vast data sets and can be used for assurance to check complete capture of all clauses as equally as it can for initial discovery."

Clementine Fox, Luminance's head of account management, adds: "The transition away from interbank offered rates such as LIBOR, IBOR and EURIBOR is an example of a problem that is best tackled with AI.

"Using Luminance, Delta Capita will drastically reduce the time of locating, understanding and remediating the volume of LIBOR, IBOR and EURIBOR-related

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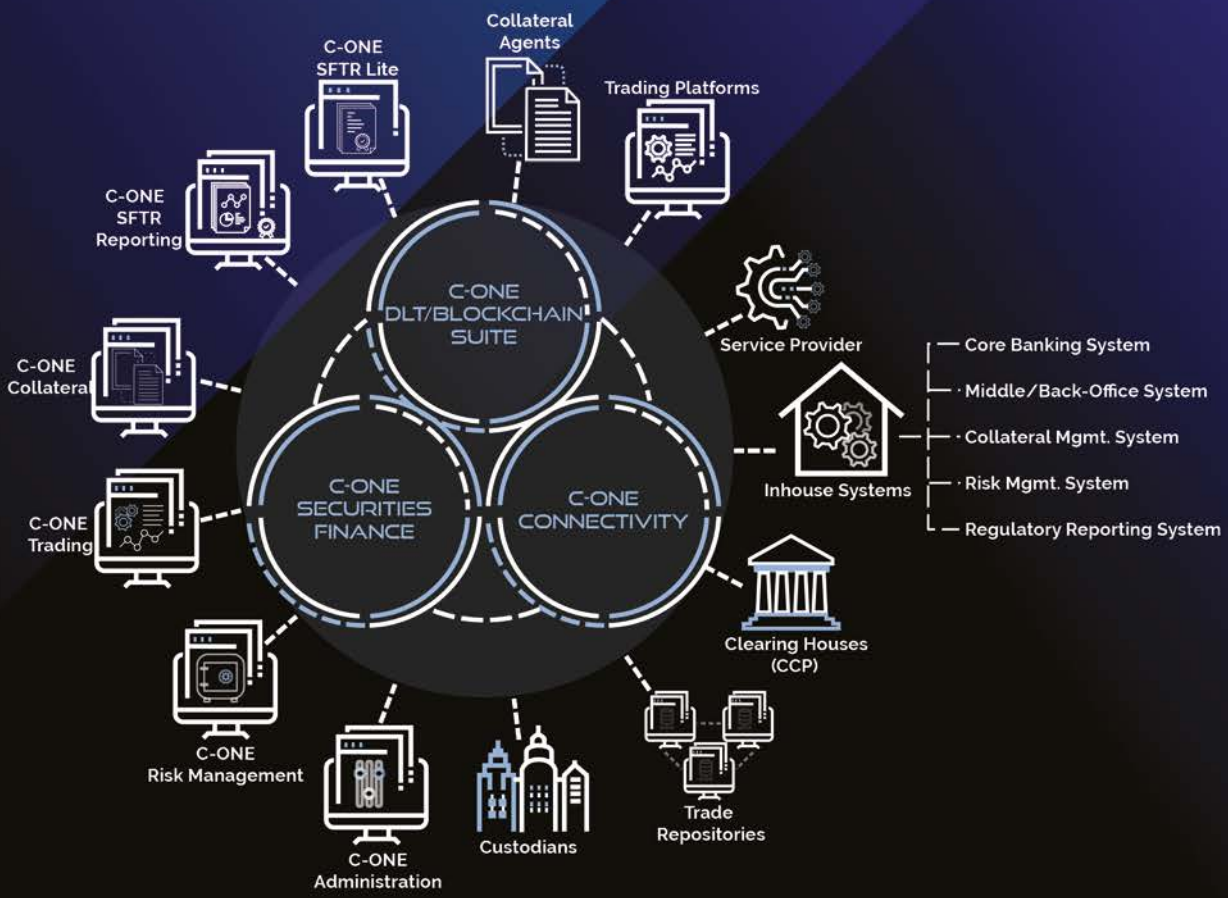

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BNY Mellon tackles settlement failures with Google Cloud

February 2021

BNY Mellon is set to leverage Google Cloud's data analytics, artificial intelligence (AI) and machine learning (ML) technologies to develop a "first-of-its-kind" collateral management and liquidity solution to reduce settlement fails.

The partnership aims to help market participants better predict billions of dollars in daily settlement failures, generate significant capital and liquidity savings, and unlock operational efficiencies.

The bank says the Google Cloud-powered tools could help clients forecast 40 per cent of daily settlement failures in the US treasury market to improve overall market liquidity.

The US treasury market is the largest and the most liquid market in the world but on a typical day, approximately 2 per cent of transactions fail to settle.

The deal comes as part of BNY Mellon's "open-architecture approach" of exploring emerging technologies including AI, ML and blockchain, to reframe common trading and settlement challenges through a technology-focused lens.

In addition to creating use cases for the US treasury market, BNY Mellon is developing AI-powered solutions for securities lending, liquidity forecasting, dynamic controls for pricing, anomaly detection for transactions, and automated document processing.

"We are excited to work with Google Cloud to develop a first-of-its-kind solution to help our clients predict approximately 40 per cent of settlement failures in Fed-eligible securities with 90 per cent accuracy," says Brian Ruane, CEO, BNY Mellon Clearance and Collateral Management.

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documents from a few months to a matter of days, and at the same time will be instilled with the greatest confidence that nothing has been missed in their review."

ISLA unveils digitisation vision and next steps in white paper

February 2021

The International Securities Lending Association (ISLA) has laid out a roadmap for its digital agenda in a white paper focusing on digital data standards created by the clause library and taxonomy project.

The trade body says that the success of the securities finance industry's digital transformation must be underpinned by a focus on documentation.

ISLA has therefore mobilised a clause library and taxonomy project with respect to its global master securities lending agreement (GMSLA) documentation suite.

The 'Legal Clause Library & Legal Data Standards' white paper, produced in partnership with D2LT, a legal documentation consultancy, seeks to answer several key questions about where the industry is today and where it's headed.

The paper reviews: how the industry is positioned today; a vision for what the strategic state looks like; the steps required to achieve this strategic state; how best to achieve adoption across the industry; and immediate next steps.

Short term next steps include the extension of the clause library and taxonomy in the same manner as the proof-of-concept (PoC), to be completed for the GMSLA clauses in 2021.

The library for the PoC clauses will be put under change control and a formal mechanism to allow any changes that are needed to conform the standard, due to regulatory, market, or other developments that occur over time, ISLA says.

Further ahead, possible future initiatives include the integration of the clause taxonomy and clause library into other ISLA Initiatives.

In the white paper, ISLA concludes that "in an increasingly data-driven world, firms are moving to operationalise their business through automating data-driven processes, allowing greater efficiency, scalability, and resilience through the medium of data".

ISLA CEO Andrew Dyson says: "The work we are doing with D2LT sits at the heart of our digital agenda. This latest white paper puts this work in perspective, and sets a clear direction of travel for the industry as we look to maximise the use of this technology for our membership and wider industry stakeholder communities."

Akber Datoo, CEO of D2LT, comments: "The GMSLA clause taxonomy and library initiative ISLA is undertaking this year seeks to digitise this agreement and will be a catalyst to unlock multiple business benefits for market participants by ensuring the documentation is connected to resource optimisation, risk mitigation, regulatory reporting and operational management of business processes through the medium of structured data."

Capitolis and AcadiaSoft partner to enable greater capital optimisation

March 2021

Capitolis, the software-as-a-service platform that drives financial resource optimisation for capital markets, has partnered with AcadiaSoft to combine its technology platform with AcadiaSoft's risk analytics and repository of industrywide margin data.

The combined services will enable greater capital optimisation for financial institutions.

The solution will allow financial institutions to eliminate large and unnecessary positions and find the most suitable party to hold the remaining positions.

It will also enable firms to more efficiently allocate their capital and has the potential to materially impact returns on capital, market liquidity and access to markets.

Capitolis says the effect of upcoming regulations such as the Standard Approach to Counterparty Credit Risk (SA-CCR) will have a major effect on the capitalisation of financial institutions.

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Pirum unveils corporate actions processing solution

March 2021

Pirum Systems has launched a solution for corporate actions processing as part of its 'Future Tech' initiative.

COACSConnect is a "revolutionary offering that brings much needed risk reduction, connectivity, and automation to the processing of both mandatory and voluntary corporate actions," Pirum says.

Leveraging its "unique network and connectivity in securities finance", Pirum's COACSConnect service aims to enable market participants to create, match and disseminate corporate action related notifications.

By centralising these processes Pirum promises to allow market participants to settle claims quickly and resolve differences in a highly secure and fully audited workflow.

COACSConnect will also "greatly reduce the friction and inefficiencies" that exist in the post-trade securities finance operational landscape, Pirum adds.

In a statement on the launch, Pirum's head of product development Robert Frost says: "This is the first step on what will become a comprehensive offering to the securities finance market and is, yet another solution launched as part of Pirum's 'Future Tech' initiative".

The Future Tech Initiative looks to automate and digitalise securities finance and over-the-counter processes from front to back.

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Front-to-back consolidation: Gaining efficiencies in securities finance

The combination of regulatory deadlines and radical shake-up to BAU has encouraged financial institutions to finally tackle infrastructure challenges they had been putting off for too long

Neil Fowler, securities lending product management, Calypso Technology

Time to renovate the kitchen

One of the unexpected consequences of the COVID-19 crisis and the associated lockdown sequences is that many individuals finally allocated time to tasks they were always putting off, due to lack of time and focus, be it learning to play a new instrument or repainting the kitchen. Financial institutions adopted the same attitude, and one of the most visible consequences is the number of IT rationalisation projects that now aim at rethinking the front-to-back system architecture, especially in the securities finance trading and collateral management space.

This desire to consolidate a fragmented infrastructure shaped by two decades of fast equipment waves is not exactly new. Firms started by replacing siloed collateral management systems with a single solution for processing all of their collateral requirements regardless of the source of the underlying transactions. The next logical step, which is still work-in-progress in many firms,

was to consolidate their inventory – their available assets to cover their exposures and to finance their business – and to do this within the same system as the collateral requirements are managed.

What we are seeing more recently, is the growing need for collateral management and associated inventory to be more central to the whole trade and process lifecycle, with real-time interactions with upstream and downstream applications. This has been initially driven by the raft of regulations, from the Basel Committee on Banking Supervision (BCBS) and the International Organization of Securities Commissions (IOSCO) Uncleared Margin Rules (UMR), Basel Fundamental Review of the Trading Book or Basel IV liquidity ratios that require traders and treasurers to mobilise more assets in front of the potential risk they will face, to the Securities Financing Transactions Regulation (SFTR) which puts fragmented data chains under the threat of heavy fines for under or over-reporting.

But, as institutions' revenue diminished, the quest for generating profit-and-loss from idle assets that could be marketed, but are hiding in fragmented or outdated inventories, has convinced IT teams that the time to repaint the kitchen has finally come.

The need for consolidation

It is still common for firms to have a number of different solutions — even for a single function like collateral management, which creates numerous data transfers and data consistency issues across their different systems, in order to carry out regulatory calculations and reporting. The requirement to have accurate, timely and consistent data has never been more important, so having multiple systems holding multiple versions of the information imposes complex normalisation and costly reconciliation, creating a significant challenge and overhead even in normal market conditions.

In 2020, the COVID-19 crisis impacted the financial markets, and created a volatility that will remain, until a complete solution is found. This resulted in a substantial increase in the value and volume of margin calls for collateral teams to handle, and the lack of a central cash and security inventory often causes issues, as collateral managers could not anticipate the coverage of future margin calls with their disparate inventory.

The source of this collateral increasingly includes the usage of global bonds and equities, where cash may once have been more prevalent. This will amplify further as the upcoming International Swaps and Derivatives Association (ISDA) rules are likely to shift significant blocks of margin calls from cash to securities. If we look at some of the numbers from the last published ISDA margin survey for the end of 2019, this shows that for over-the-counter (OTC) trades the 20 phase-one firms that were surveyed, collected a total of $173.2 billion of collateral for initial margin (IM) (either BCBS-IOSCO regulatory IM or independent amount). Of this, $140.6 billion was in the form of securities, 75 per cent of which was in government securities.

This is on top of the $269 billion that the central counterparty have collected as IM for interest rate derivatives and credit default swaps products. This shows that there is a huge amount of securities collateral (in excess of $400 billion) that the firms are not able to use for financing purposes.

Combining these factors together, the liquidity needs of an institution, the rise in the value and volume of calls and the increased usage of non-cash collateral means that the management of the asset inventory sets are now at center stage. Now more than ever is the time to address these issues to ensure that institutions are working on a consolidated, solid foundation to meet these challenges and avoid future contention over who owns the inventory and optimise where it would be best used.

Unlocking consolidation benefits

One reason why inventory consolidation has often been postponed was that asset ownership is split across the business lines, with no one having the full picture of the potential benefits of its data to other parts of the organisation. We're trying to summarise here what consolidation means in concrete terms:

One: With one system or platform, which is a single source of truth, firms can see who owns the inventory and can materially assess where it could be best used.

As consolidation also provides an accurate and real time view of the inventory, it shows what is pending intra-day and available in the future, asset ownership status, longevity, settled status and location. The integration between trade processing and collateral systems gives the most accurate and up-to date view of the state of your trade, drastically reducing the risk of poor decisions in the desks using securities.

Two: This holistic view leads to inventory optimisation. By fully capturing the inventory potential, clear rules can then decide where it will have more value to the treasury, a cross border transaction or a delicate counterparty that needs short term attention. In addition to human-driven decisions, algorithm-driven engines can improve the allocation process by suggesting the best match between exposures and inventory and minimising the deployment of cash collateral. The decisions based on a central inventory immediately improves your ROI.

Three: From a securities trading desk standpoint, this holistic view of your cash and securities inventory, helps answer daily questions such as:

- Do we have enough of these higher valued assets, or do we need more?
- What do we have that could be used to create more?
- What optionality do I have with the least valuable assets?
- Can I mobilise these idle assets and for how long?
- From a treasurer's perspective, access to the repo and securities lending markets helps release contingent liquidity and reduce overall funding costs for the enterprise.

Four: Consolidating on the right collateral management platform can eliminate the most manual interventions in processing margin calls. Straight-through-processing workflow, cross asset coverage, global integration, multi-agreement support and triparty services integration — each of these features of a robust system unlocks more benefits of faster transaction processing times, eliminating errors and timely reporting.

A deep connection between collateral and regulation

A fundamental objective of financial regulations is to guarantee the stability of the financial ecosystem by avoiding a cascade of defaults among its participants. It is, therefore, no surprise that collateral holds a central place in many regulations as it secures current and potential future exposures.

Besides the European Markets Infrastructure Regulation (EMIR), Dodd-Frank and SFTR, BCBS-IOSCO UMR alone will impact an additional 1,100 financial firms by 1 September 2022. The Basel III framework and Standardised approach for counterparty credit risk (CCR) measures mandate the use of collateral management data to calculate the CCR with different methods for computing replacement cost and potential future exposure in the case of margined or unmargined netting sets.

The main purpose of collateral is to reduce CCR, so it seems counter-intuitive that the actual settlement of the collateral received is often not fed to the risk solutions, leaving them to assume perfect and immediate settlement. In a fully integrated system, the real time impact of collateral receipt is reflected in exposure computation, which allows better risk management, and can prevent trading with troubled counterparties, in case of a crisis.

Conclusion

Whether it is to reduce risk or to be able to better finance the business, firms will more safely navigate these tumultuous waters of the current financial world using platforms and systems that provide a single view of the inventory and sharing assets across the various business lines of repo, securities lending, treasury and derivative trading.

Multiple waves of regulatory requirements created immense pressure for timely compliance and accurate reporting. The regulators expect firms to have visibility and control regarding the assets they hold and will increasingly sanction fragmented infrastructures that cannot guarantee a timely mobilisation of collateral and a precise reporting of the institution's activity and risks.

To that extent, the changes in the working environment due to COVID-19 crisis offer a unique opportunity to renovate the collateral and securities finance kitchen and efficiently manage the business by unifying all securities finance activities on a single platform that will ultimately drive business value.

We clear the path

OCC has the largest centrally-cleared stock loan offering in the world with approximately $80 billion in cleared loan balances. Over the last 25 years, OCC has built an innovative and unique U.S. program for securities lending transactions where OCC steps in as the counterparty (with a two percent risk weight) and guarantees the return of stock or collateral. We continue to enhance and expand access to our stock loan program in order to offer clearing solutions and capital efficiencies for our members and the entire securities finance industry.

As the world's largest equity derivatives clearinghouse, OCC is committed to providing market participants with high quality and efficient clearing, settlement and risk management services. As a Systemically Important Financial Market Utility, we work to enhance our resiliency in order to reduce systemic risk, increase market transparency, and provide capital and collateral efficiencies for the U.S. capital markets.

OCC

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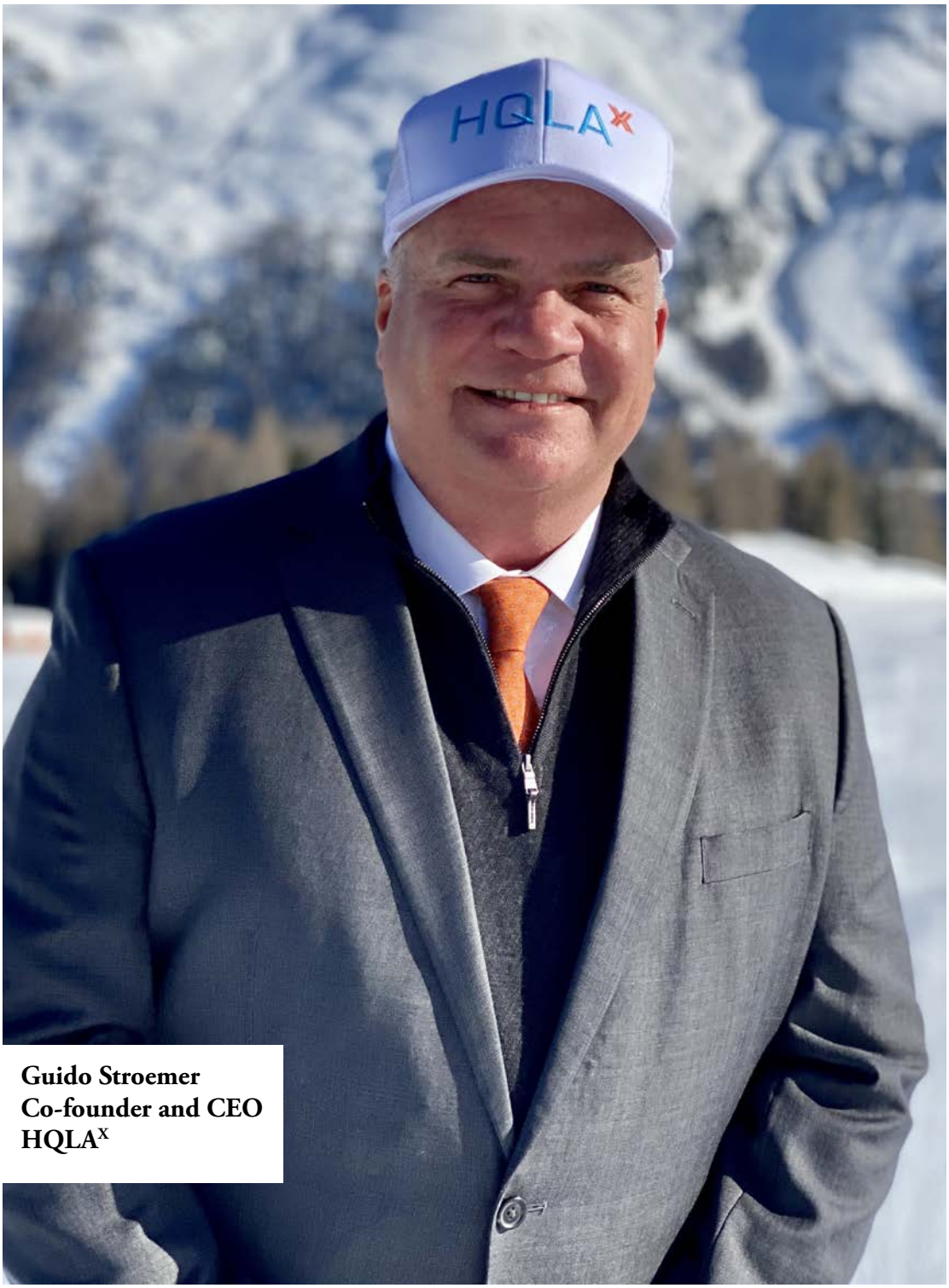


Guido Stroemer
Co-founder and CEO
HQLA^{X}

HQLA^X – product development opportunities

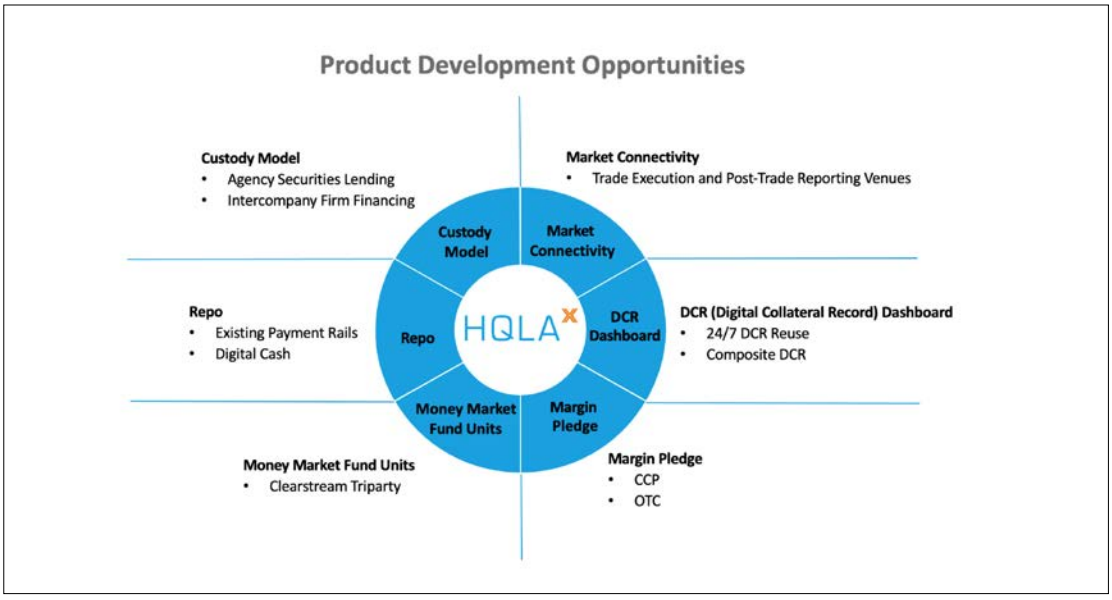
Guido Stroemer outlines how HQLA^X plans to expand its product scope and functionality, while further extending connectivity to triparty agents, custodians and market participants

We are extremely proud of our recent series B funding round with new strategic partners BNY Mellon, Goldman Sachs, BNP Paribas and Citigroup, and long-standing strategic partner Deutsche Boerse Group. Not only is the €14.4 million financial backing substantial, but the public commitment from our new investors to connect to our platform speaks volumes towards validating our shared vision to accelerate collateral mobility across the global securities finance ecosystem.

We are often asked what we will use the funding for? Well, the simple answer is that it will be used to accelerate market adoption of our platform by expanding our product scope and functionality, while further extending our connectivity to leading triparty agents, custodians and market participants.

In this article, we would like to share a sneak preview of some product development opportunities that lie ahead.

But before doing that, let's quickly summarise who we are, and what our key value proposition is today. HQLA^X's core clients are financial institutions active in securities lending and collateral management. Our unique value proposition is to enable market participants to transfer ownership of securities seamlessly across disparate collateral pools at precise moments in time without moving the securities across custodians. This enables our clients to better optimise their liquidity management and collateral management activities, thereby generating operational efficiency gains and capital cost savings.



Here is a very brief refresher on the background of the regulations and regulatory ratios that were the genesis behind the creation of our platform.

As a result of the global financial crisis, the Basel Committee on Banking Supervision introduced a host of new regulations to promote global financial stability by strengthening the capital and liquidity positions of the banking industry. These regulations were implemented through the introduction of global minimum standards, including the following four key financial ratios: capital ratio, leverage ratio, net stable funding ratio (NSFR) and liquidity coverage ratio (LCR).

The capital ratio measures the riskiness of a bank balance sheet by comparing a bank's capital position to the amount of risk-weighted assets (RWAs) on its balance sheet, while the leverage ratio is risk-agnostic and simply measures a bank's capital position relative to the total size of assets on its balance sheet. NSFR represents a bank's available long-term stable funding (ASF) relative to its long-term required stable funding (RSF) for funding with maturities of greater than one year, and LCR reflects a bank's ability to weather short-term liquidity shocks by comparing the stock of high-quality liquid assets (HQLA) to the expected liquidity outflows during a 30-day stress period.

Managing across these regulatory ratios is no easy task for the banking industry. This is due to the fact that it is very difficult to manage the ratios in isolation. They often interact in an opposing manner, and an action to improve one ratio may have a knock-on effect of adversely impacting one, or more, of the other ratios. As a result, many banks have created centralised financial resource management teams to help manage the key regulatory ratios, and allocate scarce resources and associated costs in a holistic fashion across trading desks and business lines of their organisations.

What makes managing these regulatory ratios even more challenging is when intraday liquidity and intraday credit are added to the optimisation engine as scarce resource constraints, which is something that more and more banks are now doing.

Some banks already allocate costs for consumption of intraday liquidity and intraday credit to trading desks, and many banks are finalising plans to do so in the near future. This evolving focus on intraday credit and liquidity management is beginning to manifest itself as a significant market pain point. This pain point is piquing market interest in our platform, and here's why.

While the existing triparty collateral infrastructure works very well for optimising obligations in a single custody location, it suffers from the inability to provide an industrial-strength solution for atomic delivery-versus-delivery (DvD) of baskets of securities across triparty agents and custodians. DvD refers to instantaneous exchange of ownership of one basket of securities versus another basket of securities. Current market practice is to settle collateral upgrade transactions in one of two ways: two free-of-payment (FoP) settlement instructions or two delivery-versus-payment (DvP) settlement instructions. Unfortunately, both settlement practices have drawbacks. The former generates intraday credit exposure, and the latter generates intraday liquidity exposure — both cost capital.

This is where the HQLA^X solution comes into play. HQLA^X enables DvD ownership transfers for baskets of securities in a collateral upgrade transaction. The HQLA^X DvD solution consumes neither intraday credit nor intraday liquidity, and that is why we are seeing strong demand from banks to on-board to our platform, especially from those banks most advanced in optimising intraday financial resources.

The initial design of the HQLA^X minimal viable product offering (MVP) was driven by practitioners from leading global banks. The basic idea from the very beginning was for the HQLA^X platform to be 'designed by the industry, for the industry'. Staying consistent with this approach, and based on feedback from our clients, we are now developing the following products to further enhance the HQLA^X service:

Custody model

To accelerate the on-boarding of agent lenders to our platform, we are now designing a custody model whereby an agent lender may deliver principal loan

securities via custody, while the collateral leg is delivered via triparty still achieving DvD. This is relevant because the agency securities lending community is accustomed to delivering principal loan securities via custody today. Therefore, the custody model we are designing will support scalable onboarding of the broader agent lending community. In addition, the custody model is also expected to open up new business opportunities for our platform. One such opportunity is to expand our product offering from collateral transformation trades, to also enable lending of specific securities to support short-covering activities.

Another opportunity we are pursuing with the custody model is to support capital-efficient intercompany financing trades (firm longs versus firm shorts). Due to Brexit, more and more banks now have bifurcated legal entity set-ups whereby market-making for outright purchases and sales of securities is conducted in one legal entity, and the financing activities to support the outright trading activities are conducted and managed by another legal entity.

The long and short positions of specific securities are typically transferred across the legal entities via internal repo and reverse repo transactions, which consume costly intraday liquidity. The use case we are developing will enable longs and shorts to be transferred between entities on a DvD basis, without consuming intraday liquidity and credit.

Market connectivity

To streamline our connectivity to the agency lending community, we will collaborate with third party service providers that specialise in facilitating trade execution and post trade reporting between bank borrowers and agent lenders.

Digital collateral record dashboard

Digital collateral records (DCRs) are the record of ownership of securities that are recorded on the HQLA^{X} platform's ledger. We are currently designing a prototype for a DCR dashboard to provide our clients with an overview of encumbered and unencumbered DCRs. One interesting use case that we are pursuing with one of our clients is to leverage this dashboard to enable the client to transfer ownership of unencumbered DCRs between two of its legal entities on a 24/7 basis.

We are also in early design stages for what we are calling a composite DCR (a single DCR to be collateralised with DCRs from multiple triparty locations), and to enable dynamic substitution of DCRs on a DvD basis.

Margin pledge and money market fund units

Following the extreme, pandemic-related market volatility from last Spring, we received a significant amount of interest from market participants (both sell-side and buy-side) to leverage our platform for managing margin exposures, both for over-the-counter (OTC) and central counterparty (CCP) derivative exposures. We are currently in discussion with a major EU derivatives CCP to accept DCRs as record of ownership of baskets of securities to satisfy CCP initial margin requirements. We are also considering use cases in the OTC margin space, specifically related to mobilising money market fund units held in Clearstream's triparty environment.

Repo

Our current operating model caters strictly for non-cash ownership transfers, but we plan to expand our product offering to include DvP in the future. One possible use case to pursue is to link our platform to existing payment rails to create a DCR repo market. Another potentially transformative use case under consideration is for HQLA^{X} to interoperate with other distributed ledger technology platforms active in tokenising cash, either central bank money or commercial bank money.

There are certainly many product development opportunities to consider, and we are actively engaging with our stakeholders, our existing clients, and our prospective future clients to help shape our product development, so that our platform remains true to our guiding principle of being 'designed by the industry, for the industry'.

Navigating choppy waters in derivatives

In the modern, highly-regulated and collateral intensive market environment, Cassini promises to integrate securities lending and repo for a truly holistic approach to treasury

Liam Huxley, CEO and founder, Cassini Systems

Trading derivatives brings with it operational overheads, regulatory compliance obligations and importantly, real cost of carry. These are all a result of margin, collateral and funding costs that are now an essential part of the cost profile and risk management of any portfolio.

As a portfolio manager how do you ensure you have the lowest cost impact on your portfolio and remove operational risks? This is the question Cassini was founded to answer.

Multiple intersecting regulations in recent years have changed how asset managers and hedge funds trade derivatives, and the cost of doing so. Collateral utilisation and carry costs have become much more significant across the buy side than historically had been the case. Dodd-Frank and the European Market Infrastructure Regulation (EMIR), the second Markets in Financial Instruments Directive, and the Uncleared Margin Rules (UMR) mean that firms have to both post and call collateral on trades that historically had required low or no collateral at all whilst being fully transparent about post trade costs including carry costs. As always with new regulations, these have had unintended side effects, such as in this case creating potential for insufficient collateral forcing close out of trades, or the funding cost of a position affecting the profit and loss.

Cassini solves all these challenges and also integrates securities lending and repo for a truly holistic approach to treasury.

Volatility and collateral risk

2020 was a perfect example of how a market storm can arise without warning and cause stress on even previously low-risk portfolios. Due to the sudden huge market swings, variation margin and initial margin levels spiked. Luckily, the bilateral margin rules (Uncleared Margin Rules) hadn't yet rolled out for most of the buy-side but the impact on cleared portfolios was still huge. Firms had margin doubling or trebling overnight, others were liquidating $100 million of their positions in order to free up cash for margin posting.

This illustrates how margin liquidity is a real and present risk in stability and profitability of a portfolio and needs to be monitored and managed as much as credit or market risk.

Regulatory compliance

As mentioned, 2020 could have been worse if the UMR rules had been in force. These rules require buy side firms with uncleared derivative exposure of over $50 billion or $8 billion to start calculating initial margin on their agreements as of September 2021 or 2022, respectively. However, an initial margin level of below $50 million (a guidance level but may be lower) means that collateral does not have to be moved. It is essential that firms know their margin levels to ensure compliance but also to inform trading decisions to stay under the posting threshold where possible.

Reduce carry cost and ensure best execution

Carry cost is a calculation that requires the margin impact of new trades, then the collateral requirements/needs over time, the funding costs of each type of collateral, and any other central counterparty, broker, or internal fees over the holding period. Calculating this for all possible execution and clearing routes then allows transparency over the cheapest cost of carry. Combining that with the execution spreads results in clarity on the true best execution.

Integrated solutions

To understand and control all the above, asset managers need to put in place business processes that:

- Deliver regulatory compliance with clearing mandates and UMR
- Control collateral risk and trading impact in volatile markets
- Reduce carry cost for derivative trades and deliver best execution

Addressing these challenges requires the creation of a consistent and holistic view of margin, collateral and funding across the organisation and trade lifecycle.

The Cassini mission is to provide the unified analytics backbone and toolkit to deliver all these elements.

Securities lending, repo and treasury optimisation

Widening our field of view, we see that a truly efficient inventory and treasury solution needs to not just look at delivery obligations and regulatory compliance, but how to maximise trading liquidity and returns.

We call this 'treasury optimisation', it is something Cassini is very focused on as the next stage in our vision. There are a range of elements that combine to create a truly integrated solution:

- Margin and collateral transparency
- True collateral optimisation
- Inventory upgrade/downgrade tools and counterparties to meet obligations and max returns
- Implementing a consolidated collateral management model
- Refining allocation of high-quality liquid assets across securities lending, repo and margin obligations

- Optimising cash buffers through tools like reverse repo, or money market funds rather than simple bank deposits

The target operating model

Achieving all the above requires multiple steps but it is key that the core framework is laid out early to support all these elements over time.

The overall approach is an analytics framework that:

- Consumes portfolios and data from front office, risk, treasury, collateral, and securities financing functions
- Then provides analysis and tools with the appropriate perspective back to each function

The first step is to ensure that you have the operational controls and technology to avoid the risk of being insufficient on eligible collateral to support trading and can also truly determine the carry cost as part of total cost of trading.

Once this is in place you can extend the framework to ensure that collateral risk is monitored and controlled on an equal level with market risk and credit risk.

Then the post trade and financing controls are added to bring in the external financing sources and opportunities.

Innovating solutions to new problems

Combining data from different business lines and from different silos such as font, middle to back office with no common infrastructure are complex.

Integrating processes that have previously been independent can be challenging.

Big plans for 2021

In 2021, we will eventually be able to meet up, work and socialise together which is key because no matter how automated we get, finance is a people business and being able to meet, get to know each other, brainstorm, collaborate, and build trust is critical to success.

Cassini is focused on four core areas:

- UMR, average aggregate notional amount, and standard initial margin model solutions, delivering the solutions the industry needs for UMR phase five and six
- Rolling out Cassini Core, our new software-as-a-software-based platform for more standardised use cases
- Collateral optimisation and liquidity management — extending our tools that maximise the use of inventory, across all asset classes
- Treasury optimisation tools — including financing trades and opportunities in optimisation and analytics

UMR phase five

Despite the delay in UMR rollout to September this year, many firms are not yet fully set up and prepared. They will need to lean on their technology and outsourced partners for the subject expertise to help them get compliant and also make their business cost efficient. We will be playing a large part helping these firms get across the line in good shape and with low stress!

Cassini Core

Our standard platform provides a lot of flexibility and power for firms to answer their specific questions across all business units. However, some firms with less bespoke requirements, and smaller technology footprints require a more out-of-the-box solution, hence we are launching Cassini Core to meet that need.

We offer standard packages for asset managers, hedge funds, and firms captured by UMR, with a quick switch on, and rich reporting which will provide risk controls, cost savings and low friction.

Our initiatives focus on reducing collateral friction on trading activities. Ensuring that collateral inventory can be used optimally so that valuable assets are retained for alpha generating activities is key

Liam Huxley, CEO and founder, Cassini Systems

Collateral liquidity and treasury optimisation

Our initiatives focus on reducing collateral friction on trading activities. Ensuring that collateral inventory can be used optimally so that valuable assets are retained for alpha generating activities is key. Having tools to see collateral hot spots, stress test collateral requirements, and forecast unwind risk provides confidence that collateral will never obstruct trading or force unwinds in stressed markets.

Cassini is the leader in this area and is rolling out new reporting tools in 2021 that provide more transparency and control on collateral liquidity across the firm.

Constant evolution

We never stop developing and evolving our solutions to meet the needs of the buy side across the capital markets world. 2021 will be another big year and we look forward to meeting you all at an event somewhere.

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Going micro means offering more, for less

Trading Apps' MD Laura Allen retraces her company's journey from offering a monolithic, on-premise solution to a SaaS model for its microservice architecture, and outlines all the ways it benefits clients

Trading Apps is known for delivering first-class front-end functionality with high-touch customer support. Historically it was an on-premise solution resulting in high internal costs to install and support the hardware which made the overall implementation an expensive option. I can recall countless times that a prospective client has said “it’s great but it’s expensive!”. It was therefore a key focus for the new management team to consider how to reduce the overall cost to the customer. The team applied their knowledge to create the optimal IT infrastructure to deliver the same quality of product but at a more competitive cost.

Like other smaller software providers and startups, Trading Apps started with a monolithic application as this was the simpler, quicker, and cheaper way to create and deploy an on-premise application. Although the application was a monolith it was well-architected with multiple tiers and those tiers had loosely coupled components and libraries. As the functionality expanded and the customer base grew, Trading Apps recognised that to improve stability and scalability, they needed to migrate to a more flexible approach. The company chose the microservices architecture as the means to achieve this. Microservices are self-contained applications that can be developed and deployed individually. Setting up a network of these services allows for agile development, shorter release cycles, and faster time-to-market.

Microservices are sexy and a hot trend right now and this model is adopted by some of the largest providers such as Amazon and Netflix, and who are we to argue with them.

Of course, Trading Apps does not have thousands and thousands of microservices like these companies as it does not have the same requirements or workload. What it does have is the correct organisational structure to succeed. Trading Apps has always adopted a cross-functional team which allows it to pull on the broad expertise of its people, which is essential when implementing microservices. What it did need to do, however, was ensure it had the right infrastructure and tools in place to orchestrate and monitor the different microservices it created, as this architecture has drawbacks given the complexity surrounding managing distributed applications.

The transition began with evaluating and choosing the most appropriate technologies for developing microservices that would enable the evolution of the monolithic architecture. For example, the inter-process communications mechanism used between services is a key part of the toolchain and Trading Apps chose gRPC. Trading Apps also decided to concentrate its development using two programming languages C++ and Java. This approach provides us with the ability to reuse stable functionality already deployed in Production but also the ability to mix that with microservices that use modern Java libraries (Microsoft Graph Java SDK is an example of this).

The monolith transition plan, which is underway, can be configured in a certain way to meet a customer need. For example, if a customer has particular high-volume reporting requirements, we can use a cluster of data aggregation microservices to meet that need. Trading Apps has already introduced microservices for additional functionality for connectivity to NGT, Bloomberg, IHS Markit, and Microsoft 365. Next, the remaining parts of the monolith will be split into separate microservices providing trade maintenance/lifecycle and data analysis, thereby allowing us to scale the data analysis microservice containers independently from the trade lifecycle microservice. This is more cost-effective as resources are only allocated where needed.

The advantages of this approach are clear. If there is a failure of a single module the larger application is more resilient to failure. Additionally, it allows for smaller codebases and scope which translates to quicker builds and faster deployment, with a view in the longer term to transitioning to continuous deployment and serverless computer where it makes sense to do so.

This approach can present new challenges. This change in architecture will increase the complexity of communication between the services and remote calls could experience latency. Furthermore, testing becomes more intricate as, unlike a monolithic approach whereby just one application needs testing, with microservices each dependent service needs to be considered before testing can occur. Also, the system now has multiple data repositories which

require more resources and finding fixes for bugs can be more cumbersome as you have multiple logs to review (mitigated by using centralised log consolidation). And, finally, the actual deployment of the system may be different depending on the services the customer has.

These challenges apply to all microservices-based architectures and can be managed with the correct tools and staff experience. But, the most efficient way to mitigate them is to employ software-as-a-service (SaaS), whereby Trading Apps provides customers access to applications that reside on a remote cloud network, accessed through a secure VPN or leased line. Our move to microservices combined with feedback from prospective customers, who were striving to transform the management of IT to maximise business value, was forefront in our minds when we debated the optimal IT deployment solution for Trading Apps.

When I first joined Trading Apps in early 2015 it only offered a traditional model of delivery, where software was installed on-premise. This approach has several drawbacks for the customer and Trading Apps. As each customer represents a separate installation it carries a high cost for us which ultimately is reflected in the cost to the customer, thereby potentially making Trading Apps appear expensive in comparison to its peers. For the customer, it lengthens the implementation process as it requires the internal IT department to be fully engaged and understand the hardware requirements, to build multiple environments for production, DR, user acceptance testing (UAT), etc, install the application and configure it.

So, in addition to licence fees customers incur ongoing internal maintenance expenses associated with on-premise hardware and software. Furthermore, the customer takes the responsibility for operating the hardware and software, rightsizing the microservice containers to the load, upgrading operating systems, patching security vulnerabilities, patching and configuration, all of which require employing a dedicated application team.

This did not sit well with us as the task of maintaining functionality and performance is transferred to the customer. Therefore, the responsibility for ensuring that timely software updates and data backups are done to prevent downtime, service interruption and any other operational issues reside with the customer.

This led us to explore SaaS, whereby Trading Apps provide customers access to applications that reside on a remote cloud network, accessed through the web. The things which were important when evaluating cloud providers were availability, compatibility, reliability, scalability, performance, and security, among other things. Previous experience of hosting our volume testing environment and discussion with providers helped us to realise our requirements were for an infrastructure provider, not simply a server hosting company.

AWS provides the breadth of services with a flexible, cost-effective charging model. Its self-service approach to the construction of virtual private clouds and all the components within was a good fit with the existing skills set within Trading Apps. The benefits of this decision are still being felt as we can make use of AWS artificial intelligence and machine learning services such as SageMaker from within our existing private cloud environments.

AWS managed services mitigate many of the complexities surrounding managing distributed applications. The Amazon Elastic Container Service, for example, allows us to manage a cluster of microservice instances. Additionally, Relational Database Service (RDS) or serverless databases reduces the management and maintenance overhead of running replicated databases. We also chose to use an infrastructure-as-code model to allow us to easily replicate environments in development and QA which mirror the structure of our customers' production environment.

Trading Apps has always taken IT security seriously and been aware of software supply chain risk. For instance, we have been a customer of Veracode and used its security-focused static code analysis since 2013. However, with the migration to SaaS and the storage of customer production data we have

redefined our cybersecurity strategy. For example, we use endpoint security products from companies to protect against malware infection and follow the principle of least privilege. Our security vulnerability and patching policy is driven by continual scans of devices from both within and outside of the network. We use an industry-leading security information and event management (SIEM) platform to monitor assets both on-premise and within the cloud (both AWS and Azure). This provides a single pane of glass visibility of indications of compromise and enables us to implement the Mitre Att&ck framework to defend against bad actors.

Besides the speed of implementation, the SaaS model provides significant advantages for our customers and results in considerable cost savings. There are no high up-front costs, and it allows our customers the ability to scale. Trading Apps monitors the applications with various metrics to enable us to increase capacity as required, so customers can add further functionality quickly and easily so the growing needs of their business can be met without having to buy new hardware or secure budget for internal IT assistance. Support is significantly improved as data is stored in an external data centre so logs and performance metric data is immediately available resulting in easier bug identification and quicker fix builds and deployment.

Furthermore, within the SaaS environment customers have at least one UAT environment which mirrors the production setup, so it is easier to test both functionality and performance. And lastly, version upgrades are managed by Trading Apps translating to lower effort and costs compared to the traditional on-premise model. Although Trading Apps does not have any comparative cost data yet, it is reported that organisations that upgrade from on-premise to cloud financials save up to 21 per cent in IT spend (Oracle Netsuite).

There are also additional advantages for Trading Apps. We can now scale the customer base by offering new products like TA Link to non-Trading Apps clients. Moreover, AWS allows the automatic flexibility to scale or shrink SaaS use based on its specific needs, which allows Trading Apps to do efficient server capacity planning and control costs. The final benefit for Trading Apps is the ability to capture data and analytics more easily as the information is found in a centralised location. It can therefore create structured or semi-structured data which can be applied to the tasks that machines execute. This creates the foundation block for developing machine learning applications, such as identifying rate anomalies in the data flowing through TA Link or our automation apps and allowing the machine to adjust rates offered in real-time. Additionally, there is increasing focus on reducing carbon footprints and being energy and resource-efficient within our customer base, and SaaS is seen as less environmentally impactful vs. on-premise solutions.

Introducing a SaaS model coupled with our microservice architecture is proving transformational for Trading Apps. We have significantly reduced the implementation costs and time to benefit our customers and real-time monitoring and automation can identify and resolve issues before they impact a customer or end-user. Our SaaS offering combined with microservices provides our customers with the ability to scale without the need for further hardware costs and ongoing maintenance costs. All these factors translate to Trading Apps being more competitive in terms of functionality and cost versus our peers. Say hello to potential!

Laura Allen
Managing director
Trading Apps

Building the next generation of application ecosystems

Using cloud adoption as the catalyst for the next generation of securities finance and collateral applications at FIS

Ian Morris , head of securities finance technology, FIS

The reliance on technology in financial services has been well established for 40-plus years. In the UK, the so-called Big Bang of 1986 cemented the need for technology solutions in UK equity trading, continuing automation that had already begun in other markets across the world. Recently, the question has been raised on whether there is a need for a Big Bang 2.0 but this time with a focus on processing efficiency rather than execution efficiency.

In those early days of financial services technology, the number of standardised vendor-supplied platforms was limited. The major players in financial services invested heavily in bespoke platforms out of necessity and out of a belief that there was a competitive edge to be gained by building solutions across the front-to-back process.

FIS was one of the first firms to identify the opportunity to provide platforms that performed the standardised and often complex processing, avoiding the use of error-prone manual work. Since then we've established multiple securities finance and collateral platforms that are fundamental to the smooth operation of these markets, investing in each to keep pace with the functional needs of the marketplace and the rapidly evolving technical landscape.

Staying ahead of trends

Now we're actively building the next generation of market-leading platforms across the front, middle and back office. We're leveraging our deep experience in the securities finance and collateral markets to provide tools for more informed trading decisions, higher process automation and easier integration through open application programming interfaces (APIs) and standardised market connectivity. This reflects the increasing crossover of traditional securities finance and collateral business operations, which has led to the consolidation of functions to address the securities finance value chain more holistically and better support businesses that no longer operate in silos.

The FIS securities finance and collateral reference architecture reflects this business consolidation, the increased need for flexibility, the rapid pace of change in the business model and the challenges inherent in integrating any platform into a customer's end-to-end application ecosystem for reference data, market data, securities settlements, payments and more.

However, staying current on technology trends is not an academic exercise for us; it's based on identifying customer-centric benefits. How will the technical investment benefit our customers? The reference architecture supports the high availability and scalability requirements that large-scale global market participants demand given their reliance on technology platforms. Our decisions on the use of new technologies are always founded on identifying the benefits that will be brought to customers. For example:

- Optimising the allocation of collateral using linear programming algorithms
- Increasing the automation of front-office processes with advanced workflow tools
- Improving the profitability of securities lending trading activity with artificial intelligence (AI) and machine learning (ML) algorithms
- Simplifying platform upgrades by delivering independently deployable services in support of

evolving regulatory requirements such as SFTR, UMR and CSDR

- Providing extensive reporting capabilities via a rich REST API library to support customer-specific needs, including the ability to integrate with data analytics platforms such as Hadoop and out-of-the box custom reporting universes through tools such as Business Object, Tableau and more

The FIS securities finance and collateral reference architecture also lays the foundation for building future solutions based on seven principles:

Event-driven, service-oriented architecture: The reference architecture defines the use of microservices to simplify deployment, provide easier upgrade paths and support greater platform scalability through elastic cloud scaling models. In addition, the architecture enables the integration of AI and ML components to turbo-boost the processing automation.

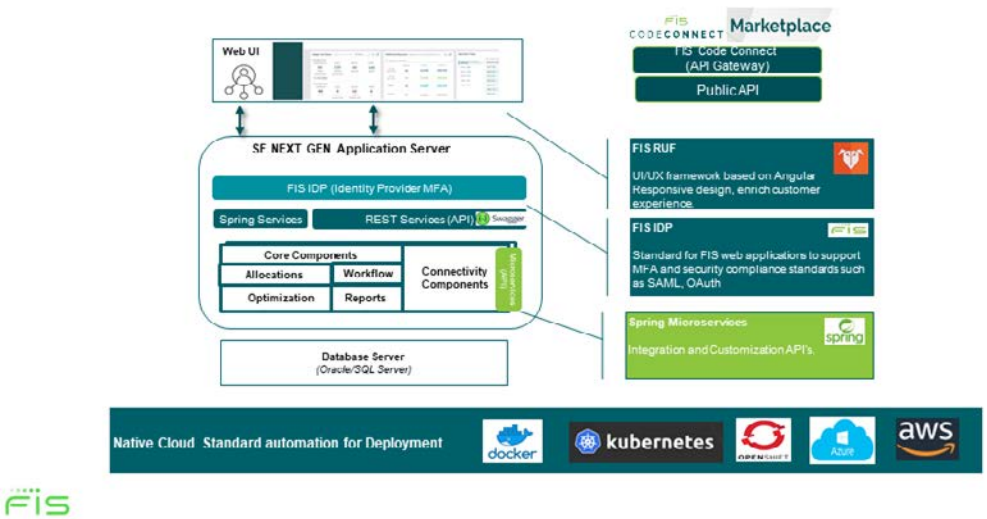
Open APIs for real-time connectivity: Technology has matured considerably in this space with greater standardisation and widespread adoption of standards. The reference architecture utilises these to facilitate real-time connectivity to market infrastructure providers including electronic communication networks, central securities depositories, custodians, trading venues, exchanges, triparty agents and central counterparties.

Industry-standard specifications: The increased availability of industry-standard specifications provides an opportunity to simplify application implementation, integration and upgrades. These are included across the reference architecture:

- REST APIs that are fully compliant with Open-API specifications
- Full IDP integration with support for SAML and OpenID
- Implementation of core common domain model (CDM) concepts, which standardises the modeling and documentation of trade events and therefore simplifies trade execution

Cloud-native technology: Customers are overcoming any concerns and initial hesitation in deploying business-critical applications in the cloud.

FIS securities finance and collateral: reference architecture



In fact, we're increasingly seeing requests from clients on how our solution suite can be delivered via the cloud.

The reference architecture embeds cloud deployment at its core, taking full advantage of cloud-native services to deliver software as a container and improved capabilities for scaling, throttling, fault tolerance, reusability, resiliency and monitoring. The reference architecture is built on cloud technology to drive reductions in the total cost of ownership.

Software as a container deployment: Simplifying and de-risking platform upgrades makes keeping current on the latest version a more achievable target. This ensures that the business benefits from the latest features added to the platform, including:

- Deployment automation using standards such as Docker, Kubernetes, OpenShift and Helm Deployments
- Certification against major Kubernetes infrastructure offered by Azure AKS and Amazon EKS

Rich and responsive user experience: We've designed a modern user interface based on the latest version of Angular to provide a rich and responsive user experience and an intuitive and configurable UI that reflects current design patterns and usability best practices.

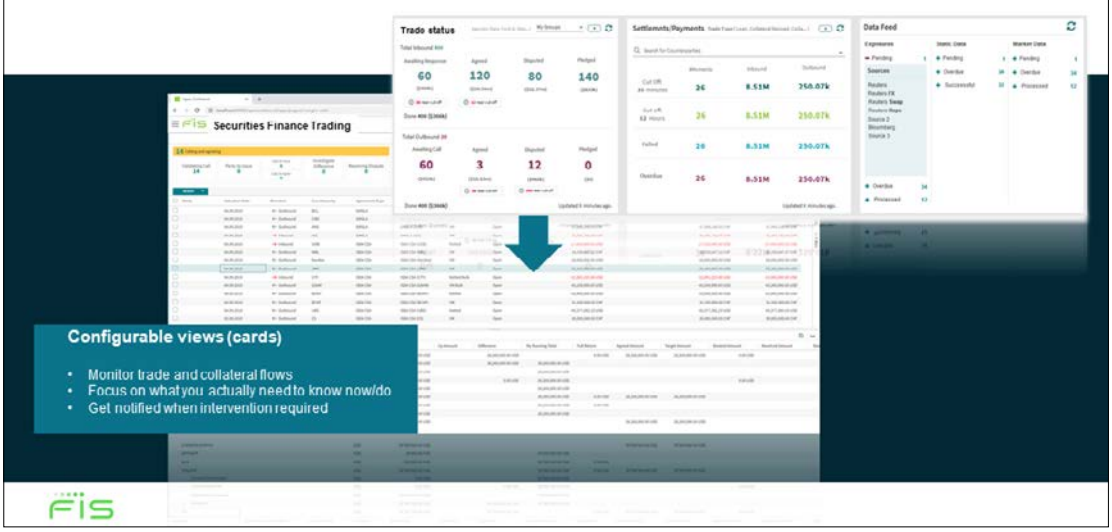
There's a wealth of data in modern securities finance and collateral platforms. Being able to summarise it to identify patterns of activity or identify exceptions is fundamental to the value-add.

Simplified custom portal integration: The complex, cross-business application environment that many customers operate often requires the consolidation of data in a portal. The reference architecture supports this through secure REST APIs, including full IDP integration.

The FIS next-generation securities and collateral solution components underpin the smooth operation of the market today.

With the accelerated investment in this reference application architecture they will continue to stay at the heart of the market, providing functionally rich and technically advanced solutions that deliver real benefits to the industry.

FIS securities finance and collateral: Web UI



How to leverage UMR compliance to reach a 'transformative state'

VERMEG's solution for UMR compliance will put clients in good stead for the future, says director Wassel Dammak

The regulatory push of the past decade has shaped the collateral space in a way that has promoted the emergence of many service providers in collateral management in general and regulatory compliance in particular.

Typically, financial institutions in scope for UMR waves five and six need to define their collateral and liquidity strategy and assess the different options available in order to streamline the compliance journey as much as possible, in the context of insufficient internal resource capacity and the high volume of change that is required.

The journey begins by identifying which firms are in scope through the aggregate average notional amount calculation (AANA) and estimating the level of Initial Margin with each counterparty through ISDA SIMM or GRID methodology computation.

These calculations help firms to further explore possibilities to either drive down the AANA or reduce the initial margin (IM) level using techniques such as trade compression or moving trades to clearing through central counterparty clearing (CCPs). The same calculations could, in certain cases, impact

trading strategies when the cost of compliance is deemed too high.

At this stage, firms should know whether they will be breaching the $50 million threshold or to what extent they will be close to it:

- If the IM is substantially below the $50 million threshold then firms need to monitor it by setting internal thresholds and an automated alerting mechanism to continuously track breaches over time
- If the IM is above or close to the $50 million threshold, then firms need to define their strategy for the segregated IM custody accounts (third party custodian or triparty agents) and establish how they will reconcile sensitivities. They also need to negotiate the legal documentation with their custodian and counterparties

Along each step of this journey, the in-scope financial institutions will have to select the most suitable operating model to support requirements:

- Internal build: this option may be costly but could make sense if the firm would like to closely control certain functions such as in-house analytics for sensitive calculations
- Outsourcing to a fund administrator or investor servicer: in this case, firms would completely externalise operational and technical functions. It makes sense to leverage existing relations because most of those servicers have added UMR compliance to their offering
- Using a third-party software solution: This could be a natural extension of the solution already used for collateral management, especially if the software provider has developed the features needed to comply with UMR
- Contracting a SaaS service: In this model the IT infrastructure, software solution and overall technical monitoring is outsourced to a SaaS provider, while operations are kept internally. This could be cost efficient; although firms need to carefully assess data security and segregation with this option

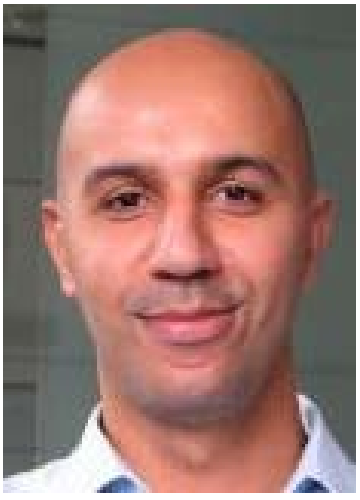
Looking to the landscape of financial institutions involved in UMR waves five and six, there isn't a particular model that fits all businesses and strategies. In certain cases, it makes sense to mix a combination of models.

Strategically, the model chosen should take into consideration a longer-term view because the journey of transformation will not end with compliance with UMR. Firms will still be pressured to reduce collateral cost and therefore will look to achieve more automation, higher operational efficiency and further standardisation to reduce operational friction and its associated risks.

The new IM requirements will further stress inventories and liquidity. Optimising the utilisation of the inventories is not a 'nice-to-have' anymore but rather a 'must-have' once UMR wave five hits, as firms will need to decide which strategy optimises the long box buffer when settling IM through the triparty model and optimise margin call allocations when pledging collateral through third party custodians segregated accounts.

At VERMEG we think that it is possible to leverage UMR compliance in order to pave the way for future transformation. We can help at every stage of the value chain by offering Colline.Cloud, a platform that is by its very nature transformative thanks to its componentised architecture coupled with integrated digital apps.

If you need more details on Colline.Cloud — with SaaS hosting or on premise installation — please reach out to us. We will explore how we can help in your UMR compliance journey and beyond.



Wassel Dammak
Director, collateral management solutions
VERMEG

An emerging data standard for the derivatives industry?

Industry-wide standards are halfway there, but AcadiaSoft's Roland Lichters believes the final stages of UMR provide a golden opportunity to adopt much needed standards across the board

Does standardisation in over-the-counter (OTC) derivatives matter? For years, regulators and industry organisations have lobbied for a higher degree of standardisation in the derivatives industry to create more transparency. While one could argue that the issue is far too complicated to tackle, the industry has slowly been making strides towards standardisation since the financial crisis. The adoption of industry-wide standards would provide important guardrails to prevent another financial crisis from happening in the future.

Lessons learned from the financial crisis

The financial crisis demonstrated how damaging the lack of standardisation was for the derivatives space. There was huge innovation in derivatives leading up to 2007, much of it aimed at the disaggregation of risk and the ability to move it around freely within the financial system. Around the same time, new instrument types and new asset classes emerged, particularly around credit, interest rates and equities. This allowed financial

institutions to disaggregate risk and move it from one place to another where it would be best managed, but this also gave rise to increasing complexity. Here's a prime example of the lack of standardisation endemic to the industry: it has been reported that there are over 250 different derivative types, but in fact no one actually knows the real figure because there is no comprehensive naming system for OTC derivatives.

One of the big issues that emerged during the crisis was the failure to anticipate the huge amount of counterparty risk that was being built up by the risk transfer. If risk is transferred from one institution to another, in effect the firm is transferring an obligation. If that obligation gets very large, that has a significant impact on its balance sheet and potentially its solvency, which ultimately affects the entire financial system. When there are no standards for counterparty risk or risk transfer, these impacts can go unnoticed until it is too late. As institutions started to fail in 2007, this is what brought us to the brink of collapse.

A shift towards standardisation

The financial crisis brought a new wave of industry regulations, including the Uncleared Margin Rules (UMR). UMR and other regulations and initiatives like SR 11-7, Basel IV, the European Market Infrastructure Regulation and the Targeted Review of Internal Models are regulatory responses aimed at least in part at standardisation, but barriers still exist towards achieving it.

The standardisation in the data representation of derivatives will likely be one of the last barriers to overcome, but it is one of the most important. Implementation of data standards will allow a new wave of transparency, interoperability sharing, cost reduction, and, ultimately, safety in the industry. As the final phases of UMR approach, we have an opportunity to migrate the industry to a common data set using an accessible and transparent open-source framework.

A market standard for data, and ultimately for pricing and valuing derivatives, would be

beneficial for market participants and regulators alike. We have been working towards this goal for several years and are excited for the industry to embrace standardisation. Below are some initiatives and products AcadiaSoft and Quaternion have implemented that will help move the industry towards standardisation.

Open Source Risk Engine

Quaternion (now part of AcadiaSoft) first released the Open Source Risk Engine (ORE) in 2016. ORE makes complex financial risk more manageable by providing a transparent and powerful valuation and risk framework for financial derivatives. The goal of ORE is to:

- Provide a free open-source pricing and risk application, accessible to the end user, at a high level of technical sophistication allowing for full scalability and production usage
- Offer broad analytics covering valuation, market risk analysis, credit exposure simulation and XVA calculation
- Cover all relevant asset classes — interest rate, foreign exchange, inflation, equity and commodity derivatives
- Publish annual releases to take account of market changes and ORE user input

Importantly, end-user accessibility means that ORE can be downloaded and used out of the box, with trade data provided in ORE's public XML format. ORE also comes with various examples and a detailed user guide that facilitates its adoption and ongoing application.

Many firms leverage ORE as a blueprint and extensible foundation for tailored pricing and/or risk solutions. Once this is achieved, the full benefits of having a fully transparent framework for pricing and risk management kick in.
Firms that adopt ORE typically do so in the areas of:

- Derivatives and structured asset valuation
- XVA calculation and CSA pricing and decision making
- Collateral management and liquidity forecasting
- Model validation
- Market risk monitoring and management across the balance sheet
- Financial planning and controlling

AcadiaSoft's SIMM calculation service (IM Risk Generator), as well as the SIMM backtesting and benchmarking service uses ORE (with extensions called ORE+) as a core component. The ORE+ extensions for that purpose comprise a wide range of additional financial instruments, with more analytics than ORE currently provides, performance enhancements and a web service integration layer.

Data standards and UMR

With Phases five and six for the uncleared margin rules coming into scope in September 2021 and 2022, respectively, and the vast number of firms that this impacts (AcadiaSoft expects upwards of 1,000 firms will be in scope for the last two phases of the regulations—compared to 75 firms in total in Phases one to four of UMR), an industry-wide market data standard could emerge on the back of the UMR requirements. Initiatives like the ISDA common domain model could add greater value to efforts in improving how data is used, shared, and stored.

To date, more than 50 per cent of all in-scope Phase 5 firms have adopted AcadiaSoft's IM Risk Generator service. The IM Risk Generator service takes client trade data as an input and generates either an ISDA SIMM — or Schedule-based Common Risk Interchange Format (CRIF) file that forms the input to the initial margin calculation. In the case of an ISDA SIMM CRIF, a key component of the service is the calculation of the risk sensitivities that enable the ISDA SIMM calculation.

The CRIF file forms the input to the initial margin calculation — it contains the clients' positions that

are subject to UMR and its trade risk sensitivities, generated on a daily basis. A typical buy-side firm — even fairly large firms that are subject to these rules — simply does not have the resources available to manage this daily process.

On the regulatory front, firms need to demonstrate that SIMM is appropriate for their specific portfolios. Being able to demonstrate this in a standard model has a number of benefits for the industry. An increasing number of market participants are adopting the ORE XML trade format, as evidenced by the volume of financial institutions that have onboarded to AcadiaSoft's SIMM service.

In addition to the SIMM calculation, several firms are required to perform quarterly ISDA SIMM™ backtesting and benchmarking for the regulators. The ORE/ORE+ analytics and methodology allow for a standardised data representation and reporting. This has been widely welcomed by regulators.

As the number of market participants that leverage the ORE framework increases, we see the potential to establish a standard for trade representation in the OTC derivatives market. The increased adoption also allows for expansion into additional analytics services on top of the ISDA SIMM related ones.

Moreover, adopting AcadiaSoft's analytics services means adopting a consolidated market data feed process that is managed by AcadiaSoft and fuels the service analytics in ORE/ORE+. This leads to a somewhat more hidden standardisation of market data usage across the industry, which can open up further opportunities to provide standardised model calibrations for Valuation, Market Risk, Initial Margin, Credit Risk and Capital Requirements calculations in the future.

All of these pieces fit into the larger puzzle of creating industry-wide standards. Standardisation makes products safe, transparent and accessible. As the final phases of UMR approach, we are on the cusp of a widespread adoption of industry standards.

This is welcome news for regulators and businesses alike.

> ***"Adopting AcadiaSoft's analytics services means adopting a consolidated market data feed process that is managed by AcadiaSoft and fuels the service analytics in ORE/ORE+"***
>
> *Roland Lichters*
> *Co-head of quantitative services , AcadiaSoft*

Matt Wolfe
Executive director securities finance
Options Clearing Corporation

Reducing discrepancies and improving efficiency within securities lending

OCC is dragging the decades-old clearance and settlement process into the 21st century, reducing errors, slashing risk and creating value for lenders and borrowers alike

At OCC, we pride ourselves on being the foundation for secure markets. A critical component of secure markets is accurate and timely information about the contracts that we clear. This is true not just for OCC, but all market participants including clearing firms, traders, custodians, clients, and regulators. I would like to share three areas that we are working on to help reduce discrepancies and improve the timeliness of information within the securities lending market:

- Improvements to the existing clearing workflow to reduce the number of errors and improve the amount of information within the securities lending market
- Defining a standardised messaging protocol that the industry can leverage to lower costs
- Supporting flexibility in how the industry communicates with OCC

As of 1 March 2021, OCC has guaranteed more than $120 billion in the notional value of stock loans. For each of those contracts, it is critical that we have accurate and timely information and are in sync with both the lender and borrower on the details. However, OCC's records do not contain certain information, such as the rebate rate, which means that we cannot guarantee or settle the accrued interest. Lenders and borrowers settle those obligations among themselves. Not only can this introduce counterparty credit risk, but it requires a process of reconciling and settling interest with each counterparty every month. If OCC guaranteed the interest and the parties involved only paid or received a single net payment each month, this would be a more efficient solution for those involved, especially clearing members.

OCC is working to address this situation by enhancing the clearance and settlement process. When the clearing program was created over 25 years ago, OCC collaborated with the Depository Trust Company (DTC) to obtain copies of the settlement confirmations when a lender and borrower exchanged shares on a loan to be cleared by OCC. We used the existing settlement process for what was previously uncleared activity. This process has largely remained the same since 1993. When a lender delivers shares to a borrower versus payment of the original collateral amount, they indicate that OCC should be given a settlement confirmation. OCC receives those confirmations in near real-time from DTC, and we create a position reflecting who delivered and received the shares, how many shares were exchanged, what security was loaned, and the original contract value. These are the common elements for every stock settlement, whether that be an outright purchase/sale or loan/borrow. The settlement confirmations do not include certain elements that describe the stock loan contract such as the rebate rate and term structure.

OCC is introducing changes to improve the completeness of records to include these additional contract terms. Doing so will require the industry make some adjustments but it may result in noticeable benefits. In the future, lenders will submit a record of each stock loan to OCC prior to settlement. OCC will validate the loan terms and confirm that the borrower agrees to those terms. Once the loan terms are confirmed, OCC will automatically instruct DTC to transfer the shares versus the collateral.

This improved workflow offers several benefits:

- Agreement on the terms prior to settlement will help reduce errors made by the parties to a loan contract, which in today's world are discovered after settlement has occurred. Fewer errors will result in fewer reconciliation issues researched and corrected, which can be costly and inefficient
- OCC's record of the stock loan contracts will include more information such as rebate rate and term. This will allow OCC to expand our guarantee

and reduce counterparty credit risk by margining for, and then settling, interest payments

- Tracking the rebate rate will enable OCC to perform the daily rebate calculation and keep track of accrued rebates. At the beginning of each month, OCC will automatically withdraw the net amount for accounts that owe interest and deposit the net amount into accounts owed interest from the prior month. This is a more efficient and cost-effective process than the scores of bilateral settlements between each combination of lender and borrower
- OCC's records will include the term structure of loans, where applicable. This will enable OCC to maintain that term structure. Doing so is intended to reduce counterparty risk and provide balance sheet savings through netting of the cash flows
- When a group of loans are initiated as part of a structured financing arrangement, OCC will be able to track and guarantee the basket of loans as opposed to viewing them as individual and unrelated contracts
- This new workflow will enable OCC to support loans collateralised by securities. Non-cash loans are a large and growing part of the US market, for which there are no clearing solutions. A cleared solution could potentially save the industry billions in regulatory capital along with all the other benefits clearing provides
- Along with the added loan terms, this workflow will enable OCC to store more information about the lender and borrower, including recognising agent lenders and the allocation to beneficial owners, paving the way to buy-side clearing. Such an expansion would reduce risk in the securities lending market and unlock significant balance sheet savings for many lenders and borrowers

The sum of these improvements can reduce costs, enable growth, increase utilisation, improve rates, and generally provide a much more secure foundation for the securities lending market. All of this becomes possible through more accurate information. OCC is working on these improvements through a set of technology changes.

The first technology component OCC is focusing on is how market participants communicate. OCC is working with industry bodies and a variety of its members to define a standardised set of FIX messages and workflows. Ways of communication are not currently standardised, and connecting to a new trading platform or service provider can be an expensive and difficult project. OCC is working with the industry to agree upon common workflows and a shared taxonomy of terms. This will help lower ongoing technology and operational costs. By lowering the barriers to entry, this can enable a new wave of innovation to the benefit of lenders and borrowers alike.

The second technology component is our clearing platform. We are developing a new distributed ledger-based clearing platform. It will cover most aspects of a securities lending contract, from its initiation when the new loan is submitted for clearing to its termination through either a return or buy-in, and every step in between. The system will enable a range of automation and provide new ways for transactions to be initiated for greater flexibility.

Similarly, the system will support a variety of ways for clearing members to receive information. They can view information through screens and reports, subscribe to receive messages in either real-time or in batches, and connect directly via a node. We believe this is critical to allow clearing members the freedom to choose the communication method that suits them best. Screens and reports are the most manually intensive but may make sense for firms that don't have a lot of activity. Sending and receiving messages is similar to the way the majority of firms communicate with OCC today. A distributed ledger technology node enables a more seamless connection, but it is an emerging technology that some firms may not yet be comfortable with.

To summarise, OCC is working on initiatives designed to improve the stock lending process, lower the cost of communication through standardised means of communication, and introduce innovative ways to connect more seamlessly.

The combination of these efforts will help to reduce errors and risk in the industry, provide more detailed information, reduce the cost and difficulty of reconciliation, and lower the cost to connect and maintain connections to counterparties and service providers.

INNOVATION SHOULD BE IN YOUR TECHNOLOGY'S DNA

FIS is a strategic growth partner that gives you resilient, secure and scalable technology today – while continually innovating for the future.

Our next-generation platform provides end-to-end support for the front-, middle- and back-office processes of the securities finance and collateral value chain. The cloud-native solution is based on a lean and modern technology stack which provides real-time connectivity with market infrastructure providers via open APIs.

With advanced automation, the latest digital functionality and simplified integrations, you can increase economies of scale while generating new revenue streams and better serving your customers. And with the support of the world's largest fintech provider, you can do more than just keep pace with change – you can be ready for whatever comes next.

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New revenue opportunities, keeping compliant and EquiLend Spire's fully-paid lending solution

Changes to US regulation governing equities pledged as collateral have implications for fully-paid lending programmes. Stonewain's Chris Valentino explains how EquiLend Spire offers the tools to mitigate these challenges

Chris Valentino, head of business development, Stonewain Systems

Recent clarifications from the SEC on Rule 15c3-3 fully-paid lending (FPL) requirements mean broker-dealers (BDs) are now facing more stringent obligations. If you happen to find yourself in this position, you've come to the right place. In this article we take a look back into the rule's more critical requirements and lay-out how BDs may seamlessly meet the deadline and maintain compliance thereafter.

Fully-paid lending: what it's about?

FPL transactions are a commonly used tool in the lending space today. In fact, practically all of your household retail broker names regularly engage in FPL. For investors, opting for an FPL strategy is a great way to grow the value of their portfolio without exerting any real effort or active decision making, not to mention without incurring any significant risk. How? By putting their otherwise idle and segregated positions to work.

So what exactly is an FPL? Let's break it down. Really, an FPL is no different than any other securities lending transaction (SLT). An investor may lend out their inventory to a financial institution for lending to other investors in exchange for a fee. The fees received shared between the securities owner and the FI broker, typically split down the middle, 50/50. Just the same as any SLT, stock loans are collateralised at around 102 per cent to 105 per cent of the loan value and are marked-to-market daily thereafter.

Typically, cash collateral is given to secure the return of the loan until the date of termination in addition to interest for each day the loan exists. So how does FPL differ

from other SLTs? SLT lends shares that are purchased on margin, whereas FPL deals in securities which an investor has paid for in full – thus "fully-paid lending".

Rule 15c3-3

In 1982, the US Securities and Exchange Commission (SEC) amended its Rule 15c3-3 introducing section (b)(3). The new provisions required BDs borrowing fully-paid and excess margin securities from customer accounts to enter into a written agreement specifying management terms for BDs including that they must: (1) provide the lender with collateral to fully secure the loan; (2) mark the loan to market no less than daily and provide additional collateral as necessary to fully collateralise the loan; and (3) notify the lender that the provisions of SIPA may not protect the lender, and that collateral delivered to the lender may constitute the only source of satisfaction of the BDs obligation to return the securities. Most critically, the rule obliges "the firm to turn over the collateral physically to the lender." The SEC has recently made it clear that depositing collateral into a lender's securities account at the BD or an omnibus account at a bank in the name of the BD does not satisfy turning over collateral physically to the lender. The SEC states that enforcement measures will not be taken for non-compliance provided that:

- The BD is operating a FPL programme that was in existence prior to the date of the SEC notification letter (22 October 2020)
- The BD operating the FPL programme remains in compliance with all other aspects of rule 15c3-3(b)(3)
- The BD comes into compliance with paragraph (b)(3) of Rule 15c3-3 as soon as practicable but no later than 22 October 2021

Leveraging EquiLend-Spire's FPL module

For those not yet familiar with its vast benefits, EquiLend Spire is a comprehensive, front-to-back securities lending solution. It is modular, customisable and, conveniently, is fit for managing and maintaining compliance with Rule 15c3-3 and other regulations around the globe.

Essential to any FPL solution is the ability to integrate with stock record systems for ingesting underlying customer account and position data. EquiLend Spire can ingest all such data, which is further enriched with market/pricing data, vetted against relevant rules and restrictions and aggregated so inventory is presented at the rolled-up security level into a consolidated account — all in real-time. With an aggregate view of fully paid inventory, BDs can disseminate availability to their counterparties through EquiLend's Next Generation Trading (NGT), Bloomberg, LCOR or by direct file distribution.

Through its robust Order Management System, EquiLend Spire receives and processes inbound borrow requests. Requests are scanned against the rules engine and checked to confirm ample credit is available to ensure the appropriate lending rate threshold is met. If no exceptions are identified, the fully paid for transactions are automatically processed and the necessary memo seg releases are triggered at the depository. The transaction then follows the standard trade processing including maintenance, comparison, marking and so on by the system, in coordination with the appropriate post-trade reconciliation providers.

At the close of each trading day, EquiLend Spire sends the necessary journal entries to the stock record system and ensures loan and collateral positions are appropriately reflected in both the client's fully paid account and the collateral management account. Through this functionality clients are enabled to adhere to (b)(3); collateral is maintained in an account that is separate and 'physically' accessible to the lender and protected from borrower risk.

FPL can be a lucrative business tool, and one which further presents interesting opportunities. Beneficial owners, for example, having the underlying position of the security lent are enabled to participate in earnings on the trade.

For those yet to benefit from FPL, it represents a greenfield opportunity in a market which can at times be lacking. As with any new opportunity, however, the rules of engagement (i.e., (b)(3)) must be adhered to. With the right solution compliance with evolving legislation can be accomplished while also unlocking lucrative revenue opportunities for your customers and your securities finance business.

Always true

The drama of the cargo ship that blocked the Suez Canal holds some instructive parallels to the securities finance industry, where the risk of growing too large too quickly, combined with global ripple effects, poses a genuine systemic risk

Sal Giglio, COO, GLMX

On 23 March 2021, a quarter-mile-long cargo ship got stuck in the sidewalls of the Suez Canal preventing ships from passing for six days. The Suez Canal is a 120-mile man-made waterway running north to south through Egypt, connecting the Mediterranean Sea and the Red Sea, and supports up to 10 per cent of global maritime commercial traffic. By the time the ship and its cargo, believed to weigh 200,000 metric tons, was freed it is estimated that 367 vessels were waiting to pass through the canal. The financial repercussions of this accident are still being calculated but the numbers are expected to be significant. For those in the funding markets, a cautionary tale can be drawn from this incident.

Throughout its history, the Suez Canal has been widened and deepened several times to accommodate both the increasing volume of traffic and the increasing size of ships. In fact, in 2014 the canal was widened from 200 feet to over 1,000 feet across a 20-mile stretch to allow ships to simultaneously pass in both directions. However, as Murphy's Law would have it, the mega-ship ran aground in an area that was only wide enough to accommodate one-way travel.

As a result of extreme conditions caused by heavy winds and a sand storm, the ship's bow ran into one bank of the canal while its stern swung to the other bank, creating a complete blockade. The Suez Canal is an attractive route for merchants involved in European and Asian trading since it can cut weeks off of delivery times as cargo ships do not have to travel around the southern tip of Africa. As global demand for goods continues to increase, so has the size of cargo ships. The stuck vessel, named Ever Given, is one of the largest cargo ships in the world at 1,300 feet in length and can carry 20,000 20-foot-long shipping containers. That load is a four-fold increase since the turn of the century.

Unfortunately, this type of mishap was foreseen by many in the industry. The securities finance market is an essential channel that allows participants to access needed liquidity. Securities and cash are exchanged daily via the repo market. These transactions support both growing debt issuance in the public and private sectors as well as the ability for large financial institutions to execute trading strategies. Both the US and European repo markets have grown roughly 15 per cent since December 2017, according to the Securities Industry and Financial Markets Association and International Capital Market Association. The combined markets now measure close to $14.5 trillion. As the weight of regulations, challenging market conditions and a long list of industry initiatives continue to build, securities finance participants seek to employ tools to help prevent them from also running aground.

Regulators, looking to make the industry safer and prevent systemic events from impeding the proper functioning of markets, are actively implementing rules for market members to follow. Some regulations have taken effect recently, others will be implemented in the coming year and still more are being contemplated. To mention just a few, Securities Financing Transactions Regulation (SFTR), the Uncleared Margin Rules, the Central Securities Depositories Regulation, the Sustainable Financing Disclosure Regulation, potential money market fund reform and enhanced short selling reform. Complying with additional mandated controls increases costs for financing desks at a time when revenue-generating opportunities are facing strong headwinds. Among them are zero interest rate policies which are expected to last well into 2022, the implications of Brexit for financial services firms which are yet to be fully understood, the results of the transition from the London Interbank Offered Rate to alternative reference rates, like Secured Overnight Financing Rate and the Sterling Overnight Index Average, and the termination of the supplementary leverage ratio exemption for US banks.

The need to run funding businesses more efficiently and safely has never been more important. Finding ways to be capital efficient and ensure access to liquidity when needed are essential for the well-being of funding businesses. To meet these challenges and to strengthen the market structure that supports these markets, firms are increasingly turning to innovative technology. For example, optimising internal collateral usage is a key initiative for many firms since it frees up excess collateral, minimises the cost of margin requirements and brings down capital costs. Since firm-wide collateral optimisation is a complex puzzle, only technology can effectively manage the myriad demands

and constraints around the process. To make sure that liquidity is available at all times, widening access to market participants via alternative funding vehicles such as sponsored and cleared repo has grown in popularity. Newer and yet unproven mechanisms like peer-to-peer repo and distributed ledger technology (DLT), too, are being explored with renewed enthusiasm. For these tools to scale, they too will look to technology.

A sector of the industry that has seen impressive growth and large industry adoption over the past 18 months is D2C electronic securities finance trading technology. Transacting via this type of ecosystem provides many benefits including straight-through processing (STP), real time position management and lifecycle trade management, to name a few.

GLMX's own, patented technology provides a digital bridge that connects users to their counterparties. With quicker trade negotiation and subsequent STP, traders can monitor their risk more effectively as their positions are updated in near real-time and with significantly fewer errors compared with more manual processes. Accurate position management is essential when volatility spikes as happened in September of 2019 and March of 2020. To revisit the earlier metaphor, digitising workflow can help keep the ship straight in turbulent times.

Why GLMX?

GLMX is a complete global securities finance trading solution. The technology is flexible and customisable. It handles all the diverse RFQ-driven securities financing transaction types including classic DVP, packages, lists, triparty, opens, cleared, evergreen, extendable, index-based, callable and cross-currency. Another GLMX differentiator is that trade lifecycle events are handled on a bilateral basis on the platform so that our users can leverage STP and thus can avoid trade outages and the potential for fails when repricing, partialling, substituting, early terming, rerating and correcting existing trades. With this full array of functionality, GLMX handles not only traditional liquid collateral such as treasuries, sovereigns, agencies and mortgage-backed securities but also handles transactions involving non-traditional collateral such as corporates, emerging markets and structured securities. Complementing the platform's expansive workflow capability is our comprehensive pre- and post-trade application programming interfaces which use both industry standard and custom protocols.

GLMX is built on three key principles. First and foremost, we value our subscribers and, with our unique, intense focus on securities financing, provide a superior level of client service. Our dedicated staff stand ready to support our subscriber base and to immediately answer any questions that arise throughout the day. Second, GLMX provides modern, flexible and intuitive technology that covers the spectrum of trading styles, types and protocols. Third, GLMX provides a custom user experience. Although the majority of functionality and features that subscribers require already exist on the platform, some level of customisation is often required to conform to their workflow. GLMX works with our users to build the specific technology, connection or logic that will make the transition from manual workflow to digital workflow as easy, efficient and cost-effective as possible.

Conclusion

The stranded Suez cargo ship's name, Ever Given, has been interpreted by some to mean "always true". The Ever Given situation holds some instructive parallels to our industry, where the risk of growing too large too quickly, combined with global ripple effects, poses a genuine systemic risk. In this case, the Ever Given, a mega-sized vessel that experienced unexpected turbulence, not only ran aground causing severe losses for its immediate owners but set off a chain of negative ramifications for other shipping market participants and the industry as a whole.

It is "always true" that dramatic market growth without attendant growth in infrastructure eventually and dramatically plays out poorly for stakeholders. Traders, salespeople, and operations and risk managers are well-advised to endeavour, wherever possible, to "shore up their infrastructure and processes while they scale up their business". As has been emphasised that much more by the work-from-home necessity of the pandemic, electronification of workflows has been proven to provide a superior level of risk mitigation over manual processes. And GLMX has proven to be a superior technology solution provider.

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The green roof: Making recalls automated, data-driven and ESG-friendly

Broadridge zeroes-in on the evergreen issue of recall management to detail how this fundamental process remains suboptimal for much of the market

It is very easy to keep feeding the hype on topics such as automation, data and environment, social and governance (ESG) driven investment. What conference would be complete without sessions on each of those topics? However, there is one area of the securities lending business where these important but much-hyped topics come together in a very real way, recalls management.

Generating and managing recalls is one of the fundamental processes of the securities lending business. Securities lending transactions are normally transacted on an 'open' basis i.e. there is no fixed term to the transaction. The end of a transaction is generally dependent on either the borrower determining the securities are no longer required, generating a return or a lender determining they need the lent securities to be returned and generating a recall.

Though some trading systems have functionality to significantly automate the recalls process, in general there is a high degree of manual effort involved in recalls management including a great deal of reliance on human decision making.

Recalls processing has two main areas:

- The internal decision-making process regarding when to make a recall and what to recall
- The management of the bilateral process between the party making the recall and the party being recalled

What generates the need for a recall?

The most common motivation for recalling a stock that has been loaned out is having a short position in the security lent. The short position would typically result from the lender selling the security or making a loan to another party (potentially at a better rate). Where the lender is using an agent it may be possible for the agent to re-allocate the loan to other funds but if it's not possible to fully cover the short by re-allocation (or the security has been loaned on a principal basis) there will generally be a need to initiate one or more recalls of loans.

The other motivations for recalling a stock are:

- Corporate actions – the lender may have policies for recalling securities if there are up and coming corporate actions such as dividends, share splits or rights issues. Particularly if the lender wishes to avoid tax complications and the risks related to dividends or exercising a particular option where there is some degree of choice in the corporate action such as whether to take up rights or not
- Credit limit breaches – a credit limit breach at the legal entity, counterparty or fund level may mean trades need to be recalled to reduce the overall position in order to clear the breach
- Changes to lending policies - a recall is also possible where the lender has changed policies about whether particular stocks are to be lent or what proportion of a portfolio are to be lent
- General meetings or any other vote in relation to the issuer (this is discussed in more detail below in relation to ESG)

Using data to drive the recall process

Identifying the short — the fundamental data required to

drive a recalls process, whether manual or automated, is good quality inventory data. This is necessary to view current or projected short positions. With that data it should be possible to automatically generate recalls but given that future short positions will be impacted by pending trades and potential settlement failures, an automated solution needs to give a lender a choice of algorithms that are to varying degrees 'optimistic' or 'pessimistic' regarding what to view as a short. For example, should a position include traded positions (optimistic) or just settled positions (pessimistic)? Should intra-day purchases be included (optimistic) or just intra-day sells (pessimistic), or one of many variations on this theme?

Identifying what to recall — the first step to identifying what to recall is identifying outstanding loans for the relevant securities which could potentially be recalled. Data to drive this process comes from both the outstanding loans and the historic data on recalls. Relevant factors include:

- The loan type (whether fee, rebate or evergreen) – the recall algorithm for instance may prioritise cash collateralised trades over non-cash collateralised
- The fee and rebate rates — typically loans with lower fees or higher rebates would be recalled first
- The quantity — an algorithm may prioritise minimising the number of loans that need to be recalled by choosing the largest trades
- The age of the loan — newer loans would typically be recalled later that older trades
- The number of times a counterparty has been recalled — recalling a particular client too frequently is bad for client relations and may undermine the broader relationship

The recall lifecycle

Recalls in general have a similar life cycle globally. However, in the US domestic market there are additional steps and variations such as callbacks and terminations, making it a more complex workflow. There are also market utilities available from DTCC (smart/track available in US), EquiLend and Pirum that help the bilateral management of the recall process. The following is a simplified generic semi-automated workflow:

- The recall is identified
- The recall is 'generated'
- The recall is in an unactioned state 'pending'
- The recall is 'sent' (via email, phone call or any other communication method)
- The recall is disputed
    - The disputed recall moves to either a 'cancelled' state, or
    - The disputed recall moves to an 'agreed' state
- The recall is cancelled – end of lifecycle
- The recall is agreed – but the settlement date or quantity differs
- The recall is agreed with no changes to its parameters
- The return is booked
- The return is cancelled (due to a cancel of the recall or other reasons)
- The return is booked but the settlement status is 'failing'
- The return is booked but the trade has failed settlement
- The return has settled – end of the recall lifecycle

Bilateral communication

Current processes for managing the communication relating to recalls tends to be manually intensive involving spreadsheets, emails, Bloomberg messages and phone calls.

There are also multiple vendor platforms for managing recalls that can simplify the process but there is no prevailing market standard. Establishing a market standard for the communication of recalls data is one of the areas that could potentially be achieved through initiatives such as the International Securities Lending Association's Common Domain Model (CDM) initiative. This would be a good opportunity to make the recall lifecycle more granular to enable additional standardisation and automation of currently highly manual processes. Any standard introduced however needs to be global and incorporate the requirements of both the US and International markets.

The ESG dimension

Though one of the most publicised aspects of ESG is the environmental dimension, the governance aspect is equally, if not more important. In general, good corporate governance policies aim to avoid the problems that can arise from the separation of ownership and control in public companies, the well-known 'agency problem'. Over the past 18 months of frothy and volatile markets, it has sometimes been very hard to see a direct relationship between good corporate governance and shareholder returns. However, there is a solid body of research going back decades that demonstrates that firms where there are clear mechanisms to monitor and hold management accountable, generate higher shareholder returns. Not to mention reduce the risk of general mismanagement or even outright fraud.

One of the key measures of a buy side firms' commitment to investing in firms with good corporate governance is corporate voting. Voting on issues such as the constitution of the board and executive are vital to maintaining accountability. Corporate votes may also be on matters that impact other areas of ESG. Voting on matters related to diversity and inclusion, for instance, are important to social objectives of ESG. Feeding corporate voting data into an automated recalls process can improve both efficiency and firms voting records. Voting information can trigger either automatic recall of equities or flag loan trades as requiring a recall to allow a human to determine whether to make a recall. Using the right data provider allows an even more effective and targeted identification of the need for recalls. Data available includes information on the specific ESG objectives impacted by announced votes as well projected (but not yet announced votes) based on historical data.

It is likely the importance of voting rights as a motive for recalls will have an increasingly large impact, potentially leading to higher volumes of recalls in the future. Thus, putting more pressure on the industry to improve automation.

Conclusion

Though recalls are frequently treated as an afterthought to the core trading process, the costs of and impacts of a manual process can be significant. Failures in the recalls process can lead, amongst other things, to reputational damage, loss of voting rights, credit limit breaches and corporate actions losses.

Recalls processing is an area that would clearly benefit from more automation, particularly automating decision making though the better use of data. It is also a great example of an area where there is scope for data driven automation to add additional value, notably in ESG, without adding additional headcount.

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Timing, frequency and depth

As the needs of securities finance traders evolve, IHS Markit Securities Finance is striving to deliver the broadest, deepest and most timely global securities finance data insights

Securities finance trading involves automation as well as high-touch human oversight. As the former takes on a larger share of the total, the importance of accurate, timely data has taken on greater significance. On the other hand, partly as the result of market structure, trades with economic value sufficient to warrant special oversight are a more important contributor to securities finance revenues than ever. As the needs of securities finance traders evolve, IHS Markit Securities Finance is striving to deliver the broadest, deepest and most timely global securities finance data insights.

For trades involving human oversight, a few data delivery options are available. The Web Portal

is primarily a front-end delivery mechanism and includes a screening tool that can be set up to receive daily updates of securities meeting certain criteria. The quote screen displays current levels and time series for key single security data metrics in aggregate, such as weighted average fees and loan volumes. Additionally, the quote screen displays recent transactions to allow a deeper appreciation of trade sizes and rates behind the weighted averages. A critical final piece of the quote screen is the intraday data monitor, which shows a time series of trades and rates along with individual trade details. An intraday screening alert tool is currently under construction. Our partnership with Pirum Systems has aided in the collection of intraday securities finance transactions, by allowing common clients to direct transaction data via their market data gateway.

Ingesting files containing security-level data into front-end trading systems is another key delivery mechanism, allowing key fields to be placed alongside internal data and applications. The Open API can also be used to ingest on-the-fly security level data for front-end visualisation. The Excel Toolkit is a bridge for traders between the other front end delivery mechanisms, where data can be used as flat files or an application programming interface (API) for one-off data extracts. In addition, it has all available client and group datasets, so it can also be set up to mimic Web Portal front-end functionality as well. The time-series data behind the charts on the quote screen is available for traders to download and for more detailed data queries or recurring data table needs, the Excel toolkit is an ideal fit.

For more automated use cases there is some overlap with tools for human oversight, including flat data files, meaning that each row of the file contains a separate singular record. These may be the same security level files that feed front-end trading screens as well as transaction-level files or custom feeds. Another delivery mechanism featured in both use cases is the API, which is used systematically to customise daily data feeds as well as to run one-off queries in a fashion similar to the Excel toolkit. The securities finance dataset has also been onboarded to the IHS Markit Data Lake, the cloud-based platform that supports advanced analytics and data science at scale.

The use of security level value-weighted fees to calibrate rate expectations is now augmented by transaction level spread analysis, which provides insight into which securities are likely to benefit most from greater trading oversight. The transaction-level flat file and API fuel these decisions at a macro level, while the Web Portal and Excel toolkit provide security level insight.

Tools for securities finance trading continue to evolve to meet modern demands. The breadth, depth, and timeliness of data to power these decisions has never been more important. As more trading of all types is automated, the value of efficient execution increases. For special situation trading the ability to identify opportunities and fully realise their potential is more important than ever as a contributor to lending returns. Securities finance data assists practitioners with identifying and executing the optimal trading strategy for a given security.

Sam Pierson
Director,
securities finance
IHS Markit

Comyno's C-One platform: Efficient. Innovative. Modular. State-of-the-art

Comyno's future-proofed software aims to drive down costs and streamlines processes

Comyno is a specialised fintech company with more than 15 years experience in securities finance, focusing on software and consulting. Comyno is led by its founder Markus Büttner, Admir Spahic and Frank Becker.

Comyno works with leading private and public financial institutions, asset managers, clearing houses and triparty agents, combining their expertise in strategy, processes and technology.

Extensive experience in the provision of standardised and tailor-made solutions, increasing functionality and efficiency across the entire value chain of securities finance business is the main reason why customers choose Comyno´s C-One software solution and consulting services.

About Comyno´s hybrid platform: SLB, Collateral Management, Regulatory Reporting and Blockchain Technology in one single source

C-One's modular approach leads the securities finance business step-by-step into the future with low costs, on budget and on time. A particular focus here is to expand existing business while simultaneously increasing profit. The current legal regulations, such as compliance with regulatory key figures or compliance with the SFTR, are very important to Comyno and our customers.

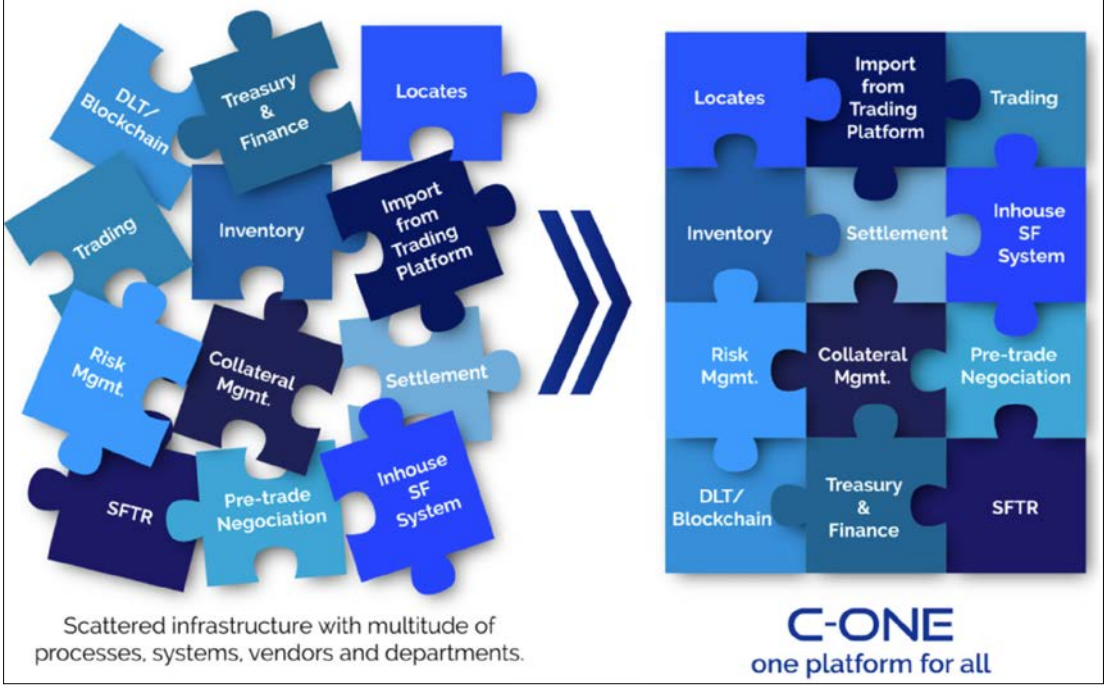
Our innovative strength and future-oriented software is demonstrated by our expertise in Blockchain/DLT and its practical application through its implementation in our C-One trading software.

In 2016, Markus Büttner stated in the course of an interview with SFT: "I expect there to be a time of coexistence between the legacy world and blockchain/ distributed ledger infrastructures. We have already shown that we are able to support the transition with our ready-for-blockchain software. As we are connecting legacy market infrastructures with C-One, we can act as the 'enabler' to move from the current to the future world, step by step. Investment in the current experiments will pay-off for Comyno and the wider markets."

Now, Comyno is in a fortunate position. As mentioned in AST´s March magazine: "Germany boasts a highly developed and mature market for asset servicing. Amid opportunities to seize, and challenges to overcome, experts believe that Germany is on the forefront of innovation." Comyno is working together with DekaBank on the digital collateral protocol (DCP) blockchain/ distributed ledger technology (DLT) project. The aim of this initiative is to decentralise and democratise the future financial infrastructure across jurisdictions while enabling secure, global trading and settlement in real-time for every type of asset. DekaBank, Hauck & Aufhäuser and DekaInvest settled a total of €350 million worth of securities lending versus collateral trades on the DCP. Comyno implemented the DLT-based protocol via their C-One Securities Finance Platform.

Within C-One´s Securities Finance System, the worlds of securities lending, repo and collateral

Figure 1



management for 'traditional' and digital assets have merged. Having connected C-One not only to traditional market participants, but also to most common blockchain and DLT infrastructures, for example Corda, Stella, Ethereum, we enable issuing and settlement of digitised traditional securities and native digital assets.

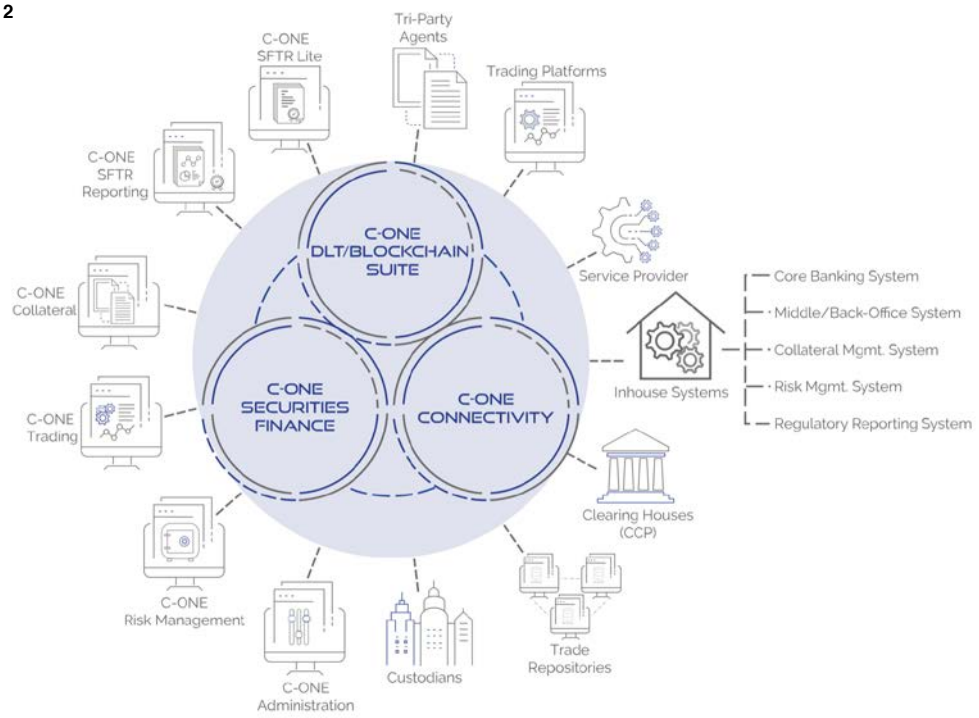
Example use case:

As an example, consider the following case: you and your client (or counterparty) could now manage a locate request, agree the terms of a lending trade, set up or use a collateral schedule which could comprise traditional and digital assets, settle the transaction as a whole and fulfil the requirements of the Securities Financing Transaction Regulation (SFTR) with C-One´s regulatory reporting (including delegated) functionality by seamlessly reporting the trades to the trade repository. All this with a few clicks in one single system and within less than a minute. And above all, already proven in production environments.

The innovative C-One suite offers a complete solution for securities finance trading and collateral management, covering the complete value chain of the corresponding transactions. It is built as a 'hybrid platform'— incorporating features for an in-house trading and collateral management system, a multi-entity and multi product platform across asset classes. This enables clients not only to manage their whole securities finance business with C-One, but also grants online access to and for their clients and counterparts, including white-labeling potential, simply via the web. C-One provides seamless possibilities for position sharing, location management as well as affirmation processes. Furthermore, clients and counterparts can see 'their side' of the trading activity as well as 'their side' of the collateral and exposure management. Even the profit and loss features can be used by all entities with access to the platform.

One of the biggest cost drivers for the industry is the multitude of internal and external parties involved in securities finance transactions. The variety of software systems and IT components as well as a big number

Figure 2



of manual workarounds and interfaces, which are necessary to fill gaps, lead to high inefficiencies. Comyno has tackled this industry challenge for the benefit of our market with its C-One solution: with an extensive modular approach that covers the whole value chain, both from a business and technical perspective.

Sticking to the slogan 'one-stop shop', Comyno implemented SFTR reporting capability into C-One in early 2020. As with all our other functionalities, this was built using a modular approach. The SFTR functionality can be used as a stand-alone tool connected to in-house systems, or out of the box for firms already using our full enterprise suite.

An important and necessary tool for an asset manager or a bank's securities finance desk is Comyno´s Locate Manager. Bringing structure and clarity to unstructured and very diverse information is a great challenge, which Comyno passionately accepted. There are thousands of locate messages with single or multiple security requests being sent every day. Every sender has his own way of putting in the request with varying degrees of information. No trader is able to handle these requests efficiently by reading the email, extracting the relevant data and comparing the requests security-by-security against the available inventory. When inventory is identified, the trader must then determine the offer rate, the offer price and then finally find the time to author a response. Multiple time-consuming steps for often little revenue. Manual scanning of an ever-changing inventory for the requested securities can also be error-prone.

Comyno's Locate Manager is therefore a very powerful tool for both sides: The potential lender is improving the utilisation of his inventory and increasing his revenues. On the other hand, the requesting entity has an improved chance of finding securities in the depth of the pockets of its trading network. The traders can focus on concluding the trade itself or more complex activities, while the laborious, time-consuming tasks are covered by the Locate Manager. The installation of the C-One Locate Manager does not even require the implementation of a complex, much larger system environment. The dedicated module can be installed with limited interaction with the existing technological framework of the lending desk — just basic static data, the available inventory, and a connection to the email server to begin with. It generates a benefit immediately with limited effort, and it can be further integrated into the overall architecture.

Launching Comyno´s hybrid platform C-One at your company means moving your securities finance business on to an efficient, modern, and state-of-the-art system. Low entry costs and customised solutions through its modular and extensible approach increases profits right from the start, with the emerging field of digital assets paving the way for Comyno to add further modules to cover the full 'digitised' lifecycle — from issuing, registration and investments to asset management and secondary markets.

Markus Büttner
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Vendor profiles

www.acadiasoft.com

AcadiaSoft, Inc. is the leading industry provider of risk management services for the derivatives community. Its industry-wide repository of margin and collateral data helps firms to mitigate financial risk and optimize resources across the entire trade life cycle.

AcadiaSoft's suite of analytics solutions and services helps firms measure the quantitative aspects of risk management. Through an open-access model, AcadiaSoft brings together the top derivatives banks and asset managers, along with several market infrastructures and innovative vendors.

Backed by 16 major industry participants and market infrastructures, AcadiaSoft is used by a community of over 1600 firms exchanging more than $1 trillion of collateral on daily basis via its margin automation services. AcadiaSoft is headquartered in Norwell, MA and has offices in Boston, Dublin, Dusseldorf, London, New York, and Tokyo.

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Broadridge Financial Solutions, a global Fintech leader with over $4.5 billion in revenues, provides the critical infrastructure that powers investing, corporate governance, and communications to enable better financial lives. We lead business transformation and deliver technology-driven solutions for enriching client engagement, navigating risk, optimising efficiency, and generating revenue growth, helping our clients get ahead of today's challenges with products that streamline and simplify the Securities Finance industry.

Broadridge Securities Finance and Collateral Management (SFCM) offers a suite of global, front to back office securities finance solutions for buy side and sell side. Both our full service integrated Mainline solution and new FastStart rapid spin up operating solution both support agency and principal trading of equities and fixed income securities across securities lending, repo, collateral management, collateral optimisation, and end to end transaction reporting solutions. Broadridge's solutions help customers comply with new regulations, increase efficiency, improve strategic decision making and make more intelligent use of capital, balance sheet and liquidity.

In addition, Broadridge provides project management, consultancy, business analysis and testing support to augment firms' internal regulatory project teams and help them comply with the rules in a timely manner. Broadridge's technology and operations platforms underpin the daily trading of on average more than U.S. $10 trillion of equities, fixed income, and other securities globally.

For more information about Broadridge and our proven securities finance, collateral management, and transaction reporting solutions, please visit our website.

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Calypso Technology, Inc. is a cloud-enabled provider of cross-asset front-to-back solutions and managed services for financial markets with over 40,000 users in 60+ countries. Its award-winning software improves reliability, adaptability, and scalability across several verticals, including capital markets, investment management, central banking, clearing, treasury, liquidity, and collateral.

With 23 years of experience delivering cross-asset solutions for trading, processing, risk management and accounting, we are able to focus our significant resources on customer problems, bringing simplicity to the most complex business and technology issues. The constant pressures for better allocation of capital and improved risk management, matched by an ever-changing regulatory landscape in the financial markets demand technology solutions that are reliable, adaptable, and scalable. In response Calypso provides customers with a single platform designed from the outset to enable consolidation, innovation and growth. The result is compelling. Faster time to new markets, enterprise risk reduction and lower technology costs drive immediate improvements to our customers' bottom line.

Calypso is pioneering innovative technologies (native cloud technology, AI, Big data) that reimagine capital markets.

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Founded in 2014, Cassini Systems offers an award-winning derivatives margin analytical platform that provides the industry's only front-to-back margin and cost analysis across the entire lifecycle of a trade. Cassini users can calculate any margin on any cleared or uncleared derivatives asset; analyse drivers and movement in margin exposure; reduce Initial Margin levels; and maximise margin efficiency with the firm's industry leading, advanced algorithms.

Cassini services have a proven track record of enhancing portfolio returns at every point in the daily business cycle, empowering traders, and portfolio managers with the ability to analyse instantly in the pre-trade stage the all-in, lifetime cost of a transaction. Top-tier hedge funds, asset managers and Tier 1 banks rely on Cassini for powerful, flexible, automated tools to manage their portfolios of over-the-counter (OTC) and exchange-traded derivatives(ETD) products.

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Comyno is a specialised fintech company with more than 15 years of experience in securities finance, focusing on software and consulting. We work with leading private and public financial institutions, clearing houses and triparty agents, combining our expertise in strategy, processes and technology.

We have extensive experience in the provision of standardised and tailor-made solutions, increasing functionality and efficiency across the entire value chain. Our innovative strength is demonstrated by our expertise in the area of blockchain/DLT and its practical application, e.g. its usage in our trading software.

Consulting Services
- Strategic Consulting
- Project & Program Management
- Business Analysis & Consulting
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- Software Development
- Blockchain Development

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- C-One SFTR
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EquiLend is a global financial technology firm offering trading, post-trade, market data, regulatory and clearing services for the securities lending, collateral and swaps industries.

EquiLend's services include:

- NGT, the securities finance industry's most active trading platform
- Collateral Trading, enabling funding and financing desks a centralised way to execute and manage trade structures with their counterparties
- Swaptimization, automating global equity total return swaps trading workflow
- EquiLend Post-Trade Suite for securities finance operations
- DataLend, providing performance reporting and global securities finance data to agent lenders, broker-dealers, beneficial owners and other market participants
- EquiLend Clearing Services, offering trading services and CCP connectivity
- EquiLend SFTR, a no-touch, straight-through solution for the Securities Financing Transactions Regulation
- EquiLend Spire, a front-, middle- and back-office platform for securities finance businesses

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FIS is a leading provider of technology solutions for merchants, banks and capital markets firms globally. Our more than 55,000 people are dedicated to advancing the way the world pays, banks and invests by applying our scale, deep expertise and data-driven insights. We help our clients use technology in innovative ways to solve business-critical challenges and deliver superior experiences for their customers. Headquartered in Jacksonville, Florida, FIS is a Fortune 500® company and is a member of Standard & Poor's 500® Index.

Sitting at the intersection of technology and finance, FIS is focused on delivering fresh ideas and inventive solutions to help our customers adapt and thrive in an ever-changing environment. With a blend of software solutions, cloud infrastructure, global service capabilities and deep domain expertise, FIS is capable of supporting virtually every type of financial organisation, including the largest and most complex institutions in the world.

Whether on the supply or demand side, FIS' comprehensive range of market data, securities finance and collateral management solutions gives our clients the efficiency to run smarter operations and the agility to capitalise on opportunities.

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Combining Wall Street expertise with Silicon Valley technology, GLMX has developed a thriving ecosystem for the negotiation, execution and management of securities financing transactions (SFT). Using state-of-the-art streaming technology, GLMX facilitates a wide array of SFT including multi-variable negotiation, lifecycle events management, STP, reporting and data management. Funded by leading Silicon Valley venture capital firms, GLMX brings unparalleled trading and liquidity management workflow efficiencies to existing counterparties in the global securities financing markets.

The GLMX solution provides intuitive technology, extremely quick development times and enhanced customisation. These characteristics allow GLMX to create a premium user experience.

GLMX technology supports:

- Web-based, RFQ-driven, Multi-variable Negotiation
- Bilateral, cleared, and triparty
- Cross-currency, locates, rate runs, packages
- Extensive data capture
- Trade life-cycle management
- Full SFTR reporting
- Pre and post trade API
- Pre-trade control functions

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HQLA^X is an innovative financial technology firm founded by financial market practitioners. Our core clients are financial institutions active in securities lending and collateral management, and our shareholders include market-leading service providers in the global financial ecosystem.

Our long-term vision statement is to accelerate the financial ecosystem's transition towards frictionless ownership transfers of assets. We aim to achieve this vision by collaborating with our clients to design, develop and deliver innovative, technology-driven solutions for specific pain points in the financial markets.

Our immediate value proposition and mission statement is to improve collateral mobility amongst market-leading triparty agents and custodians. In the HQLA^X operating model, there is no movement of securities between custodians. Instead, a digital collateral registry is used to record ownership of baskets of securities, whilst the underlying securities remain static in the custody location of the collateral giver. This enables banks and broker dealers to execute delivery versus delivery (DvD) ownership transfers for baskets of securities across triparty agents and custodians, providing capital cost savings due to reduced intraday credit risks and intraday liquidity requirements, as well as reduced operational risks.

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IHS Markit (NYSE: INFO) is a world leader in critical information, analytics and solutions for the major industries and markets that drive economies worldwide. The company delivers next-generation information, analytics and solutions to customers in business, finance and government, improving their operational efficiency and providing deep insights that lead to well-informed, confident decisions. IHS Markit has more than 50,000 business and government customers, including 80 percent of the Fortune Global 500 and the world's leading financial institutions. Headquartered in London, IHS Markit is committed to sustainable, profitable growth.

Securities Finance

Gain market sentiment insights and trading transparency from a macro to an individual stock level, with a dataset covering more than $30 trillion of global securities from 20,000 institutional funds, fifteen years of history and over three million intraday transactions. IHS Markit Securities Finance data is sourced directly from leading industry practitioners, including prime brokers, custodians, asset managers and hedge funds.
We empower firms to manage securities lending programmes, optimize trading performance and enhance investment decisions through unparalleled trading data and analytics, powerful benchmarking tools and governance reports.

Learn more at ihsmarkit.com/securities-finance.html

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The Options Clearing Corporation (OCC) is the world's largest equity derivatives clearing organization. Founded in 1973, OCC operates under the jurisdiction of both the U.S. Securities and Exchange Commission (SEC) as a registered clearing agency and the U.S. Commodity Futures Trading Commission (CFTC) as a Derivatives Clearing Organization. Named 2020 Best Clearing House - Equities by Markets Media for the third consecutive year, OCC now provides central counterparty (CCP) clearing and settlement services to 19 exchanges and trading platforms for options, financial futures, and securities lending transactions. More information about OCC is available at www.theocc.com.

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Stonewain Systems Inc. develops software solutions for the securities finance industry. Our modular and scalable securities finance platform—Spire—is a comprehensive, fully-integrated solution that combines industry-specific functionality with ground-breaking technology and automation. Our deep domain knowledge lends itself to relevant functionality resulting in accelerated workflows, greater operational efficiencies and lower costs.

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Do you want to see your Securities Finance team outperform their peers?

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VERMEG

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VERMEG is a specialized software house covering three main market segments in financial services: Banking, Capital Markets and Insurance.

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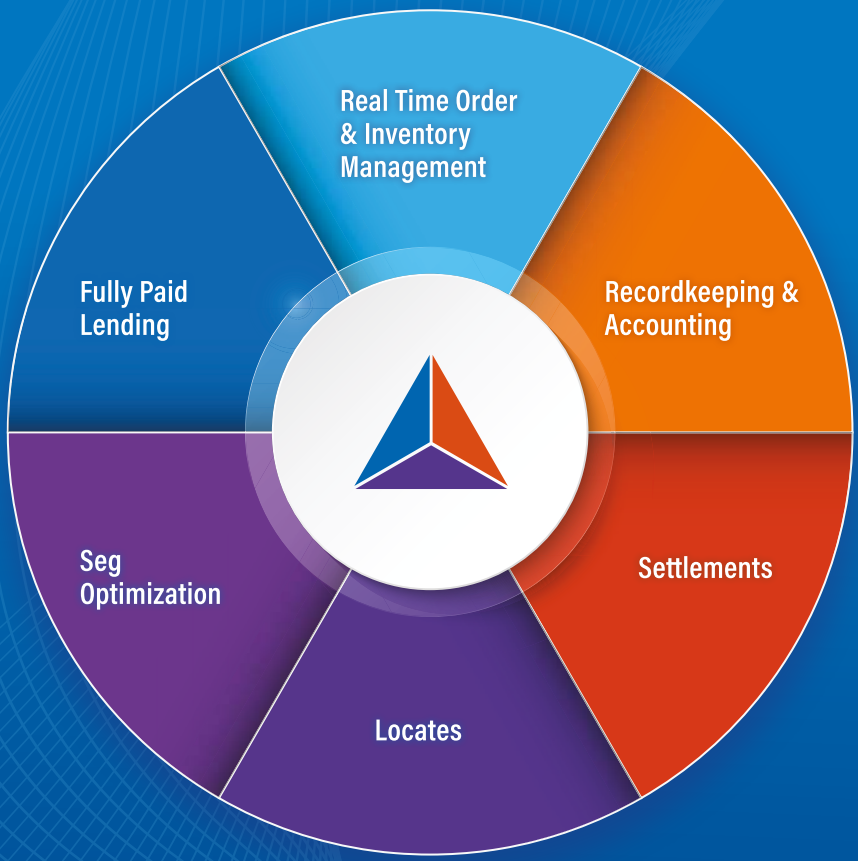

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