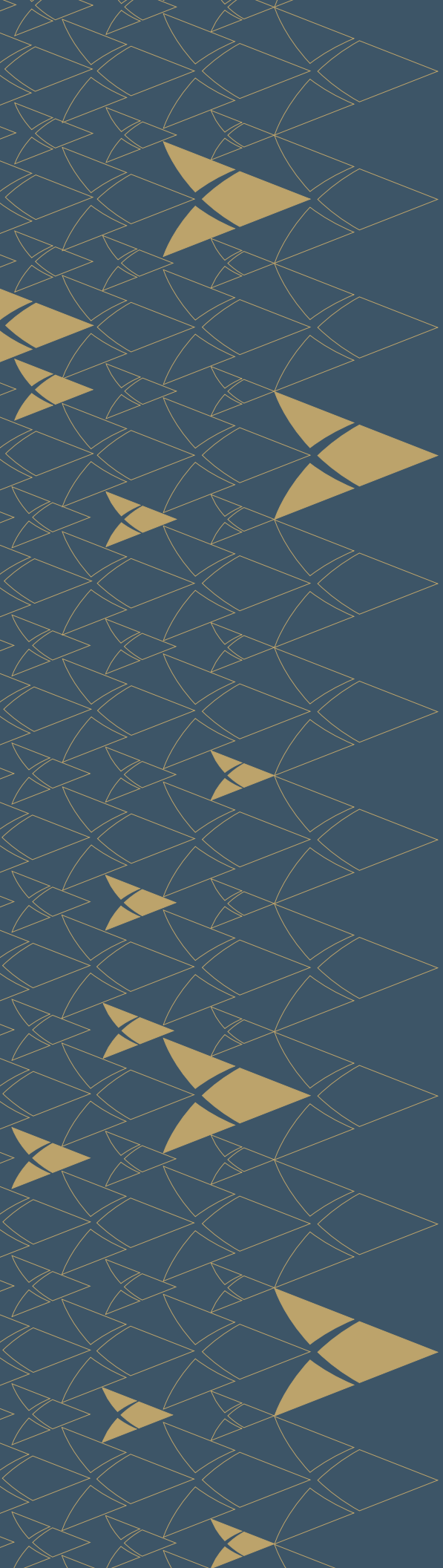
THE FUTURE OF PAYMENTS—
A Corporate Perspective

TREASURY SERVICES

BNY MELLON



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As a member of BNY Mellon Treasury Services' Global Relationship Management and Business Development Leadership team, Jeff's career spans more than 25 years in treasury management. Jeff has also held positions with ABN AMRO Bank in the U.S. and Europe, Dreyfus Corporation, Standard Chartered Bank and The Walt Disney Company. He has served as a board member for BNY Mellon Trust Company, an adjunct staff member at the University of Pittsburgh and an adjunct faculty member at the New York Institute of Technology. Jeff is currently a member of the BNY Mellon Credit Portfolio Management Committee, and is a frequent speaker at industry events on topics that range from payments and working capital management to credit and liquidity.

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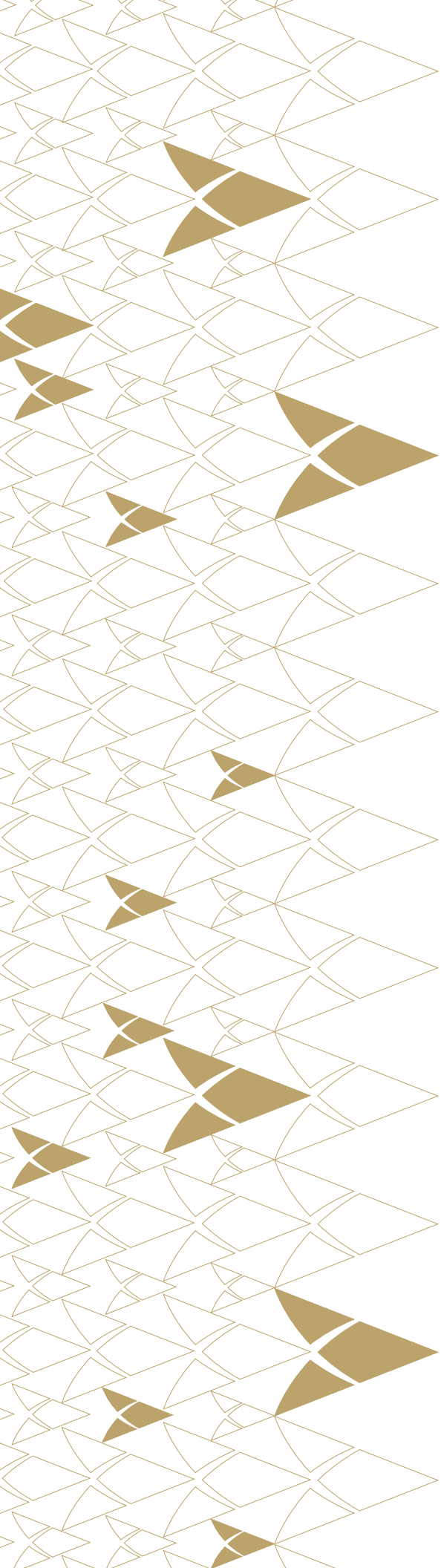
In his current role, Carl is responsible for the strategy and development of BNY Mellon Treasury Services' new faster payment solutions such as Real-Time Payments and Tokenized Payments® now available with Zelle®. Prior to joining BNY Mellon in 2014, Mr. Slabicki was the Treasurer for the Wurth Group of North America Inc. which is the regional in-house bank, holding company and shared service center for the Wurth Group. Currently enrolled in SIFMA's Security Industry Institute at Wharton, Carl is a Certified Treasury Professional (CTP), an Accredited ACH Professional (AAP) and a member of the Association for Financial Professionals (AFP).



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Foreword

In the rapidly evolving world of payments, BNY Mellon is driving innovation and supporting our clients on their digital journeys. This paper lays out our perspectives on the future of payments and how we will get there together.

Our goal at BNY Mellon Treasury Services is to provide a best-in-class client experience and help your organization—whether corporate, financial or public—progress along your individual path to modernize your operations.

We offer compelling solutions for global, FX-linked and multiple currency payments, as well as liquidity and trade services, to enable your success.

Firms around the world trust us as a key and stable industry provider at the forefront of real-time payments and other innovative solutions they need to evolve and address their own strategic priorities.

We hope the contents of this paper—with its insights into how your industry peers are experiencing the developments in payments, facing the inherent challenges that change brings, and embracing future technologies—will help you take the important next steps needed for a thriving future.

Thank you—and please let us know how we can help you realize your future objectives.

Paul Camp
Chief Executive Officer
BNY Mellon Treasury Services

Introduction: Why A Corporate Perspective?

The payments industry has transformed—in the space of several years—from one of stagnancy to one of radical, sweeping change. New technologies, and innovative solutions spawned from these new capabilities, have surfaced in a space that hasn't progressed in nearly 80 years, particularly in the U.S. The result of these changes has been one of upheaval for all parties involved—and primarily for the corporate space. With payments systems facing a variety of challenges, businesses are confronting a new set of options and capabilities that are compelling them to adjust and move with the changes if they are to grow and continue to succeed.

But such change comes at a price. At this juncture in time, entire corporate industry segments realize that now—as these new offerings are coming to the forefront—is the time to address the many pain points rife in payments operations that their industries have been encountering for decades.

This paper was prepared to help you learn how businesses are experiencing the state of corporate payments today, the challenges they are facing as they seek to enter this burgeoning space going forward, and consequences for their industries and the payments industry as a whole.

To derive an accurate view of the state of corporate payments today, we have combined the results of a BNY Mellon in-depth industry survey on the subject with payment-industry insights gleaned from more than a dozen comprehensive interviews of industry leaders—chosen among a select group of large U.S. domestic and multinational companies—who possess in-depth knowledge of and opinions about the evolving payments space. These insights, along with those derived from our experience in the payments market, combine in this paper to represent a referendum on the current effects of the radical changes that have been sweeping the payments industry on corporations today, and their vision for a dynamic and exciting payments future.

Forces Behind The Changes

The swiftly-transforming payments space has been largely heralded by a potent mix of market and cultural factors, including:

- **Existing Payment Rail Limitations.** Prior to the last few years, payment infrastructure across the globe was generally decades old, despite acceleration in technology developments. In response, a number of countries embarked upon initiatives to upgrade or invent new payments platforms, with the current real-time payments platform in the U.S. arising as the first in the U.S. market 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, can take up to four days to settle and are expensive, unpredictable and provide little transparency.

- **Rise of Industry Competition in the Payment Space.** With fallout from the 2008 financial crisis resulting in increased regulatory demands, and banks prioritizing accommodations to these requirements, opportunities arose for non-bank providers, such as fintechs, to fill the gap for an improvement in the payment experience. A combination of an increase in demand for mobile, person-to-person (typically small) payments, and customer attraction to the improved client experience, provided inroads for these new offerings. For corporate and other institutional clients, these improvements being provided directly to consumers did not go unnoticed, recognizing that service levels that providers offered to them seemed stuck in the past.

- **A New Generation of Client Expectation.** As millennials entered the age of consumerism, corporates and banks faced a growing client base not only more comfortable with new technologies and more demanding of the solutions provided them than previous generations, but also lacking the ingrained perception that banks are necessarily trustworthy and reliable and, therefore, the natural stewards of the world's payment systems. And, with the ever-growing concerns around compliance and risk, ensuring new payment innovations that can more effectively meet the expanding client experience demands—combined with ensuring full and comprehensive compliance with regulatory and risk requirements—will be of paramount importance.

- **Existing Technology Limitations.** These changes foreshadowed the opportunities that have resulted in an explosion of new payments technologies and offerings among industry providers. But the transition toward modernizing payment infrastructures is understandably arduous, given a payments system that has been so staid and unmoving for so long.

The Transformation Underway—The BNY Mellon Perspective

Thus, the inquiry—from the corporate perspective—has quickly evolved from what needs to change, to how much and how quickly that change can happen; a need for greater understanding around which improvements will best meet organizations' unique payment requirements; the feasibility of applying those changes to their complex operations; and ensuring smooth transitions.

BNY Mellon is committed to helping you stay current as you seek to embrace and derive value from understanding the payments transformation underway. As part of that commitment, we strive to provide real, actionable insight into these questions to help you navigate your plans to expand and improve your day-to-day payments-related activities, and ultimately, the solutions that will help your business grow.

This paper follows a series of reports BNY Mellon recently published on how emerging technologies—from the perspective of banks—promise to transform the payments experience for our clients in unprecedented ways. It turns the spotlight on impacts from these important trends onto the corporate space.

Section 1:
A Collaboration of Insight: Our Industry Survey and Corporate Leader Interviews

Earlier this year, BNY Mellon Treasury Services conducted a comprehensive and in-depth survey (N=55) of a select group of corporate clients representing a cross-section of industries about the impacts of current industry payment trends and the resulting opportunities for their businesses and their treasury operations. The survey questions included their thoughts on:

- Key pain points in today's payments processes, and what's needed to improve those issues
- Using digital interactions to improve tracking, inquiries and investigations for payment efficiencies
- Incorporating data intelligence and analytics to improve payment processes
- Realistic timeframes for their organizations' plans for incorporating the latest industry payment tools

Organizations representing the following industry segments participated in the survey:

- Communications, Telecom, Media and Cable
- Technology
- Manufacturing/Construction
- Auto and Trucking
- Energy, Utility
- Healthcare (Insurance, Provider, Pharma, Healthcare manufacturer/distributor)
- Services
- Transportation
- Real Estate
- Mortgage
- Other

Additionally, to glean a deeper understanding of how these changes are impacting operations across the U.S. and globally, we sat down individually with a select group of corporate payment leaders representing a cross-section of varying industries. These leading practitioners, who face daily payments challenges to their organizations, generously provided their first-hand insights into impacts and issues surrounding payments modernization. By combining survey responses with the insights shared with us via these interviews, this paper confers how these changes are experienced by those on the ground floor of corporate payment operations today. We would like to thank the following industry leaders whose insights were integral to understanding the impact of the evolving payments space across multiple industries. Their views and observations appear and are quoted throughout this paper. (Please see the Appendix for biographies and company information for the participants listed below.)

Payment Industry Expert Contributors:

Dan Cella, Treasurer, Bayer® (LifeScience Company with Businesses in Consumer Health, Pharmaceuticals, and Agriculture)

Frank D'Amadeo, Director of Treasury Operations, Con Edison® (Energy, Utility)

Charles R. L. Ellert, Senior Payments Strategy Leader, Verizon® Communications Inc. (Communications, Telecom, Media, Cable)

Pratap Sarker, Group Chief Executive, Financial Services & Healthcare, Conduent® (Insurance [Administrative Services])

Marc Vandiepenbeeck, Vice President and Assistant Treasurer; Marcio Righetti, Director International Treasury Operations; and Liz Blair, Cash Manager; Johnson Controls® (Manufacturing/Construction)

Emily Vaughn, Blockchain Product Development Director, Change Healthcare (Healthcare, IT)

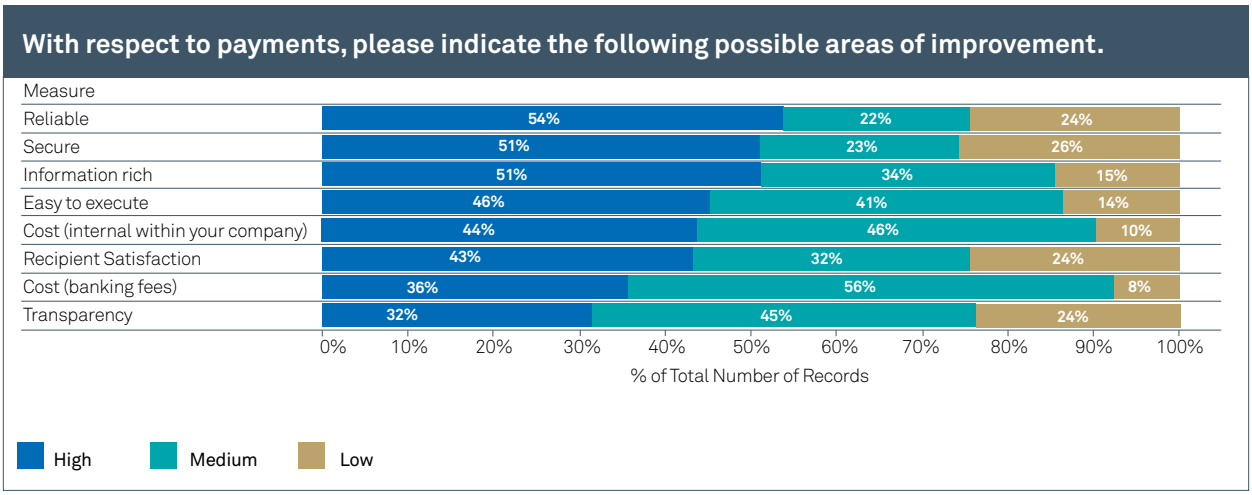
Jeff Winchenbach, Senior Director, Fiscal Services, MaineHealth® (Healthcare Provider)

Section 2:
The Payments Transformation Underway

Though each industry faces its particular challenges and improvement needs when it comes to their payment processes and plans, there are commonalities across industries in how current processes are failing to provide optimal payment experiences. The pain points – drawn out in the similarities across survey respondents (see the accompanying graph on Top Payment Improvement Areas) – reveal key areas that businesses are looking for the new payments technologies and solutions to address.

And while survey respondents indicated they are, for the most part, open to change and embracing new technologies (as shown throughout this paper), the pain points with their current technologies and platforms have them skittish. Will the problems they experience be addressed with the new solutions, and if their current technologies are effectively addressing their needs, will new technologies meet those issues as effectively?

Top Payments Improvement Areas



More than half (54%) of respondents believe payment reliability needs the most improvement when thinking about the future of payments.

Identifying the Pain Points—Finding Common Ground

There is clearly much room for improvement in current payments processes for corporations today. Survey respondents and payment experts we interviewed indicated that increased reliability, security and information richness are the top areas for payment enhancements. **Reliability** was referred to most often, with more than half of respondents noting that the certainty of knowing that their domestic as well as international payments—for their particular industry and the payments space overall—were accurate and cleared is of the highest concern for transacting in today's space. While banks are generally perceived as providing acceptable levels of reliability around payments—and our respondents expressed that level of confidence—maintaining high levels of certainty around transactions remains a concern going forward as new technologies are introduced. And as third-party operators (fintechs, etc.) move into the space, that level of confidence will continue to be the number-one concern for payments practitioners today, regardless of which party operates those systems into the future.

Payments' **security** and wealth of information **("information rich")** tied as the second most important areas for improvement when thinking about new payment technologies in practitioners' payments processes. Industry experts we spoke with agreed, noting that payment security remains top of mind. According to **Jeff Winchenbach, Senior Director of Fiscal Services for MaineHealth, "As we move towards more electronic payments, I think we have to be concerned both internally and throughout the system with security. It seems like every day or so there is another story in the news about somebody being hacked or information that has been misappropriated."**

"On the payroll side, we are using Same-Day ACH. There are some limitations in regard to business payments as far as the $25K* amount goes. I think the technology is there to allow the expansion of both the dollar amount as to the payments being made and the remittance information that goes with it. It seems like it was the right thing to cap the amount of a payment. You need to take baby steps, but I'm not sure we need to keep those caps anymore. I would love for that to expand as well over the next 3-5 years."

—Charles R. L. Ellert, Senior Payments Strategy Leader, Verizon Communications, Inc.

**NACHA supports same-day Automated Clearing House (ACH) transactions that have a payment value up to $25,000, as does The Clearing House's RTP® network. Same-Day ACH is currently scheduled to increase this limit to $100K at a pre-defined date in 2020. TCH is continually evaluating an increase to this limit as well for RTP, and will likely do so in the future.*

For businesses right now, a **lack of payment information** (on the customer and payer side) can cause rampant problems through the payments cycle. From payers lacking a mechanism to tell businesses or their banks how they want payments applied (leaving the servicer to often make an educated guess about where to correctly apply a payment), to wire payment receivers not always knowing who sent a payment or what it's for, the lack of clarity around a payment can create much internal backtracking and customer service work. The result is increased time and cost across the entire payments workflow. From the practitioners' viewpoint, higher visibility into bank accounts would offer fast knowledge about the settlement of a payment, reducing the risk for the business by allowing for quicker decisioning.

"Nobody wakes up and says I want to make a payment today. Payments are a means towards procuring goods and services that we need to live our lives and run our businesses, and not the end objective in itself. To the degree that we can make payments invisible, frictionless, secure and auditable, we will be addressing the true needs of people and businesses as they engage in commerce."

—Pratap Sarker, Group Chief Executive, Financial Services & Healthcare, Conduent

Overpayments to customer accounts also plague payment processing operations, as a lack of information mechanisms in certain payment types (Automated Clearing House [ACH], for example) offers no provisions for a customer or payment facilitator to instruct how to apply a payment. According to **Pratap Sarker, Group Chief Executive, Financial Services & Healthcare, "When it comes to receiving an ACH or a wire transfer, there's very limited information. So the more information you can give about that payment—especially as we integrate into ERP systems or general ledger systems—we can really start to improve the quality of the reconciliations and the postings, as well as reduce the cost."**

More than half (53%) of Healthcare respondents cited lack of information richness as the highest need for improvement in payment processes in the future.

While the need for **increased payment information** is applicable across industries, the requirement is often in proportion to the particular payment nature and circumstances distinct to certain segments. More than half of healthcare providers that responded to the survey (53%), for example, responded that insight into payment information was the highest area in future improvement needs among the options cited.

And that data, for this industry segment, is often inherently connected to security issues. An example includes healthcare providers that pay for medical treatments that have a critical need for robust information accompanying a payment to remain secure throughout the payments system (to conform to industry regulations). This need also ties, in turn, back to the importance of payments security, and reveals the difficulty and intricacies involved that make one-size-fits all payment solutions virtually nonexistent.

By citing **ease of execution** and a company's **internal costs** as main payments process pain points (garnering 46% and 44% of responses, respectively), respondents indicated that limited staff and funding resources remain a continual hindrance. To incorporate new payment methods, business costs often include more than getting a new system up and running to accommodate new transaction types and reconciliation procedures (which can be costly enough). Additional costs for remapping internal workflows, such as handling process interruptions (e.g., when incorrect funds are received, etc.), since staff involvement to intervene in potential issues drives up costs even further, can be substantial.

Many businesses also grapple with dated legacy systems that dictate how they are able to pay their customers, preventing them from modernizing solutions that require new technology infusions into their operations unless the cost benefit can be justified (and proven) at the highest levels. This concern highlights the need for banks to help solve this problem via offerings that provide access to customized electronic services that require minimal effort and investment for practitioners, and in many cases, for banks to help with and consult in effective cost-benefit analyses.

In looking at transactional (vs. operational) costs, internal cost concerns were just as relevant for international as for domestic payments operations. Respondents noted they have little control around fees incurred for international payments. Depending on the receiving banks in various countries, there may be additional fees charged on the transaction. A company may be powerless to control those costs, and the fees can add up—as separate costs incurred on both sides of a transaction (accounts receivable and payable) were additionally noted as contributing to the mix of overall cost drivers—unless practitioners work closely with a financial service provider that is closely connected to the payment.

For corporates heavily reliant on manual payment operations, ease of execution was understandably paramount. According to **Pratap Sarker, Group Chief Executive, Financial Services & Healthcare, Conduent, "Easy execution in facilitating a payment is critical. Participants in day-to-day commerce, while aware of the multiple payment mechanisms at their disposal, are also concerned about the underlying complexities that accompany them. I believe that ease of execution has a lot of room for improvement and growth."**

"Ease of execution is particularly important to us right now...how the applications behave with certain payment requests—to put in the required information and release it—is important for us."

—Leading Technology Company Representative

The Transparency Imperative—for Domestic and Cross-border Payments

Our discussions around transparency highlighted the need for further insight into U.S. domestic payments (where they are moving—or held up—within the payments continuum and why) as well as for transparency for payments made internationally, across borders.

Having full insight into what's occurring with a payment moving from one domestic market to another—and where it is in the system, the information and addenda that goes along with it that a company sends and/or receives—was continually highlighted by payment experts as a glaring lack that's costing them in many ways. Companies have no insight into where a cross-border payment stands in the cycle, so customer inquiries about the status of a payment cannot be easily addressed. When businesses originate an international payment, the lack of transparency can be costly if there are insufficient funds in the account when the payment is ready to clear. And the limitations inherent in the cross-border payment flow prevent customers from seeing if a payment has been received by a company, reconciled and applied to their account. This issue is deeply embedded in current international payments and messaging systems, and is driven in part by the legacy batch-oriented processing of many currently-used payment types, and too much reliance on the old, traditional correspondent banking model.

Issues abound in current international payment operations. With new options entering the fray, the question of whether old problems can be fixed by the new solutions is only part of the issue. Acceptance of these new services carries additional concerns that also demand attention. (For more information on new solutions addressing international transactions, see the section on SWIFT gpi: Improving Cross-border Payment Processes on page 22.)

Addressing the Concerns Through a New Wave of Solutions

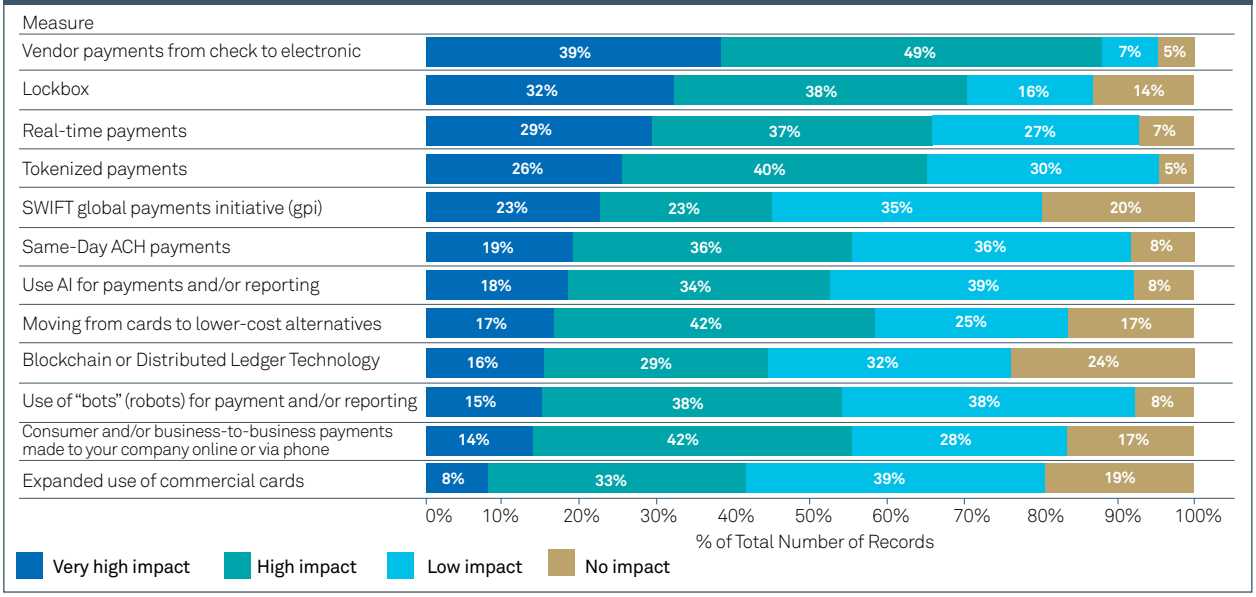
The new payment platforms and technologies currently arising (and under development) in the industry are in many ways a direct response to the industry payments concerns reflected in our study. They are an attempt to address many of the issues and systemic problems that corporates responding to our survey cited in their current payments processes, with some of the more impactful and recently-realized solutions comprising major updates to traditional payment rails, networks and capabilities, including The Clearing House's RTP® network, SWIFT's global payment initiative (gpi), tokenized payments and Same-Day ACH solutions. Their collective industry effect aims to improve the client experience, increase payments speed and transparency, and boost payments-cycle performance and operability while reducing overall cost. Their arrival on the payments scene is generating a new era for the payments space for both providers and practitioners.

Addressing a list of current and new payment initiatives, including traditional options (like lockbox, particularly in the U.S.), survey respondents revealed a crucial truism for today's payment practitioners—the movement to electronic is unmistakable and unstoppable.

"We went in 10 years from 10% to probably 33% funds transfers now. We handle about 40 million checks a year, so that's a significant amount that's going to go to electronic funds transfer. It's going to change the way we do a lot of things."

—Leading Technology Company Representative

Most Impactful Payment Initiatives Within the Next Three Years



Comparing the Solutions

Vendor payment services hasten paper-to-electronic payment migration for businesses while minimizing the risk they must assume by maintaining bank account information for their vendors and helping to reduce fraud associated with check payments. By enabling companies to quickly convert their vendor payments from paper checks to electronic, vendor payment solutions (like BNY Mellon with Paymode-X®) eliminate the need for companies to collect, store and maintain vendor banking information by allowing them to automatically join a network of vendors already set up to receive electronic payments. These solutions help to eliminate the expenses and risk associated with creating and managing paper checks, while easing the payment process with vendors. According to our survey, services that enable **vendor payments from check to electronic will have the highest impact among payment initiatives in the next three and four or more years, with 43% noting that their company is ready now for this type of program.**

Almost 90% of corporates believe that moving vendor payments from check to electronic will have a very high or high impact on their businesses within the next three years.

The BNY Mellon with Paymode-X solution is a B2B settlement network for vendor payments that helps you transition from paper check to electronic payment and remittance delivery, reducing the overall cost of your Accounts Payable (AP) operation via the use of an existing, extensive vendor network set up to receive electronic payments. The solution can speed payments, decrease paper usage, reduce labor-intensive processes and deliver critical transactional information while creating a valuable source of cash via a revenue share—all of which aim to facilitate payments and enhance companies' trading relationships.

"One of the things that I know our supply chain is working on, which has an impact on accounts payable, is a standard set of payment terms based on payment type. We can better manage our cash flow and have people understand how we're going to be paying, how they will interact with us.

"Right now, everybody basically has their own payment rules, especially with certain entities involved. We're undergoing a big initiative to standardize that. Also, we believe we can use the payment terms to drive stabilization. Even if there's not a revenue share involved, some of our vendors, especially in Maine, are mom and pop shops; we want to be a good community steward. We would rather keep the same payment terms or possibly accelerate them if they're willing to go electronic. Payment terms may be able to serve as an incentive to change the payment method."

— Jeff Winchenbach, Senior Director, Fiscal Services, MaineHealth

For those with operations that are still heavily reliant on check payments to vendors, however, some question the time and efficiency cost of moving to an electronic payment system. They prefer to more clearly understand details that support such a change, including insight into how vendors actually prefer payments, whether the solution is more beneficial for those who disburse to a large volume of vendors (versus a small number), and the most effective ways of developing controls around who is in charge of releasing the transactions.

Thoughts on Receivables Solutions

Even as much of the discussion around payments today focuses on the impact, type and workable methods of electronic payments, processing paper payments (lockbox) continues to hold a solid place for practitioners with customer bases that still pay primarily with check today, and appear as if they will continue to do so into the near future. Taking the second spot in our survey responses that rank payment initiatives that will continue to be most impactful for them, 70% of respondents believe remittance processing will have a high or very high impact on their company within the next three years. Long term, however, that enthusiasm recedes. While 60% of respondents rated their company as currently being ready to implement lockbox, only 6% saw that readiness in more than five years from now.

Some struggle with the thought of changing to electronic solutions, citing that the status quo of paper checks is hard to envision going away, particularly in the U.S., indicating that the many industry articles heralding the death of checks may be (as Mark Twain said of his death) highly exaggerated.

According to **Dan Cella, Treasurer for Bayer, "To a certain extent, the banks have done such a good job with the check process—between lockbox, account reconcilement, and positive pay/positive payee—that in essence the process is very automated, and to a certain extent very electronic…So, as much as I would like to eliminate checks and be more electronic, I struggle with that because the check process is working very well and in some cases better than electronic."**

The Trend Toward Online Payments

Despite this hesitancy among practitioners, and as revealed in the long-term trend in the survey, the movement toward digital lockbox solutions is quickly gaining traction as these organizations recognize the necessity of giving their customers the alternative of electronic presentment, whether online or mobile. And the growing number of digitized options—which offer new ways to further help corporates shift beyond check—reveal the trend toward these new digitized options is advancing exponentially. These options include electronic billing and payment solutions like BNY Mellon's Bill Pay Advantage℠ platform that enhance traditional billing and payment processing by enabling businesses to replace paper bills, statements, invoices and payments with more efficient and innovative digital alternatives, as well as the newer options explored throughout this paper. According to **Jeff Winchenbach, Senior Director, Fiscal Services for MaineHealth, "The first thing we are focused on is trying to reduce the number of checks we are writing and converting to some kind of electronic payment whether it is card or ACH. Our primary goal right now is to get out of the check writing business."**

The Leap to Real-Time Payments

The Clearing House's (TCH's) RTP® network represents a game-changing advance in the U.S. payment industry. The solution affects both the way payments are made and the expectations of payers, payees and providers. RTP—and the solutions that providers have developed to link businesses to that network—are clearly at the top of practitioners' minds when considering what new payment solutions will impact their industries in the near future. Taking the third spot in upcoming, impactful initiatives, RTP offers potential that practitioners are clearly responding to. According to **Charles R. L. Ellert, Senior Payments Strategy Leader at Verizon Communications Inc. "Real-time payments—that's something that we really want to push internally. We need to craft the pilot for that and we'd like to make it a reality. Even the impact on our credit strategy, it has a lot of opportunity there."**

Nearly 70% of survey respondents believe RTP will have a high or very high impact on their businesses within the next four or more years.

The Clearing House's (TCH) RTP Network®

Launched on November 13, 2017*, the RTP network allows consumers and businesses to send and receive funds and messages in real time, 24/7/365, with end-to-end completion within a few seconds, on average, directly to and from their existing bank accounts. The brand new payment system for account-to-account transactions between banks is the first new core U.S. payments infrastructure since the ACH network was introduced nationally in 1974.

It allows people and businesses to exchange payments more quickly, more safely, and more efficiently than via current payment rails. It supports complex digital commerce services with integrated messaging that allows issuing and paying of e-invoices, e-bills, and requests for payment. It provides rich remittance data, confirmation of delivery, and requests for information or return of funds. RTP is the first U.S. payment network to operate on ISO 20022 standards, providing a seamless transition for the many U.S. corporates already using that standard in their payment operations. It also provides the ability to send and receive payments and messages directly to and from your bank account at various financial institutions or business partners or customers.

The RTP system is accessible to all financial institutions in the U.S. and is growing its reach across the banking industry as more and more banks join the network. The industry goal is to reach full ubiquity by 2020 allowing seamless payments and messaging to flow instantly 24/7/365 to every bank in the country. RTP has the ability to integrate with current systems, so that companies can use their existing bank accounts, and it supports complex business payment services, including electronic invoicing, rich remittance data and confirmation of delivery. Companies are able to initiate payments from smart phones, tablets, electronic wallets, Application Program Interfaces (APIs), file transfers and via the Internet.

**BNY Mellon originated the financial industry's first-ever payment on the RTP network on this date.*

Along with the hype and buzz that RTP is igniting in the marketplace, many practitioners we talked to voiced a need for more details around how the network's capabilities would benefit their particular business, as well as how a transition to the network would impact their current payment operations. As business payment requirements vary, some may need to only receive payments in real time, while others may only want it for payment initiation. And the differences in needs grow exponentially in scale and scope. Corporates are looking for clarity around specifics, and details around how the network might accommodate their specific payment demands, especially as many of their own customers are actively seeking practitioners' guidance around the technology, since its 2017 launch into the industry spotlight.

Some discussions revealed a common belief that RTP is a product offered by banks rather than the TCH network it truly is, which provides a new payment rail for the industry. Its development and use is groundbreaking, creating a new industry-wide vehicle for making payments that hasn't been updated since the 1970s when ACH was created. The distinction is an important one for payment operations, as its implications reveal that a new payment scheme has the potential to change the rules of the game across the payments space—not merely for those who sign up to provide the RTP product through their bank.

Questions about the solution cover a wide spectrum for practitioners, and they are looking to their providers for the answers. Their concerns cover whether the solution is right for them—given their particular industry and customer needs—e.g., does a move to RTP provide the most value for companies that are currently paying via checks? Are existing electronic payment options sufficient for companies that are mainly using those currently (such as ACH and wire), versus making a change? And how would the transition impact their daily operations? **As Pratap Sarker, Group Chief Executive, Financial Services and Healthcare at Conduent noted, "There is a feeling that people want to know about RTP now, but I think that implementation is going to be about 1-3 years out. I feel like right now there are a lot of questions about RTP but there's not a lot of understanding of where it makes sense to use it versus a same-day payment, versus standard ACH. As we get more and more options, there is more and more interest. But, as an industry, we have to work carefully with our clients to help them understand where each of these types of payments works best for their solutions. Where does each option fit best with that use case?"**

"I think RTP would have an impact on companies that process payments through checks, especially on a working capital side. If you have check payments and you shift to real-time payments, that would have an impact on working capital and cash flow."

—Marcio Righetti, Director International Treasury Operations, Johnson Controls

Comparing Features: RTP Vs. Traditional Electronic Payment Options

	Automated Clearing House System*	Wire Transfer*	RTP
Increased System Availability (for Payment Turnaround)	Accepts files up to 10 p.m. ET, Monday through Thursday, and 7 p.m. ET Sunday for next-business-day settlement. For Same-Day ACH settlement, files are accepted up to 9 a.m. and 1 p.m. ET Monday through Friday.*	Available 4 p.m. ET Sunday through end-of-processing Friday, with daily deadlines of 5:30 p.m. ET: • Payment instructions received after 5:30 p.m. ET, or those that require operator intervention, are processed on a "best efforts" basis. • Payment processing cut-off times are extended when the Federal Reserve (Fed) extends its hours. • Payment instructions sent after the Fed closes are held for processing when the Fed reopens	Available around the clock (24/7/365), with no down time for transacting and messages—including nights, weekends or holidays. Payments on the network can be initiated, sent and received instantly.
Faster Clearing	Next business day (generally). Same-Day ACH transactions are made available at approximately 1 p.m. E.T. and 5 p.m. E.T.**	Payments settled through the two principal U.S. dollar clearing systems, CHIPS and Fedwire, are irrevocable upon release of the transaction to the respective system. Payments are generally released within a few minutes based on actions that may need to be managed, such as OFAC/ Compliance, Funds Control and repair.	Funds availability is instant, final and irrevocable.
Transparency via Expanded Messaging	An addenda record is used to transmit information concerning a payment to The Receiving Depository Financial Institution or receiver. Not all ACH Standard Entry Class (SEC) codes are leveraged (length and adoption vary by SEC).	Messaging can be processed via SWIFT, or a provider's electronic banking system, depending on the ability to receive these message types. Advices are released as soon as the payments are completed.	Robust messaging and information can accompany payments. This includes Requests for Payment, Requests for Information, detailed remittance advices and immediate Acknowledgements of Receipt.
Cost Effectiveness	A cost-effective method because it goes through the low-value payment in a batched process. The NACHA format used for initiating all ACH transaction types in the ACH network is well established and standardized, which keeps costs to a minimum.	Typically the most expensive of some of the options.	Transactions cost cents per item*** due to an efficient, back-and-forth system.
Initiating Payments Capability	Both ACH debits and ACH credits can be created by the originator. Standard ACH transactions are sent one or two days in advance of the settlement date. NACHA also supports Same-Day ACH transactions that have a payment value up to $25,000.	Sent to bank accounts (only); Wire transactions cannot draw from an account to initiate a payment.	Allows consumers and businesses to send and receive funds. For corporate accounts at a bank that is real-time enabled, corporates can send an RTP to those accounts from any business partner or client of theirs. The RTP receiver doesn't need a pre-established relationship with the company to receive the payment (but banks are turning on the receive capability in waves).

**BNY Mellon network deadlines; other financial institution network deadlines may differ.*
***OFAC screening is required for International ACH Transactions only. U.S. Domestic ACH transactions are not subject to OFAC requirements.*
****Refers to BNY Mellon fees.*

RTP Request for Payment (RFP) Messaging

There is growing interest in using RTP's real-time messaging capability as an effective way to handle reconcilement/exception issues more efficiently, including the ability to send a request for payment. RTP RFP messages allow for the immediate electronic delivery of invoice details, desired payment due date, and other pertinent transactional details. The receiver of this message may approve or reject the request before payment transfers. Once the recipient approves the request, payment is immediate, final, and irrevocable. This capability promises to greatly streamline billing and payments for businesses or their consumer customers, and is primarily used for high-volume, low-value payments.

Messaging is an important payment feature for many practitioners who either do not have sufficient systems in place to communicate to customers about payment details, or that currently communicate to clients via separate systems and workflows (e.g., paper, texts and emails). RTP's built-in capability could be crucial for these businesses.

RTP—Tackling Implementation Issues

Despite its status as a highly-anticipated solution, many respondents had questions about the level of preparedness to implement RTP into their processes. This may be why only **11% said their business is ready to implement the network now.** So, while that reluctance around immediate readiness may result from a lack of current understanding about how the new network would directly impact a company's specific set of payments needs, most seem to detect RTP's eventual ubiquity and value, and believe it's a matter of time before their concerns are assuaged.

Ease of implementation for RTP is a chief concern for practitioners. For corporates with complex legacy systems that are intricately woven into existing back-office operations, many have reservations around implementing the new capability into those processes. As RTP is the first U.S. payment system to provide instant 24/7/365 processing, many wonder how easily their companies' technology applications, operational processes and service components would accommodate the transition. Many institutions still operate primarily in a batch environment with specific downtimes on a daily or weekly basis, a process that RTP would entirely transform.

And for those that are ready to take the plunge into the new technology, and have either begun or have plans for the transition, they require the continual support necessary from their bank providers to do so. And they acknowledge that changes to infrastructures necessary in managing the complexities of transitioning to a new payment process for initiating and receiving payments may involve internal, cross-departmental participation, including implementations, client support and operations, to name a few. In short, continual assistance is critical. (See the accompanying chart on "RTP Q&A – Understanding the Basics" for a rundown of how the solution addresses common practitioner concerns.)

11% of survey respondents said their business is ready to implement the RTP network NOW.

RTP Q&A – Understanding the Basics

How Would RTP Impact ...	The RTP Solution
Cash positioning when payments are 24/7?	For most banks, although the payments and messages will move instantly 24/7/365, the value date of these transactions will still follow a typical business calendar schedule, allowing corporates to use their existing reconciliation windows.
Whether I need to implement ISO 20022 standards (i.e., will I need to implement them to use the network)?	No. Just like other payment types, you will have multiple options for originating RTP payments and messages, as well as for receiving reporting around them, including online capabilities, ISO 20022 and other proprietary formats that you may already use today.
Multiple billing systems?	For businesses that may not have allocated a sufficient IT budget to build a completely new accounts receivable format, many providers (such as BNY Mellon) can offer data translation and mapping services based on existing channels and data formats so that, clients do not have to do it on their own.
Prior-day reporting?	RTP is a new transaction type—in addition to wire, ACH and check. BNY Mellon and many others are adding RTP transactions to existing reports to allow businesses to continue leveraging existing formats.
Customers who haven't asked for the change? If current payments systems are working smoothly today, why fix what's not broken?	Having RTP as an option to transact and message customers and business partners instantly 24/7/365 is an option in addition to today's existing channels. Practitioners should explore the best strategy to leverage this where it makes sense as part of their holistic payables or receivables strategy.
An operation that only handles minimal consumer-based, round-the-clock payments—is the transition worth it?	Most companies currently have a payments system that is out of sync with their bank at least a few hours each day. The question is whether having that information in real-time will provide enough value to your liquidity management, accounts receivable, customer service and accounts payable teams to either manage your internal operations more efficiently, or further enhance your external customer experience.
Other banking providers: Is the network ubiquitous enough to enable transactions?	RTP can now reach approximately one-third of all accounts in the U.S. and is expected to reach one-half of all U.S. accounts by early 2019. The network's value and reach is expected to grow as it continues towards full ubiquity.

"The main question to financial providers about RTP is: How are you going to help me bridge that gap if the internal tools aren't there? Companies are going to need to talk to our financial partners to see how they're going to help us bridge those gaps. Are you bringing a product to the table that allows me to get around this?"

— Frank D'Amadeo, Director of Treasury Operations, Con Edison

Given the advantages and benefits of RTP (see the accompanying chart on Comparing Features: RTP vs. Traditional Electronic Payment Options), it behooves corporates to demand insight from providers into how RTP can work specifically to their payment requirements. The onus is on payment providers to educate companies about the details on how that can be done.

Once again, education is the first step. Providers need to educate the right people. The treasurer alone doesn't need to understand these new technologies and systems. The experts we spoke with discussed the necessity of including other internal groups that often have an important say in payment systems. A company's' Chief Administrative Officers, customer support and implementation leaders, etc., all potentially need to be onboard with (and fully understand) workflow and process changes that can accompany RTP into the implementation and billing processes.

Tokenized Payments

Tokenized payments allow a company to facilitate business-to-consumer disbursements using a token, which can either be an email address or phone number. The solution allows companies to modernize their process by digitizing their payments without storing bank account information (e.g., transit routing and account numbers). Individuals register with their email/mobile numbers through their bank or network of payers, and can send and receive money within minutes. (See the side bar on BNY Mellon Tokenized Payments® now available with Zelle® solution.) The drivers behind the migration to tokenized payments solutions are typically increased transparency, immediacy (i.e., customers receive money faster and quicker notification that funds have been disbursed), the reduction of paper (as businesses can execute payments to vendors and notify them via email) and cost reduction (with the elimination of check payments).

BNY Mellon Payments Modernization Example: BNY Mellon Tokenized Payments® Now Available with Zelle®

With BNY Mellon Tokenized Payments now available with *Zelle*, a client can send a payment request (via file, API or online) 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 account[1]. Funds are typically available within minutes[2]. 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 minutes[3].

As this service enables businesses to send funds and notification of payment electronically without requiring sensitive banking information, the solution can significantly minimize the reliance on checks for businesses across many U.S. industries.

By combining the convenience of faster payments experiences with the security of financial institutions, *Zelle* can reduce processing costs while allowing the receiver 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 wider range of corporate disbursements and other use cases when getting faster access to funds is of value—all on the same efficient, integrated platform.

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[1] *Zelle is available to U.S. bank account holders only. The Zelle Network® currently includes 50 financial institutions—20 are already active on Zelle and more are launching weekly.*

[2] *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.*

[3] *Use cases accomplished through partnerships with fintech and other third-party providers (BNY Mellon Tokenized Payments—now available with Zelle).*

Often referred to—along with RTP—as a payments industry game-changer, **tokenized payment solutions were named by our survey respondents as a top initiative set to strongly impact their business within the next three years.** And no wonder, given the stated need for payments to be more reliable, secure and rich in information than they have been historically. But whether practitioners are prepared for the change is another question, with only 43% responding that their company would be ready to implement the solution within that same time frame. That number rises to **64% however, when asked whether the tokenized payments initiative that will have an impact on their company in four years,** with almost half (43%) again stating that they'd be ready in that time frame.

For those companies embracing tokenized solutions via pilots and full-fledged implementations, success measurements, such as expense reduction and customer satisfaction—including being able to realize that the intricacies of implementing a tokenized solution and altering legacy payment systems will be worth the level of change required—are top of mind for practitioners. Businesses with less complex payment operations (i.e., smaller operations or those handling few payments), are also closely examining the efficacy of overhauling their financial systems with complex electronic processes that they may not be staffed to cover.

Many also alluded to the internal costs needed to inject a tokenized payments system into dated legacy operations that would require potentially significant system development, such as generation of check numbers, or detecting potentially fraudulent checks. And the change required by customers themselves can also be an issue if they're already getting paid electronically. But increased understanding of the true benefits of these technologies, such as the increased speed and ease of use, may help boost adoption rates among corporates as they become more familiar with the technology.

> **"I think even back in the day when people didn't want to give us their bank account information, they wanted the payment in their account right away. I think tokenized solutions actually give them a good vehicle to do it because they can get an email. They trust the exchange with a tokenized network, because they've already signed up for it...I think that's why we're starting to get the adoption."**
>
> —Leading Technology Company Representative

SWIFT gpi: Improving Cross-border Payment Processes

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 affected after calls or mailings, especially in the case of high-value transactions for priority payments. 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.

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 for providers. Others, notably PSD2 and the UK Open Banking Standard, have the capacity to irrevocably change the manner in which companies and non-bank payment providers interact with banks, radically altering the terms of relationship between a bank and their client.

A View into International Transactions

Nearly half of our survey respondents (49%) felt they are ready to implement SWIFT's gpi initiative, either now or within the next three years. With its focus on increased transparency and allowing businesses to access details on cross-border payments, SWIFT gpi provides insight not only into the payment itself but also into the associated cost (e.g., lifting fees taken by various correspondent banks along the way). Very often when practitioners send international payments, it can feel like they fall into a black hole. By shedding light onto that process, the solution is of great interest for companies handling both incoming and outgoing international payments.

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 enhanced payments service meets cross-border payments transparency and traceability requirements.

Live since January 2017, more than 280 financial institutions around the world have signed up to SWIFT gpi, sending 700,000+ gpi payments daily across 700+ country corridors. Additional features and services will be added to the platform.

These include:

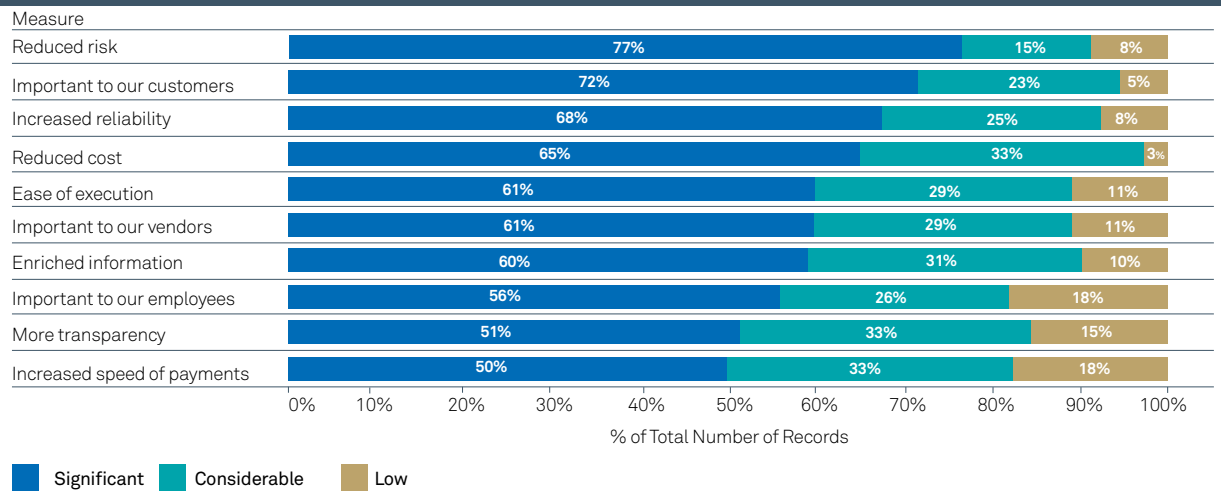
- A stop and recall payment service, enabling gpi banks to stop a payment no matter where it is within the correspondent banking chain.
- The transfer of rich payment data, along with the payment, and with the additional information necessary for payments compliance checks or line item details. This 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 an industry challenge initiative working with the global fintech community to develop additional overlay services on the gpi platform using its APIs. The service will leverage new technology and secure APIs, predictive analysis and AI to help pre-validate payment instructions.

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. 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.

Future Benefits of the New Payment Initiatives

For payment initiatives that might have an impact to your company within the next 10 years, how would you rate the potential benefits of the following?



Addressing the Top Concerns

Nearly 80% of respondents cited reducing risk as the top benefit of new payment initiatives that might impact their companies over the next decade. With cyber security risks to corporate and industry systems ever-evolving, high profile and having the potential for high reputational and recovery cost for companies, capabilities to drive down incidences of fraud are key for these new initiatives. According to **Dan Cella, Treasurer for Bayer, "I think right now, providers do a very good job in preventing fraud. But with fraudsters getting more and more creative, I think this is a topic that we need to continue to treat as significant."** Indeed, as attacks to cyber systems are increasing in frequency and intensity, regulators are enforcing compliance to cybersecurity protocols and laws globally—an effort that continues to receive the highest attentionamong providers.

When discussing the potential benefits of new payment mechanisms, delivering client-centric capabilities—i.e., what's most important to customers—was consistently noted among respondents. Regardless of how well current payment options are received, customer needs are evolving, and providing new payment options may offer the only means for continually meeting their increasing requirements for faster and easier payment processes. According to a representative from **a national technology company that we spoke with, "If they want payments faster and we don't give it to them, then we lose market share, so we need to pay attention to it now."** Some of the strongest responses throughout our interviews reflected the importance of considering client expectations and impacts when considering any new payment initiative, revealing that, despite predicted levels of readiness for payment changes, companies realize that the potential benefit to customers may outweigh much of the hesitancy that may exist for implementing new processes. Simply put—customers are demanding the latest capabilities. And practitioners may have no choice, in the end, about delivering on those demands.

Respondents see reducing risk and "importance to our customers" as the biggest potential benefits from new payment initiatives throughout the next decade.

"Consumers expect real-time in their lives today. They expect the frictionless use in their everyday lives and for it to be seamless. That is where we need to get the payment systems and networks to. Seamless, frictionless—an after-thought. We need to 'Uberize' payments and make them transparent."

—Charles R. L. Ellert, Senior Payments Strategy Leader, Verizon Communications Inc.

The confidence that systems remain up and running and working as needed (which can include processes requiring 24/7 functionality) is always going to remain important. Whether respondents felt it was a current concern or not for their particular company, many relayed that increased reliability is always important, since any problem is unwanted, and the highest level of resiliency remains a top priority.

Reduced cost was also noted as a highly significant factor in choosing and implementing payment systems, referring to both internal costs (operational, but also expenses driven by the option itself, such as moving from check to RTP or check to ACH). Practitioners are focused on initiatives that allow their customers to pay via the lowest-cost option.

Respondents noted that effective tools within a treasury management system (TMS) that ease the initiation, approval and movement of a payment are only part of the story when it comes to ensuring **ease of execution**—another highly-cited benefit for new payment options. The process gets difficult when payments get halted or held up for a variety of reasons on the bank's end, and a lack of transparency can impact the entire payment cycle. Improving awareness around when the payment was processed, along with all delivery information, would improve execution.

Given the many pain points in payment processing —including varying supplier processing formats, electronic versus paper payment types, extensive data exchange, and the degree to which new payment initiatives are **important to vendors** is important to practitioners. Streamlining that process is critical to ensure straight-through processing. According to **Dan Cella, Treasurer for Bayer, "A vendor may send their new banking instructions to someone at Bayer, they may send it to an area that doesn't understand payments at all, so getting that information to the right person is important. Then once we get it and we want to confirm it, getting to the right person at the supplier is an issue. And sometimes when you get to the supplier, you may be dealing with a sales person who does not understand the finance department of their company. That whole process is a big issue for us, and when I find that there are fire drills over late payments or payments that went to the wrong account, it often surrounds changes in banking instructions."**

Reduced internal costs were a significant benefit of new payment initiatives for 65% of respondents.

Enriched information—Referring to whether companies believe they—or their counterparties or customers—are getting the complete information they need around a payment, can strongly impact a workflow, halting the system at regularly recurring intervals, costing additional time and effort that sacrifice a smooth operation. **Dan Cella, Treasurer for Bayer, also mentioned that, "A lot of it is more of an issue with our counterparties, having the remittance information clearly included on the payment. We have some instances that you have to log onto a website to get the payment information and some send it via email. There are so many different ways that the information is transmitted to us, ideally if we could have a process where it's always with the payment, that would really add value for us."**

Half of the respondents said that having more transparency, or visibility into where a payment is—from beginning to the end of the payment cycle —was highly beneficial, and when combined with increased speed for payments, the initiative would have a significant effect on companies in that it would potentially reduce call volumes (thus time spent) in handling payments.

"Standards first. I know it's difficult because there are so many industries. If there was a standard agreement about how you format an invoice, how you format a payment that actually helps you understand what you receive or what you pay, to add information to the payment processing system, that would be fantastic."

—Marc Vandiepenbeeck, Vice President and Assistant Treasurer, Johnson Controls

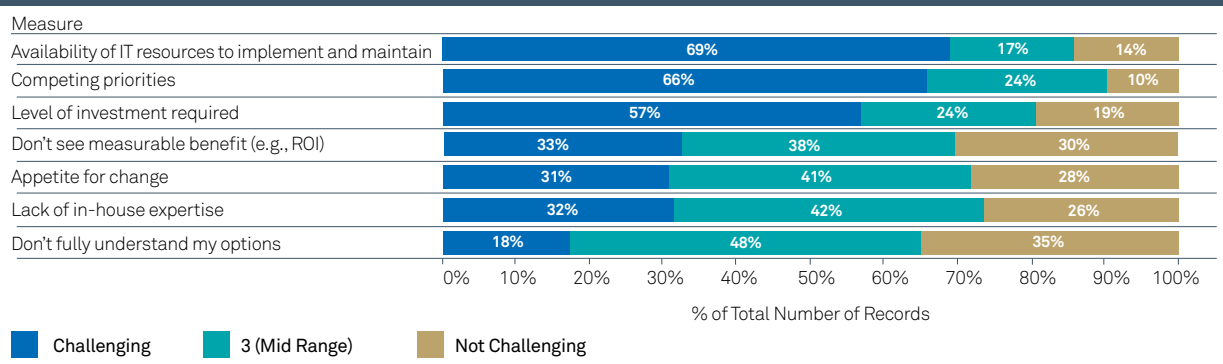
"I think in this day and age, speed of payments is highly important. Clients want to hold on to their cash as long as they can while meeting their obligations."

— Jeff Winchenbach, Senior Director, Fiscal Services, MaineHealth

Section 3:
Embracing Change: Industry Adoption/Challenges

As corporates actively delve into what industry solutions can work for their future needs, adoption concerns around making accommodations for specific payment types, account structures, urgent/non-urgent payments, and overall information management can be overwhelming. And these issues often impact how soon their often complex operations can navigate the many challenges.

What Are the Biggest Challenges To The Ideal Future Payment Experience? (On a scale of 1 [Not Challenging] to 5 [Most Challenging])



Barriers to Implementing Payment Changes

Payments professionals we spoke with and those who responded to our survey have a deep understanding of the payment challenges they face, and how those barriers threaten to prevent their businesses from effectively taking advantage of the new payment options that are out there.

Availability of IT resources *and* **competing priorities** are cited as the most challenging obstacles to overcome from respondents. The internal battle for IT resources within a company, as agreed upon by the majority of respondents, is the supreme struggle within their organizations—requiring cross-departmental collaboration to constantly weigh multiple initiatives, (e.g., tangible benefits, security and cost), against ROI. The IT department often reviews and approves incoming proposals, and practitioners look to providers to help them demonstrate the strong business case often required for payment initiatives both parties see as imperative.

Availability of IT resources is cited as the biggest challenge in achieving an ideal future payment experience.

For example, according to **Marc Vandiepenbeeck, Vice President and Assistant Treasurer for Johnson Controls, "The problem we have, particularly as a company that has so many ERPs, is that there is constantly another project that you're conducting. So while you should start everything at the ground level, with most of a certain project funded and worked on internally, we have competing resources. For example, importantly—two ledgers being brought together into one single ERP so they can close one of those ERPs, or focusing on an entity that's right now making sure they can actually pay. Those debates are really tough internally because there's no right or wrong answer. What feels the biggest to the internal stakeholder is the most important."**

"IT isn't knocking on my door; they're not looking to do things. That's why I think the providers like BNY Mellon are vital. You need to be my IT resource…If I need to touch my billing system, for example, there's a five year-long list of things to do. So how do I get on the top of the priority list if I can't provide a really strong business case? That's the challenge."

—Frank D'Amadeo, Director of Treasury Operations, Con Edison

The payment evolution is placing IT groups (and the Treasury groups that must guide the changes) squarely in the midst of significant upgrades to company business models. The changes—representing a daunting set of complex funding needs—compete with other business priorities and distractions for a company's attention and resources. As such, competing priorities rate as the second highest in our survey, with **66% percent naming it as the biggest barrier in achieving the ideal future payment experience.**

Corporates cited increased technology resources as the most imperative strategic need to implement new payment solutions.

Acquiring the level of investment needed to implement future payment technologies was the third highest challenge noted by respondents, as practitioners must obtain extensive buy–in across their company—from claims to treasury, to accounting and technology, bringing all constituents to the table to understand the effort and the benefits. And in noting a lack of in-house experience as a detriment to payment change, respondents acknowledged they rely upon their banking provider's expertise when internal understanding is lacking in an effort to avoid under-optimized operations or underutilized solutions. According to **Dan Cella, Treasurer for Bayer, "Return on Investment is a big challenge because…there are things that would really add value and are nice to have, but when you look at the amount of effort and resources you have to contribute to setting it up, that's a challenge on whether or not you really get a return on your investment."**

Because of the increased payments options entering the market, making a decision for which technology is best used for specific payment situations can be a confusing topic for corporate practitioners. As a result, many don't fully understand their options. Our interviewees repeatedly said the large number of options do not add value to a company. What adds value is fully understanding how they can best use those options, either together or separately, for their particular payments operation and processes. That is where the providers must come in—to fill the void of confusion that exists in the marketplace today.

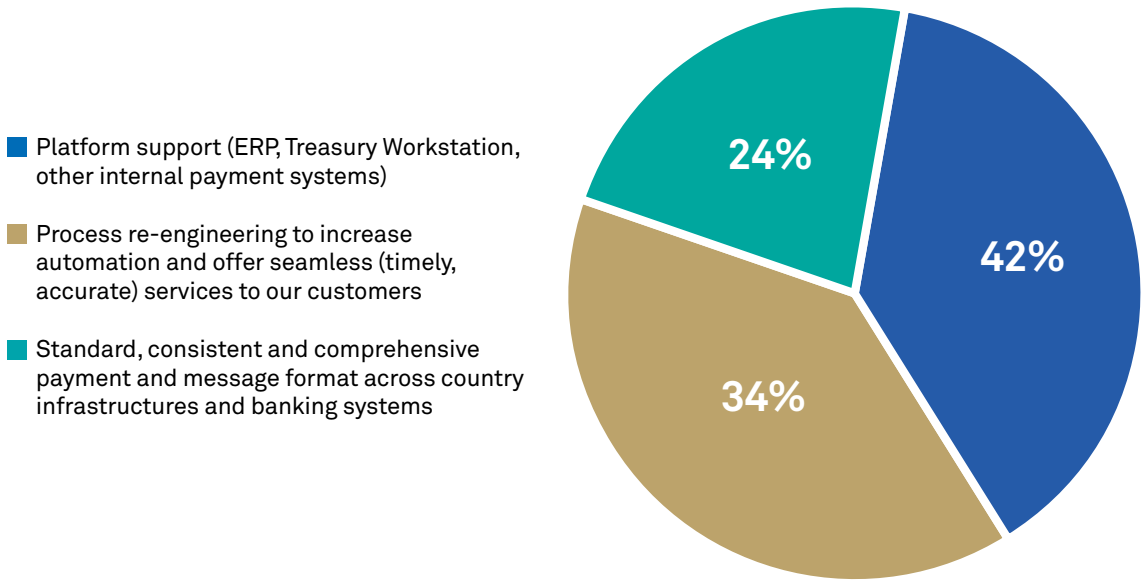
Many companies are also finding that education itself around the new solutions as a whole needs to be amped up for practitioners to completely understand how the payment options will benefit them, with many highlighting the strong need for more education by providers to bridge the gap. Respondents indicated that having a good banking partner is what makes a lot of the options less challenging to understand, as opposed to those without access to such expertise.

What adds value is fully understanding how practitioners can best use payment options, either together or separately, for their particular payments operation and processes. That is where the providers must come in—to fill the void of confusion that exists in the marketplace today.

Factors Driving the Necessary Change

A growing number of companies realize that customizing their cash management platforms (ERP, Treasury Workstation [TWS] or other existing internal payment systems) is a necessary driver of change to successfully accommodate—and reap the efficiencies inherent in—the new payment capabilities. Many businesses realize that the new offerings often require updates to legacy treasury management systems and platforms (e.g., accommodating newly required payment formats and processes, such as RTP capabilities within an ERP platform and to adapt to standards such as ISO 20022). Further platform customization can incur additional cost for companies that have already heavily invested in those systems. The question often comes down to absolute need. Corporates must understand how their treasury platforms are going to change in the future and how that change fits into implementation discussions.

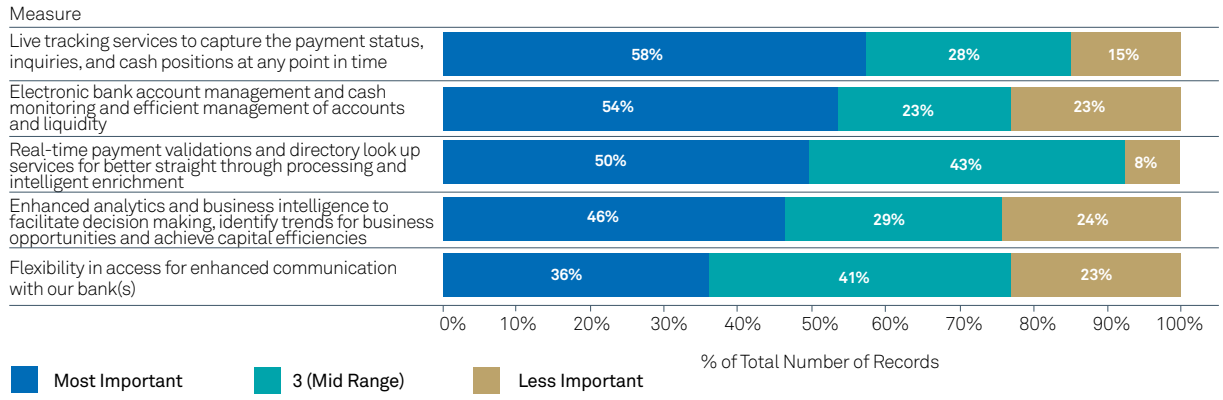
Which of the following are necessary to drive change in your company with respect to embracing future payment efficiencies?



More than 40% of respondents noted that process re-engineering to increase automation and offer seamless (timely, accurate) services to customers is necessary to streamline incoming payments that have exceptions or other anomalies. And they realize that strong workflows are necessary to reduce expenses, increase operational efficiency, and improve the overall customer experience. Respondents with robust treasury workstations noted that they would welcome ways to enhance those systems even further with technology applications improvements integrated with their payment hub and electronic banking systems.

Platform support was reported by respondents as the most necessary item needed to drive change within a company in order to embrace future payment efficiencies.

For the following, please rank their importance on a scale of 1 to 5 (1=Most Important and 5=Least Important) to improving your company's payment process.



Live tracking services to capture the payment status, inquiries, and cash positions at any point in time are the most important improvement for the payment process.

Nearly 60% of respondents highlighted that tracking vendor creation or vendor changes in a live environment would be helpful for companies to further streamline payment processes when new bank information is received and when tracking unique, one-time payments not going through the usual treasury process when validating bank detail. Any process that reduces time spent investigating payments that are halted in the system for any reason (e.g., containing deducted fees, delivered late, etc.) would be important from a treasury point of view. And solutions boosting multibank reporting and that help ease electronic bank account management and cash monitoring, and that promote efficient management of accounts and liquidity, were noted for their potential in reducing large swaths of time spent tracking bank notifications received for payments that are problematic.

Real-time payment validations and directory look-up services for better straight-through processing and intelligent enrichment (as it relates to end-to-end payments transparency) was highlighted by practitioners that valued having the latest payment information at their fingertips without having to log on to multiple systems.

In addition to treasury management systems and SWIFT reporting capabilities for international payments, having a single system to access the comprehensive real-time information in one place was cited for its potential for quickly validating individual payment information.

"RTP validations, directory look-up services...To me this is the glue here. RTP validation and directory look-up services for straight-through processing is one of the most important things because I don't want to go solicit banking information. To me, the real strength of the RTP model is going to be some day when I can rely on a directory to send a payment request to my customer by looking them up in the directory."

—Frank D'Amadeo, Director of Treasury Operations, Con Edison

Section 4:
The New Frontier: APIs, Robotics, AI and Blockchain (DLT)

The latest wave of payments technologies, in their infancy of industry development and initial offerings, are promising even further efficiencies, streamlined capabilities and cost savings that aim to speed payments operations of the future.

Defining the Terms

APIs connect the capabilities of one or more products to applications that allow the application users to experience those expanded features. They operate in the background when a service recipient (API consumer) builds applications that provide a quality user experience, and quickly bring together the capabilities and features of desired services to applications. They have long existed in the financial industry in the form of web services and Single Sign On technology.

APIs—The New Payments Protocol

It has become clear that APIs are an emerging technology that have already begun to dramatically impact the payments industry and how companies will interact with their bank providers going forward, enabling companies to better accommodate requirements for on-demand, real-time needs. To prepare, banks are dedicating product management resources to oversee API services and development, and bank and non-bank providers are actively deploying APIs in various forums.

Without the cost of retrofitting existing systems from the ground up, APIs aim to allow companies to execute and view transactions across multiple devices, via the cloud, and allow plug and play integration between providers and their internal systems. This allows for real-time data exchanges and can reduce implementation costs.

In the payments environment, the real-time nature of APIs offers to boost straight-through processing through several factors:

- **Speed**—Provides faster cash disbursements and balance information for better cash efficiency.
- **Automation**—Eliminates the need for older technologies, helps provide efficiencies and reduces risk associated with manual processes.
- **Transparency**—Allows the immediate tracking of payments status and insight into payments, accounts, FX rates, etc. in real time.
- **Integration**—Streamlines information sharing throughout electronic banking portals and improves the client experience by providing richer functionality at users' fingertips.
- **Flexibility**—Increases support for unanticipated future technology changes and provides faster and easier data migration when back-end systems are upgraded with new technology.

APIs and Open Banking—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. The main drivers of this are:

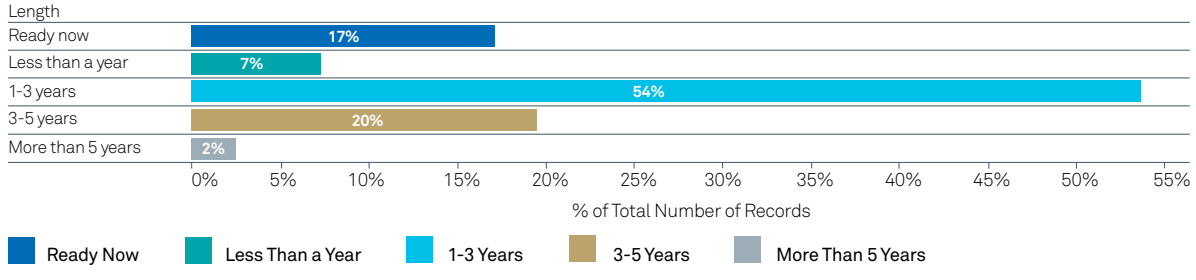
Digital. The development of APIs that will create and allow communication between banks and non-banks and the customization of banking data in ways heretofore unimagined; and

Regulatory. Initiatives such as the second Payment Service Directive ("PSD2") in Europe and the Open Banking Standard in the UK have mandated that banks, given client approval, share their data with clients and with two sorts of third-party providers: Account Information Service Providers (AISPs) and Payment Information Service Providers (PISPs). Although the longer-term effects of these changes are unclear, they may represent an end to banks' monopoly on their clients' account information and a game-changing transition away from existing banking models.

Roughly half of respondents think APIs will bring a fundamental shift in how corporations communicate with banking partners, and 54% believe their company's first API interaction will be within one to three years.

As indicated in our survey, a widespread commitment exists for companies implementing APIs in the near future, indicating a potentially significant shift in how practitioners currently interact with their banks and pointing to the vast need that exists to educate corporate payments staff on how APIs work, providers' existing and planned solutions, and benefits they can provide. Practitioners need specific use cases to understand exactly how an API would be worthwhile in their payments operations. Specifically regarding what's out there now, many of our interviewees noted that they are not clear on providers' current API offerings. And beyond that, questions abound about how to update legacy treasury and payment platforms to get up to speed with the new technology, since APIs require integration with those internal systems.

How far away do you think your company's first meaningful API interaction with your bank would be?



"I want to see my treasury workstation (TWS) provider work in conjunction with a standard API from a bank so that I don't have to customize everything. I'm really excited about how this will change the way we work today. It's not going to be revolutionary; it just makes things cleaner... Maybe someday the TWS might work with the banks and develop integrated APIs. And if I can have an API on what really happened with my daily cash position at a point in time? To me, that's the value add."

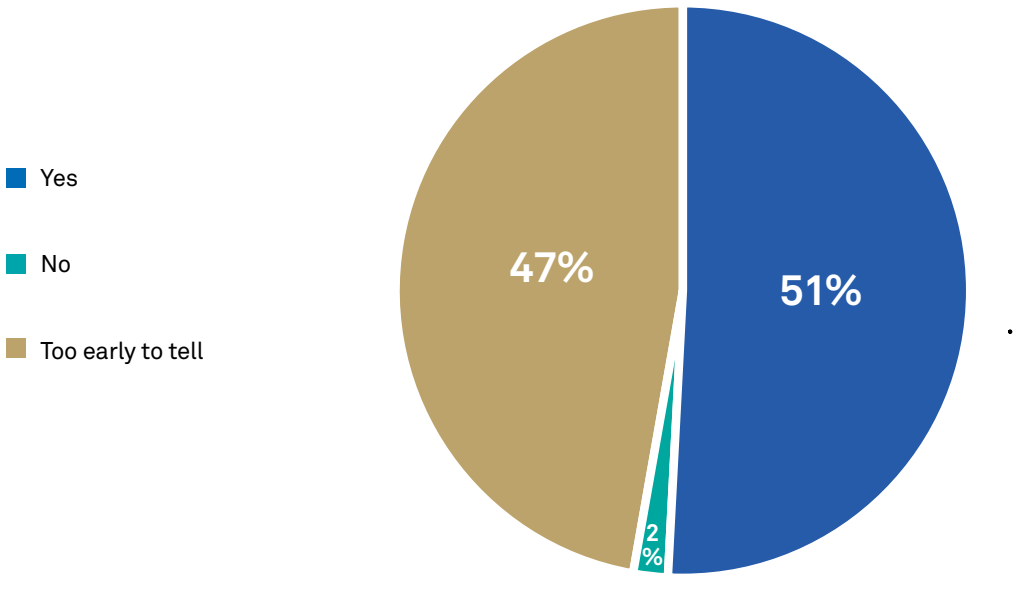
—Frank D'Amadeo, Director of Treasury Operations, Con Edison

For organizations with efficient payment processes that are working well, translating those processes into an API also would require a sea change in current thinking for many corporates—they need to understand more about how the new applications would generate meaningful value for them and their customers. For corporates actively considering a future that incorporates APIs, their concerns center on whether they will enable easy, fast, inexpensive interfaces to the existing systems.

While the question of whether fintechs will be the true disruptors for banks in this space (or partners that add value to banks) is still open, many practitioners are working with bank providers to collaborate in the development of industry APIs. Financial institutions' vast customer bases, embedded regulatory compliance processes, and comprehensive system networks present robust opportunities for industry cooperation to develop and provide the technology, for providers in both spaces.

Only 5% of respondents are not looking to their bank providers to integrate and facilitate API services.

Do you think that direct peer-to-peer system interaction through APIs will bring a fundamental shift in how corporations communicate with their banking partners, and is a step towards overcoming some of the current challenges?



"We focused and engaged a number of our banking partners and we don't see an adoption of an API in place yet. Everybody is thinking about it but not everyone has it up and running yet. Ultimately, I think our dream state would be to have a connection that streamlines in real-time (into our TMS) for the next several years while everyone gets to that point...The world of the future is probably API for us."

—Leading Technology Company Representative

For some—the anticipation is there, but the true partners in the API relationship would be software companies—or intermediaries—that provide back-end payments systems to many companies, or in a company's IT department itself, to those who directly interface with the software, rather than the end user where the back and forth communication resides.

Top Use Cases for Payments APIs

There is a strong current for APIs to become the standard protocol in the payments industry as we move into the future—with use cases that are easily integrated into clients' existing systems that address their particular payments pain points, especially as outlined by the survey, such as availability of IT resources, competing needs, developing in-house expertise, and a desire to attain true real-time insight into the status of incoming and outgoing payments. Many corporates can envision a treasury market that allows their clients to easily onboard and integrate new services into current and future offerings, all while potentially improving communication with their bank systems—all through API end-to-end system connectivity.

When asked which API use cases would be optimal for solving their current payments challenges, and that add value to their current process, **half of respondents cited protocols built into an API that perform Account Reconcilement as a "must have". Nearly half also cited live tracking, amendment and cancellation of payment instructions as a top API use case, which speaks to the importance of real-time insight into payments, enabling quick decision-making for various types of payment exceptions.** (Note: With the introduction of SWIFT gpi, these legacy issues have either been addressed or are in the process of being addressed. The question now is how to access the data needed. Clients can look for the information on a bank's portal by doing manual inquiries, but that's slower and labor intensive. The more efficient way to find the data needed is to integrate client inquiry systems with bank API's that can automatically pull the data requested.)

A majority of survey respondents cited Account Reconciliation as a "must have" API use case.

APIs also provide a virtual investigation/enquiry center with up-to-date status tracking, via dashboards or integration directly into the system via APIs that trigger workflows—capabilities that were also cited as desirable as they would potentially allow for added control including:

- 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

In facing the many pain points of the current payments process, and improving how staff time could be redirected, corporates are visualizing a wide range of beneficial scenarios employing APIs that have not been offered to them as solutions by providers (or their IT groups) as of yet. Solving payment issues with APIs doesn't necessarily have to start with addressing the payment issues per se, according to corporates, but can often start with problems in the account itself. According to a representative from a **national technology company, "We have a lot of bank accounts and so many different product lines. Opening and closing these bank accounts, we would love to have a smart API system with the intelligence that lets us**

perform more tasks real time and see the results immediately. The banks can approve our activity without needing to recreate it. Also, the minute payment files are initiated and sent, we want to know about it on a real-time basis. So there are a lot of API-related projects we're looking at internally and between our systems."

Whatever API solution(s) they may settle on as the technologies become available, companies are looking to leverage system investments they've already made, and retain control of internal processes as much as possible, with many citing a need to ensure that controls over payment origination and data access remain efficient and effective.

Defining the Terms

Robotics (or bots) refer to machines that have been programmed to independently follow a specific set of rules or steps faster and more error-free than a human could, thus increasing efficiencies, reducing costs and freeing staff to focus on more value added functions.

Source: bnymellon.com/us/en/who-we-are/people-report/innovate/the-rise-of-robots.jsp.

Robotics in the Financial Industry

With their capacity to liberate businesses from redundant tasks while adding efficiencies and cost reductions that could not otherwise be obtained, a number of smart technologies—from bots to AI to natural language processing—are beginning to change the way banks run. Many of these tools are still in the early stages of development, but they are driving major innovations across the financial services industry.

Specifically, bots are being designed and used to free staffs from uninspiring, mechanical, routine and repetitive tasks. With Intelligent Process Automation (IPA) and Robotic Process Automation (RPA) technologies underpinning the new capability, the aim is not a full scale replacement of current infrastructures, but for the capabilities to coexist and to operate with organizations' existing technology. Bots are reliable and deliver what they are designed to perform, aim to to reduce risk and improve quality in a controlled environment. Within BNY Mellon, for example, bots have been implemented in everyday operations, not just in pilots (e.g., streamlining trade settlement by performing research on orders, resolving discrepancies and clearing trades, reducing the time it takes to reconcile a failed trade from 10 minutes to one quarter of a second).

We asked survey respondents what their expectations are for how important these technologies either are now or might become to their industries and the financial industry as a whole. Overwhelmingly, the corporates that responded and who talked directly with us indicated a strong interest in embracing these technologies. And while many could foresee their broad use in their particular company's future, the need for education on what the technologies offer, how they can be applied and who will provide them, ruled the day.

Putting Bots to Work for Treasury

While a few advanced firms are using bots for various payments processes (e.g., reconcilement), many are currently more familiar with and using the technology to assist with reporting workflows rather than payments at this point. And many companies actively using bots in other areas of the business (e.g., for client service and inquiries [i.e., online medical chats], tax reporting, etc.) are waiting to see how the technology will successfully translate into tackling overly-manual treasury payment tasks, including cash application and straight-through processing, and solving for decisioning items that require manually researching exceptions. Many are looking for turnkey bot solutions (with full cybersecurity protocols intact) that can demonstrate a proven track record of success.

More than half of respondents said their companies will be ready to implement bots for payment and/or reporting within the next three years.

"We're looking into using bots or artificial intelligence to do repetitive type activities. Bayer is focused on innovation and part of that is to free up employees' time so they can be more creative and more analytical in what they're doing and to eliminate as much repetitive type activity as possible. Bots and/or artificial intelligence are viewed as something that might be able to assist in those goals."

—Dan Cella, Treasurer, Bayer

Blockchain (Distributed Ledger Technology [DLT]) and Payments—A View to the Future

Defining the Terms

Blockchain refers to shared, distributed database architecture that keeps track of ledger accounts and their balances. Its decentralization eliminates the need for a central authority or intermediary to process, validate, or authenticate transactions and creates an environment wherein:

- All participants have their own, identical copy of the ledger.
- Changes are reflected in all copies, in near real-time.
- Records are stored one after the other in a continuous ledger, automatically creating an audit trail.
- Security is enabled by encryption and a combination of public and private keys.

DLT has the potential to drive simplicity and efficiency through new financial services infrastructure and processes through:

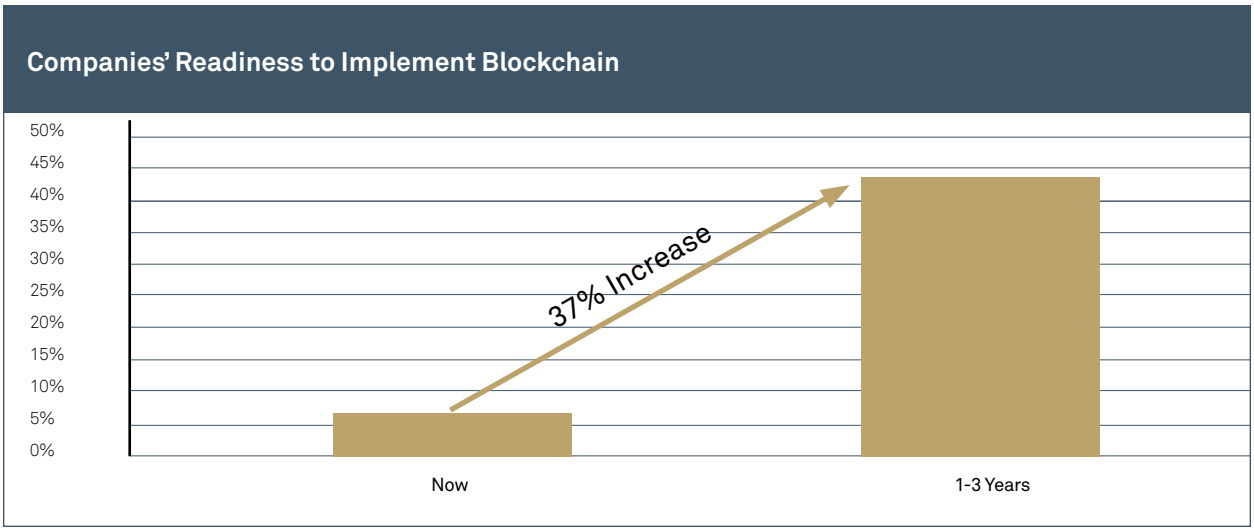
- Operational simplification—Reduces/eliminates manual efforts required to perform reconciliation and resolve disputes.
- Regulatory efficiency improvement—Enables real-time monitoring of financial activity between regulators and regulated entities.
- Counterparty risk reduction—Challenges the need to trust counterparties to fulfill obligations as agreements are codified and executed in a shared, immutable environment.
- Clearing and settlement time reduction—Disintermediates third parties that support transaction verification/validation and accelerates settlement.
- Liquidity and capital improvement—Reduces locked-in capital and provides transparency into sourcing liquidity for assets.
- Fraud minimization—Enables asset provenance and full transaction history to be established within a single source of truth.
- Resiliency improvement—Improves systemic resiliency while reducing an individual's barriers to entry.
- Long–tail innovation—Enables innovation in the long tail of trust-based services.
- Supply chain automation—Opens up financial services' supply chains for future automated applications.

Just as the internet changed the way we work and live, DLT appears to be on the verge of transforming the way we store and exchange value and assets. Whereas the internet altered the way we access, use and analyze data, DLT is the building block for the "internet of value", and enables the recording of interactions and transfer of value over a peer-to-peer network without the need for a central authority or coordinating entity.

"Blockchain technology is currently a network infrastructure technology, with the potential to enable advanced analytics and automation. Blockchain helps to solve the problem of data reconciliation that happens between parties. It's a log that runs in the back end of applications and it keeps them in sync. Cryptocurrency is one of its applications that is in production at scale, but there are many potential applications for blockchain technology, including in healthcare.

"Right now, it seems the blockchain market is focusing on infrastructure. Most of the software development that's going on is with companies who are trying to figure out how to build blockchain networks. How can we increase their throughput? How can we achieve high levels of transparency and visibility about the assets that we want to transact on these networks?"

— Emily Vaughn, Blockchain Product Development Director, Change Healthcare



While only six percent of companies believe they are ready to embark on DLT payment initiatives now, 43% felt they would be within the next three years. While many are aware of what the technology is, the experts we talked with are less clear on how it will be made available to help their organizations. And that may be due to the rapidly-evolving nature of the technology and its continuing search to find a foothold within the payments industry. There are outliers in the space, however—businesses that are moving forward with clear goals for integrating the technology into their systems. According to **Charles R. L. Ellert, Senior Payments Strategy Leader at Verizon Communications Inc., "Verizon is very focused on digital finance and leveraging technologies and solutions that will enable that. We're doing some interesting things within blockchain. And it's primarily around transaction integrity across multiple untrusted systems… Our go-to market strategy is to initially go out and focus on machine-state integrity. At the same time we're leveraging it internally to streamline our reconciliation and audit process across various ledgers. So, for us, our focus is not to disrupt the existing ledgers, replacing them with a blockchain, but to leverage blockchain technology to streamline the process."**

Blockchain was cited as the most impactful payment initiative within the next five years or more, with bots and AI for payments tied for second place.

DLT and Payments

Existing payment providers are under pressure to modernize, address traditional payment challenges, and compete with new market entrants. Banks and existing operators have recognized this and are looking to DLT as an example to facilitate and streamline trade and supply-chain management. In the near term, use cases will focus on capital market and securities solutions, with a potential for the solution to be extended to corporates, including the potential for tracking of goods in the supply chain.

The long-term expectation for potential integration of DLT with payment platforms offering combined capabilities is not expected to include a full scale replacement of existing infrastructures, but a technology that will coexist and be interoperable with a company's existing environment. The industry expects to see institutional use cases before retail use cases (e.g., how the Australian securities exchange is using DLT to change core infrastructure). The industry is working to deliver a global payment experience within 10 years that provides for:

- Global, real or near-real time execution
- Complete transparency as to end-to-end cost, payment status, and all parties to a transaction
- Real-time fraud analysis at a reasonable cost

Blockchain and Healthcare—Q&A

As part of our discussions, we sat down with Emily Vaughn, Blockchain Product Development Director for Change Healthcare, an organization that is currently playing a role in the digitization of the health insurance claims process; the clearing and claims management business; revenue cycle management software; and provider data management software. Her insights, given the company's active role in the space, are excerpted below.

BNY Mellon (BNYM): When do you predict a full-scale impact of DLT to your customers?

EV: We think the impact of blockchain to our customers will be greatly felt within the next two or three years. The applications that are being developed today will be for the early adopters. But the mass adoption, where exponential value potentially could be unlocked, will happen within the next three to five years. That's when we think it will really start catching momentum and hit a hype cycle peak. That's the prediction.

BNYM: What are your ideas of a potential use case for blockchain technology in the healthcare payments?

EV: I think you'll see blockchain payment technology actually take off first in healthcare. Paying patients for their participation in a clinical trial, settling payments between companies who do a lot of business together, looking at HSA accounts … I think those are going to be the first use cases for blockchain payment technology in healthcare."

You could recreate the claim process using a smart contract, which seems very futuristic but actually could have a massive economic impact to payers managing complex provider contracts. We're not exactly starting there, because it's very disruptive. We think the path to getting to this point is a gradual one because there's a culture to the business of healthcare. That's not going to change just because you have new technology. Our thinking is to first demonstrate the speed, efficiency, security, and transparency of the network before we start reinventing these workflows from scratch.

BNYM: How would a typical B2B payments cycle potentially change with virtual wallets and tokenized payments, as they would relate to blockchain technology?

EV: You have a hospital that needs to be paid, and an insurer will make payments based on the claim information that goes back and forth. The insurer will either send a check or an electronic payment such as ACH or Virtual Credit Card. With a blockchain, the efficiencies gained today could be increased transparency, increased speed, and enhanced automation.

Blockchain has the promise to reduce the cost of settlement and reconciliation for the payer and payee by efficient use of smart contracts between all the players who touch the payment. Perhaps in the future, you could have the existence of a digital token, which could actually be spent like a currency. If you connected a bunch of other applications and empowered other businesses to accept this health token, then the provider wouldn't necessarily have to exchange it for cash. You could just replicate the claims process replacing paper dollars with digital claims dollars that stay in the hospital environment.

BNYM: There's currently a lot of room for error in today's healthcare claims process (e.g., overpayments due to changing deductibles, claim status, refunds, billing errors)—how could blockchain potentially alleviate that?

EV: We think that automation of the claims process and transparency of the rules and the contributions of the stakeholders can reduce a lot of the errors that we see today. The payment connection to that comes when we can ensure that the data delivery is accurate. For example, we wouldn't want to have blockchain payment integration with the billing system if the billing system is inaccurate 30% of the time because blockchain refunds are really difficult to process. It's like a cash payment.

BNYM: What challenges have you been presented with from potential partners or clients who would want to pursue this technology (in some manner)?

EV: The challenges we see from partners and clients vary—from trying to assess the value in developing a new solution vs. enhancing their existing solution, to lack of funding before having quantifying returns. I see a lot of companies who develop use cases, a Proof of Concept (POC), and then they get into that POC and they realize they need five technology partners to make it a reality. That can really take the wind out of your sails. I empathize because in a lot of cases my customers or partners have these brilliant ideas and these POCs that are highly functional and have extreme potential, but they can't find the funding for the development of that as a product because their company isn't in the position to develop that as a product.

BNYM: What are the challenges that you foresee in the marketplace for this technology?

EV: The hype, which is distracting and creates a false sense of security around the how and why of building these applications. The infrastructure is not ready; you have companies that don't know what their role is in this ecosystem, and they feel compelled to invest. They need to know—are they a producer of digital value? Are they a consumer? Are they a transporter? Are they exchanging digital value on behalf of their customers? What role are they really playing? From there, let's figure out how they should interact with the technology.

BNYM: What kind of receptivity are you seeing in the marketplace for blockchain?

EV: In most cases, companies want to join a pilot that we or a group of our partners are supporting. They would invest in a pilot but they don't necessarily want to be on the ground floor having to build all of the technology to make the pilot happen. They want to join when it's ready for them. But those that want to participate in a pilot, they're not trying to get in and own the blockchain network. I think they expect that IT providers—because they run infrastructure today—will run the nodes for healthcare and that the healthcare companies will be the application end users.

BNYM: What about privacy considerations (e.g., Health Insurance Portability and Accountability Act [HIPAA])?

EV: Privacy is definitely a pillar of the main considerations when you're doing application design. Government regulators and the policy makers may say if you are a company and you are using a blockchain to transmit electronic patient data, you have to be HIPAA compliant in that electronic transmission. And there are methods of obscuring the data (and HIPAA is very specific about what data fields are considered protected) so that it remains private. There's logic for obfuscating that so that no HIPAA-protected data goes into the meta data of a blockchain transaction.

Artificial Intelligence (AI)

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 moreso as the technology continues to be refined. Banks are also beginning to use AI in two areas that will directly impact clients' experience: so-called "chat bots" and customer recommendations.

Defining the Terms

AI is the theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages. The term refers to the ability of a computer program or a machine to think and learn. It is also a field of study which tries to make computers "smart".*

**https://simple.wikipedia.org/wiki/Artificial_intelligence*

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 significant amounts of data related to the behavior and habits of users, allowing them to adapt and become more precise and life-like. Chat bots are already in use in the banking industry in relationship management and customer service functions.

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 AI, such algorithms should play a major role in how recommendations are made in the banking sector.

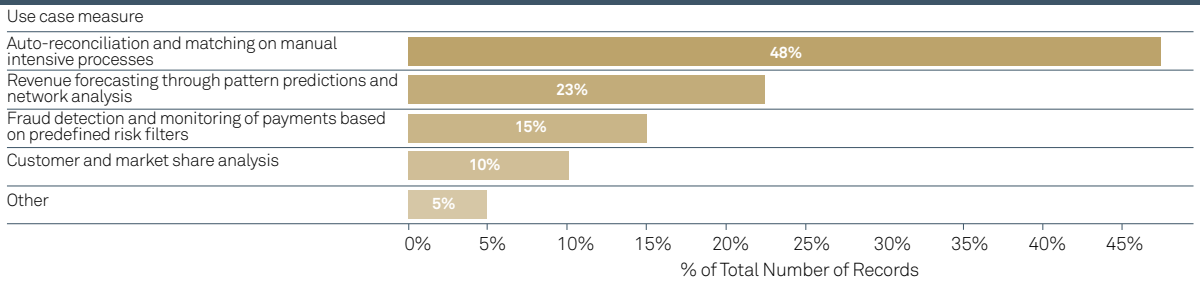
AI, Analytics and Data Management

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 company 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 SWIFT 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 can still lead to significant business challenges in building a data repository and direct client data exchange.

Data analytics can aid in decision making based on prior trends, including funds availability and payment patterns. AI and machine learning technologies have the potential to assist with cash forecasting and to help companies with efforts to make payments based on least-cost-routing strategies, or when a payment must reach a beneficiary. Fueled by big data, AI is expected to create enormous productivity opportunities by reducing exception handling and increasing companies' straight-through processing.

The majority of survey respondents said they are 3-5 years away from a meaningful AI implementation, with almost half indicating that auto reconciliation and matching on manually intensive processes are top use cases for the technology. This is similar to the outlook for many providers, where the first real AI focus for many is on manual operational process automation. And the trend speaks to the survey findings that companies are truly reliant on IT resources if implementing these changes is to become a reality.

Which of the following would be your top use case for AI?



AI & Payments: Potential Use Cases

While some respondents indicated that their payment platforms perform portions of the auto-reconciliation and matching on manual intensive processes, the acknowledged human intervention still required in these processes falls well short of the AI capability use cases we laid out in our survey (see the accompanying chart on Top Use Cases for AI).

Many can see the use for the technology to help payments, but acknowledge that their companies have not begun the deep dive. These perceived uses cover heavily manual processes that currently require human thought/intervention to navigate a myriad of issues that could stop the payment from being streamlined (e.g., detecting necessary payment information that's missing; recognizing and solving disputes in a system that currently require manpower to research and rectify; and using the technology to detect invalid payments and learn how to prevent them from occurring [via real-time messaging with the sender, for example]).

According to **Marc Vandiepenbeeck, Vice President and Assistant Treasurer, Johnson Controls, "We're in the construction business. What often happens is that somebody pays a portion of an invoice because it's faster or some item wasn't delivered or they weren't happy with something. That payment then becomes a reconciliation item. Somebody could spend hours reconciling all of these items right away to make them perfectly match. The cost of a human being to do that work is insane because they have to look at the contract, the invoice and make the repeal; call the customer (maybe); email the manager; and send confirmation and the final payment. That is all stuff that's easy for an AI platform to find the complex pattern for and learn how to auto-reconcile all the information."**

Conclusion: Education and Guidance Through a Time of Change

The future of corporate payments is already here! Many of the company pain points highlighted in our research—and throughout this paper—such as the need for increased transparency, reduced risk and increased security for payments, are being addressed by the new solutions that have most recently been introduced to the marketplace. Whether companies take up the mantle to implement these new options depends on many factors. While companies are ready for the improvements that the new solutions promise, many have questions that need to be addressed before fully embarking upon the formidable journey required to experience the benefits the changes pledge. These include a need for:

- **Continuing, In-depth Education—**The sheer number of new options creates confusion for practitioners. While many are closely following industry advancements, the need for guidance around what the many options mean for their particular payments circumstance is crucial. The extent that providers can help practitioners define new terms, interpret how solutions actually translate into benefits, and provide full disclosure on which option would work best for their specific operations is what is needed now. With education, guidance and clarification around these points, companies will be ready to embrace the changes necessary to move their operations into the next era of operability.

- **Increased Technology Resources—**Many businesses are dealing with legacy payment systems that necessitate an extensive and often costly commitment from internal system development teams and resources to accommodate the new solutions. With their stated need for platform support, opportunities exist for corporations to work with providers to help develop those systems in a timely and cost-efficient manner—under expert guidance—or to use outsourced solutions to bridge the gap where possible.

- **Access to API-ready Solutions—**As many companies look to embrace their first API interaction within one to three years, they acknowledge that this technology heralds a fundamental shift in how corporations communicate with banking partners. As APIs expand their access to financial service features and capabilities, many look forward to extended integrations across provider platforms, cohesive user experiences and faster access to critical information. Their goals include using the technology to access a wide array of payment management solutions and to keep pace with emerging payment trends and options.

Companies don't want to have to come to us and say, "My payments operation needs this specific solution to move forward." There are too many issues needing clarification, too much education still needed on the options. Companies want providers to say to them, "Because we understand your business, here is the customized payments solution you need. And here is how you need to move forward." That's how we create value for them in this evolving space.

Managing Innovation—The Provider Directive

The dearth of solutions, combined with corporates' need to address pain points while accommodating new payment demands, make it imperative for industry providers to help companies understand their options. They must provide guidance around and identify key service-oriented solutions that will help simplify the payment process and provide timely information to their end clients, vendors and other counterparties, assisting in their efforts to make their businesses more cost efficient and resilient.

"When contemplating the future of payments for corporations, it is all about the client experience. Payments need to be as timely and efficient as possible with robust information readily available. Corporations are keenly aware of the functional expectations in recognizing changes around them that impact how payments are made and received, ranging from increased cross-border flows to heightened concern around risk, compliance and security, to supporting new clients in the market, such as millennials. Working with the right business partner is crucial amidst the vast amount of changes taking place within the payment landscape."

—Jean Wynn, Managing Director, Head of Corporate Banking, Global Client Management BNY Mellon

As we look to the immediate future, BNY Mellon is focusing on specific means to achieve this end:

- **Rigorous, system-specific education** about available payment solutions, meticulously explaining the benefits of each, and what particular (or combination of) solutions would boost a company's operations given the unique challenges they face.

- **Innovative solutions—**We have been actively leading various industry and transformational initiatives to look at new and improved solutions that enhance the client experience. At the forefront of offering services that provide access to today's newly-offered payment networks and capabilities, we customize payments solution sets through industry-driven initiatives (SWIFT gpi, RTP) and collaborations with third-party providers (BNY Mellon Tokenized Payments now available with *Zelle*, BNY Mellon Paymode-X, etc.). **As the first bank to originate a transaction on the RTP network, we secured our place as a leader in the space.**

Our three-pillar payment strategy includes:

1. Building global infrastructure solutions to enable new services and improve existing solutions
2. Entering into new markets, products, and industry initiatives by leveraging our world-class payments processing experience
3. Enabling real-time client interoperability with us using our systems and technology

- **Access to the payments technologies of tomorrow—today**, including **provider-based APIs**. We are making significant development investments in API's that offer sophisticated automation options to enhance straight-through processing and provide interactive messaging and data through direct system-to-system access to Treasury Services' payment and reporting platforms. Additionally, BNY Mellon's robotics solutions promote increased standardization, cost efficiency, and resiliency for such processes as automating steps to complete global USD Funds Transfers for faster handling and processing times, automation of simple repairs, and quick responses to cyclical or unexpected changes in the payments ecosystem.

Our presence in the DLT space has uniquely positioned BNY Mellon to be the digital asset custodian of choice, based on our trusted brand, deep custodial customer relationships, and innovative blockchain POCs. We are actively engaged in projects that are looking at tokenization of regulated and unregulated assets, and will be sharing updates on internal resiliency projects and Utility Settlement Coin (USC), an asset-backed digital cash instrument implemented on DLT for use within global financial markets and internal resiliency projects that use DLT as the underlying technology stack. Our goal is to develop a product that will help improve capital efficiency, improve settlement, and reduce systemic risk.

- **Creating company-centric payment experiences.** We strive to provide a payment experience wherein, at every stage of the payment journey, a client's interaction with us comprises a full integration of products, channels, operations and client service expertise to create a payment experience that focuses and aligns all its working parts with clients and their particular needs.

  It is important to note that we are not referring to an imagined, typical client, but to individual clients with varying ideas of what constitutes an ideal payment experience. So, the various components of a client-centric payment experience are not only in place, those components are flexible and customizable so as to suit the particular client we are working with.

"Failure is not fatal, but failure to change might be."

—John Wooden
Former Basketball Head Coach for the University of California at Los Angeles

We've found that corporations are reliably feeling the truth of this maxim, and that, despite the many challenges of making these costly and complex payments changes, failing to do so could very well determine their staying power and ability to witness the next wave of change. It is also a message to providers themselves—we must deliver the solutions, the expertise and the support needed for companies to take full advantage of those opportunities—one side cannot pursue this level of change without the other.

APPENDIX

Payment Industry Expert Contributors:

Dan Cella, Treasurer, Bayer (LifeScience Company with Businesses in Consumer Health, Pharmaceuticals and Agriculture)
Dan Cella is currently Treasurer of the Bayer U.S. operations. In his role, he oversees the Cash Management, Capital Markets, Trust Investments, Insurance, Real Estate, and Pittsburgh Facilities Management operations for the company. He has been with Bayer for 22 years entirely in the Treasury function, taking on roles of increasing responsibilities, most recently as Treasurer for the past 1.5 years.

Bayer is a global enterprise with core competencies in the Life Science fields of health care and agriculture. Its products and services are designed to benefit people and improve their quality of life. At the same time, the Group aims to create value through innovation, growth and high earning power.

Frank D'Amadeo, Director of Treasury Operations, Con Edison (Energy, Utility)
Frank D'Amadeo has been with Consolidate Edison Company of New York for the past 43 years. During that time he has held numerous project and leadership positions within the Company.
He currently oversees lockbox operations and day-to-day cash management needs for Con Edison Incorporated and its subsidiaries. Frank also heads CEI's Stock Transfer operation. His recent accomplishments include the implementation of a new Treasury Workstation and redesign and upgrade of Con Edison's in-house lockbox operation. Prior to joining Con Edison's Treasury Department, Frank has held various other positions at Con Edison, such as Assistant Controller and Director of Financial Systems Development.

Con Edison is a subsidiary of Consolidated Edison, Inc. [NYSE: ED], one of the nation's largest investor-owned energy companies, with approximately $12 billion in annual revenues and $49 billion in assets. The utility provides electric, gas and steam service to more than three million customers in New York City and Westchester County, New York.

Charles R. L. Ellert, Senior Payments Strategy Leader, Verizon® Communications Inc. (Communications, Telecom, Media, Cable)
Charles Ellert is responsible for driving strategic payment initiatives across the enterprise. In this role, he works across the company to identify new and innovative solutions to maximize customer satisfaction, streamline operational efficiencies and improve business agility.

Verizon Communications Inc. (NYSE, NASDAQ:VZ), headquartered in New York City, generated $126 billion in 2017 revenues. The company operates America's most reliable wireless network and the nation's premier all-fiber network, and delivers integrated solutions to businesses worldwide. Its Oath subsidiary reaches people around the world with a dynamic house of media and technology brands.

Pratap Sarker, Group Chief Executive, Financial Services & Healthcare, Conduent (Insurance [Administrative Services])
Pratap Sarker has global, end-to-end responsibility for Conduent's accounts in the Banking, Insurance and Capital Markets, Healthcare Payer, and Healthcare Provider, Pharma and Life Sciences businesses across the entire Conduent solution portfolio. The solution portfolio includes customer experience, business process optimization, human resource services, learning, legal, finance and accounting and workers compensation services. Pratap also has end-to-end delivery responsibility for Conduent's finance, accounting and procurement, workers' compensation, and legal and compliance services businesses.

Conduent creates digital platforms and services for businesses and governments to manage millions of interactions every day for those they serve. We are leveraging the power of cloud, mobile and IoT, combined with technologies such as automation, cognitive and blockchain to elevate every constituent interaction, driving modern digital experiences that are more efficient, helpful and satisfying. Conduent's differentiated offerings touch millions of lives every day, including two-thirds of all insured patients in the U.S. and nearly nine million people who travel through toll systems daily.

Marc Vandiepenbeeck, Vice President and Assistant Treasurer; Marcio Righetti, Director International Treasury Operations; and Liz Blair, Cash Manager; Johnson Controls (Manufacturing/Construction)
Mr. Vandiepenbeeck currently manages the Company's capital markets, global liquidity, retirement plan asset management, strategic banking relationships, and SEC reporting for treasury operations. In this role he supports the JCI regional treasury centers in North America, South America, Europe, and Asia. Prior to his current role, Mr. Vandiepenbeeck worked in regional treasury centers in Hong Kong, Brussels and Milwaukee.

In 2009, Mr. Vandiepenbeeck co-founded Whitewater Analytics, a Fintech company that provides exposure management services for global companies. Mr. Vandiepenbeeck still serves on the executive team as Managing Partner where he helps oversee the business development aspects of the Company.

Mr. Righetti joined Johnson Controls in January 2007 and currently supports the Treasury leadership globally with debt and capital markets activity. In his current role, Mr. Righetti also contributes to Tyco Integration efforts globally and the N.A. Cash Management processes. Prior to joining Johnson Controls, Mr. Righetti served as Regional Treasurer for Latin America at Panalpina World Transport in Sao Paulo, Brazil and Treasurer at Rexam South America in Sao Paulo, Brazil.

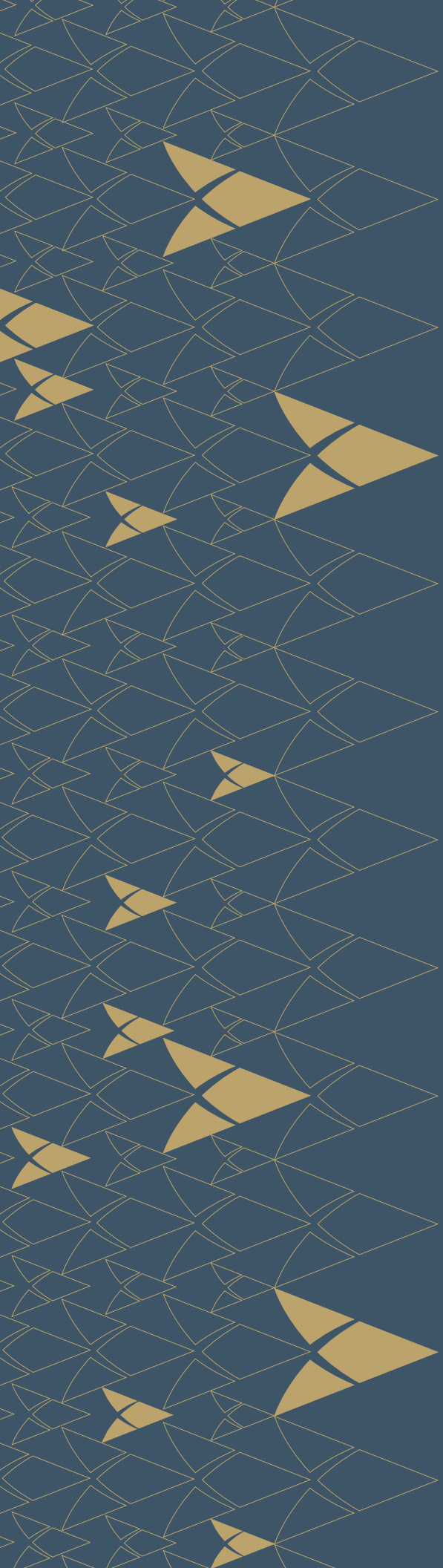
Johnson Controls is a global diversified technology and multi-industrial leader serving a wide range of customers in more than 150 countries. Its 120,000 employees create intelligent buildings, efficient energy solutions, integrated infrastructure and next generation transportation systems that work seamlessly together to deliver on the promise of smart cities and communities.

Emily Vaughn, Blockchain Product Development Director, Change Healthcare (Healthcare, IT)
Emily Vaughn oversees Change Healthcare's blockchain development and integration strategy. Prior to joining Change Healthcare, Emily assisted startups, small businesses, and enterprise companies' cryptocurrency and blockchain adoption. She worked across many markets: retail/ecommerce, healthcare, insurance and finance. Emily served as the head of business development at Gem, a blockchain development company in Los Angeles. While there, she created a global marketing initiative to segment the blockchain industry. She was responsible for the design of a consultative sales strategy for enterprise blockchain development, bringing many corporations to the blockchain market.

Change Healthcare is inspiring a better healthcare system. Working alongside their customers and partners, they leverage their software and analytics, network solutions, and technology-enabled services to enable better patient care, choice, and outcomes at scale. As a key catalyst of a value-based healthcare system, they are accelerating the journey toward improved lives and healthier communities.

Jeff Winchenbach, Senior Director, Fiscal Services, MaineHealth (Healthcare Provider)
Jeff Winchenbach is Senior Director of Fiscal Services and manages the Treasury, Payroll, and Accounts Payable functions for MaineHealth. Jeff joined Maine Medical Center in 1987 and served in a series of financial roles with increasing responsibilities prior to his promotion to Senior Director for MaineHealth. Jeff serves as the lead liaison for banking and investment relationships.

MaineHealth is the largest integrated healthcare delivery system serving Maine and northern New Hampshire, consisting of 11 community hospitals, three nursing homes, a home health agency, clinical reference laboratory, and a research institute. MaineHealth, through the efforts of its 19,000 employees and in collaboration with its members and communities served, strives to make its communities the healthiest in America.



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