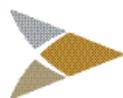




Rethinking the Client Payment Experience

In an Era of Technological Innovation



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About the Authors



MICHAEL BELLACOSA

Managing Director and Head of Global Payments
Treasury Services
BNY Mellon

Michael Bellacosa is a Managing Director at BNY Mellon and Head of the Treasury Services Global Payments Product Management group. In his role, Mike is responsible for managing strategy, financial performance, product development, and industry issues for U.S. Dollar, EUR, and GBP direct clearing services, Multicurrency Wire Transfer, Correspondent Banking, U.S. and International ACH, and Network Management. He is a member of EPN and the CHIPS Business Committee and participates in the BAFT Product Management Committee. He is currently serving on the NACHA Board of Directors.

Mike joined the corporation in 1986 in banking and cash management services including deposit and payment services product, project, and operations management.



SINDHU VADAKATH

Senior Product Manager, Global Payment Services and Asia Payments
Treasury Services
BNY Mellon

Sindhu Vadakath is a Vice President and Senior Product Manager for BNY Mellon's Treasury Services business in Asia Pacific. In this role, Sindhu is responsible for APAC Global Payments products and leads product development for payments digitization and SWIFT gpi for global clients.

She is responsible for strategic planning, product development, marketing, financial performance and compliance with all regulations.

Sindhu joined BNY Mellon in 2010 from Citibank NA and has over 16 years of financial industry experience in various roles, including as an operations manager, in product and project implementations and in driving large strategic initiatives in operations and technology.

Sindhu holds a Master's degree in business administration from the Institute for Technology and Management and a postgraduate diploma in international business from India.

Preface

In 2016, BNY Mellon presented *Reinventing Payments in an Era of Modernization*, a white paper written jointly by Tony Brady, Head of Global Product Management and Christopher Mager, Head of Global Innovation, each of BNY Mellon Treasury Services. The paper discussed the potentially radical changes to the global payments industry rendered by new technologies and technology providers and by increased client demand for the services and enhanced client experience they provide.

These changes presented both opportunity and challenge for banks, which are responding variously—some seeing and embracing the opportunity, some daunted by the challenges and the cost in both dollars and man hours in meeting them. But there was agreement that the challenges are real and that payment banks, for better or worse, cannot continue doing business as usual. Significantly, the new technology providers are largely non-banks, and their presence and the freshness and novelty of their offerings have revealed an ingrained complacency on banks' parts. Distracted by regulatory, compliance, and resilience issues, banks had allowed the payments business to become commoditized and deferred modernizing infrastructures and client experience levels.

Suddenly, there was uncertainty in a market banks had long controlled and no clear strategy for responding to these financial technology ("fintech") providers. Retreat? Compete? Cooperate? The market had become, seemingly overnight, a strange new world.

Banks' sudden vulnerability in the market to new payment providers was the product of a number of factors:

- **Weakness Within Existing Payment Rails.** Prior to the last few years, payment infrastructure across the globe was generally decades old, despite acceleration in technology developments. Within a number of countries, there have been more recent initiatives to upgrade or invent new payment platforms. In the U.S., for example, the current real-time payments platform is the first there since the development of domestic ACH payments in the 1970s. Cross-border payments, however, are still tied to legacy infrastructure. Traditional cross-border payments, sent within the correspondent banking system, might take up to four days to settle and are expensive, unpredictable and provide little transparency.
- **Distraction and Indifference.** In the wake of the 2008 financial crisis, banks seemed less safe and reliable than they had been in the past, and, at times, even indifferent to their clients' evolving needs as growing regulatory demands took priority. This presented an opportunity for non-bank providers since, in the person-to-person payment space in which they first gained market share, payments are typically small, and concerns around risk not so great as to inhibit customer attraction to the improved client experience provided. Corporate and other institutional clients took note of the improvements being provided to consumers, but noted that service levels being offered to them seemed stuck in the past, opening a door to the fintechs there as well.

- **A New Generation of Client Expectation.** The coming of age of millennials presented banks with a client base far more technically sophisticated than the baby boomer generation they were replacing. They are more comfortable with new technologies, more demanding of the solutions provided them, and without the ingrained perception that banks are necessarily trustworthy and reliable and therefore the natural stewards of the world's payment systems.

Although banks' initial response to potential fintech disruption was slow, it has grown strong and continues to build. While banks initially felt vulnerable to the fintechs' head start and to their nimbleness born of smaller size and lesser burden of regulation, they came to realize that banks' traditional strengths—size, safety, experience and global reach—still had great value in the market. Also, banks realized that they needed to manage and wait out public perception. Because, as attractive as were many of the new technologies, fintechs began to realize that they were moving into a large and established market in which they lacked experience and that it was going to be more difficult to manage than initially presumed.

The most farsighted banks have since partnered with fintechs in many instances and, in others, developed proprietary systems and technologies of their own, transforming themselves in the process into technology leaders.

Client Focus

Whereas last year's white paper focused mainly on the various technologies themselves, the focus herein will be largely on the effect of these technologies on client expectation. If last year's paper was an objective survey of a changing industry landscape, this paper is a subjective discussion of what this changed landscape means in terms of human experience.

We believe these new technologies will provide a greatly enhanced client experience, one of almost unimaginable speed, transparency, ease of use, safety, reliability and lower cost. A caveat, however: there will also be disruption—the discomfort that comes with change and adaptation, and with the loss of what is familiar and trusted, even if for something that, by any objective measure, is a clear improvement. Digitization has transformed many of the processes on which the world depends and few can imagine or would desire a return to the analog processes of the last century. But digital crime, identity theft, and the disruption of governmental procedures and privacy are negative and unwanted side effects. And so it will likely be, at least to some extent and for some time, in the payments business. The transitional investments banks are making are likely irrevocable and undoubtedly contain unforeseen pain points both for them and for their clients. But we believe the benefits are undeniable and wide-ranging and will, in time, be embraced. And, eventually, they will be unnoticed: an entirely new banking experience will be business as usual.



Introduction

This is an exciting time for users and providers of payment services, a time of innovation and change that we have not seen for decades in the U.S. and in other parts of the world, with a number of market forces and challenges creating pressure on the payments system. New entrants like PayPal®, Google Wallet™ and mobile network operators drive expectations in consumer payments, bringing ease of use, immediacy of transfer, transparency of pricing and end-to-end tracking capability. This is in contrast to traditional correspondent banking payment services where this level of service has not yet been achieved.

The intent of this white paper is to provide an understanding of how the use of new and advanced technologies can be leveraged to deliver a superior client experience. We have seen a shift from providing products to clients to delivering solutions to clients' problems in the retail and consumer banking space for the past few years. We now see that shift within the corporate and financial institution segments as well. The key areas within the payments industry that still need to be addressed are:

- Providing real-time or near-real-time solutions that simplify existing business models;
- Reducing the cost of servicing; and
- Providing greater transparency.

Corporates and individuals and their financial service providers want and need more integrated solutions—a simple, intuitive banking service that can be accessed by clients at the right time, when they need it, as part of their day-to-day business or personal transactions—with the various components brought together by their financial provider to create a seamless end-to-end client experience. With increasing regulatory and compliance efforts driving up costs, and with intensifying competition from new market forces, a new model is needed; one that provides enhanced intelligence services that better identify business opportunities, understand end client behavior, monitor activity and liquidity, and create efficiencies via straight-through processing (STP), transparency and speed. To reach this end—to create a service mix that solves for each client's unique requirements in a flexible, cost-efficient and seamless manner—requires concerted efforts to bring together internal legacy infrastructure with components from external third-party providers. This transformation is well underway.

Our discussion will be presented in four main parts:

1. Where we are.

The client payment experience today and in the immediate future. Some of the technology solutions that were discussed in last year's paper have since been realized. These include Real Time Payments, SWIFT gpi, Tokenized Payments, and Same-day ACH. Their effect will immediately improve client experience, increasing speed, transparency, and ease of performance, while reducing overall cost. Banks are also expanding access channels to their systems through increased digitization of their internal platforms, as **BNY Mellon NEXENSM has done**, our enterprise digital investment platform and with our new payments architecture.

2. Where we are headed.

We are on the verge of a long-term transformation of the payments landscape into what many are calling "Open Banking," an all-but-unbordered system of information and data sharing between clients, banks, and various third-party entities. At BNY Mellon, we identify this new world as Payment Digitization 2.0. The main drivers of this are:

a. *Digital.* the development of Application Programming Interfaces (APIs), that will create and allow communication between banks and non-banks and the customization of banking data in ways heretofore unimagined¹; and

b. *Regulatory.* The second Payment Service Directive ("PSD2") in Europe and the Open Banking Standard in the UK will, in 2018, mandate that banks, given client approval, share their data with clients and with two sorts of fintech providers: Account Information Service Providers (AISPs) and Payment Information Service Providers (PISPs). The effect will be an end to banks' monopoly on their clients' account information and a game-changing transition away from existing banking models.

3. Conclusion.

A summary of the points discussed, BNY Mellon's three-fold strategy going forward and the use cases it addresses.

4. Appendix.

As an appendix, we are including partial results of a survey in which we solicited responses from the bank clients of our Treasury Services business regarding many of the points addressed in this white paper. Close consultation with our clients is always a key driver of our strategic decisions. The responses to the survey proved illuminating and will help us to prioritize our options going forward.

¹ See the sidebar on page 14 for a description of APIs.





Where We Are: The Current Landscape of Client Experience

Today, cross-border payments are settled across jurisdictions and through a number of correspondent banks that maintain bilateral agreements to provide services to each other. With instructions crossing domestic financial infrastructures, there is little upfront visibility for the originating client on the regulatory requirements in a beneficiary's market, or on the requirements of the nostro correspondent(s), often resulting in instructions being stopped mid-way, pending details and supporting documents. End-to-end cost, transparency and timeliness are far less than optimal, and many of the processes are inefficient and complex.

Further, instructions may be initiated through differing channels, including manual input via phone or fax, resulting in incorrect information, often not realized until much further along in the payment chain. Details required in instructions are often repetitive and tedious to enter, with little information captured for re-use with recurring payments. Instruction errors often occur in fixed formats and require repairs that are manually intensive and increase the overall transaction service costs. Repairs and instruction enrichments are typically effected after calls or mailings to clients, especially in the case of high-value transactions for high-priority clients. When payments are settled through a number of parties in a chain, handling processes may take days or weeks to resolve, and only through dedicated operator intervention and follow-ups by the intermediaries involved.

These issues demand improvement, both at an industry level and within a bank's own ecosystem. And because the issues contaminate downward from provider banks to their client banks to their end clients, it behooves banks to work together and focus their attention and resources on identifying feasible approaches for addressing them.

There are other forces in play as well. Regulatory changes, stemming from the 2008 financial crisis, while generally beneficial and well-intended, have driven up compliance costs and diverted attention and resources away from innovation. Others, notably PSD2 and the UK Open Banking Standard, mentioned above, have the capacity to irrevocably change the manner in which clients and non-bank entrepreneurs interact with banks, radically altering the terms of relationship between bank and client.

Banks have also needed to assess the technologies on offer—often to bet on one vis-a-vis another—as investment is costly and wrong choices more so. And the choices are rife: it seems that not a week, even a day, goes by without the announcement of a new payment solution, market entry, partnership, or consortium seeking to gain acceptance and scale. Some of these, like Bitcoin, are entirely new, while many facilitate existing payment rails and market infrastructures, using them to provide an improved client experience in ways that banks do not. Which brings us to a key point of this paper:

Banks must not merely develop or acquire new technological solutions, they must apply them in ways that resonate with their clients' banking experience or risk a steep erosion of their client base. And, since many solutions depend on achieving ubiquity, this must be done through industry-driven initiatives: securing agreement among the many participants as to service levels and how they will be enforced.

Managing Innovation

As banks move to embrace new technologies and provide innovative solutions, they need to manage what may prove to be transformational initiatives that require large investments in time, money and manpower to support execution. This will require as well a business justification entailing a full-fledged process of assessing ideas, identifying revenue opportunities, quantifying expected revenue and spending, all of which elongate the process of developing solutions in an agile manner and that work against the need to reduce time to market.

Further, these are new and innovative digital solutions that cannot be benchmarked against existing solutions. For a bank with an organization-wide mandate to innovate and offer digital solutions to their clients, it may be necessary to adopt a “do fast, fail fast environment” that allows exploratory efforts to continue toward proof of concept solutions without requiring any business case justification. This will require a major shift of mindset.

That said, banks have begun to reformulate their existing business model and move away from product-centricity toward client-centricity. Product and relationship management are becoming more fully joined, with integrated services offered from a renewed core banking system. We will now look at these changes in detail.



The Payment Experience in the Short Term

*“The growth in networks and solutions, capabilities and services provides a wealth of new options, but at the potential expense of clarity for consumers, who want an experience that is intuitive and self-explanatory. Banks need to create a model similar to FedEx or UPS: Where, how and when do you (the consumer) want to pay? Do you want finality? Speed? Tracking? Data? In short—**We need to sell the features, not the payment type.**”*

Carl Slabicki, Director and Product Line Manager, Immediate Payments, BNY Mellon Treasury Services

As we look to the immediate future, it is BNY Mellon's goal—and, we believe, it should be the goal of all banks providing payment services:

- To provide a payment experience wherein, at every stage of the payment journey, a client's interaction with the bank is a full integration of products, channels, operations and client service expertise.
- To swiftly transition from a position of offering products and services that basically “get the job done,” and instead create a payment experience that focuses and aligns all its working parts on clients and on their particular needs.

In saying this, it is important to note that we are not referring to an imagined, typical client, but to individual clients whose ideas of an ideal payment experience may not be the same. So, the various components of a client-centric payment experience must not only be in place, those components must be flexible and customizable so as to suit the particular client we are working with. Put another way, it would be possible to vastly improve all the components of the payments process and still provide a solution that is “one size fits all.” That is not the goal.

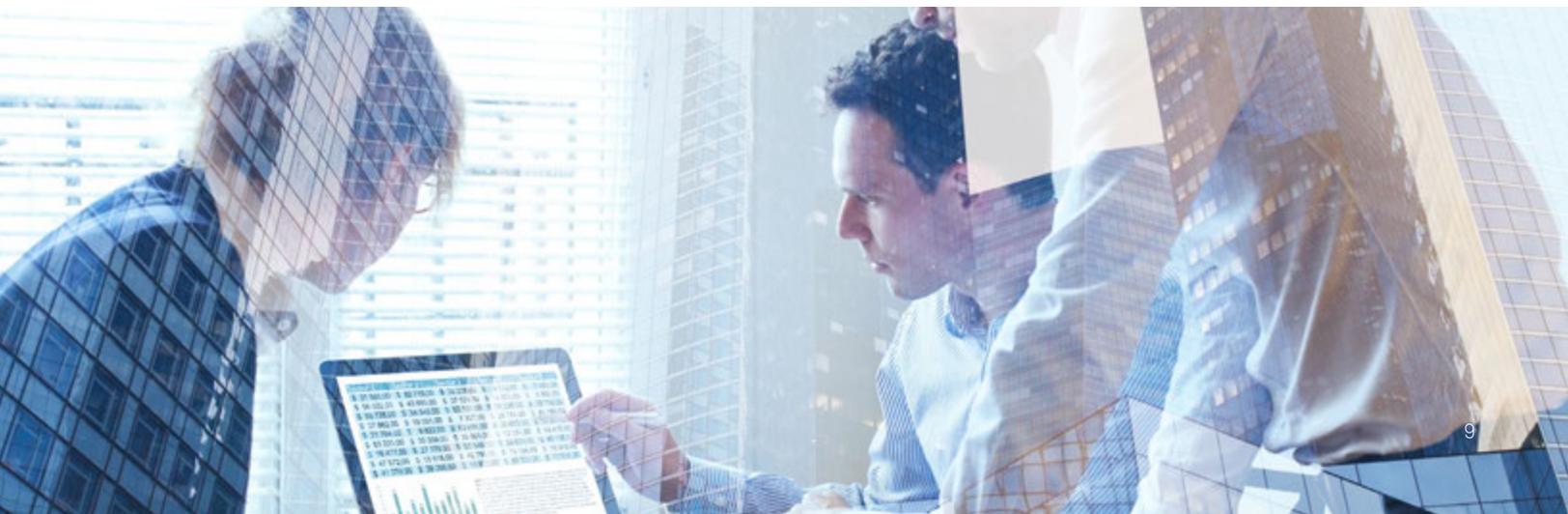
To discuss the payment experience as it exists today, and as we envision it in the immediate future, we have broken it down into six key process stages:

- 1 Initiation.
- 2 Validation.
- 3 Post-validation.
- 4 Cash position monitoring.
- 5 Status tracking, and
- 6 Reporting.



We will review each of these in detail and describe the benefits that new, adaptive technologies can provide.

NOTE: *BNY Mellon's own efforts in this direction are used as examples for this discussion.*



1 Initiation

The initiation stage is when a bank receives instructions from a client to execute a transaction. Traditionally, initiation for our clients has been primarily either file-based, initiated as a SWIFT-based interaction, or entered through an online portal.

ENHANCED PAYMENT EXPERIENCE: Flexible business service will be provided in one of three ways: (1) triggered by a bank’s own API and executed on an upgraded single-view core banking infrastructure; (2) outsourced to a larger bank that can leverage the advantages of scale and offset the cost of supporting the emerging technologies and compliance; or (3) with specific components subscribed to a third-party specialized payment service provider. This provides multiple options to communicate with a bank as part of daily transactional activities, with the bank acting as an integrated service provider across multiple products, networks, formats and message types, all highly secure and scalable as new services are added, offering a seamless unified client experience.

KEY FEATURES

- Intelligent routing through networks based on client-defined payment priorities
- Service provided across multiple products, networks, formats and message types
- Security and scalability

KEY BENEFITS

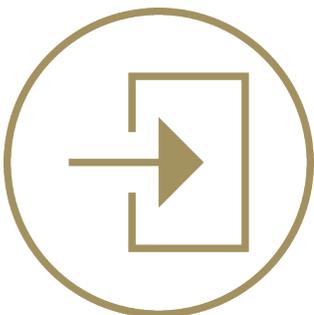
- A single integrated provider for payment needs
- Seamless integration between institutions
- Increased speed to market for new product and service subscriptions and onboarding
- Customizable access to data and functions
- Replacement with digital processes of legacy and manual means of information exchange
- Predictive analytics and machine learning to provide forward-looking views
- A common experience for payers regardless of payment rails

Initiation Example: BNY Mellon Immediate PaymentsSM

Immediate Payments is BNY Mellon’s next-generation payment ecosystem. Utilizing a new technology platform, Immediate Payments provides clients with access to all methods of payments from a single source and via a range of input methods: front-end platforms, mobile applications, the Internet and Application Program Interfaces (APIs). Further, imbedded in Immediate Payments is a routing technology that automatically matches the payment to the payment option that best addresses its cost and timeliness, according to criteria of a client’s choice.

Not every client’s needs will be the same. Some may need only to receive payments in real time, others only to make payments. And there will be differences in scale and scope. BNY Mellon will work with clients to create solutions that meet their specific business requirements and take advantage of the opportunities this new technology will provide.

As an example of how Immediate Payments will function, the matrix below suggests criteria that a client might establish for the various payments and payment types needed.



| TYPE OF PAYMENT | IMMEDIATE PAYMENT |
|--|--|
| Business to business disbursement | Real Time Payments, Same Day ACH, Next Day ACH, Wire |
| Business to consumer disbursement | Tokenized Payments, Check Issuance |
| Business to business or business to consumer receivables | Real Time Payments, Wire, ACH |
| Consumer to consumer payments | Tokenized Payments |

Once these criteria are established, Immediate Payments will route the payment as directed without further input from the client.

2 Validation

In today's process, validations of payment instructions are made after the instruction is received. While some of the validations are automated within payment systems, there are continuous changes in payment formatting and messaging standards that lead to some manual intervention during the validation process. The main reasons for manual repairs are client-specific, services-related formatting; currency formatting requirements; and the absence of mandatory information such as account numbers or remitting and beneficiary details.

ENHANCED PAYMENT EXPERIENCE: Real-time review, auto-population and reference to improved straight-through processing (STP) rates

KEY FEATURES

- Instant, upfront alerts on incorrect information drawn from internal directory and processing logic
- Intelligent enrichment of directory information, repetitive data or past errors
- Display of payment routing and processing parameters

KEY BENEFITS

- Improvements in STP rates
- Ease of use with auto-population
- In-context transparency enabling decision making
- Enhanced oversight at the point of entry of instruction
- Replacement of legacy and manual information exchange
- Faster error resolution and transaction execution of exceptions



“Corporates & individuals and their financial service providers are looking for more integrated solutions—simple, intuitive banking service that is invoked at the right time, when they need it, as part of their day to day business or personal transactions, where their financial solutions provider brings together their different components to create a seamless omni channel end to end client experience.”

Radhika, Product Manager, SWIFT gpi and Asia Payments, BNY Mellon Treasury Services

3 Post-validation

Currently, if an instruction—due to errors or to lack of transparency and predictability—requires repair, intervention by an operator is necessary. And if, depending on the type of issue, one or more client service or relationship managers need to interact with the client to collect the supporting information necessary to fix the payment before releasing it to the next stage, extended delays are routine.

ENHANCED PAYMENT EXPERIENCE: Seamless exception handling to minimize manual intervention

KEY FEATURES

- Direct system-to-system integration to retrieve information relevant to processing
- Timely alerts and push notifications provided to the client for action, based on priority
- Authorization for release of information back to the financial institution

KEY BENEFITS

- Faster, on-demand processing of missing information with minimal manual intervention
- Increased timeliness and data services visibility
- Replacement of legacy and manual information exchange

4 Cash position monitoring

Currently, there is little transparency for monitoring cash balances on a real-time or near-real-time basis. Parties involved in the payment chain typically use various end-of-day or intraday reports to predict cash flow requirements. These may be inaccurate and may result in liquidity issues and inefficient use of working capital or treasury funds.

ENHANCED PAYMENT EXPERIENCE: Status alerts and cash flow analysis for transparency and “just-in-time” funding

KEY FEATURES

- View online net, gross, incoming or outgoing value or volume, with drill-down and roll-up capability
- Monitor intraday liquidity benchmarks and key metrics for clearing channels in real time
- Configure alerts for specific benchmark thresholds
- Forecast and manage instruction flow through networks
- Prioritize activity against pools of liquidity

KEY BENEFITS

- Achieve greater capital efficiencies
- Improve capacity to reduce cost and meet market deadlines
- Reduce operational risk and regulatory scrutiny
- Ensure critical payments are executed against liquidity



5 Status tracking

Currently, once a payment is processed and released into the network, clients and payment originators are not able to track the payment end to end, especially cross-border payments. Nor can they confirm that a payment has been credited to an end beneficiary, unless the originator raises an enquiry on non-receipt of funds. Stopping a transaction in progress requires extensive efforts to contact the parties in the chain to track down the payment and initiate a cancellation or recall.

ENHANCED PAYMENT EXPERIENCE: End-to-end tracking and “Stop and Recall” services for added control

KEY FEATURES

- End-to-end tracking capability as to where a payment is at a given point in time, the cost of the payment and its time to process
- Tracking via dashboards or integration directly into the system via APIs that trigger workflows
- 24/7 access to updates and status milestones
- Configurable alerts

KEY BENEFITS

- Transparency into processing milestones and exceptions without multiple phone calls and emails
- Easy access to stop or recall a payment or to open an enquiry
- Real-time updates and service delivery

A Look at SWIFT gpi

SWIFT global payments innovation (gpi) started as a platform initiative, with 45 leading banks. Through this initiative, SWIFT developed a payments tracker in the cloud, a member directory and a service level agreement observer tool, ensuring that the new service meets transparency and traceability requirements.

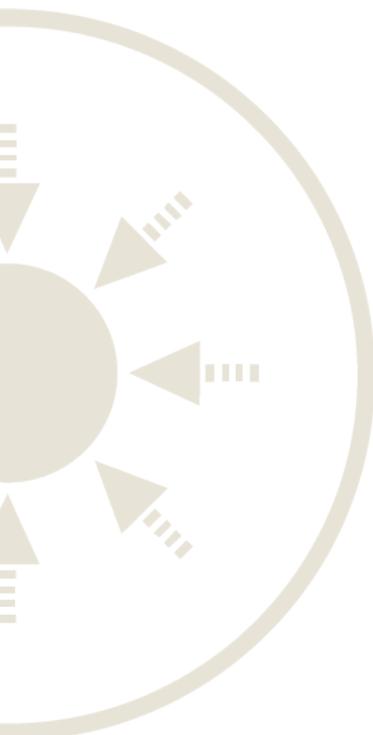
Live since January 2017, over 110 banks have committed to gpi and more than two million gpi payment messages have already been sent across more than 100 country corridors. Additional features and services will be added to the platform. These include:

- A stop and recall payment service, allowing a bank to stop a payment no matter where it is within the correspondent banking chain
- The transfer of rich payment data, along with the payment, with the additional data necessary for payments compliance checks or line item details. This will facilitate reconciliation with invoices.
- An international payments assistant to help corporates initiate error free cross border payment instructions.

Looking to future innovations, SWIFT has launched a distributed ledger technology (DLT) proof of concept (PoC) with 30 banks, which will test the technology's ability to reconcile international nostro accounts in real time. Initial findings are due to be reported at Sibos in October 2017. SWIFT has also launched an industry challenge initiative working with the global fintech community to develop additional overlay services on the gpi platform using its APIs.

BNY Mellon went live with gpi in June 2017 and, along with SWIFT, we are taking a multi-phased approach to our product offering. Initially we are focusing on developing a solution that can provide our clients with the most benefit as soon as possible. We then plan to continue to expand the currency and capability reach of the solution while building overall insight into the payments lifecycle as the initiative grows globally and within BNY Mellon.

For more information about gpi please visit www.swift.com/gpi or download the SWIFT gpi iPad app.



6 Reporting

Currently, data is available to users through intraday, day-end or monthly reports. The data transformation for extracting valuable insights is decentralized and dependent on the level of sophistication at the receiving party's end. This results in no better than a basic analytics capability, with only limited information on trending and forecasting of payment activity without actionable insights.

ENHANCED PAYMENT EXPERIENCE: Client-specific advisory with trend reporting and benchmarking for better cash management

KEY FEATURES

- Configurable reporting and data extraction in customizable formats
- Reporting APIs across sources that directly integrate into systems for cross-provider, aggregated views
- AI-driven insights, trend analysis and benchmarking that enable clients to better manage their cash-related activities

KEY BENEFITS

- User-definable dashboards with drag-and-drop components
- Faster, seamless and secure on-demand reporting
- Continuously growing catalog of content to facilitate decision making

BNY Mellon Payments Modernization Example: BNY Mellon Tokenized PaymentsSM now available with Zelle[®].

With BNY Mellon Tokenized Payments With Zelle, a client can send a payment request file to BNY Mellon including only the payee's e-mail address or mobile phone number, the payment amount and remittance data. Existing enrolled payees receive an e-mail or SMS text notification that a payment has been originated and will be posted to their bank account². Funds are typically available within minutes³. With no third-party intermediary, consumers never leave the security of their bank or credit union of choice, never reveal their account numbers to non-financial institutions, and get access to funds typically within minutes⁴.

When the sender and recipient are both enrolled, Zelle enables money to be sent directly from one deposit account to another. These transactions will minimize the reliance on checks and cash and help reinforce the relationships financial institutions have with their customers.

By combining the convenience of faster payments experiences with the security of financial institutions, Zelle can reduce processing costs while allowing customers access to their funds in a secure way. This consumer-level breakthrough represents just the beginning of what Tokenized Payments can do to help customers and clients. Soon, it will further accommodate a wide range of corporate disbursements and other use cases when getting faster access to funds is of value—all on the same efficient, integrated platform.

² Zelle[®] is available to U.S. bank account holders only.

³ Transactions typically occur in minutes. If a recipient is not enrolled with Zelle[®], it could take one to three days once the enrollment is completed.

⁴ Use cases accomplished through partnerships with fintech and other third-party providers (BNY Mellon tokenized paymentsSM now available with Zelle).

2

Where We Are Headed: Envisioning the Future of the Client Payment Experience

New platforms and technologies such as those sponsored by The Clearing House and by SWIFT are important and necessary steps in bringing payments into the twenty-first century. They address and improve nagging systemic problems such as transparency (SWIFT gpi) and, in the case of Real Time Payments, create an entirely new delivery platform. Client benefit should be immediate and much will be simplified for banks themselves. But they provide mostly differences of degree—improved transparency and speed of settlement, lowered cost, ease of access—rather than of kind.

APIs and the regulatory mandates that will enable them, PSD2 and the Open Banking Standard, respectively, on the other hand, open a door to a transformed future payments landscape that, because of the customization that APIs allow, is not yet entirely predictable. Because of these regulatory mandates in Europe and the UK, it is no longer speculation that technology will change the relationship clients have with their banks. It is a given and it will begin in earnest in 2018.

What Are Application Programming Interfaces (APIs)?

An API is a set of subroutine definitions, protocols, and tools for building application software. It sets out clearly defined methods of communication between software components and makes it easier to develop a computer program by providing a programmer the basic building blocks. APIs can be created for web-based systems, operating systems, databases, and other sorts of computer hardware or software. In short, it is software that allows two systems to communicate with each other. An example should make clear why their use in the payments business as advocated in PSD2 and the Open Banking Standard is so revolutionary.

Imagine you are planning a trip and need to find a hotel room. You might go onto a hotel's website, where an application allows you to enter your destination, the days you need a room, the number of beds, smoking/non-smoking, etc. When you send your request, it travels to the hotel's database, which matches it to what they have available and returns the information to you. It is an API that facilitates the transfer of information from the Internet site to the database and back. This may not seem revolutionary.

Now imagine that, rather than going to the hotel website, you visit Orbitz™ and make a similar request. Orbitz, using an API, can access the hotel database, but it can also access others as well—any hotel with whom they have an access agreement, which is nearly every hotel in the nation, since few hotels will not want to be competing on Orbitz. The result is that Orbitz returns a myriad of choices, everything available at every hotel in your destination city at the time and in the price range you specified. This is the model that the open banking initiatives are mandating for banks:

Open access to third-party providers of private and personal banking information that has been, heretofore, proprietary information of banks and banks alone, and the ability of those providers to create a public market at which banks will be forced to compete with each other on newly defined and radically altered terms that banks can no longer dictate.

“In order to achieve the new payment experience, we have to first accept that incremental improvement will not achieve the target state. It is going to require vision and leadership to make some big decisions requiring some ground-up work. The threats are large: this is a commodity function and can easily be built by a startup. Additionally, if a bank does not create and deploy APIs, its competitors will and this will give them a huge advantage. Our clients in the next three years will no longer want to use our portals. They will demand the ability to fully integrate their local technology directly into our tools.”

Jim Walker, Managing Director, Head of Enterprise Business Architecture,
BNY Mellon Client Technology Solutions

Regulatory Mandates

PSD2 (Europe) and the Open Banking Standard (UK), in order to force collaboration opportunities between banks and third-party providers, have mandated that, beginning in 2018, banks will be required to share—with client approval, via APIs—access to client accounts and account information with third parties, mainly fintech providers. These providers will be of two types: Account Information Services Providers (AISPs) and Payment Initiation Services Providers (PISPs), both of which will require licenses to operate. AISPs will be allowed to access and extract client information—balances, history, transaction data—and PISPs will be allowed to initiate and make online payments, drawing directly from a client's account, without bank intermediation.

CLIENT BENEFITS

The ways this access can be put to use are myriad. The ability, say, of an AISP to compare offerings from numerous banks and provide them to clients: examples might include car loans, mortgages, business loans, savings account returns, checking account charges. For businesses or banks themselves, a client's creditworthiness can be readily and directly ascertained, without the intermediation of a ratings company. AISPs might serve as financial advisers to both corporates and individuals, with the ability to manipulate and analyze massive amounts of data virtually and provide investment information in real time. They will be able to advise that monthly bills are coming due, pay those bills, oversee spending and provide budget advice. Competition will drive ideas and shape the market, all to the consumers' benefit.

OPENING THE DOOR

Bank responses to this, at least as stated for the public, have been mixed. While many banks have been supportive of the initiatives, at least in their public statements, there remains concern about loss of profit and the stickiness of client relationships. In the U.S., according to *The Economist*⁵ American banks are already lobbying regulators to “keep their data monopoly intact.”

Since the advent of banking, banks have held a monopoly on the information they retain on their clients. That such information would be privileged and unshared has been core to the very idea of banking and maintaining the security of such proprietary information has been strictly regulated by law and typically enforced with various fire walls within individual banks, access allowed on a need-to-know-only basis in order to thwart inappropriate pooling, leaking or misuse. Indeed, the maintenance of rigorous privacy has been the historic selling point for Swiss banks (if not always for commendable reasons). How could it have been otherwise? Clients are, after all, trusting banks with their money. But the monopolization of vast amounts of data is a very valuable business asset as well. And it is this that open banking is on the verge of changing and forcing banks to give up.

⁵ *The Economist*, “New European rules will open up retail banking,” 8/10/2017.



RISK AND SECURITY

Separate from the fear of losing control of the marketplace, there are other concerns for banks, indeed for the whole enterprise of open banking. Probably the key consideration is risk and security.

Concepts behind open banking are typically viewed from a retail or small business perspective, with the regulatory view being that smaller participants in the payments ecosystem do not have the size to negotiate the best possible deals for themselves in terms of pricing and services. This brings to light a potentially significant new risk for banks regarding liability against a fraud committed against clients or their service providers, making banks liable for recovery from these new third-party processors. These new regulations capture most client accounts as payment accounts and, therefore, in scope. As a result, large investment companies, and other financial services firms that execute hundreds of millions of dollars in transactions are also in scope. From a practical perspective, it will be difficult to insure for potential losses associated with values that high.

The enormous amount of private financial data that will be made available to third parties will be an equally large target for those seeking to obtain it illegally and they will have more avenues available by which to try to gain access to it. The creators of the initiatives have taken steps to address this, codified within the legislation. AISPs and PISPs, in order to be licensed, must convince regulators of the soundness of their data security and will be required to submit to annual inspections. They will also be required to acquire fraud insurance, adding another layer of prevention, in that insurers have a clear stake in seeing that security procedures are optimal. Also, regulations requiring a more robust authentication and two-step verification will make on-line payments more secure than they are currently.

Still the risks cannot be overstated. Regulations on paper and put into practice can be very different issues. This will be a rapidly changing and unpredictable market and the regulatory environment must be fluid not static. Replacing a single bank portal with numerous lines of access will provide many more opportunities and points of attack for criminal activity. Verizon, in a 2016 Data Breach Investigation Report, stated that 40% of data breaches occur via web applications in today's far more closed system environment, so current security procedures are unlikely to be adequate.

Artificial Intelligence

The banking industry has begun to put artificial intelligence (AI) to use in a number of areas. These include fraud detection and anti-money laundering where AI analysis of big data can reveal patterns and discrepancies to root out behaviors that appear anomalous and suspicious. It has proven effective and should only become more so as the technology continues to be refined, but does little to enhance a client's payment experience other than to provide some peace of mind. But banks are also beginning to use AI in two areas that will directly impact clients' experience: so-called "chat bots" and customer recommendation.

Verizon 2016 Data Breach
Investigation Report.



Artificial Intelligence

"Fueled by big data, AI will create enormous productivity opportunities for banks that should exponentially increase their clients' STP and automation. For these reasons, AI will likely create new outsourcing opportunities for banks and fintechs with their corporate clients."

Greg Malosh, Managing Director and Head of Information & Liquidity Services,
BNY Mellon Treasury Services

Chat bots

Chat bots are artificial intelligence-based automated systems that can simulate human conversation without human intervention. They work by identifying the context and emotions of the human end user and respond to them with the most appropriate reply. Over time, they collect a massive amount of data for the behavior and habits of users, adapt, and become more precise and life-like. Chat bots are already in use in the banking industry in relationship management.⁶ As one example, Bank of America provides customers with a virtual assistant that will use artificial intelligence to make suggestions over mobile phones for improving clients' financial affairs.

Customer recommendations

Recommendation engines are a key contribution of AI to the banking sector. They use data from the past about users and correlate it with offerings from the bank such as credit card plans, investment strategies, funds, etc. to make the most appropriate recommendation to the user based on preferences and user history. With big data, faster computations and increasingly accurate artificial intelligence, such algorithms should play a major role in how recommendations are made in the banking sector.

⁶ Not everyone will think this is a welcome change. Indeed, at BNY Mellon, person-to-person client support is an important component of our reputation for outstanding client service. But for smaller banks that cannot afford to maintain a large and ubiquitous client support team, this could prove a cost-effective solution.

Big Data and Data Management

A key challenge in data management is the decentralized data environment that exists today—not just across providers, but within multiple legacy platforms for a given provider. Big data efforts and analytics tools are being pursued to solve this problem, but key is the significant work required to consolidate or “normalize” the data. Only then can one provide the tools needed to analyze it. Normalizing the data is a challenge for any one organization and a greater one across providers. This is where standards such as ISO 20022 become so important. (This is also the value that SWIFT has provided historically and why SWIFT, with efforts such as gpi, will be a catalyst for driving change and adoption.) It is important to note that, although standards such as ISO 20022 help facilitate integration from a structural basis around key data elements, the flexibility and sheer volume of data that can be supported within the standard still leads to significant business challenges in building a data repository and direct client data exchange.

Once data has been normalized, banks can deploy it in ways that improve access controls, fraud prevention, and data privacy. Significant investments will be required to truly deliver on the concepts, but not doing so will leave behind providers that don't move aggressively in what they can deliver to clients. Much will be at stake as immediate payment systems are adopted and providers add these types of capabilities to new payment rails.



Big Data and Data Management

“Big data analytics can aid in decision making based on prior trends including funds availability and payment patterns. AI and machine learning would assist with cash forecasting. AI and machine learning could also assist clients wanting to have a payment made based on the least expensive mechanism or by when the payment must post.”

Michelle Palombo, Managing Director and Product Line Manager,
Global Client Access, BNY Mellon Treasury Services

3 Conclusion

The growth and drift of market forces from the retail industry to corporate and institutional banking make it imperative for all existing service providers to rethink the payments experience from outside in and to identify key service-oriented solutions that will help provide timely information to end clients and to simplify the payment process, making it more cost efficient and resilient.

In the longer term, the initiatives of open banking will transform and redefine the entire relationship between banks and their clients. Banks need to anticipate and prepare for this, to position themselves properly, if they are to remain active players in a business whose changes may not be driven or mandated by banks.

There are three paths toward this end, depending on the case and situation. BNY Mellon has pursued all three:

- 1 Use cases that require only an internal development effort**
(BNY Mellon NEXENSM, Global Payment infrastructure modernization)
- 2 Use cases best accomplished through industry-driven initiatives**
(SWIFT gpi, Real Time Payments)
- 3 Use cases accomplished through partnerships with fintech and other third-party providers**
(BNY Mellon Tokenized Payments now available with Zelle).

We have been actively leading various industry and transformational initiatives to take advantage of the current period of change and to look at new and improved solutions that enhance the end client experience. And we interact with clients on the particular issues they want to solve for and that advance the future vision of the client experience. We believe this is the correct approach and necessary if payment banks are to remain competitive in the future, near-and long-term.



“In the future, a client should be able to initiate a payment using any device—securely, with certainty, using the most cost-effective route without having to define that route.”

Edmund Esch, Managing Director and Global Head of Strategy and Product Management for High Value Payments, USD, GBP, and Euro Direct Clearing Services
BNY Mellon Treasury Services

APPENDIX Client Survey

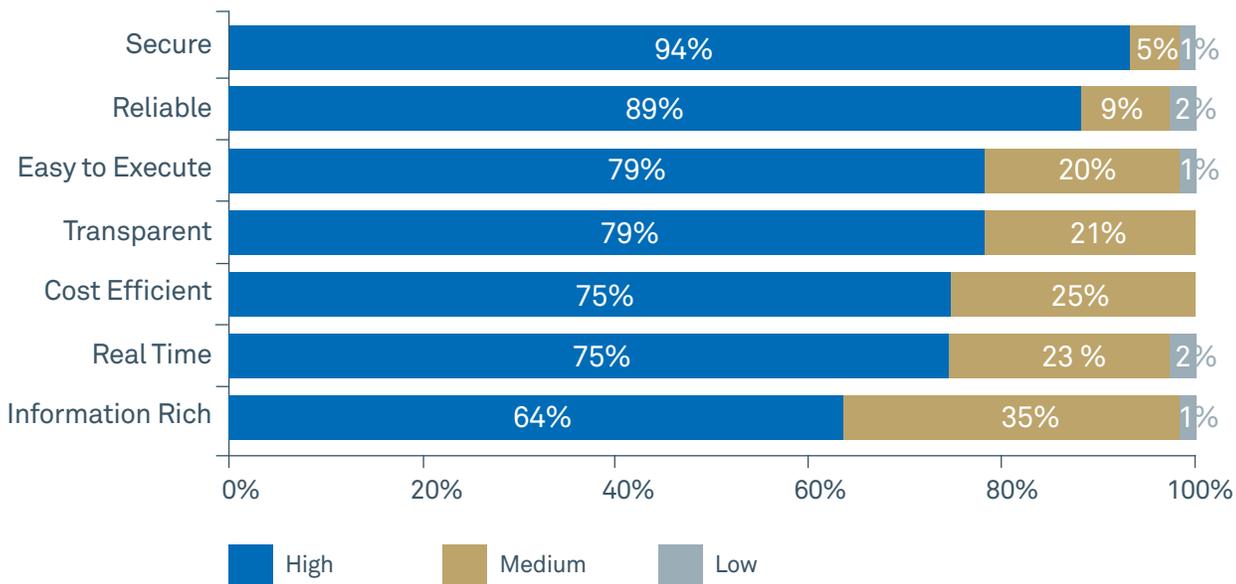
Partial results of BNY Mellon Treasury Services Payment Experience Client Survey—August/September 2017
N=80

In support of our efforts to create a continually positive payments experience, BNY Mellon Treasury Services is eager to receive feedback from our clients. While preparing this paper, during August and September 2017, we reached out to our bank clients to solicit their perspectives on:

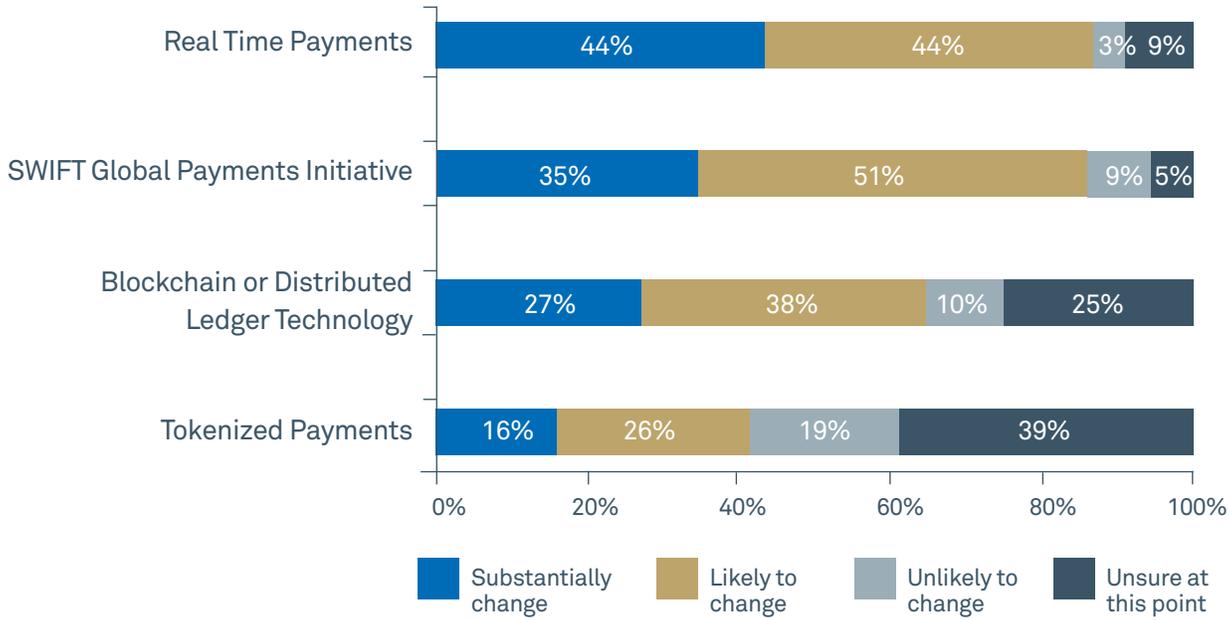
- Key areas that they believe will change due to transformation in today’s payment environment
- How digital interactions may be used to improve tracking, enquiries and investigations for payment efficiencies
- How data intelligence and analytics may help them make more informed and timely business decisions

In this appendix, we present some of the findings from that survey, which are based on responses from senior representatives from 80 global banks and which correspond to much of the information presented in the preceding sections.

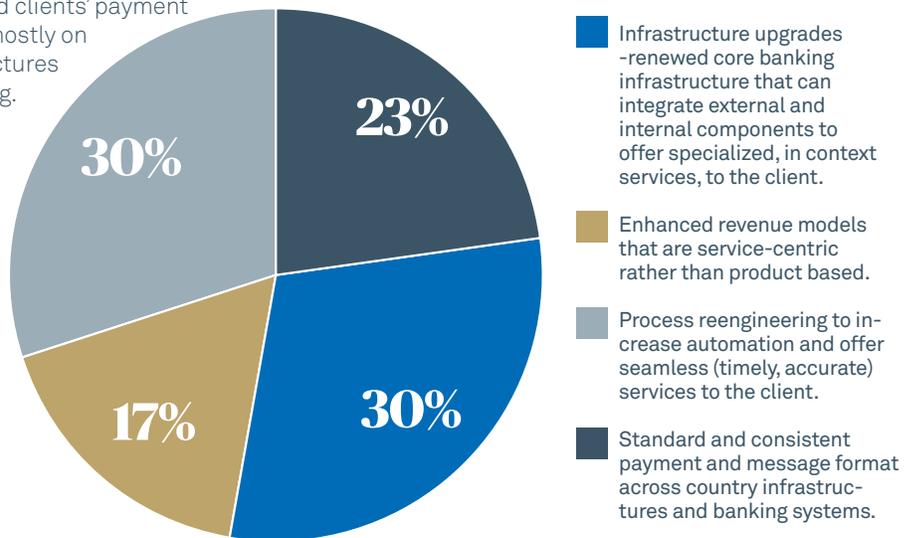
1. When asked which aspects of the payment process could be improved to create an “ideal” payments experience, respondents ranked security and reliability as their top priorities, followed by ease of execution and transparency.



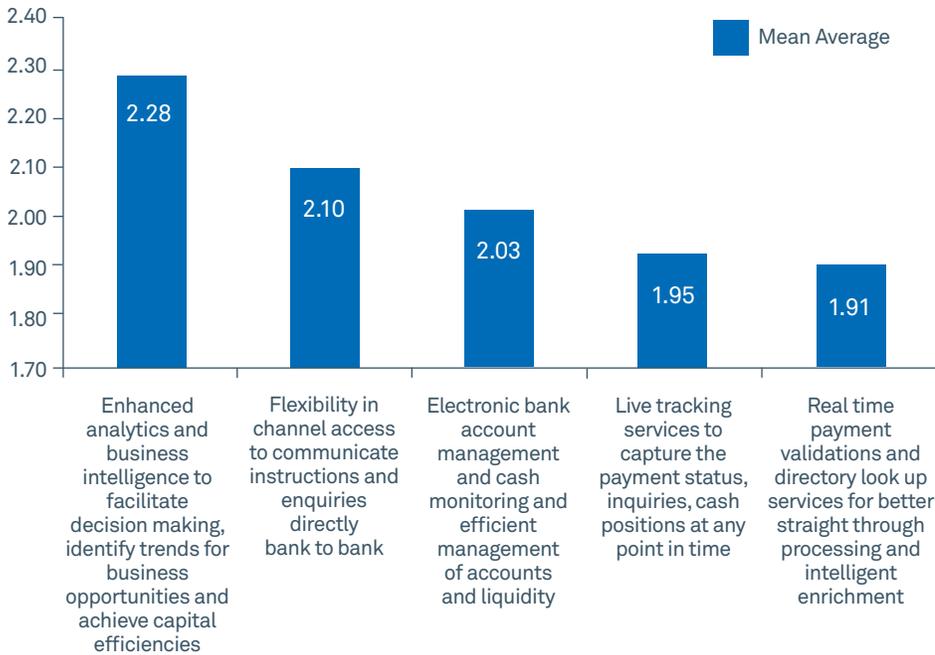
2. Respondents told us that, among the numerous modernization initiatives in play, they believed the introduction of Real Time Payments will have the most significant impact on today's correspondent banking model.



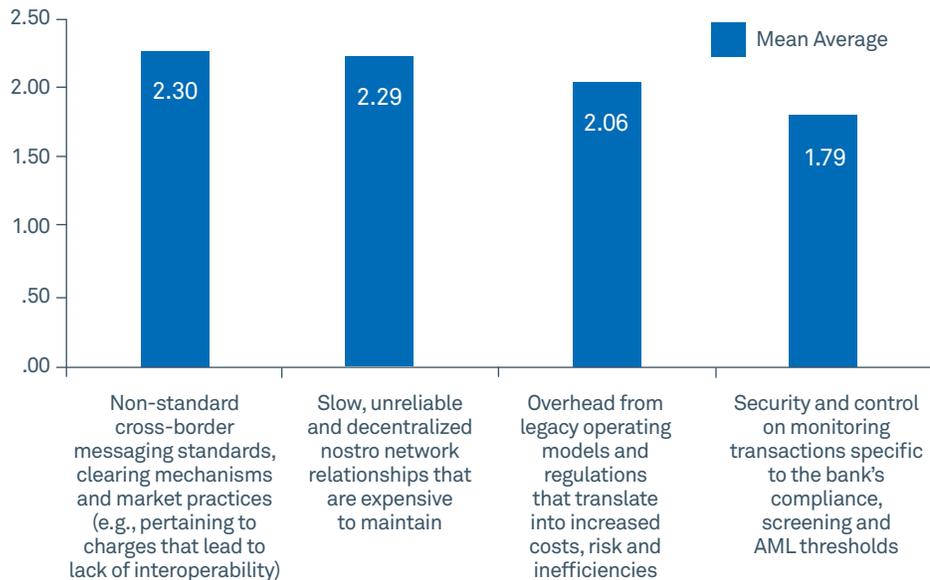
3. Respondents said that, from a business model perspective, driving change in their end clients' payment experience would hinge mostly on upgrading their infrastructures and process reengineering.



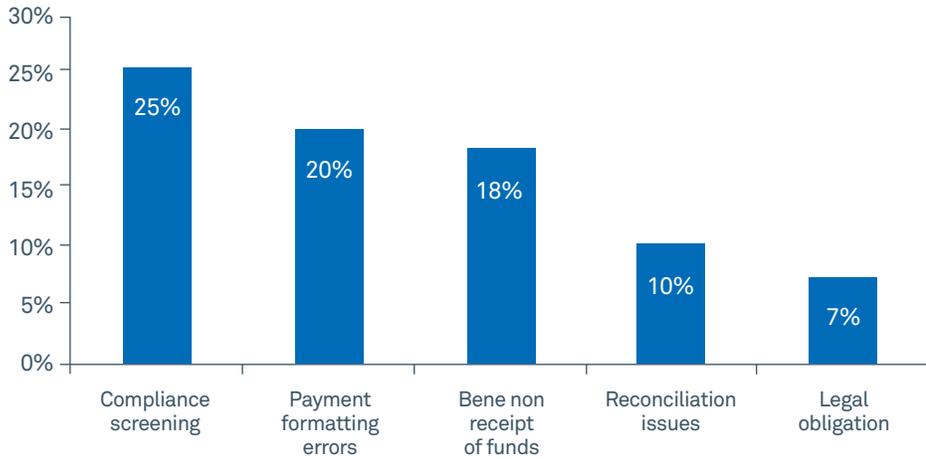
4. The survey also revealed that respondents believe that enhanced analytics and business intelligence to support business decisions will be the number one factor in their ability to improve their end clients' payments experience.



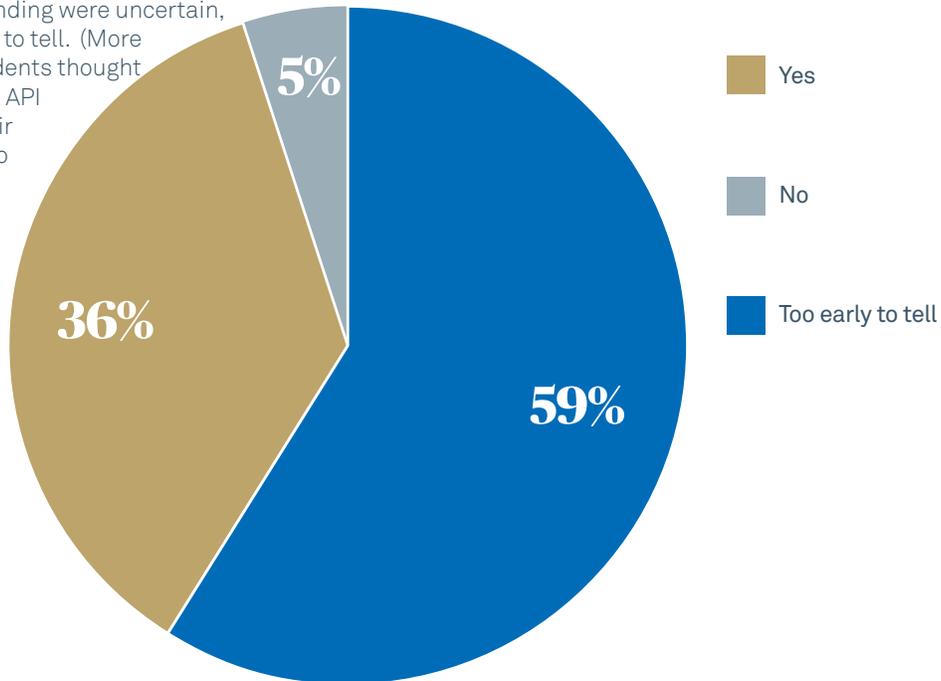
5. Respondents to the survey told us that they see non-standard cross-border messaging, clearing mechanisms and market practices as well as slow, unreliable and decentralized nostro network relationships which are expensive to maintain as their top two concerns in correspondent banking.



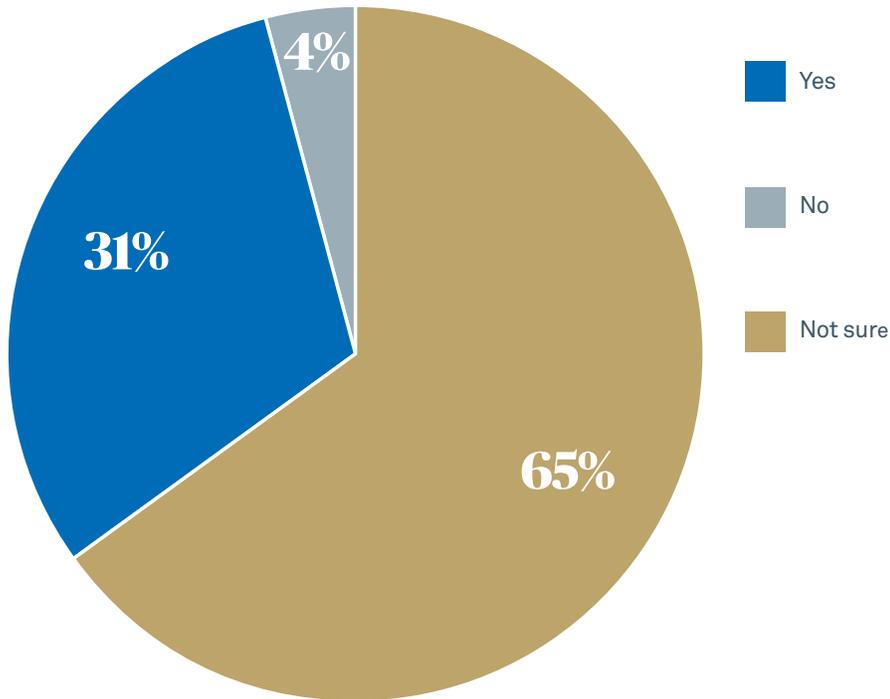
6. Respondents found that their efforts to achieve Straight Through Processing are impeded by a variety of factors with compliance screening and payment formatting errors the most challenging issues. Bene non-receipt of funds ranked third by a narrow margin.



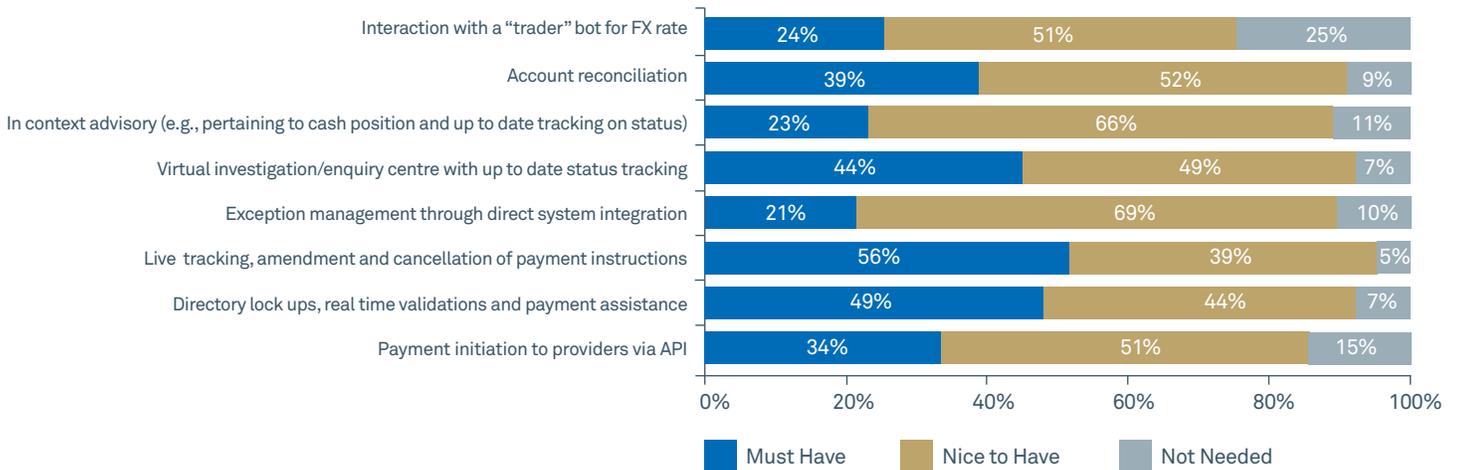
7. When asked if they thought direct peer-to-peer system interaction via APIs would bring a fundamental shift in interbank correspondent banking, more than half of banks responding were uncertain, saying it is too early to tell. (More than half of respondents thought the first meaningful API interaction with their providers was one to three years away.)



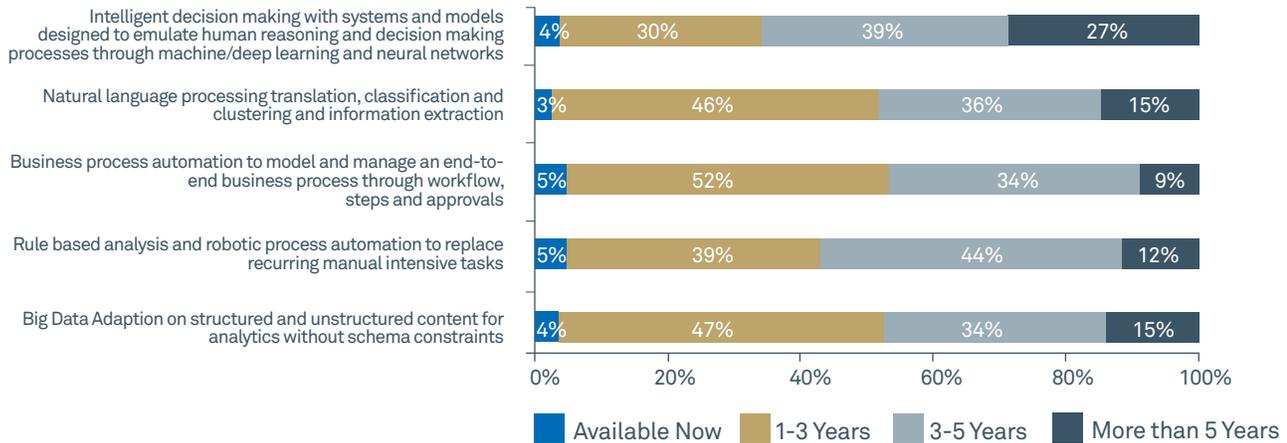
8. Sixty-five percent of survey respondents said they are not sure if they will be looking to their bank partners to integrate and facilitate API services to their clients.



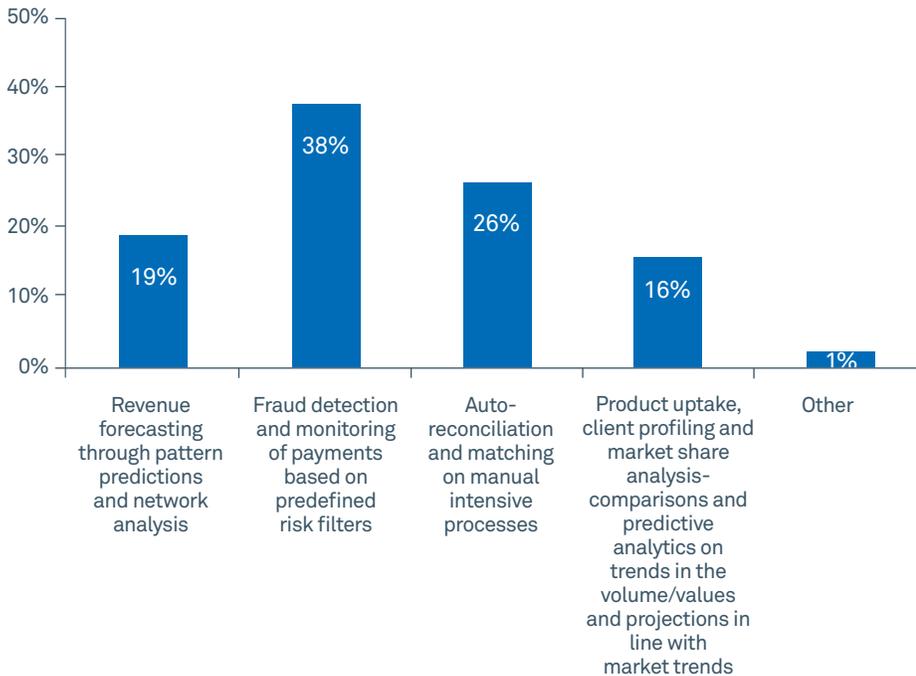
9. More than half of respondents identified live tracking, amendment and cancellation of payment instructions as a “must have” API use case for addressing their current payment challenges and adding value for their end clients.



10. When considering the use of Artificial Intelligence (AI), survey results revealed that very few of the banks responding are currently employing its capabilities. The majority thought it would take less than five years to reach a level of maturity that would enable them to reap the benefits of AI.



11. Thirty-eight percent of survey respondents identified fraud detection and monitoring of payments based on predefined risk filters to be the top use case for AI, putting it in the lead among other potential applications.



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Managing Director and Global Head of Strategy and Product Management for High Value Payments, BNY Mellon Treasury Services

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Sr. Marketing Manager, BNY Mellon Treasury Services

Denise Hampson

Manager—Marketing & Communications, BNY Mellon Treasury Services

Jeff Hawkes

Senior Product Manager—Sterling Clearing, BNY Mellon

Aneish Kumar

Managing Director and Country Head—India, BNY Mellon

Gregory Malosh

Managing Director and Head of Information & Liquidity Services, BNY Mellon Treasury Services

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Managing Director and Product Line Manager—Global Client Access, BNY Mellon Treasury Services

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Radhika

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