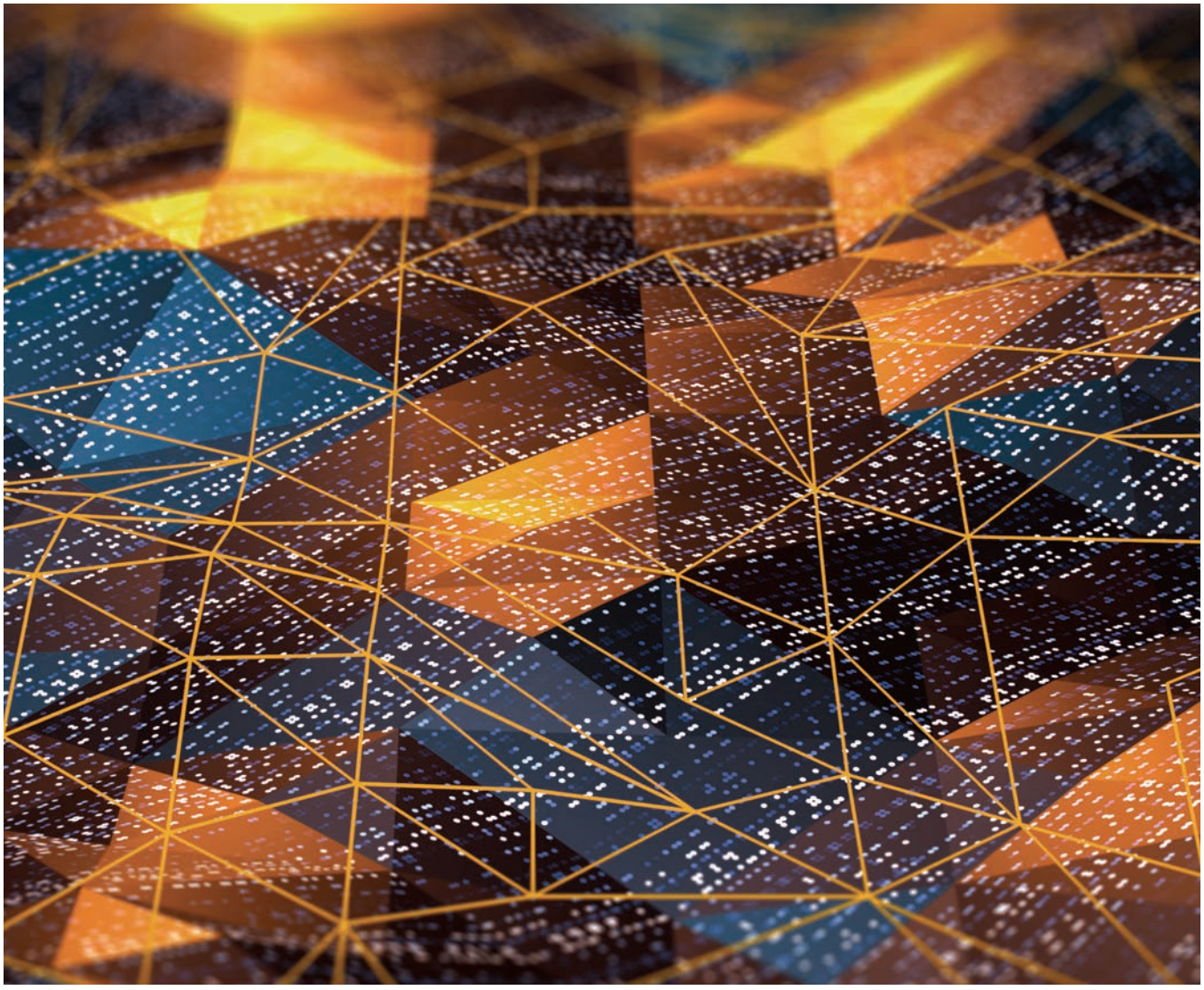
SmartStream Technologies

Product Roadmap

Special Report



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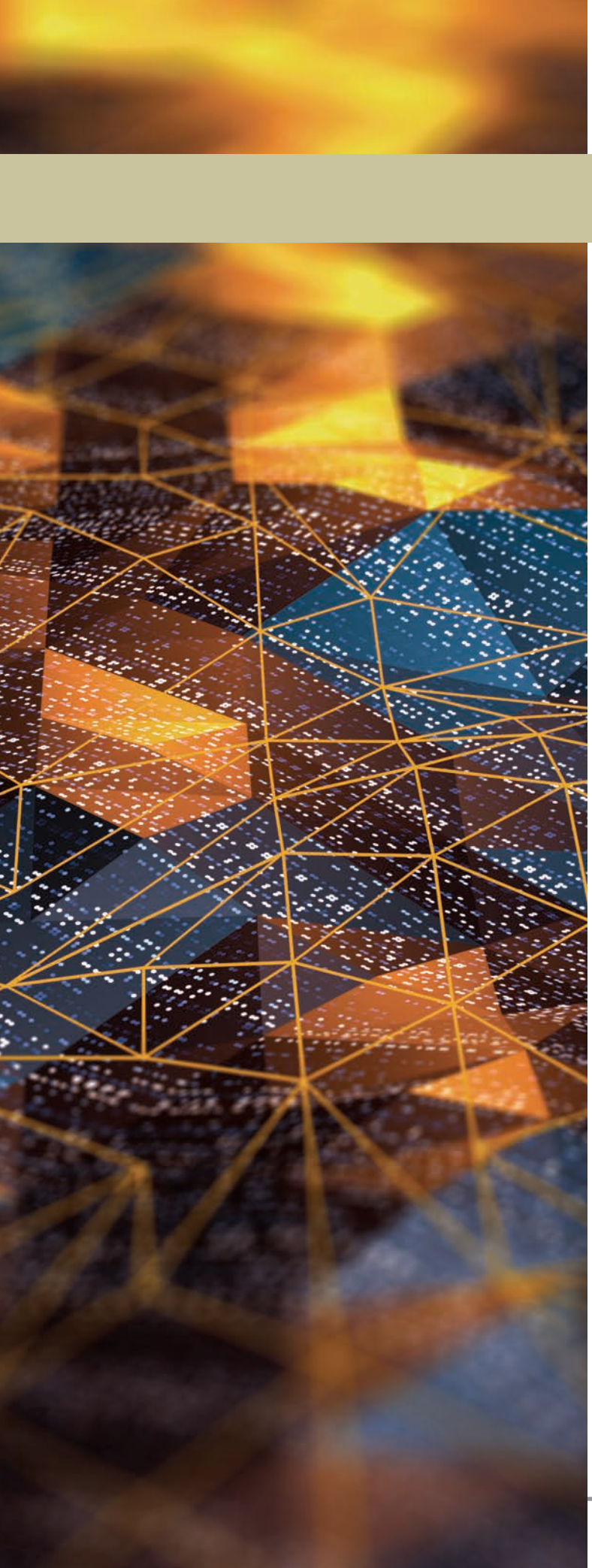

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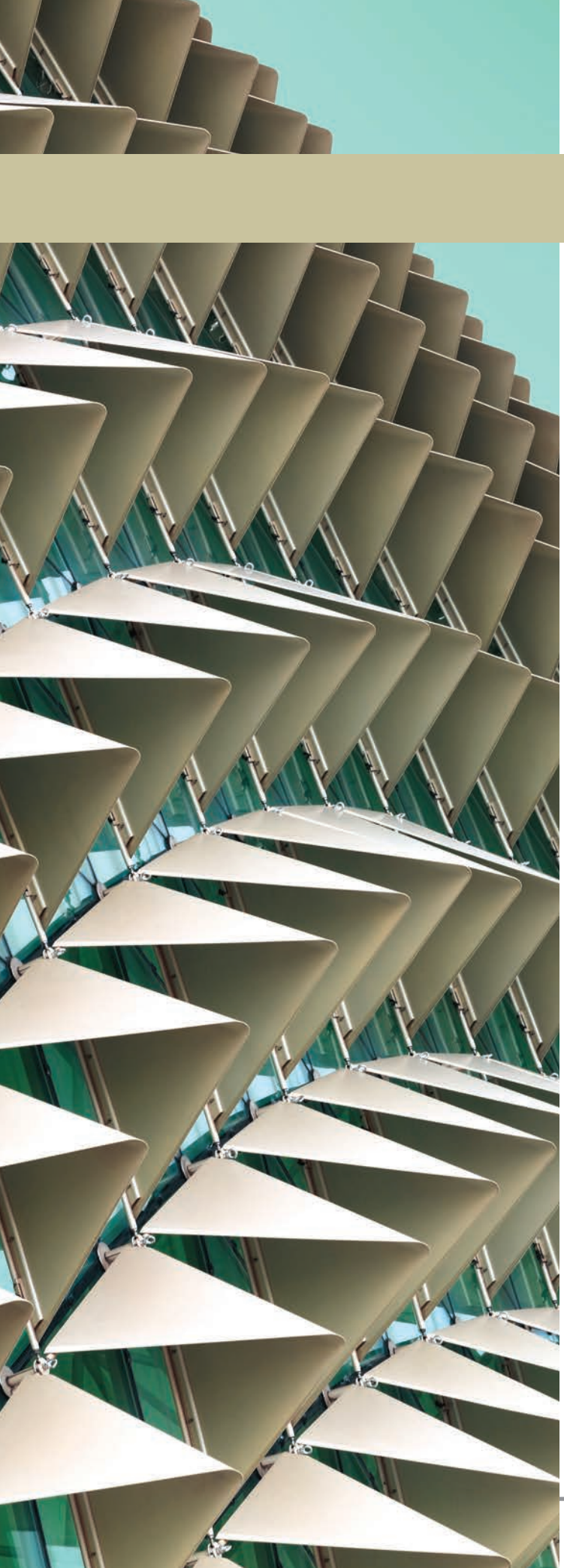


Introduction

It is no secret that, from a business and technology perspective, the rate of change across the capital markets and the pressure it continues to exert on buy- and sell-side firms that need to respond is showing no signs of slowing down. In fact, many would argue that, if anything, it is accelerating. This is due to a variety of drivers—chief among which are the introduction of increasingly complex and costly regulations, the emergence of new technologies and services specifically developed to address those challenges, and the adoption of new strategies and methodologies by capital markets firms and the third-party vendor community serving them to satisfactorily manage their day-to-day operations. Responding to those drivers—and in doing so introducing increased levels of transparency and scalability across the business, while automating manually intensive business processes so staff members can be redeployed across the business in higher-value roles—is no trivial task. However, regulatory scrutiny and investors' expectations can only be ignored for so long.

The effectiveness of capital markets firms' business and technology strategies going forward are contingent on a number of factors, including the complexity of their incumbent business operations and the technology stacks supporting them, the competence and experience of their internal IT resources and their respective budgets, their propensity to take on often complex and laborious technology projects, and the quality of their existing relationships with their third-party technology partners. Needless to say, even for the most accomplished technology teams, successfully addressing all of the above requirements against a backdrop of doing more with less and managing their fixed operating costs is a pretty tall order.

This report focuses on seven of SmartStream Technologies' key products and services— SmartStream AIR, SmartStream Aurora, SmartStream Reference Data Utility, TLM Fees and Expense Management, TLM Collateral Management, TLM Reconciliations Premium and SmartStream Managed Services—and outlines the current industry problems they are helping to solve. It also highlights recent functional enhancements folded into each of these offerings and those that are planned for the foreseeable future.

Remit

Key to SmartStream's product and services strategy is ensuring each of its offerings maintains its focus on solving users' problems, a responsibility that falls to Vincent Kilcoyne, executive vice-president and head of product management at SmartStream Technologies, who is ultimately accountable for developing, implementing and managing the firm's roadmap from a functionality and technology perspective. Kilcoyne explains that a large part of his remit entails monitoring what is happening across the industry according to three dimensions—technology, regulation and the intersection where technology and

regulation meet—which he uses to guide the overall direction of SmartStream's products. "A good example of that intersection is if we take internet technology and encryption and combine them with open banking, we get things such as payment gateways and other forms of disintermediation, which is a classic example of combining technology and regulation to create a new market behavior," he explains. "Everything we do uses those three lenses and looks at how our products map over the next 12, 24 or 60 months against those emerging landscapes. In essence, we are looking to help our clients solve future problems."

Another example of how the joint drivers of technology and regulation can lead to the emergence of new disciplines across the capital markets is the Basel Committee on Banking Supervision's standard 248 (BCBS 248), which requires banks to develop and deploy the tools necessary for them to monitor their liquidity on an intraday basis—a mandate that can be traced back to January 2013. "Until fairly recently, being able to do intraday liquidity for a reasonable volume of data was borderline impossible until you had high-performance and in-memory compute," Kilcoyne says. "A change in the hardware and software facilitated technological applications and now banks are able to do intraday liquidity, which means they have more control and better visibility and monitoring of their cash management across the business, which in turn means they can do intraday stress-tests, not only from a regulatory perspective, but also in terms of their internal policies. In addition to BCBS 248, we also address other regulations such as the European Shareholder Directive, uncleared margin rules and many others, while ensuring we look at how those regulations will drive future behaviors."

Relevance

Kilcoyne explains that SmartStream's product roadmap for the foreseeable future will largely be shaped by three key technologies: artificial intelligence (AI), including machine learning technology; blockchain; and cloud computing. "We're increasingly deploying machine learning and AI technology techniques across every one of our solutions in a relevant way," he says. "But it's not just AI for the sake of AI—it's AI that passes the relevance test. What we're doing is taking all our market practitioners and our 40-plus years of experience to solve real problems in the industry."

SmartStream is also working with a number of organizations to implement distributed ledger technology—specifically blockchain—to solve what Kilcoyne describes as "real operational problems" across fragmented business ecosystems. "We're using cloud to deliver that functionality to a broader audience, which aligns with many of the banks' new deployment strategies," he says. "Additionally, we're also making is possible for tier two and tier three institutions and new entrants to avail themselves of our investment banking tier one DNA functionality."

Vincent Kilcoyne explains that a large part of his remit entails monitoring what is happening across the industry according to three dimensions—technology, regulation and the intersection where technology and regulation meet—which he uses to guide the overall direction of SmartStream's products

"The trick with AIR is that it never looks at all the data it is presented with—its first step is to find out what data is relevant to solving the task and only working on the data that is significant to what it momentarily is computing."
Andreas Burner

SmartStream AIR—Artificial Intelligence Reconciliations in an Instant

SmartStream AIR

Interview with Andreas Burner, chief innovation officer for blockchain and artificial intelligence, SmartStream

Q What is SmartStream AIR?

Andreas Burner: SmartStream AIR is a cloud-native, artificial intelligence (AI)-based reconciliations platform designed to allow capital markets firms to manage their reconciliations on an *ad hoc* basis and provide them with results in a matter of seconds.

Q What industry problems does SmartStream AIR solve?

Andreas Burner: SmartStream AIR solves a number of problems. First, it allows users with minimal IT expertise to configure reconciliations significantly faster than is currently possible with traditional reconciliations platforms. Given that it is a cloud-native and cloud-hosted platform, new users can be up and running on the system within minutes of setting up a profile and receiving login details. Finally, it is designed to produce results based on reconciliation tasks within seconds. Processes that would typically have taken days or even weeks in the past can now be managed in under 10 seconds.

Q How does SmartStream AIR solve these problems?

Andreas Burner: The technology AIR uses is called self-supervised machine learning. That means several AI algorithms run against each other with the aim of training and improving each other in terms of the results they produce. Within AIR, the machine learning algorithms challenge one another so they continuously produce better outcomes. In terms of performance, when AIR was in its infancy, the whole AI reconciliation process took about 20 minutes, feeding in two files, computing a matching configuration and producing a result. Once the AI technology was stable and the results were fine, I asked my data scientists whether we could reduce that time to something that a user would be happy to wait for—10 to 20 seconds, but not a minute. The trick with AIR is that it never looks at all the data it is presented with—its first step is to find out what data is relevant to solving the task and to only work on the data that is significant to what it momentarily is computing. Then it runs the AI algorithms on the reduced data that is really relevant. With this approach, we were able to reduce that time frame from 20 minutes to about three seconds.

Q What is unique about SmartStream AIR?

Andreas Burner: SmartStream AIR is unique by pretty much any definition—it is cloud-based and therefore instantly available, it is lightweight and simple to configure, it allows users to set up and run reconciliation tasks on an *ad hoc* basis for the first time, and it produces results in a matter of seconds.

Q What are SmartStream's biggest challenges with respect to SmartStream AIR?

Andreas Burner: Given that AIR is an entirely new product, its most significant challenge at the moment is the length of the sales cycle typical of the capital markets. But being a cloud-native platform, implementation time frames are minimal and once the first few firms are using it in a production environment, others will follow.

Q What's in store for SmartStream AIR in the foreseeable future in terms of new functionality?

Andreas Burner: We continuously develop AI functionality to understand more complex reconciliation patterns and allow customers to use even more data structures. Currently, we are incorporating explainable supervised learning, which in prototype state already shows impressive results.

"SmartStream AIR is designed to produce results based on reconciliation tasks within seconds. Processes that would typically have taken days or even weeks in the past can now be managed in under 10 seconds."
Andreas Burner

"Banks have two issues: their traditional payment rails tend to be slower and are more prone to exceptions because of the regulations around them, and they are more expensive."
Roland Brandli

Scheme | Issuer | Payment service provider | Merchant | Acquirer | User/end customer | Industry regulator

TLM Aurora digital payments control

Reconciliation, posting generation and exception management

Transaction Lifecycle Management Aurora Digital Payments Control

SmartStream Aurora

Interview with Roland Brandli, strategic product manager, SmartStream AIR and Aurora

Q What is SmartStream Aurora?

Roland Brandli: Aurora is the latest generation of SmartStream's Corona platform. Until now, Corona has been a typical business-to-business solution—quite complex to use and configure with a lot of features and functions. This is great because it means we can accommodate all our clients' requirements, but I don't think it is what is expected of software today. Users want to keep the features and functions, but the platform needs to move more in the direction of business-to-consumer in terms of usability. That is what we have endeavored to do with Aurora. We have also built a new front-end.

Q What industry problems does SmartStream Aurora solve?

Roland Brandli: It provides two key pieces of functionality: it is an operational control center that allows banks to monitor their processes and ensure they are doing their jobs correctly and moving transactions around how they should. It also identifies the exceptions—where the risks lie—and resolves those exceptions as quickly as possible.

Q What are the key functions within SmartStream Aurora?

Roland Brandli: Aurora's key function is to manage exceptions. Most people perceive SmartStream to be a provider of matching and reconciliations software, but if we look at the fundamental reason why firms reconcile, it's to ensure that processes have been done correctly, even though no-one is really interested in what is matched—they're interested in what is incorrect. Firms incur 80% of their costs and 100% of their risk when it comes to exceptions, so ultimately Aurora is an operational control center that uses matching to trigger exception management.

Q What new functionalities were added to SmartStream Aurora in 2019?

Roland Brandli: SmartStream recently launched artificial intelligence (AI) reconciliation within Aurora. That is the first step, but we are looking to spread out the AI to help banks in other areas, where more optimization can be reached.

Q What are SmartStream Aurora's clients' biggest pain points right now?

Roland Brandli: SmartStream has just released a module within Aurora called Advanced Payment Control (APC), which addresses the various payment rails that banks use between each other—things such as Swift's Global Payments Innovation initiative, but also cross-border payment systems such as the Single Euro Payments Area and Target. Aurora provides an out-of-the box exception management layer for all payments. Basically, it provides an umbrella over banks' multiple payment rails for exception management and for reconciling instant payments. Digital payments, which are mainly driven by cards—such as Apple Pay, Samsung Pay, Alipay and so on—are beginning to provide alternative payment channels to the market. This, in turn is mostly driven by digital wallets or cards, meaning they are subject to fewer regulations and tend to be cheaper. Banks have two issues: their traditional payment rails tend to be slower and are more prone to exceptions because of the regulations around them, and they are more expensive. So they need to change the way their payments work. Since SmartStream launched APC, there has been huge interest from large numbers of banks.

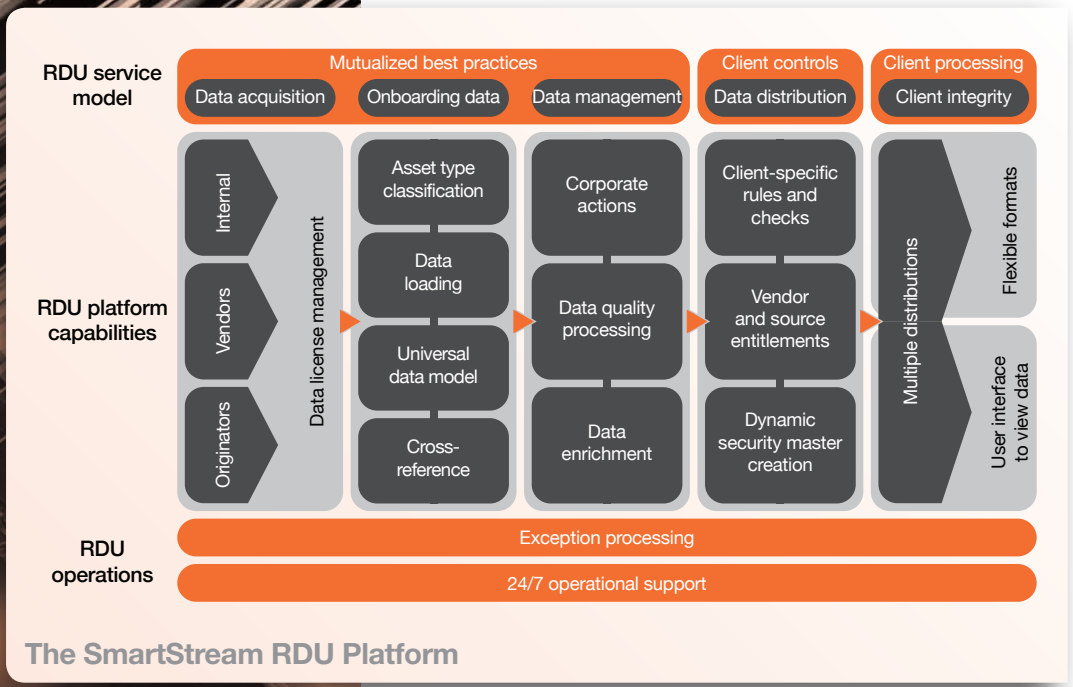
Q What can SmartStream Aurora clients expect from SmartStream over the next 12–18 months?

Roland Brandli: SmartStream is introducing AI, but is also looking at collateral management reconciliation and exception management for payment service providers. Apart from that, the main thing we're doing is transitioning previous Corona functions such as cash, securities and foreign exchange into new modules. For example, for securities, we have an application called Trade Process Control, which manages the entire process from trade instruction to settlement, including the cash legs. All of that is presented in a single view, which again enables better processing and exception management. On the software side, we have changed the paradigm: previously, users had to look for data and identify problems, but now the data looks for the users. When users login, they are presented with a list of tasks they have to manage. On top of that, we now provide much more capable analytics with the idea that users should not have to look for problems and issues—the software should tell them where problems and issues are so all they need to do is focus on solving them.

"We currently source data from a couple of hundred sources, we apply rigorous data quality checks as it comes in to the RDU [and] we have an automated platform that allows us to put various rules into practice."
Linda Coffman

RDU

The SmartStream Reference Data Utility



The SmartStream RDU Platform

SmartStream Reference Data Utility

Interview with Linda Coffman, VP product management, SmartStream Reference Data Utility

Q What is the SmartStream Reference Data Utility (RDU)?

Linda Coffman: The SmartStream RDU is a service that delivers high-quality securities master data to the financial services industry.

Q What industry problems does the SmartStream RDU solve?

Linda Coffman: The industry is increasingly automating—and automation requires technology and high-quality data. The problem the RDU solves is that it provides sufficiently high-quality data for capital markets firms to automate their businesses.

Q How does the SmartStream RDU solve these problems?

Linda Coffman: We currently source data from a couple of hundred sources, we apply rigorous data quality checks as it comes in to the RDU, we have an automated platform that allows us to put various rules into practice [regarding how that data is handled] and we have an operations teams that monitors that process as the data flows through the platform. It's a mix of rigorous rules definitions, good-quality technology and a skilled operations team that fixes issues the machine can't.

Q What do quality checks mean to SmartStream with respect to the RDU?

Linda Coffman: The focus is very much on securities reference data—the data that defines what an instrument is, how it behaves, how it is traded and how it is cleared and settled. We start by developing a clear set of definitions around the fundamentals of each instrument so we can understand everything there is to know about an instrument. We then model that information and put it into a set of rules that allows the model to be used as validation so that, when data flows into the utility, we can validate it against the definition of how each instrument should look. There is then a string of different quality checks to ensure the data is present, consistent and that it is distributed to clients in a reliable way.

Q What is unique about the SmartStream RDU?

Linda Coffman: We're the only organization in the industry that does it. We're also independent—we were created from a bank initiative and are therefore independent from other vendors, exchanges and data providers—but we're now also independent from banks.

Q What are your clients' biggest pain points right now?

Linda Coffman: The biggest issue for firms looking to automate their businesses is that the data they're sourcing from the various exchanges and data vendors isn't of sufficient quality. It's good enough to put on screens and trade with, but as volumes are so high now and businesses need to automate so much, the data quality requirement has gone through the roof. You now need incredibly accurate data.

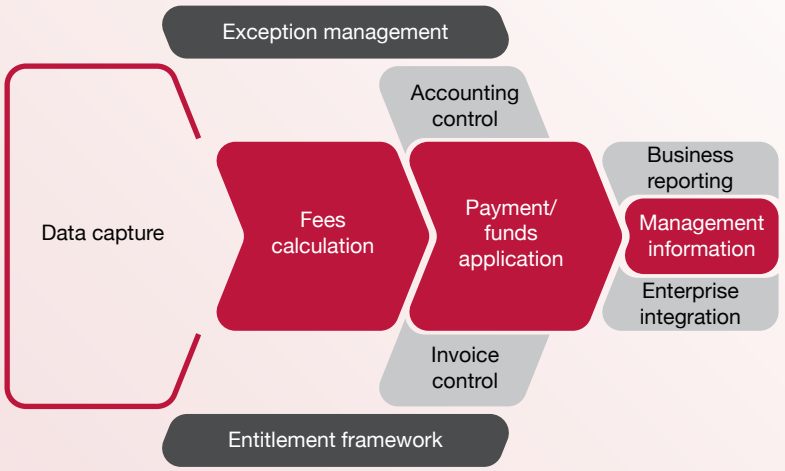
Q What is SmartStream RDU's biggest challenge at present?

Linda Coffman: Our biggest issue is that clients have a massive amount of legacy [processes, systems and technologies], which assumes a certain format of data coming into the business. We can help by allowing the RDU service to deliver data in formats customized to clients' requirements, but there is a limit to how much we can do that.

Q What's in store for the RDU for the next 12–18 months?

Linda Coffman: Our current focus is on the Securities Financing Transactions Regulation in its various phases, although we will also be adding fixed income to our securities master coverage. Currently, we cover listed derivatives, equities and a range of regulatory products, but the gap we will fill in the first half of 2020 is fixed income.

"We are able to consolidate all fees and expense data within the platform and consolidate expense information within a global repository so that banks are able to generate analytics and reports based on that data."
Bharat Malesha



End-to-end automation of the complete expense lifecycle

TLM Fees and Expense Management

Interview with Bharat Malesha, executive vice-president, Fees and Expense Management, SmartStream

Q What is TLM Fees and Expense Management (FEMs)?

Bharat Malesha: SmartStream TLM FEMs is a product that examines banks' execution costs from a payables and receivables standpoint. The core of our business focuses on what people traditionally refer to as 'BC&E'—brokerage, clearing and exchange fees, plus commissions, correspondent and custody fees.

Q What industry problems do TLM FEM solve?

Bharat Malesha: Most banks operate in a pretty complex environment across geographic locations, regions and different legal entities, and they incur significant operating costs by way of managing their BC&E fees, which represent the second largest expense for financial services firms today. The challenge of managing BC&E expenses revolves around fluctuations of transaction volumes and banks' limited transparency in respect of the fluctuations in fees from an end-to-end standpoint.

Q What are your clients' biggest pain points right now?

Bharat Malesha: From an industry perspective, the biggest challenge is the fragmentation of these processes across regions and entities. Banks tend not to have consolidated views of that information, which means they are not able to make data-driven decisions in respect of managing their fees and expenses. It's important for them to have transparency around fees and expenses so they can identify where their specific costs are, with a view to optimizing them.

Q What has SmartStream done to enhance the platform over the past 12 months?

Bharat Malesha: From a traditional BC&E fees standpoint, we are now able to process both over-the-counter and listed products globally. In the past 12 months, we've provided customers with more detailed views into their agent bank and custody fees, and we have enhanced our billing platform to provide services around custody billing. We have also developed significant scale of management information and spend analytics from the data that comes out of the platform, which is highly interactive, allowing customers to review their spending base or revenue controls on a T+1 basis.

Q What is unique about FEMs in the marketplace?

Bharat Malesha: FEMs is designed to manage banks' costs as efficiently as possible on an enterprise-wide basis. FEMs and our other services enable banks to develop data-driven initiatives internally that help improve transparency and efficiency in terms of operating costs. We are able to consolidate all fees and expense data within the platform and consolidate expense information within a global repository so banks are able to generate analytics and reports based on that data. The platform supports the development of automated processes for increased operational efficiencies and controls. We are also able to develop a standardized, enterprise-wide process across different orders and executions, and measure strategic savings across the business.

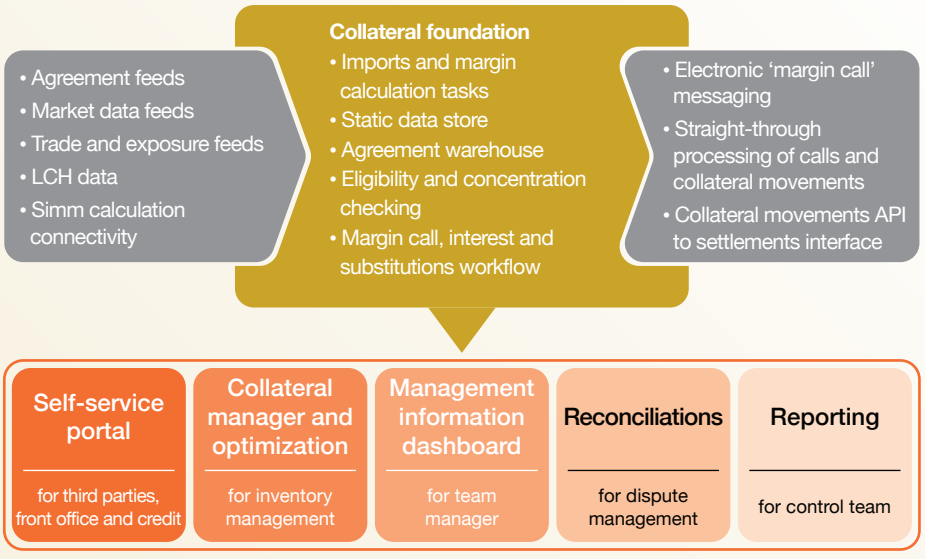
Q What can users expect from the FEMs platform over the next 12–18 months?

Bharat Malesha: We are currently working on integrating with market infrastructures such as FIA Tech—the utility for listed derivatives and give-up brokerage—through its APIs. We are also looking to integrate with other platforms such as Symphony through its chatbots so we can offer a more seamless customer experience and help banks move away from email-based workflows.

Q How can customers make the business case for deploying FEMs?

Bharat Malesha: There are various aspects around cost efficiencies of banks' core base spend—with respect to BC&E fees—and examining and optimizing flows so that they can develop cost-saving strategies through increased transparency. Additionally, there is a significant operational control audit and efficiencies driven by the automation within the platform.

"The kinds of clients we service expect outstanding quality. And while other providers might have different value propositions, the main things for us are reliability and deep functionality."
Jason Ang



TLM Collateral Management Modules

TLM Collateral Management

Interview with Jason Ang, program manager for TLM Collateral Management, SmartStream

Q What is SmartStream TLM Collateral Management?

Jason Ang: TLM Collateral Management is a platform that provides capital markets firms with a way to manage collateral for over-the-counter (OTC) derivatives, repos and securities lending transactions. On the OTC side, we're digitizing credit support annexes (CSAs), which define the various terms around the provision of collateral by parties in derivatives transactions.

Q What does this entail?

Jason Ang: We encompass all the processes and procedures that ensure firms support CSAs in an automated fashion, highlighting risk where necessary. Essentially, the entire process exists to help with credit risk management.

Q Has TLM Collateral Management changed much over the years?

Jason Ang: The gist of the product has remained the same—although its application has changed. The premise is to provide an expert tool for a very specific part of the industry. In the past, it was about providing expert tools for expert users, but now we're looking to provide that expertise using newer technologies, given that the industry itself is going through a significant amount of regulatory change.

Q What are your clients' greatest pain points right now?

Jason Ang: There are four themes. The first is knowledge: there are many industry and regulatory changes taking place right now, and our clients are looking for someone who will provide them with not just software, but also information. The second is cost: clients want to understand their cost structures, and how we can help them manage those costs. The third is connectivity: nowadays, you can't have an isolated system—there are upstream systems, downstream systems, and internal and external systems, all of which need to be connected. Finally there is security: with all this connectivity, the changes in the industry and the various costs facing capital markets firms, the last thing they need are security-related issues.

Q What is unique about TLM Collateral Management?

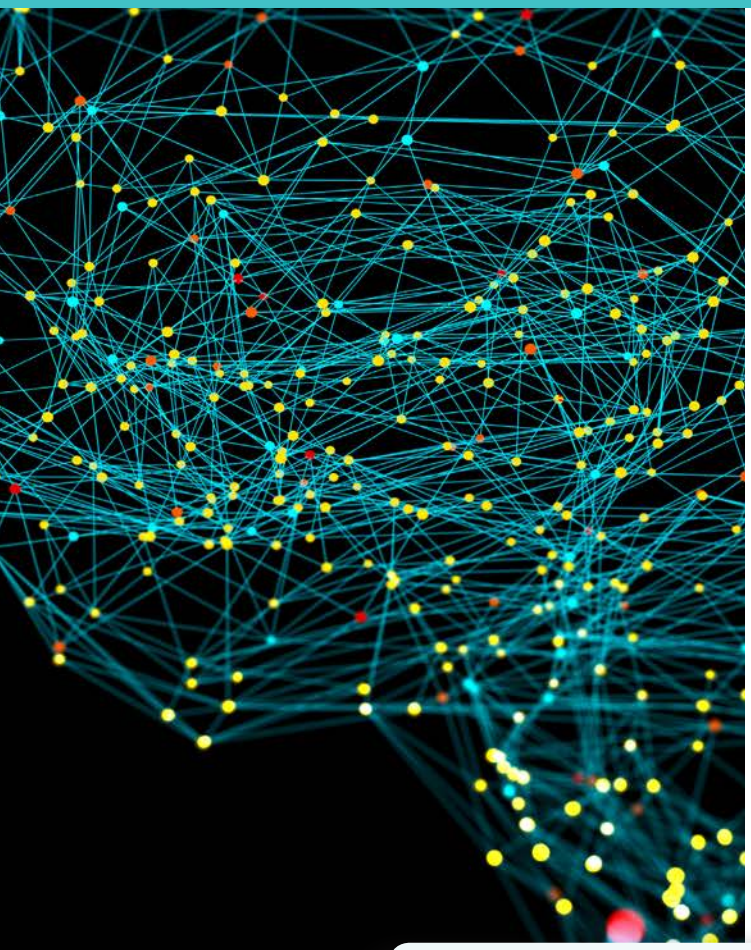
Jason Ang: The first thing is quality. That might sound like a cliché, but the kinds of clients we service expect outstanding quality. And while other providers might have different value propositions, the main things for us are reliability, quality and deep functionality. We also offer a competitive cloud service featuring non-commingled data, which is significant because we know our clients do not want their data sitting alongside that of other clients.

Q What can users expect from TLM Collateral Management over the next 12–18 months?

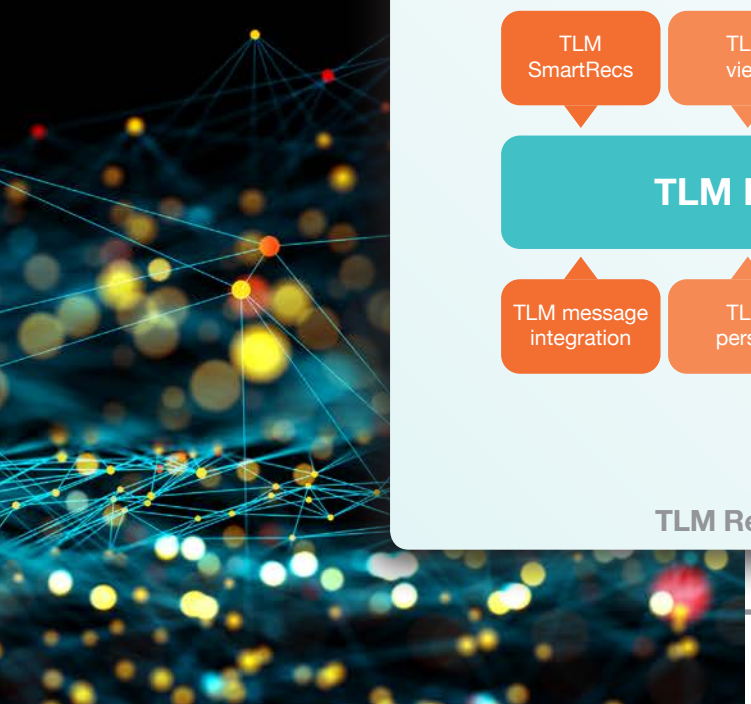
Jason Ang: We have recently introduced the ability to calculate the standard initial margin model (Simm) as well as generate the sensitivity inputs to Simm. This enables us to offer a turnkey solution for initial margin processing. Furthermore, ease and cost of deployment is fundamental to phase-five and phase-six firms, which means a cloud solution is important. Our software-as-a-service offering—with our new web user interface screens— is designed to facilitate this. Given the larger volumes coming in 2020/21, connectivity through public APIs is fundamental—as is automation using artificial intelligence and machine learning. The ability for the application to 'learn' the decision-making process around sending calls, responding to calls and reconciling disputes is also being developed, enabling us to offer a truly exception-based collateral process.

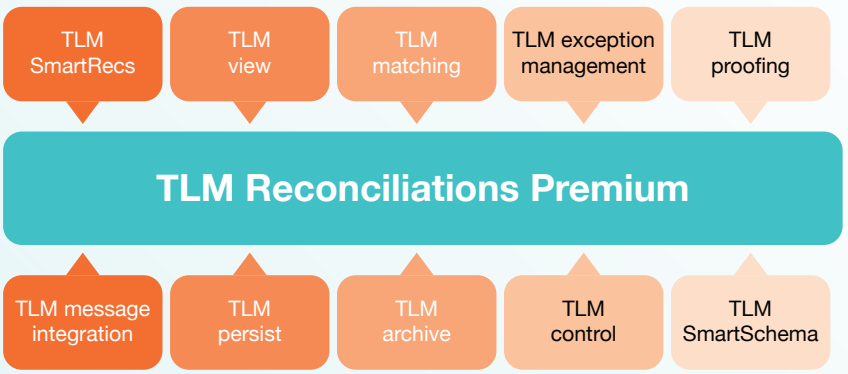
Q How do users make the business case for deploying TLM Collateral Management?

Jason Ang: That depends on the client. Some have 10 or 15 CSAs, while others might have as many as 80,000. The business cases and the way you present them are very different. Legacy-type structures also impact the business case. If you're in the 10–20 CSA range, you probably need a turnkey solution that is low-cost and can be deployed automatically. If you're towards the larger end of the scale, with large numbers of agreements, you're probably looking to partner with a provider that has a proven track record when it comes to managing large implementations—especially when complexity is involved. Given our 20-year experience and the quality of software and delivery, we are best placed to be able to de-risk the delivery of a solution for a reasonable cost.



"Looking at increasing automation, we are using artificial intelligence and machine learning in several ways—one of which is to automatically improve data quality as it loads into the system."
Robin Hasson





TLM Reconciliations Premium Services

TLM Reconciliations Premium

Interview with Robin Hasson, product manager, TLM Reconciliations Premium, SmartStream

Q What is SmartStream TLM Reconciliations Premium?

Robin Hasson: It's a platform used primarily in the back office to ensure the accuracy of information flowing between systems and to identify risk and breaks in the process. It allows users to manage the task of correcting exceptions as swiftly as possible, and it provides firms with oversight of the current state of events in the products they are trading.

Q What industry problems does it solve?

Robin Hasson: Validating the accuracy of traded data between parties is crucial to identify and fix exceptions at the earliest possible point to mitigate risk. It allows the business to monitor balance flows and asset holdings to validate the consistency of critical information. Importantly, this is within a landscape of growing volumes and a drive to standardization. There has been a significant increase in digital payments, which means more transactions flowing through clients' systems—all of which need to be reconciled as early as possible. Clients are also increasingly looking for standardized, single platforms, which again drives up volumes by way of a single system with a single interface.

Q What is unique about TLM Reconciliations Premium?

Robin Hasson: It's unique because of its longevity and SmartStream's continued innovation. Several years ago, we established a standardized reconciliations process across cash, positions, futures, static etc., with best-practice domain features, integrated workflow, exception management and a high-quality user interface. Being able to easily customize and refine workflows and tailor the user experience are critical in solving edge-case, but important issues—particularly when used for diverse needs.

Q How are you helping clients manage their fixed operating costs?

Robin Hasson: The three most valuable cost-reduction strategies are hosted infrastructure, managed services and increased automation. We have a range of deployment models to suit clients beyond the traditional on-premises model. We offer a fully hosted cloud infrastructure, and varying levels of managed business process outsourcing to manage, monitor, reconcile and investigate exceptions if required. This move to a service model can return significant benefits without compromising quality or accuracy.

Looking at increasing automation, we are using artificial intelligence (AI) and machine learning in several ways—one of which is to automatically improve data quality as it loads into the system. Fixing data quality issues using machine learning can drive up automation significantly as it removes the need to perform manual matching, which is time-consuming and costly.

Q What are your biggest challenges going forward with respect to reconciliations?

Robin Hasson: One important challenge when looking to innovate with AI and machine learning is to ensure the value proposition is clear and proven. Many AI projects across the market promise much but fail to deliver the expected return. For this reason, we work closely with clients and our dedicated AI development group to validate and prove use-cases before committing to their ongoing development.

Q What new functionality has been folded into the platform over the past 12 months?

Robin Hasson: In terms of infrastructure, we have improved our ability to deliver our systems through cloud deployments, and we have recently moved to support Docker, the container technology. A range of AI features were released this year, and more are being rolled out in the coming months. A major theme for the past 12 months has been business enablement, allowing users without IT expertise to build reconciliations. Using TLM SmartRecs, a user can define and validate the reconciliation they require without needing to engage IT until it is working as required. If their business requires a one-off reconciliation, they can build it without involving IT at all.

Q What can TLM Reconciliations Premium's clients expect in the foreseeable future?

Robin Hasson: We will continue to focus on what is most important to our clients: improving performance, reducing deployment times, minimizing time-to-market, and empowering the business. We are heavily invested in innovating with the latest technologies—in particular for high-value AI and machine learning features, and we plan to further improve the user experience. We are increasing our integration points into the system by way of publishing an API that is simpler and quicker to integrate with other systems, allowing clients to manage and extract data, whether it is for user and account management or access to operational data—balances, exceptions and trades. We will also continue to invest in new business modules such as digital payments control to deliver the controls and oversight our clients need.

"We're not trying to sell people to the client—we're looking to provide clients with solutions. All the service-level agreements we offer are geared toward the solutions they are looking to achieve."
Nick Smith

SmartStream Managed Services

Interview with Nick Smith, global head of managed services, SmartStream

Q What does SmartStream Managed Services entail?

Nick Smith: Often clients have their own technology teams who manage their TLM product suite. Our Managed Services offers them an alternative, where—rather than the client having their staff maintain the TLM suite—we use our own in-house IT specialists to do that for them. Given that we are part of SmartStream, no-one knows our products as well as we do. We have a depth of knowledge and experience within the organization, which means clients don't have to hire specialist staff and manage them on an ongoing basis.

Q How is it delivered?

Nick Smith: It can be delivered in two ways: we can install the software in the client's environment and manage all their IT requirements for them, or we can host it in our cloud, which we refer to as our On-Demand product. We host the service in a public cloud on Amazon Web Services (AWS).

Q Is the service is geared toward providing clients with a specific solution to address specific challenges?

Nick Smith: Yes—clients buy our product suite to achieve a goal. There tend to be different people within client organizations using our software. For example, if the client has purchased one of our reconciliation products, rather than using its own staff to perform its reconciliations, we can do it for them and deliver a solution to them at the end of that process. We're not trying to sell people to the client—we're looking to provide clients with solutions. All the service-level agreements we offer are geared toward the solutions they are looking to achieve.

Q What are your clients' biggest pain points right now?

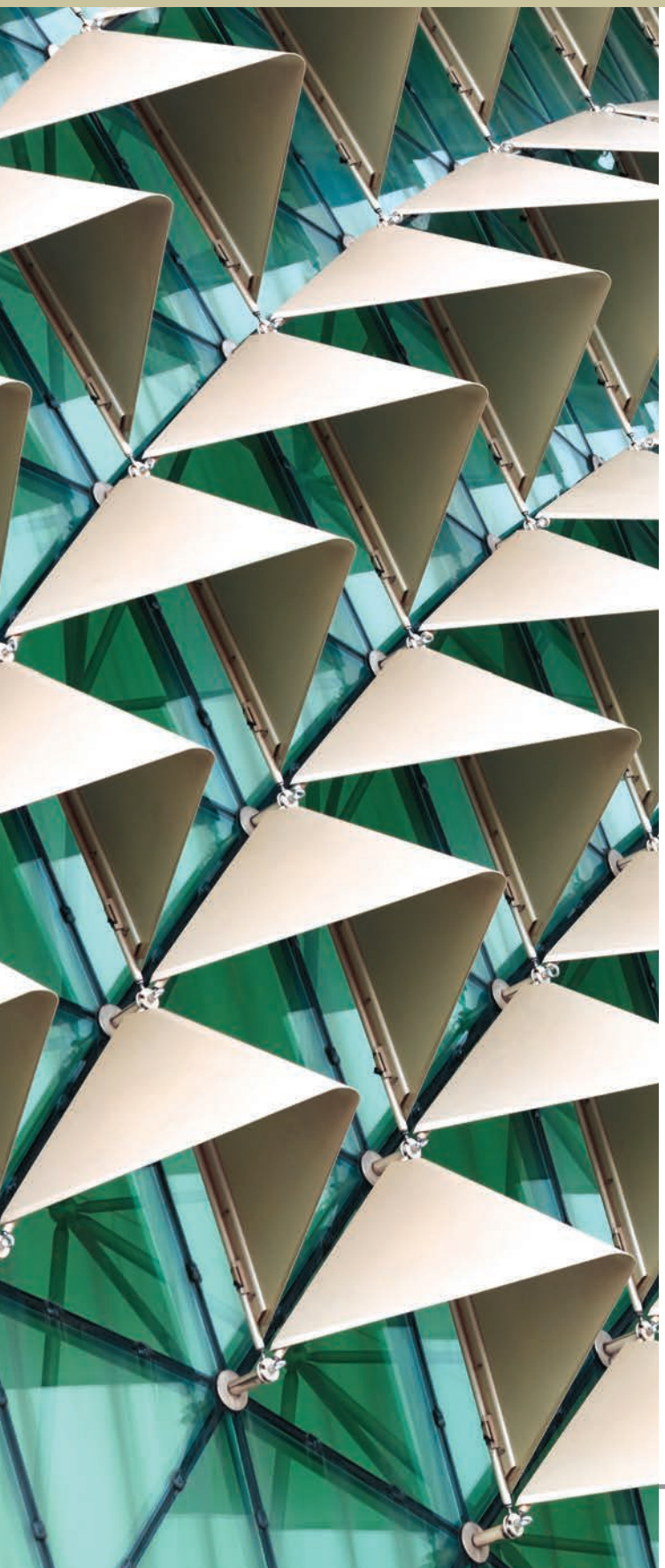
Nick Smith: Often, their biggest pain points are around scalability. Traditionally, large numbers of capital markets firms operate in a rigid environment, especially organizations that manage their technology in-house. Moving to the cloud—especially a public cloud such as AWS—addresses those scalability issues. In respect of our cloud-hosted On-Demand product, they don't have to worry about personnel or the hardware they would typically use if they were looking to scale the business. Once something is hosted in the cloud, it becomes instantly scalable.

Q What can SmartStream Managed Services clients expect over the next 12–18 months?

Nick Smith: One of the key developments this year was the introduction of artificial intelligence (AI) technology— not only to our product suite, but also to our Managed Services. We're able to manage a lot of the processes that would have been performed by people in the past through the introduction of AI to Managed Services. We are also eliminating the need around the complex configuration of products, because AI is doing that for us, which reduces time-to-market and much of the manual effort involved in delivering a solution. AI also helps capital markets firms reduce their costs per trade.

"We are also eliminating the need around the complex configuration of products, because AI is doing that for us, which reduces time-to-market and much of the manual effort involved in delivering a solution."
Nick Smith

Summary



As highlighted in the introduction of this report, SmartStream is focusing its development energy on three key technologies—artificial intelligence, blockchain and cloud computing—although a number of ancillary themes emerged during the course of the eight interviews comprising this report. Those themes include:

- Capital markets firms are always looking to make the most judicious business and investment decisions. Not only are they looking to base those decisions on 'intelligence' gleaned from advanced analytics tools, but they're also looking to understand how and why decisions were made and the extent to which they can explained and, if necessary, replicated. Increased levels of transparency across business units and functions are therefore key drivers for all capital markets firms.

- Delivering solutions and new functionality with minimum latency is another key focus for SmartStream. A good example of this strategy is SmartStream AIR, a cloud-native, *ad hoc* reconciliations platform that incorporates containerization technology in the form of Docker and Kubernetes. AIR's deployment and configuration is measured in minutes as opposed to months or even years—time frames that were unimaginable just a few years ago.

- SmartStream is focusing a lot of its development efforts on making its technology easier to live with on a daily basis by simplifying user interfaces across its entire technology stable. Simplicity and intuitiveness are often overlooked as key components of practical and genuinely useful technology solutions.

- The final takeaway from this report is SmartStream's focus on increasing the levels of control and automation across its product line-up—irrespective of the business process involved—so firms can look to deploy staff members elsewhere within the organization with the view to them adding greater value. There is a growing body of evidence that shows that staff members—especially support or back-office staff—who are moved out of menial, manually intensive roles to ones where they can see the value they are adding to the business are likely to remain within the firm for longer than those who aren't. This issue is certain to become a key theme over the next five years across the capital markets, especially as the numbers of millennials working in the capital markets continue to grow.