

# Reinventing Payments

In An Era of Modernization



BNY MELLON

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# Introduction:

## Reinventing Payments in an Era of Modernization

By Tony Brady, Managing Director and Head of Global Product Management, BNY Mellon Treasury Services and Chris Mager, Managing Director and Head of Global Innovation, BNY Mellon Treasury Services Global Product Management

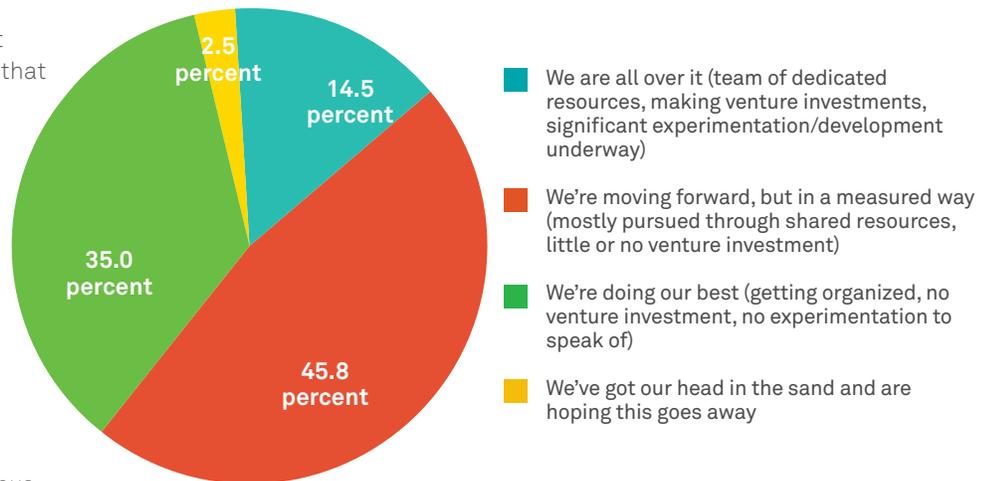
This paper is intended for readers who want to better understand the dramatic changes that have begun to take place—and that are accelerating—in the global payments industry. Based on the results of a bank client survey conducted by BNY Mellon Treasury Services earlier this year, we know that this is an area where financial institutions vary greatly in terms of their level of knowledge and perspectives and a subject that they are eager to learn more about.

In that survey, when asked, “Which reaction best describes your organization’s level of focus, attention and development in the emerging technology space?,” nearly half of the respondents—120 senior executives representing many of the global financial institutions we currently serve—said they are, “Moving forward, but in a measured way (mostly pursued through shared resources with little or no venture investment). More than one-third said they were just “getting organized.”

Clearly, it is an opportune time to share more information about the various avenues to payments modernization and associated technologies. So herein, we will share with you more results from our survey as well as explore the factors that have spawned and continue to drive changes in our industry; tell you how both banks and their clients are being affected; and look at how banks are simultaneously pursuing new opportunities for growth while also striving to deter potential loss of market share.

It is a complex saga with numerous and diverse players—some with familiar names and some brand new to the payments business—and its cast of characters and storyline continue to evolve at an unprecedented pace.

In our opinion, the industry has never been more exciting. There is a lot going on and, for once, we have more to focus on than meeting regulations and managing risk! Truly, as a result of pressures from various innovators, payment industry participants are pushing a wave of payment transformation,



focused on our clients and on what we—individually and as an industry—can do to improve our services for them. That’s a refreshing development in a field that, quite frankly, has been slow to adapt.

Veterans of the U.S. payments industry know that there has been little fundamental change in the payment infrastructure since the rollout of ACH in the 1970s. And in the cross-border arena, while generally reliable, the process long used to move funds globally is fraught with familiar challenges related to timing, cost and transparency. Until recently, however, clients were not aggressively pushing for change. Thus, banks did not attempt to fix what was not broken; they knew the amount of money, time and coordination required to effect real transformation would be immense.

The status quo might have continued were it not for several factors that combined to create “the perfect storm” for payment providers. Nimble new competitors—now commonly referred to as “Fintechs”—began looking for opportunities to apply cutting-edge technologies (e.g., blockchain) to penetrate the payments space and other revenue sources that banks have relied upon for years. Market factors such as a growing consumerism in payment solutions, more globalized trade flows, and increasing fraud and cyberattacks emerged. Concurrently, the 2008 financial crisis raised questions in some clients’ minds about how well banks were serving them. And while banks realized

that they needed to take immediate action to innovate, their ability to focus was impeded by the need to divert attention and resources to issues such as compliance and risk management.

Until recently, it seemed feasible that banks could lose their foothold in payments processing to Fintechs and other non-bank providers. Their advanced technology, agility, and fresh concepts appeared to be capable of addressing many of the historic weaknesses in the payments space. A media frenzy with numerous articles and announcements from the Fintech community contributed to that perception.

Today, the outlook has shifted somewhat. Both banks and their Fintech challengers have realized that, while Fintechs offer some intriguing ideas and advanced technologies, banks also bring value to the table. Banks have significant advantages in terms of network effect, established standards, regulatory know-how, and large, entrenched client bases that give us necessary scale. So both groups are asking how we can best proceed to achieve our mutual goals for success:

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- [Should banks evolve their current suite of payment solutions to compete head on with Fintechs?](#)
  - [Are banks better served by acting collectively among our own ranks to improve the payments system to meet our clients' changing needs?](#)
  - [Can the two groups combine our unique areas of expertise to create a better client experience?](#)
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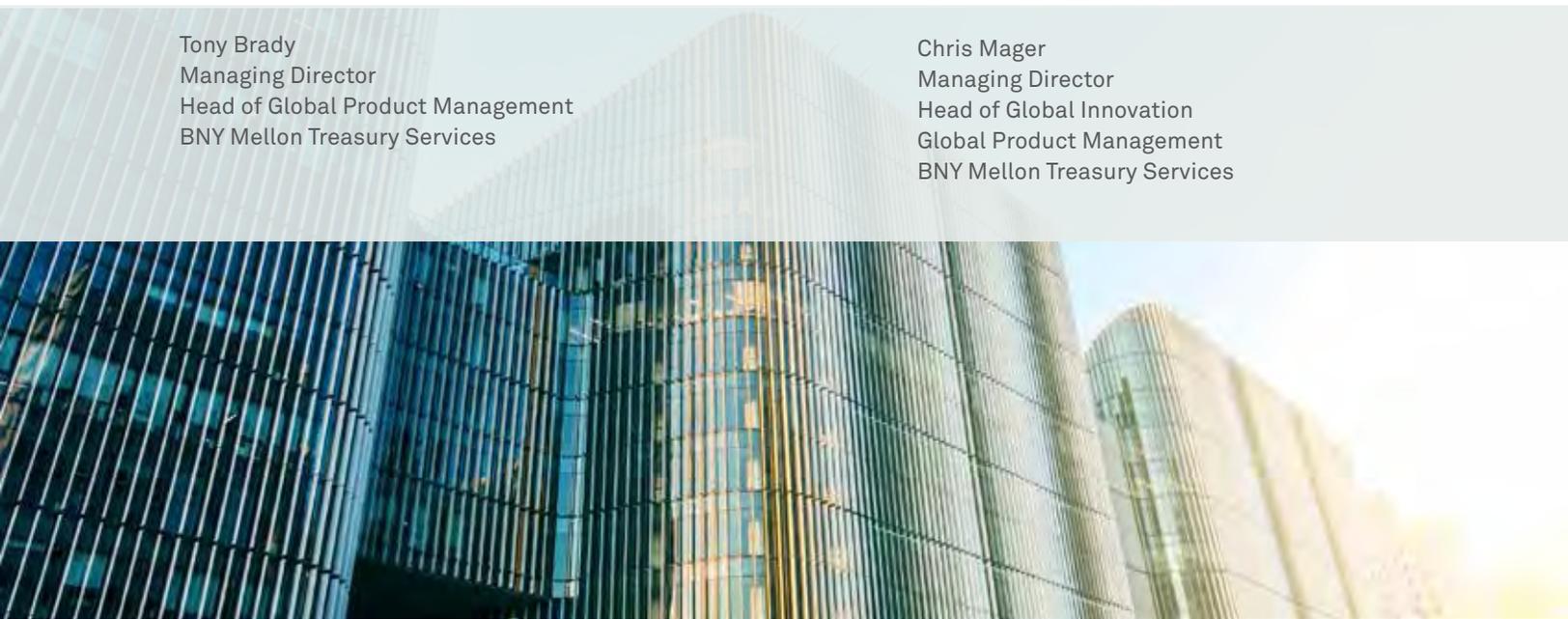
Herein you will find coverage of each of these approaches, along with BNY Mellon Treasury Services' position on which avenues we believe may make the most sense for us and for our clients as we seek to provide a better payments experience. Throughout, we will also provide you with a round robin of perspectives, gathered from a range of BNY Mellon's own senior leadership as well as respected industry experts, and share with you insights from our previously referenced client survey. And, because it too cannot be ignored, we will take a quick look at "blockchain" technology and how it factors into the transformation in progress.

As we consider the alternatives, we are all focusing on the same question. How will our clients be best served? That will drive the ultimate decision. While we welcome all innovators, banks have to be relentless in striving to create the positive experience we want for our clients and that they are seeking.

Read on to learn more about the brave new world we face in the payments industry. It is one where we all—banks, Fintechs and industry groups—have a vested interest in learning about in order to survive and thrive. Banks cannot become lax, thinking we can control the pace of change. As an industry, we need to stay focused on where we all intuitively know technology is taking us, by modernizing the payments ecosystem and striving to deliver the improvements we know clients want. Our future depends on it. *The time to act is now.*



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# Section 1:

## Payments...Interrupted

As outlined in the Introduction, today's banks face unprecedented pressure to improve the payments experience we deliver to our clients. The need for change is apparent both in the U.S. domestic payments arena (where the last significant improvement was the introduction of ACH in the 1970s) and, most definitely, in the cross-border payments ecosystem where financial institutions conduct transactions on behalf of other banks that lack the local presence needed to act independently.

Both systems have functioned reliably for many years. So some bankers may wonder why there is a need to dedicate time and resources to evolving our time-tested processes. Herein, we will look at a few of the most impactful drivers of change. Combined, these numerous market forces as shown in **Figure 1** have combined with traditional challenges to make continued inertia in both the domestic and global payments arenas an unacceptable proposition for banks that want to remain viable.

### Market Forces...



### Traditional Challenges...



**FIGURE 1:** Growing pressures on an imperfect payments system drive innovation.

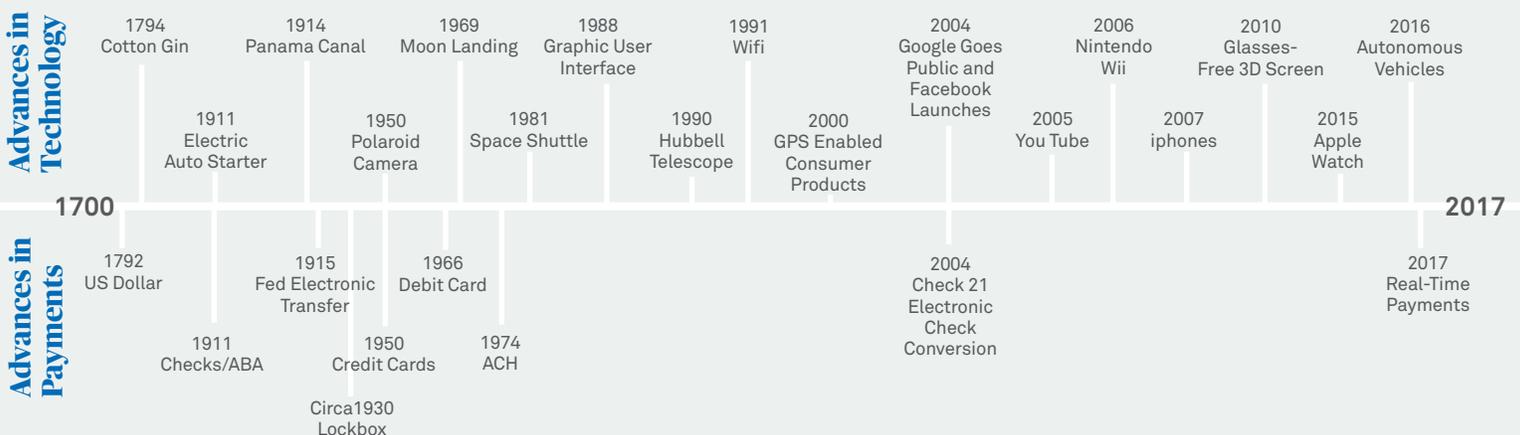
## DRIVERS OF CHANGE IN THE PAYMENTS SPACE

- A New Generation of Clients with an Appetite for a Digital Experience**

The torch is rapidly passing between the baby boomers, who designed and now operate the current payments system and a new generation of tech-savvy millennials who are beginning to take on more senior positions in the workplace. The emergence of these digital-oriented payments professionals in banking and in corporate treasury departments (as well as in their own downstream

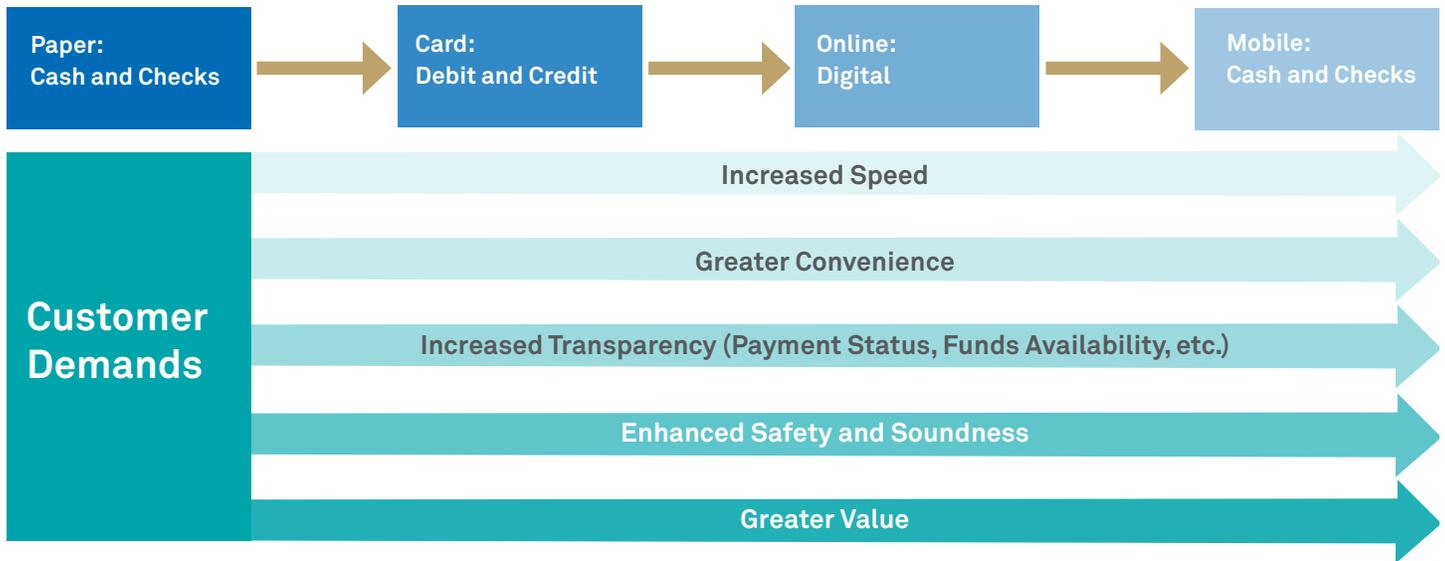
client bases) has brought new expectations to the payments industry.

In their personal lives, these emerging leaders are accustomed to enjoying the immediacy of transactions that can be made anytime and anywhere via a variety of mobile devices. When they come to work, they wonder why their professional experience does not mirror the one that they enjoy as consumers. **Figure 2** shows how the payments space has lagged in comparison to other industries where technology has paved the way to a better user experience.



**FIGURE 2:** Advances in consumer technology have outpaced improvements in the payments industry.

As depicted in **Figure 3**, fast, anywhere, easy-to-execute, information-rich, secure transactions are what clients want their banks to support at home and in the office, at a reasonable cost. And, if their banks do not deliver, they are open to looking elsewhere for solutions.



**FIGURE 3:** Client demands of payment providers are evolving.

Source: The Clearing House U.S. Real-Time Payments Business Playbook, November 2015

- **Weaknesses within Existing Payment Rails**

As previously mentioned, in the **U.S. domestic payments** space, little innovation has occurred since the 1970s when ACH was first introduced. Since then, the solution has become widely employed and has certainly offered significant advantages in terms of speed and convenience over the use of paper checks. However, with the ongoing emergence of perceived real-time payment alternatives in the consumer space, the speed of ACH is no longer considered sufficient by many. Currently, ACH credits settle in one to two business days and ACH debits settle on the next business day. For some, that is just not fast enough. *(See page 13 for information about how this is about to change).*

On the cross-border payments front, the correspondent banking system has likewise been fraught with issues that detract from an optimal client experience. These include:

- **Cost:** From the end-to-end customer perspective, fees can be relatively high.
- **Unpredictable Timing:** Cross-border payments may occur same day but can take up to four days to complete.

- **Lack of Transparency:** Generally, banks in the network cannot provide clients with real-time and precise information about payment status, including updates on when funds reach beneficiaries and the exact costs involved in end-to-end execution. Likewise, there is inconsistency in banks' ability to carry all appropriate information on the parties to a transaction along with the funds.

- **Intensified Competition from Fintechs**

Together, the prolonged absence of innovation in both U.S. domestic and cross-border payments and weaknesses in existing payment rails have opened the door to a new breed of competitors in the form of financial technology companies (aka Fintechs). Fintechs are a widely varied group (there are literally hundreds of them, ranging from garage-based entrepreneurs to more well-established companies such as the much talked-about Ripple). By no means do they all focus on the payments space. However, many are targeting niche banking applications and scores are intrigued by payments—and specifically correspondent banking—for the very reasons outlined on the previous pages. For these Fintechs, this is the ideal hunting ground.

While banks have been distracted from innovation in the payments space, many Fintechs are singularly focused on using their creativity and well-honed technical skills to streamline and accelerate payments—to try to bring the digitized consumer experience to the world of cross-border payments. To date, new payment rails such as blockchain have yet to find commercial use. But some Fintechs have already deployed commercial solutions that rely on existing payment rails to improve the client experience. Over time, in theory, many of their offerings could outperform the existing system by providing clients with a real-time, user-friendly, less expensive and more transparent experience. These improvements are appealing to clients of cross-border payments—and it has been unsettling to banks.

*More about Fintech's potential to unseat banks is explored beginning on page 22.*

- **An Erosion of Client Trust Driven by the Financial Crisis of 2008**

Finally, the 2008 financial crisis in the U.S. was truly a wake-up call for banks and their clients in a number of ways. One of its consequences was that it caused clients to begin to question how well their providers were serving them. As a result, clients and regulators began to consider working with non-bank providers to access traditional bank services. While banks are still very much trusted with most of the world's capital, the crisis

certainly opened the door to more competition from those outside of the industry.

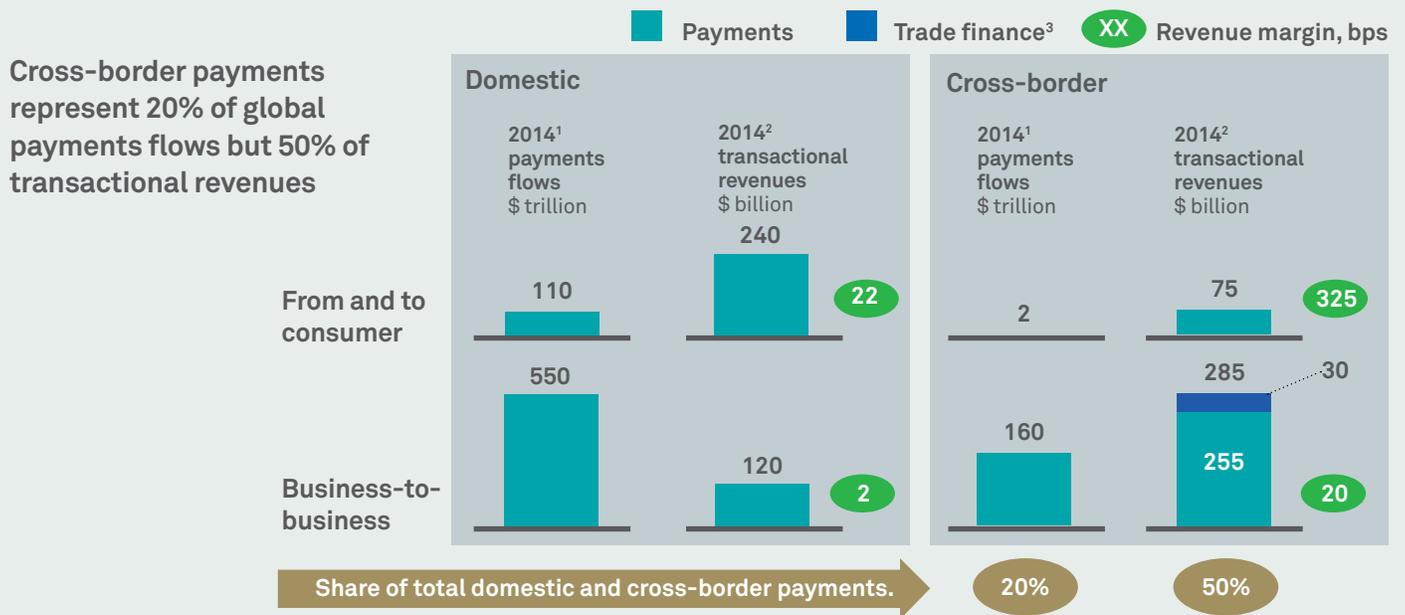
## IMPEDIMENTS TO BANK INNOVATION

Clearly, there are many sound reasons for banks to innovate in the payments space. And, both clients and banks realize it is time for a change. So why have banks been slow to advance their solution sets? There are a few good reasons.

- **Revenue at Risk**

Financial impacts are an important consideration when evaluating the opportunity to innovate. According to McKinsey in its report titled, *McKinsey on Payments* (June 2016), the company's 2015 Global Payments Map revealed that cross-border payment transactions represent 20 percent of total transaction volumes in the payments industry, yet they generate 50 percent of its transaction-related revenues. See **Figure 4**.

Today, correspondent banking offers healthy margins that banks are reluctant to tamper with. They realize that disruption of the scope that would be needed to effect the extensive change necessary to fulfill client expectations would likely lead to reduced earnings, at least in the short term. Developing a business case to justify change is difficult in view of potential financial impacts. Ironically though, this is one of the primary reasons this space is attractive to Fintechs—a profit pool to attack.



**FIGURE 4:** Growing pressures on an imperfect payments system challenge banks to innovate.

Source: McKinsey Global Payments Map, McKinsey on Payments, June 2016. <sup>1</sup>Excluding flows between banks. <sup>2</sup>Includes transaction fees, float income and FX fees; excludes revenues not directly linked to individual transactions, mostly maintenance fees, net interest income, and incident fees related to cards. <sup>3</sup>Includes fee revenue from documentary business but not revenues from trade-related financing.

- **Complexity of the Existing Global Payment System**

Another reason contributing to bank reticence is that, today, thousands of correspondent banks collaborate to process payments globally. To do this, they employ a wide range of proprietary and diverse technology. The expense and collaboration needed to effect coordinated change while maintaining the ability to participate in the network would be significant, expensive and time consuming. And any effort of this magnitude would need to be carefully synchronized among banks and controlled to safeguard the level of privacy, resiliency and security that banks are obligated to provide in moving money and information for our clients.

That's a tall order when many players in the industry are encumbered by unwieldy legacy IT systems festooned with applications grafted on as needs have changed over time. Add to that the tendency for various business and support units to operate within "silos"—a situation made worse because of multiple acquisitions over the years. Taken together, the result is a condition that some have described as "too complex to change."

- **A Proliferation of Regulations Driven by the Financial Crisis**

Unfortunately, at the same time the 2008 financial crisis was driving clients to question status quo in terms of their experience, the event also resulted in the need for banks to address a new patchwork of regulations and risk mitigation requirements. Following the terrorist attacks of 9/11, requirements imposed by the likes of FATF (the Financial Action Task Force), OFAC (the U.S. Treasury's Office of Foreign Assets Control), KYC (Know Your Customer), FCPA (the US Foreign Corrupt Practices Act) and MiFID 2 (the EU directive on markets in financial instruments) were already requiring banks to make significant, yet much needed, investments in areas other than new product innovation. And, following the crisis, new forces such as Dodd Frank, the Volker Rule and a plethora of other protective measures further consumed already scarce resources.

The effects were not just felt in the U.S. Although the impetus for more regulatory reporting began in the U.S., its repercussions extended well beyond American borders. Today, similar legislation has been enacted on a global level. Thus, bankers everywhere now face many of the same challenges.

While necessary and important to shore up the financial system, these significant new and globally pervasive mandates also served to further distract banks from the need to begin to evolve the payments system to address higher customer expectations. Resources that might once have been dedicated to innovation have been necessarily reallocated to compliance, risk, audit and legal support areas where they aim to head off potential issues. Innovation has been placed on the back burner by many banks.

Revenue retention. Complexity. Regulatory obligations. Facing these factors, banks have not rushed to reinvent a process that, while imperfect, does offer important advantages in that it is ubiquitous, global, currency agnostic, and secure. Unfortunately, that's no longer enough.

The bottom line is that, collectively, banks know that it is no longer feasible to rely on increased interest rates and to focus on meeting regulations. We are being driven to turn our attention to providing a better client experience if we are to remain relevant. And we need to find time to do this among myriad other distractions including those previously described along with others such as working to deter increasingly menacing cyberattacks and to better support the ongoing globalization of manufacturing and trade flows.

But how can we best do this? As we consider how to deal with our new operating environment, should banks be focusing on collaboration, competition or coexistence with our new competitors? In the next section, we will explore these potential paths to payment modernization.

"Inertia is no longer an option in the face of today's fast and wide-reaching change. While uncertainty remains with regard to exactly how the transaction landscape will unfold in the next five to 10 years, the future of payments— involving faster, more transparent transactions—is quickly approaching, and banks need to maintain their authority in this new paradigm."

– **Dominic Broom, Global Head of Trade Sales, BNY Mellon Treasury Services**



## Section 2:

### Compete / Collaborate / Coexist?

#### How Banks Are Working to Modernize Payments Processing

For the reasons outlined in the previous section, many banks are focusing on payments modernization to retain a position of leadership in the payments industry. We understand that we must help our clients address numerous pain points that will support their desire for:

- **Enhanced interactions with us**
- **Improved timeliness**
- **Increased transparency**
- **Reduced end-to-end cost**
- **Help in mitigating payment system risk**
- **Advanced tools for managing payee information.**

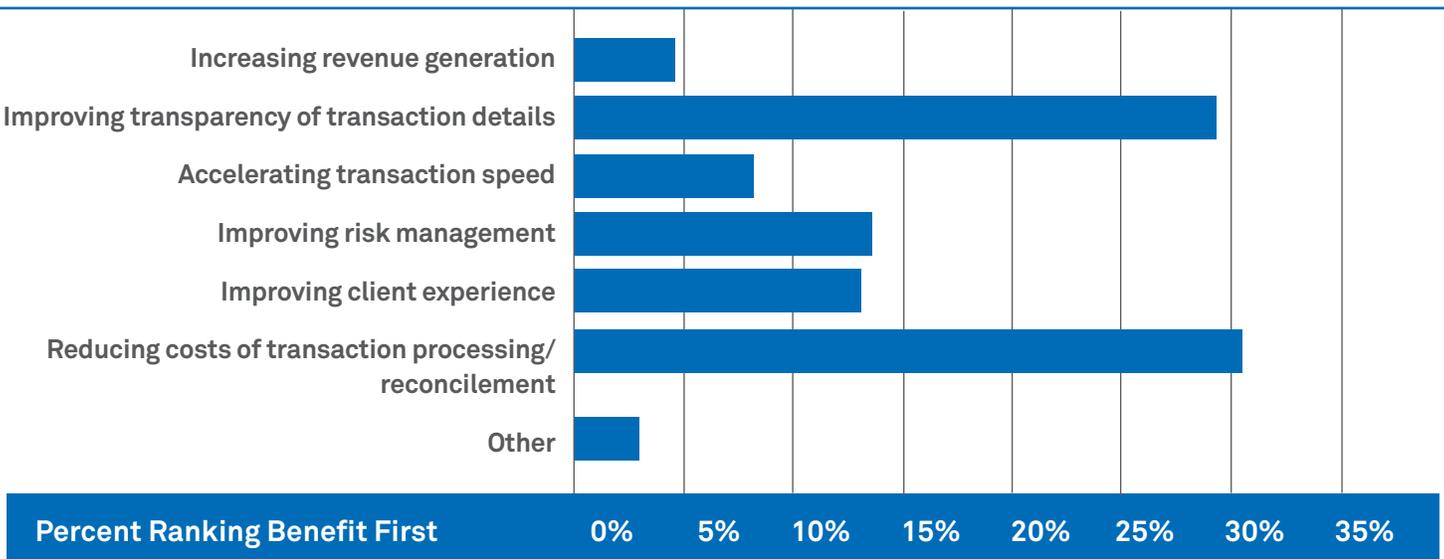
The objectives are clear. How to best pursue them is the question.

Banks are exploring several paths in this regard—some taking action individually to enhance their existing capabilities and launch new products; others working in collaboration with one another through leading industry groups such as SWIFT and The Clearing House (TCH); and still others teaming with Fintechs—the very organizations that have, of late, been challenging bank dominance in the payments space.

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**In our 2016 client survey, BNY Mellon Treasury Services asked bank clients, “If you had to choose just one, what is the single most important benefit of employing emerging technology to improve payment/trade processing for your institution?” Of the 120 senior bank executives who responded, the majority identified cost reduction and improving transaction transparency as the two most significant potential benefits they would seek. Additional responses are ranked below.**

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Each approach is unique in terms of its challenges and benefits. Each may also, to an extent, compete with the other paths when banks decide which initiative(s) they will ultimately pursue. However, when stitched together, these diverse components appear to hold promise to help banks deliver the kind of global payment experience clients are seeking.

Together or individually, however, for any transformational improvements to take hold, three key markers for success are essential, regardless of the approach taken:

1. **NETWORK EFFECT**—A critical mass of payment system players must be involved to drive both sufficient scale and acceptance.
2. **STANDARDS**—Uniformity will be necessary to create opportunities for payment system provider interoperability and network effect.
3. **REGULATORY ENGAGEMENT**—Regulators will need to actively participate in and get comfortable with any changes, improvements or new business models payment system providers are planning. Among other things, they will be evaluating implications for payment system security, liquidity, ubiquity, scalability, and transparency.

On the following pages, we will look at a few of the efforts underway both in the U.S. domestic payments space and in the correspondent banking industry, exploring how they differ in terms of approach, and the unique and shared benefits that they may offer to banks and our clients.

## COMPETING: Enhancing Existing Payment Solutions

Numerous banks are seeking to implement improvements within their existing solution sets, including by teaming with organizations that aim to help accelerate payment processes, and address other key pain points identified by their clients. By enhancing their current payment solutions, banks hope to be able to better compete with each other and head off new market entrants like Fintechs.

## Solution: Digital Payments Network

Many banks are now engaging with digital payment companies in an effort to enhance their solutions, including introducing new tools for vendor/consumer payment enablement to advance paper to electronics migration. Case in point: BNY Mellon and several other banks are working with the digital payments company Early Warning® to automate business-to-consumer (B2C) payments without requiring their business customers to store and maintain consumer banking information (e.g., transit routing and account numbers). Banks can offer this solution to their business clients who need to make payments to consumers who hold U.S. bank accounts.

Among the issues that the solution addresses are:

- Expense for printing/ mailing checks, tracking outstandings and fulfilling escheatment requirements.
- Lack of transparency into when funds are received.
- Managing high volumes of customer service inquiries.
- Lower consumer satisfaction rates due to the preceding issues.
- Inability to easily and securely gather and store payees' bank account information.

For these reasons, banks, including BNY Mellon, are using Early Warning's clearXchange<sup>SM</sup> network – a digital payments company formed in 2011 by some of the largest retail banks in the U.S. (Note that, at BNY Mellon, the solution will be available in early 2017).

*As of the date of publication of this paper, the banks that make up the clearXchange network collectively handle more than 59 percent of the ACH volume in the industry and serve more than 50 percent of the current online mobile banking population. While this does not yet constitute a ubiquitous network, the solution already has great reach with nearly 25 million registered consumers.*

## HOW THE SOLUTION WORKS

clearXchange provides quick access to databases of e-mail addresses/mobile phone numbers (aka “tokens”) of registered consumers and enables a real-time messaging capability between its network banks. Their solution has a similar look and feel to some non-bank payment providers’ systems, such as PayPal®, Venmo (a service of PayPal, Inc.), and Dwolla—all of which facilitate P2P payments.

Using the tokens in its database, clearXchange acts as a real-time messaging platform to connect financial institutions. The solution relies on the existing ACH network to help those financial institutions assist their business customers in easily, economically and securely distributing funds to U.S. consumers who hold bank accounts domiciled at any U.S. financial institution.

## POTENTIAL BENEFITS AND USE CASES

By transitioning paper payments to ACH without collecting and storing consumer banking information, the solution:

- Provides next-business-day funds availability which can be further expedited, if needed.
- Mitigates check fraud and eases security concerns.
- Leverages the ACH network; no change to normal settlement and reconciliation processes is required.
- Provides faster consumer notification when funds are disbursed.
- Enhances client satisfaction.
- Reduces escheatment costs.

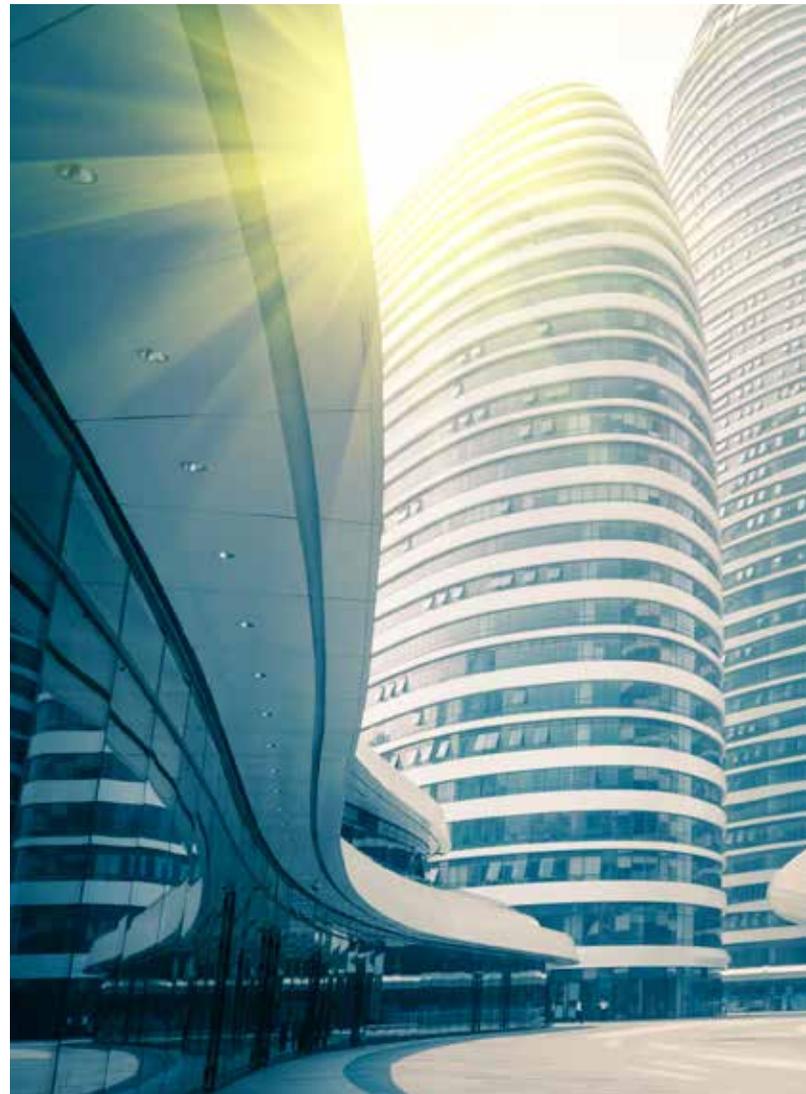
Example use cases for this digital payments network include insurance claims, account refunds, rebates and human resources reimbursements.

## POTENTIAL FOR SUCCESS

clearXchange addresses the three criteria that BNY Mellon believes are necessary for success.

- **Network effect** – The substantial group of large retail banks that Early Warning has enlisted to participate is anticipated to provide sufficient critical mass of transaction originators and receivers.
- **Standards** – Early Warning has established transaction standards that all participants will abide by, promoting complete interoperability.
- **Regulatory engagement** – Regulators have been involved in the development of the service.

This is just one example of how banks are working to enhance current solutions by working with digital payments companies to head off the competition.



## COLLABORATING WITHIN OUR INDUSTRY: How Banks are Working Together to Modernize Payments

BNY Mellon believes that great momentum toward payments modernization can be achieved through proactive collaboration among the banking community. In summary, banks will be best served by moving from a network working model—past coordination, past cooperation—to true collaboration. Only in this way will we be able to drive true transformative innovation and enhance collective capabilities. Efforts to work with one another under the auspices of established industry organizations are already resulting in initiatives such as those discussed on the following pages in the U.S. payments space.

### Solution: Same-day ACH

Being developed by NACHA, the Same-day ACH initiative is designed for businesses and consumers seeking expedited payments.

### HOW THE SOLUTION WORKS

Historically, ACH credits settle in one to two business days and ACH debits settle on the next business day. Focused on USD domestic payments, Same-day ACH allows the same-day settlement of certain ACH transactions, including receiving and originating transactions, should this be desirable over next-day/future-dated settlement. Clients have the option to send transactions using new network functionality without affecting existing ACH schedules and capabilities. By offering easy and convenient ways to determine which transactions to originate via same-day settlement or next-day/future settlement, the service allows clients to select between the offerings by so indicating on the origination files sent to their ACH providers. In order for transactions to be settled same-day, clients will need to deliver their origination files within predetermined time windows.

All Standard Entry Class (SEC) codes will eventually be allowed for same-day settlement except for International ACH Transactions (IATs), so payments to businesses and consumers, tax payments, check conversions, returns and pre-notes can all be made via same-day settlement after implementation. Importantly, Same-day ACH requires the originating party to know the banking information of their counterparty, so ACH works best when this information is known or can be securely collected and stored.

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**Banks will be best served by moving from a network working model—past coordination, past cooperation—to true collaboration. Only in this way will we be able to drive true transformative innovation and enhance collective capabilities.**

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### POTENTIAL BENEFITS AND USE CASES

In addition to providing for faster processing of business and consumer transactions, same-day settlement of ACH transactions creates many opportunities for both constituencies, in that they:

- Are more cost effective than wire transfers.
- Provide a contingency payment method for missed or other urgent payments.
- Accelerate returns processing, notifications of change and pre-notes within the network.
- Reduce credit risk within the ACH network and between business partners.
- Accelerate receivables.
- Increase speed of sharing transaction-related information.

Common use cases expected for Same-day ACH include:

- Late or immediately due payments between business partners or for bill collection.
- Converting checks to ACH debits on a same-day basis (in phase 2—see next page).
- Payroll for hourly workers or emergency payroll payments.
- Other urgent disbursements to consumers and businesses.
- Trading partner payments.

Currently, plans are for the solution to be implemented in three phases to ease operational changes across the industry and allow users to adapt to the new environment, one transaction set at a time.



## POTENTIAL FOR SUCCESS

Same-day ACH addresses all three of the criteria BNY Mellon believes are necessary for success.

- **Network effect** – The entire ACH network of thousands of banks is being leveraged.
- **Standards** – NACHA tightly controls ACH transaction standards to support complete interoperability and straight-through processing.
- **Regulatory engagement** – Regulators have been involved in the development of the service.

## Solution: U.S. Real-Time Payments

Designed to support the needs of businesses, consumers and the government, this initiative aims to create a ubiquitous real-time payment system for the U.S.

## HOW THE SOLUTION WORKS

Today's U.S. legacy payment systems such as check, wire and ACH need increased speed, transparency, convenience, security and added value in order to meet competitive pressures. Several factors are driving change:

- Increasingly, Fintechs and other non-bank providers are offering perceived real-time payment transfers between persons, commonly referred to as P2P transactions. While PayPal is best known, there are many others including Venmo and Dwolla. While P2P transfers appear to occur in real time, these systems continue to ride the same settlement rails that banks use, most commonly, the ACH.
- As shown in **Figure 5**, a growing number of countries are operating domestic real-time payment systems, each with their own unique features and functionality. The United Kingdom, Denmark, Chile, Mexico, India, and many other countries have real-time payment systems that can settle around the clock in just seconds. As this trend continues, banks will need to prepare for the day when these systems open the door to cross-border payment.
- Emerging markets have used new technology to leapfrog the U.S. and other developed countries in regard to their payments platforms.

These factors make it critical for U.S. financial institutions to take action to improve their payments offerings, not only to increase user satisfaction, but also to keep pace with the global market.





**FIGURE 5:** Many countries have built and operate domestic real-time payment systems.

Source: The Clearing House U.S. Real-Time Payments Business Playbook, November 2015

The Clearing House (TCH) is leading development of real-time payments in the U.S. Owned by 24 U.S. financial institutions, including BNY Mellon, TCH has served as the cornerstone of the U.S. payments industry since 1853. For their 300 member banks, the organization oversees CHIPS (wires), EPN (ACH) and SVPco (image check clearing).

In October 2014, TCH announced a multi-year initiative to build a ubiquitous real-time payment system for the U.S. Subsequently, TCH contracted with Vocalink, a software vendor experienced in assisting other countries, including the U.K., with similar projects. The new U.S. system aims to enable consumers and businesses to send and receive payments and messages in real time (within seconds) directly from their accounts at U.S. financial institutions 24/7/365 and to equip banks to compete with non-bank payment providers by providing a safer, more viable alternative for clearing payments.

In addition to the U.S.-focused Real-Time Payments project, similar efforts centered on real-time payments are likewise

taking place around the globe. TCH and other organizations have already begun collaborating with representatives from other countries and markets to support interoperability of real-time cross-border payments in the future.

While not yet formally underway, efforts to weave together national real-time payment systems to handle cross-border payments will likely focus on C2B and B2C payments, initially leveraging ISO 20022, which is widely regarded as the new global standard for payments and related messaging. There will be challenges including addressing local regulations, operating rules and requirements specific to each country—which will be crucial if payments are to adapt to the growing needs of businesses and consumers.

### POTENTIAL BENEFITS AND USE CASES

Anticipated advantages associated with Real-Time Payments include:

- Lower costs due to the utilization of more efficient technology.

“Achieving international harmonization and interoperability is easier said than done, with legacy payment systems and the specifications of global and local regulatory requirements forming significant obstacles. It is hoped that, with the incorporation of ISO 20022, there is scope for the banking community to work towards a fully harmonized global payment system.”

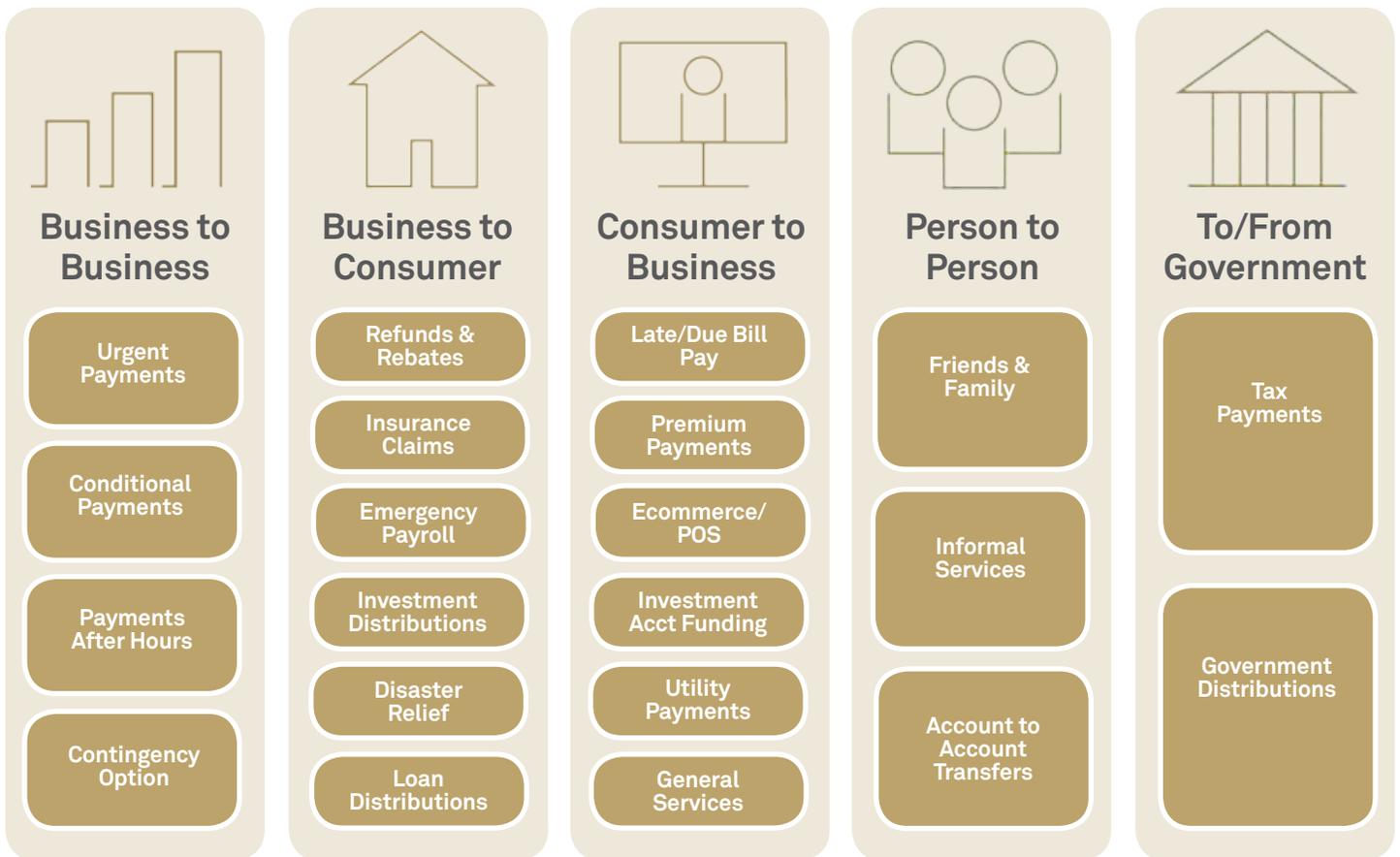
**– Ed Esch, Managing Director and Head of USD Clearing Product Management, BNY Mellon Treasury Services**



- Improved cost-effectiveness compared to USD wires.
- Increased speed, transparency and accessibility when compared to ACH, check or card.
- Better transparency supported by immediate confirmation of payment and notification of receipt.
- The ability to use alias and tokenized accounts to enhance security and reduce risk around managing beneficiary banking information.
- Improved capability to send enhanced invoice and remittance data with transactions, facilitating cash application and reconciliation.
- Reduced reliance on paper bills and check payments by offering billers electronic “request for payment” transactions that consumers can respond to with a real-time payment.

As depicted in **Figure 6**, anywhere there is a need for immediacy, finality, robust messaging or after-hours processing, Real-Time Payments has promise to provide added value and efficiency to users throughout the payment chain. B2B, B2C, C2B, P2P and government payments will all be supported.

Currently, the U.S.-focused concept is in the development stage. Testing with TCH and select banks is anticipated toward the end of 2016. Once finalized, this will be the first new U.S. payment rail since ACH was introduced in 1974. The goal is to launch in 2017. Thereafter, its success will hinge on bank readiness to achieve network effect. TCH is working with all owner banks and with third-party software firms that provide banking platforms for small to mid-size financial institutions to promote maximum adoption scale and timing.



**FIGURE 6:** Real-Time Payments has broad applicability across the payments spectrum

## POTENTIAL FOR SUCCESS

Real-Time Payments addresses the three criteria BNY Mellon believes are necessary for success.

- **Network effect** – Real-Time Payments is leveraging the significant TCH owners and financial institution participants for rollout, and is backed by TCH's significant efforts to achieve ubiquity. The initiative has

also been acknowledged by the Fed's Faster Payment Taskforce for achieving the objectives of that initiative.

- **Standards** – TCH has invested significant effort to put in place collaborative Real-Time Payment standards to foster efficient and broad adoption.
- **Regulatory engagement** – TCH has appropriate regulatory oversight and enjoys regulatory support for Real-Time Payments development.



“In the future, payments will be substantially interactive transactions that will be easy to originate, provide a confirmation that the receiver got the payment, be fully authenticated for appropriate receivers, and acknowledged in real time. Parameters associated with the execution to satisfy specific local requirements will be identified as clients execute their transactions. As improvements become available, clients will need to consider how to leverage these new interactive tools.”

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



# EXPERT PERSPECTIVES ON PAYMENTS MODERNIZATION



**Steve Ledford**, Senior Vice President, Product & Strategy, The Clearing House

The Clearing House (TCH) operates industrial-strength payment systems at the center of the banking industry and works with commercial banks to create new capabilities for the next generation of payments with the same safety and soundness principles that have always underpinned our core systems. Here, TCH Senior Vice President Steve Ledford shares with BNY Mellon his perspectives on payments modernization and how the organization is driving progress in this area.

**BNY Mellon:** As the payment industry modernizes, what is TCH's role in the process?

**SL:** TCH will continue to develop and operate core industry utilities to support payments and related services provided by financial institutions. By operating efficient, reliable, secure, high-quality, national interbank services, we provide a platform for innovation by financial institutions in a highly competitive market.

TCH currently operates the underlying infrastructure for three core U.S. payment systems: ACH, wire transfer and check image clearing. These utilities provide a competitive alternative to Federal Reserve payment services. Financial institutions and their technology partners use these services to offer products such as electronic bill payment, mobile check deposit and high-value U.S. dollar settlement to their customers.

New TCH utilities under development will create an infrastructure for real-time payments (RTP) and related

financial transactions, and for tokenization of sensitive payments data. Like existing utilities, RTP and Secure Token will provide a platform for financial institutions to offer products to their customers. TCH will not offer these services directly to end users. Our role is to provide a common infrastructure to foster innovation and competition among financial institutions.

In addition to our role as an operator of payment utilities, TCH is an advocate for policies that support the ability of banks to be effective providers of financial services. Our approach is to engage with regulators and legislators as a provider of fact-based research, analysis and insights.

**BNY Mellon:** Given the ongoing change in the payments industry, how is TCH positioning for even greater relevance going forward?

**SL:** TCH is launching two major new utilities, RTP and Secure Token. RTP is a new payment system that will provide immediate payment and exchange of extended payments data, as well as support for secure, real-time delivery of electronic bills/invoices, fulfillment data and other ancillary messages. Secure Token provides a comprehensive infrastructure to replace sensitive payment credentials with innocuous tokens, protecting customers in the event of a data breach. Both of these utilities are designed to underpin new digital payments services that are safer, faster and more responsive to the needs of a rapidly evolving market. In the future, TCH will continue to evaluate opportunities to create inter-bank utilities that support the safe, efficient delivery of products by financial institutions.

## The Solution: SWIFT Global Payments Innovation Initiative (gpi)

Designed by SWIFT (The Society for Worldwide Interbank Financial Telecommunication) to help banks in their efforts to facilitate cross-border payments for their business clients, this solution leverages SWIFT’s proven messaging platform and global reach to enable faster, more transparent and traceable global payments.

### HOW THE SOLUTION WORKS

Today, the cross-border payments process is characterized by:

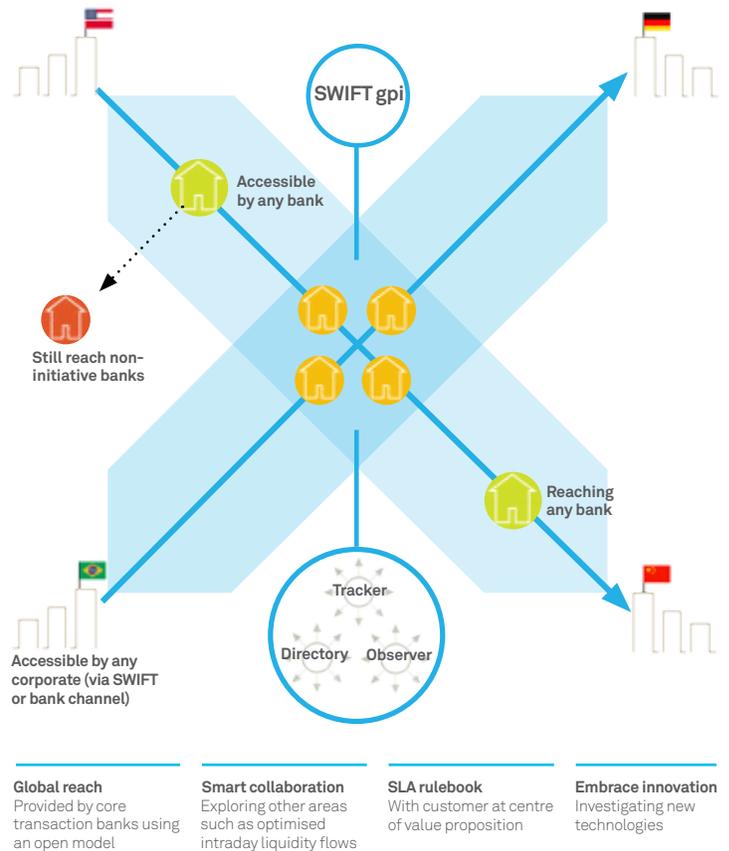
- Lack of consistency in speed of settlement—hours to days depending on location.
- Lack of traceability—transaction status cannot be tracked after payment orders are sent.
- Little predictability on how a payment will settle.
- End-to-end cost for cross-border payments can be high and uncertain in part because transaction standards are not consistently adhered to, driving the need for considerable exception handling.

SWIFT gpi aims to enhance cross-border transactions by leveraging SWIFT’s existing messaging platform and global presence. Working with their member banks, SWIFT will be implementing a new service level agreement (SLA) rulebook, providing banks with an opportunity to offer a higher level of global payment experience to their clients, backed by all gpi-enabled banks. These SLAs tie the gpi participants to a set of standards promoting transparency of fees, improved settlement timing, and data flow.

**Figure 7** shows a high level schematic depicting the reach and functionality of gpi.

At the core of the gpi initiative will be a shared suite of products, including:

- **Tracker**—a payments tracking database “in the cloud,” securely hosted at SWIFT, to give end-to-end visibility on the status of a payment transaction, from the moment it is sent until it is confirmed.
- **Observer**—a global view of gpi banks’ adherence to the gpi SLAs.
- **Directory**—available in a wide variety of formats and access methods from SWIFTRef, the Directory will be a complete listing of the banks that can send and receive gpi payments.



**FIGURE 7: Global reach and functionality of SWIFT gpi**

Source: SWIFT

SWIFT has also worked with its gpi Vision Group to prioritize new product enhancements that hold the potential to transform the cross-border payment experience of both originators and beneficiaries, as well as to enhance the efficiency of participating banks by accelerating transaction settlement, improving data quality, and reducing payment inquiries.

Since inception of the initiative, and under SWIFT’s guidance, more than 73 banks have been involved in the effort to develop the SWIFT gpi solution. The participants include major transaction banks across Europe, Asia Pacific, Africa and the Americas. More banks are joining the initiative ongoing.

## POTENTIAL BENEFITS AND USE CASES

In its first phase, the initiative will focus on business-to-business payments. Designed to help corporates grow their international business, improve supplier relationships, and achieve greater treasury efficiencies, the new service will enable corporates to receive an enhanced payments service directly from their banks, with the following key features:

- Faster, same-day use of funds (within the time zone of the receiving member).
- Transparency of fees.
- End-to-end payments tracking.
- Remittance information transferred unaltered.

Twenty-one banks—including BNY Mellon—signed on to pilot the first phase, which kicked off with testing in July 2016. The expectation is for SWIFT standard charges to be implemented in November 2016 during the standard SWIFT implementation release. Once all testing is completed, “go live” is tentatively expected at the end of the first quarter or beginning of second quarter 2017.

Phase 2 is still being discussed. Currently, some of the potential concepts include cloud-based solutions, rich remittance credit transfer, ideas for domestic clearing, stop payment for fraudulent transactions, STP formatting on a pre-check basis for domestic payments, standard formatting requirements for checks for cross-border payments, standardized interbank billing formats for claims, a tool box for intraday liquidity reporting, a common KYC directory, and more.

## POTENTIAL FOR SUCCESS

SWIFT gpi addresses the three criteria that BNY Mellon believes are necessary for success.

- **Network effect** – SWIFT has assembled a list of the top global transaction banks that process a combined

75 percent of all SWIFT global payment traffic.

Twenty-one of these banks have signed up to pilot the effort. Clearly, a critical mass of banks is already supportive of this effort.

- **Standards** – Thousands of financial institutions abide by the standards SWIFT has helped develop and apply.
- **Regulatory engagement** – SWIFT is experienced in working with regulatory bodies, and importantly, enjoys significant credibility with global regulators.

With this in mind, SWIFT is ideally positioned to bring about real world change for cross-border payments. Find out more about the initiative as it progresses at [swift.com/gpi](http://swift.com/gpi).

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**“From the go live of the service, participant banks will quickly realise cost savings thanks to the efficiencies found from enhancing the speed and traceability of cross-border payments. Moving forward, additional savings will result from enhanced compliance practices, optimized intraday liquidity flows and increased payments straight through processing.”**

**– Wim Raymaekers, Head of Bank Marketing, SWIFT**

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“The prospect of implementing a system that facilitates real-time cross-border payments is ambitious, but we must set our sights on achieving such goals as the technology to implement these capabilities develops and becomes available. If the capabilities are there, both banks and regulators need to be on board, in order to convert possibilities into reality.”

**–Michael Bellacosa, Managing Director and Head of Global Payments, BNY Mellon Treasury Services**



## EXPERT PERSPECTIVES ON PAYMENTS MODERNIZATION



**Wim Raymaekers**, Head of Bank Marketing, SWIFT

SWIFT is a global member-owned cooperative and the world's leading provider of secure financial messaging services. The dynamic organization combines the creativity of its member banks, and is committed to pursuing a range of improvements aimed at eliminating many of the common issues corporates report to their banks when completing cross-border payments. The organization provides frequent updates on [www.swift.com](http://www.swift.com). Here, Wim Raymaekers, Head of Banking Marketing, provides insights into where the organization sees opportunities for payments modernization.

**BNY Mellon:** As the payment industry modernizes, what is SWIFT's role in the process?

**WR:** The emergence of new technologies, business practices and regulations poses challenges as well as opportunities to all sectors, including and in particular, to the financial industry. New technology innovations have the potential to radically change existing business models and shift consumer expectations. Companies that fail to innovate risk being left behind.

SWIFT is a good example of a company that has, together with its community of members, embraced the opportunities from innovation over the past 40 years. With its very inception itself, the banking community disrupted the prevalent technology of that time, relegating the telex to the history books, and with standards brought a level of automation up till then unseen in correspondent banking. And SWIFT has continued to modernise the payments industry ever since, moving from BSC to X.25 to IP, adopting PKI and ISO 20022, to developing peer-to-peer messaging services.

SWIFT "did" Fintech before the term became fashionable. But SWIFT is more than a technology company. It is also a community, embracing tens of thousands of members—financial technology companies themselves—in over 220 countries. As a cooperative, SWIFT also plays, unlike any other commercial company, a dynamic and federating role in evolving the understanding and adoption of technology in the financial industry. Programmes such as SWIFT Innotribe,

the SWIFT Institute and the SWIFT Labs demonstrate the importance SWIFT places on research and innovation within the industry. For example, the SWIFT Institute has awarded 30 research grants and published 17 academic papers since April 2012 and the Innotribe StartUp Challenge, running since 2011, has engaged more than 650 Fintech startups to allow the financial community to stay abreast of the latest innovation activity. The SWIFT Labs provide a "playground" to collaboratively experiment, learn and share—like for example, the recently published SWIFT/Accenture paper on distributed ledger technologies.

**BNY Mellon:** How is SWIFT positioning itself for even greater relevance in the payments industry going forward?

**WR:** As a global provider of secure financial messaging services as well as a facilitator of standardisation and automation, SWIFT is an integral part of the fabric of the payments industry. We can very broadly distinguish three domains of SWIFT's engagement: the corporate-to-bank space, the cross-border bank-to-bank space—also known as correspondent banking, and the domestic market infrastructure space.

Specifically in cross-border payments, SWIFT launched in December 2015, together with our community of banks, the global payments innovation initiative (gpi). (See page 19 of this paper for details). This initiative is a real game-changer, for four key reasons:

- **Reach:** Since its launch, the gpi has become "relevant" as 72 global banks signed up, representing 75 percent of all cross-border payments on the SWIFT network and effecting payments in over 220 countries;
- **Adoption:** Over 20 of those banks already started to enhance their systems and test together in a pilot, to show early results at Sibos in September 2016, and with an additional number of banks planning to go live in early 2017;

- **Innovation:** To enable the end-to-end tracking of payments, SWIFT has added a new, unique end-to-end transaction reference as global identifier in the header of its payment message that banks will include from the moment a payment is sent, across multiple banks, until it is confirmed, so that multiple payment “hops” will be captured as one transaction in a database “in the cloud” hosted at SWIFT—similar to the parcel tracking service provided by international shipping companies; and
- **Vision:** In addition to this first phase, over 40 banks participated in a series of workshops held in Frankfurt, Singapore, London and New York in April and May 2016, and defined a new vision for correspondent banking dubbed “the digital transformation of cross-border payments,” a supporting client-centric and pragmatic roadmap, was established to deliver an additional set of data-enhanced payments services, creating more value for customers as well as further reducing operating costs for banks.

For these four key reasons, the gpi will make SWIFT even more relevant for cross-border payments, and more importantly, make banks more relevant in this fast evolving landscape, by proactively responding to evolving customer needs for a better global payments experience.

## TEAMING WITH DISRUPTORS: How Banks are Collaborating with Fintechs

Collaboration between banks is thriving thanks to the industry-wide initiatives described on the previous pages. But many banks believe that those collective efforts alone may not be enough to secure our long-term success in the payments industry. They believe that we would be missing an opportunity were we not to at least consider possible solutions outside of our own ranks to modernize our suite of payment solutions. Where better to look than our potential competitors—the Fintechs? The time seems right.

Only a couple years ago, it looked like a major shift in power could be nearing in the payments industry as Fintechs poised for rapid entry, if not dominance. But that’s beginning to change. As the newcomers dipped their toes into the complex waters of cross-border payment processing, they found the same patchwork of regulatory and other checkpoints that banks face would impede their trajectory.

For this reason, to date, Fintechs have yet to launch the “killer app” that possesses the required scale, ubiquity and acceptance from regulatory and risk perspectives. And, banks and Fintechs have gained some breathing room to get to know one another and assess potential ways we might work together.

“Fintegration” is the new term being used to describe the opportunity for collaboration—to summarize the effort to leverage the combined strengths of banks and Fintechs to create better solutions for our clients.

“Emergence of Fintech will play a crucial role in enabling digitization. Fintechs challenge traditional models and large financial institutions with their niche technology and nimble operating models making them the right candidates to disrupt existing players. Large organizations would have to adapt and establish a symbiotic ecosystem. Regulations would play a crucial role in this particular model and there will need to be a healthy balance and collaboration between the Fintechs and financial institutions. Financial institutions will invest in Fintechs not for returns but to create and establish IP which uniquely positions them in the marketplace.”

**–Saket Sharma, Chief Information Officer, BNY Mellon Treasury Services**





FIGURE 8: It is estimated that about 1,500 Fintechs are pursuing a foothold in payments today.

**“Fintegration” is the new term being used to describe the opportunity for collaboration—to summarize the effort to leverage the combined strengths of banks and Fintechs to create better solutions for clients.**

#### Strengths and Weaknesses Come Together

Banks are one of the most entrenched of incumbent industries. The industry has existed for more than 500 years, dating back to a small bank in Sienna, Italy that is still operating today. Banks have trillions of dollars in assets, and comprise six of the 10 biggest companies in the world. Drawing on their history, banks offer trust, capital, safety, stability, and long-tenured client relationships.

Right now, it is estimated that about 1,500 Fintechs are working to challenge banks, many by entering the payments space. See [Figure 8](#) for some of them. They are, on one hand, creative, generally young, tech savvy, and in touch with the emerging generation. They understand how that generation prefers to interact with payment systems and services. They focus on offering nimble innovation and have the advantage of being unencumbered by the way things have always been done and reliance on well-entrenched legacy systems. But while many of their solutions are good ideas backed by sound technology, they are often in search of a problem to solve, a way to scale solutions, and they need market validation.

As a result, while financial institutions are looking to Fintechs to help them drive internal innovation and evolution, numerous Fintechs are likewise looking to financial institutions for assistance with these issues.

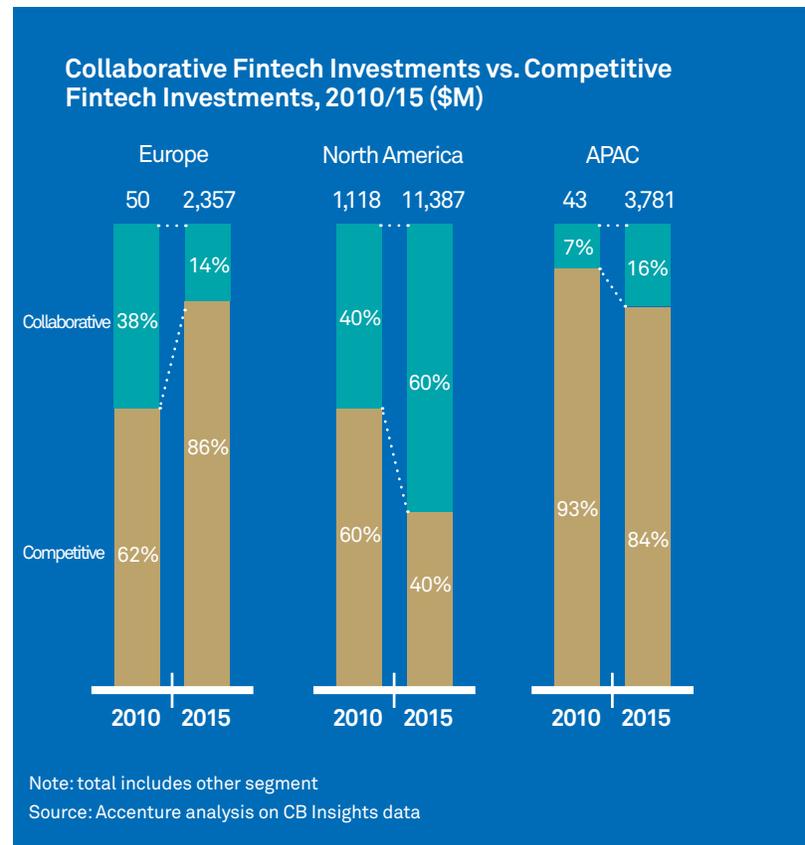
Still, their ranks are mixed in terms of their interest in teaming up with banks. **Figure 9** categorizes them into two types—the competitive group that is directly challenging incumbent financial institutions and the collaborative group that offers solutions to enhance the position of existing players.

**Figure 9** also reveals that:

- In the North America and Asia Pacific regions, there is a shift toward funding collaborative Fintech investments.
- In Europe, on the other hand, there is a trend for Fintechs to compete directly with banks as the regulatory environment (e.g., the PSD 2 directive) is more conducive to competitive disruptive technology. In that region, nearly 90 percent of funding is going to competitive Fintech firms.

At BNY Mellon, we believe that banks and Fintechs have complementary strengths and the opportunity to leverage each other’s capabilities to modernize payments, perhaps more effectively than what is possible if we each acted on our own. Fellow banks seem to agree. It has been estimated that global banks have poured more than \$1B into funding Fintech efforts so far. Based on this, we expect to see a higher level of fintegration for payments going forward.

To explore this potential, BNY regularly engages with Fintechs to understand their solutions, target markets, business models, and what problem(s) these solutions seek to solve. If there are potential overlaps and synergies with the problems we are trying to solve for our clients and within our own technology and operational infrastructure, these discussions will continue to greater depths and possibly even proofs of concept (POC) or



**FIGURE 9:** According to Accenture, 2015 investment in collaborative Fintechs increased 138 percent vs the prior year and represented 44 percent of all Fintechs investments.

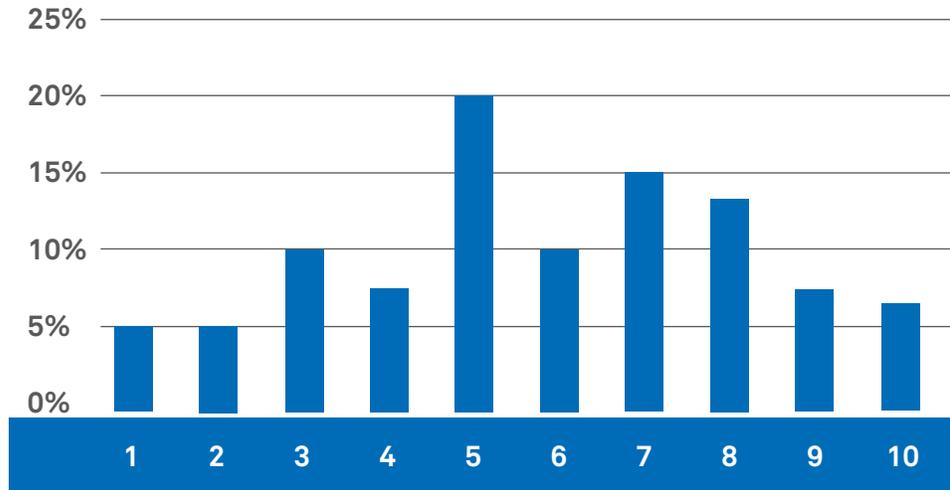
pilots to test the solution in our environment. In one example, our recent POC in collaboration with a Fintech explored the potential for improving our low-value cross-border payment capabilities using distributed ledger technology. While the POC resulted in a decision not to proceed with the solution at this time, the well-structured process provided meaningful learning, hypothesis testing, and validation for both organizations.

“Banks have a long-established role and unrivalled expertise in the requirements of the transaction space. It is our responsibility to guide payments safely into the new era. Teaming up with Fintechs can certainly be an effective approach, helping banks “future proof” their position by plugging into new ideas, gaining access to up-to-the-minute technology developments and, thereby, being better positioned to implement new innovative solutions for our clients.”

**–Dhiru Tanna, Sales Officer, BNY Mellon Treasury Services**



**In BNY Mellon Treasury Services' 2016 bank client survey, nearly one fifth of the 120 respondents rated their understanding of emerging technology (blockchain, distributed ledger, smart contracts, etc.) being developed by the Fintech community and others as a "5" on a scale of 1 to 10, with 10 representing a high level of knowledge.**



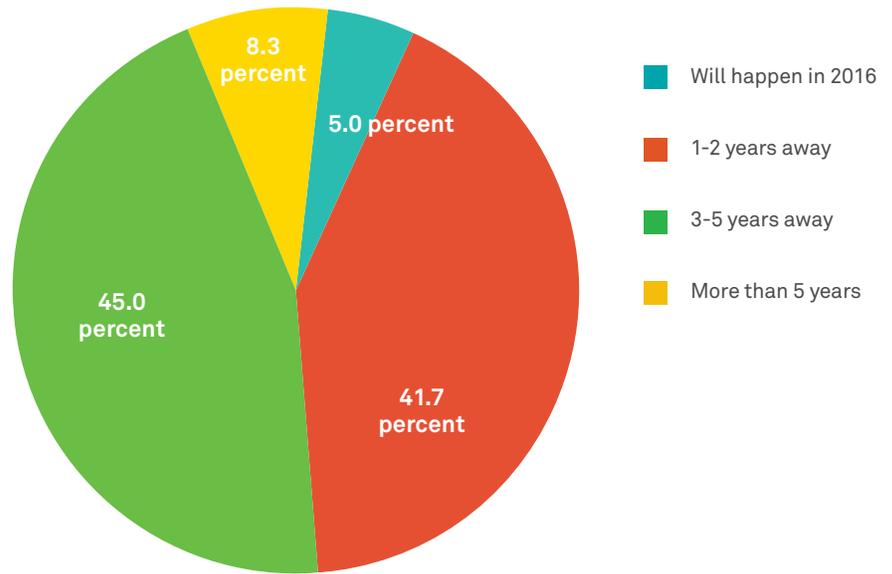
“The potential for Fintechs to radically alter transactions is significant and banks cannot afford to be bystanders if they are to flourish in the evolving technology-driven finance world. Banks should be in the middle of the action, capitalizing on new technology capabilities, breaking down barriers and driving enhancements to the client experience.”

**– Vivek Kohli, Director, Emerging Payment Technology Segment Manager, BNY Mellon Treasury Services**



**In BNY Mellon Treasury Services’ 2016 bank client survey, we asked our clients, “How far away do you think the first meaningful and commercially viable product/use case for emerging technology is?”**

**Of the 120 respondents to the question, nearly half told us that they believe it will take three to five years for this to happen. A slightly smaller number of respondents said it will happen within two years.**



### The Solution: Blockchain

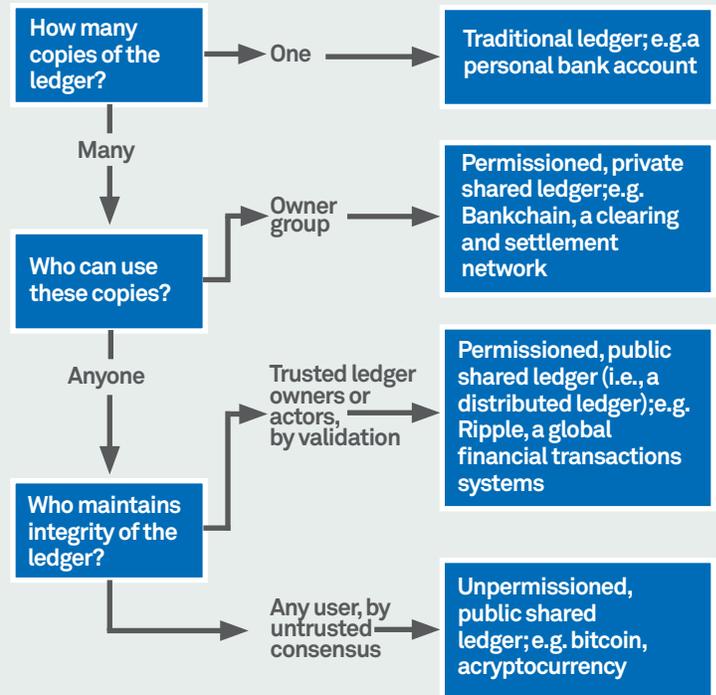
We would be remiss if we didn’t talk a bit about blockchain in this paper as it is one of the hottest topics in financial services modernization today. While not a brand new concept, it is still not fully understood by many bankers in terms of how it might support, or threaten, our way of processing payments. We are really only beginning to test the technology on our own or in collaboration with Fintechs. Here’s a brief primer on what blockchain is and why banks continue to monitor and assess its potential applications.

The term “blockchain” used herein refers to any distributed ledger, public or private, and not solely the bitcoin blockchain. For those not familiar with the term, a distributed ledger is defined as a consensus of reproduced, shared, and coordinated digital data that is spread across multiple sites, countries, and/or institutions.

Blockchains, which operate on distributed ledgers, consist of unchangeable, digitally recorded data contained in parcels that are called “blocks.” As the name implies, these blocks are stored in a sequential chain. Each block in the chain contains data and is cryptographically hashed. Each block draws upon the previous one, to ensure that the data in the overall “blockchain” remains unchanged.

Most people became aware of the term in connection with blockchain’s use to record transactions made using the digital currency bitcoin. But blockchain can be used to move many different types of cryptocurrency as well as various other asset and data types. Blockchain is defined as shown in **Figure 10**:

**Blockchain is a distributed ledger that can be decentralized, as the bitcoin blockchain is. Several banks are also experimenting with permissioned versions of the technology**



**FIGURE 10:**What is a blockchain?

Source: Consult Hyperion.

Figure 11 shows how the technology operates:

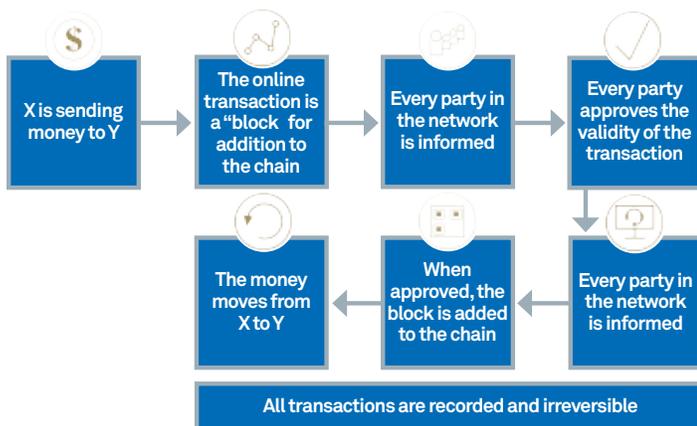


FIGURE 11: How blockchain operates

For reasons outlined later in this section, at least theoretically, many believe that blockchain could bring huge advances to financial and business processes by supporting transparency, speed and security. Indeed, many say that it could potentially revolutionize how business is conducted.

Today, the technology’s potential is being explored as a better solution to a number of inefficiencies and challenges in today’s financial services environment, including those associated with areas such as trading platforms, capital markets and investments. However, one of the major areas of such exploration is payments, and global payments in particular. Banks and their clients are asking if blockchain might be the answer to many of the issues that arise from continued reliance on existing payment rails.

The appeal of blockchain is broad, attracting wide interest due to its diverse applicability. Fintechs, financial institutions, governments and various other industries want to test and, potentially, apply the technology. For this reason, collaboration between new and established players is growing, and various consortiums and work groups have formed to look at how blockchain might apply, including in the payments ecosystem.

Global banks, including BNY Mellon, Barclays, UBS, Citibank and many others have publicly stated their interest in exploring the technology. The New York Stock Exchange, Nasdaq, Goldman Sachs and USAA have all invested in start-up Fintechs seeking to exploit this unfolding technology. And many more major companies have started attending conferences and otherwise exploring blockchain technology, realizing that while bitcoin may fade, the technology it pioneered is here to stay.

Examples of group initiatives which BNY Mellon has joined are:

- **Utility Settlement Coin Concept.** A small group of companies including BNY Mellon, Deutsche Bank, ICAP and Santander Bank has been enlisted to help plan tests for a new Utility Settlement Coin (USC) Concept.

The effort is led by the global bank UBS and Clearmatics, a company that develops next-generation enterprise technologies for distributed business process design. These two organizations launched the USC concept in September 2015 to validate its potential benefits for capital efficiency, settlement and systemic risk reduction in global financial markets. USC is an asset-backed digital cash instrument implemented on distributed ledger technology for use within global institutional financial markets. It is a series of cash assets, with a version for each of the major currencies (e.g., USD, EUR, GBP, CHF, etc.) and is convertible at parity with a bank deposit in the corresponding currency. USC is fully backed by cash assets held at a central bank. Spending a USC will be spending its paired real-world currency.

The focus of the work conducted during the test will consist of financial structuring of the USC and wider market structure implications, as well as market integration points for a fully operational USC for future use by institutions. Additionally, Clearmatics is working to deliver early releases of the technology platform to underpin the concept. Active dialogue with central banks and regulators will continue to promote a regulation-compliant, robust and efficient structure within which the USC can be fully deployed.

- **The Hyperledger Project.** The Hyperledger Project is a collaborative effort aimed at advancing blockchain technology by identifying and addressing important features for a cross-industry open standard for distributed ledgers. Some believe that it may transform the way business transactions are conducted globally. Initiated in December 2015 by the Linux Foundation to support blockchain-based distributed ledgers, the project focuses on ledgers designed to support global business transactions for organizations such as technological, financial, and supply chain companies.

The project’s goal is to improve many aspects of performance and reliability associated with those areas and to bring together numerous independent efforts to develop open protocols and standards, by providing a modular framework that supports different components for different uses. This

would encompass diverse blockchains with their individual consensus and storage models, and services for identity, access control, and contracts.

- **R3, (R3CEV LLC).** Headquartered in New York City, this blockchain technology company leads a consortium of about 60 financial companies in research and development of blockchain usage in the financial system. R3 focuses on developing common standards for blockchain development and on defining and building the base layer development fabric and communication protocols. R3 has recently applied for a patent on its Corda platform, which will record and manage financial agreements between participating institutions. BNY Mellon is an active participant in various use case groups, including those focused on commercial paper, trade, smart contracts, repos, and cash on ledger. Payments is not one of the top areas of exploration by the R3 consortium (cash on ledger is the only use case being explored), which is one of the reasons why BNY Mellon has joined the small group of banks that is looking to develop the Utility Settlement Coin (see previous page).

Assuming that the payer and payee (and/or their respective financial institutions) have each adopted a shared distributed ledger that feeds transactions into the same blockchain, the technology could theoretically address all of the noted challenges shown in Figure 1 on page 6 because:

- Transfer of value could be recorded in real or near-real time.
- End-to-end cost may be reduced.
- Third-party dependencies might be reduced, thereby diminishing risk.
- Transaction fees and exchange rates would be known to participants, increasing transparency.
- Payee banking information might not be necessary.
- Globality would be achieved.
- Transactions recorded on the blockchain are immutable and traceable.
- Blockchain's open source, decentralized nature deters a single point of failure.
- Public and private encryption provides strong security.

Banks are in the early days of exploring blockchain for commercial payments, so many questions remain about numerous important factors that will impact its ultimate success, including as examples:

- **Privacy** – Is transactional data visible to the “right” parties and hidden from the “wrong” ones?
- **Security** – Is the blockchain truly immutable? Can value recorded on the blockchain be “stolen” by bad actors?
- **Scalability** – Can blockchain applications handle the volume and throughput requirements of modern global payment systems?
- **Oversight** – Given its open source nature, who will look after the blockchain applications that banks would all become dependent on to support global financial transactions and capital flows?
- **Cost** – Who will pay for the potentially significant effort to integrate blockchain applications into existing systems of payment system providers? What business case will drive providers to make this investment?

Additionally, while the technology holds promise, when dealing with money the need for third parties such as banks is likely to continue, since companies hold funds in accounts at those institutions and take advantage of other related services. In the foreseeable future, distributed ledger technology may be more likely adopted to improve the efficiency of processes already in place, whether involving payments within an organization or other related functions such as reconciliation.

At any rate, so far, transactions enabled by distributed ledger technology that have been discussed or tested have been relatively small in scale, typically P2P scenarios, and it remains unclear when the technology will be sufficiently robust to handle thousands of transactions much less the millions conducted by banks daily.

Some market observers estimate large-scale deployment of the technology in five to 10 years, although the concerted interest in it by so many major organizations may foretell quicker adoption. While it is uncertain if blockchain might become the next global payment infrastructure, it does look as if we might have opportunities to apply it to specific functions involving payments. After all, the banks that participate in cross-border payments maintain accounts (i.e., nostro accounts) with one another. All banks reconcile the nostro accounts they maintain with their correspondents, which are essentially mirror images of each other. Blockchain might serve as a mechanism for

streamlining the reconciliation process for nostro transactions by recording them on a central ledger such that reconciliation need only occur once. As this example illustrates, the best opportunity to leverage blockchain may not be to attempt to use it to replace an entire payment infrastructure, but rather to apply its unique characteristics to certain functions which support the payment ecosystem.

Payments are not, however, the only area of exploration for blockchain that banks are involved in today. While outside the scope of this paper, it is interesting to note that some other potentially attractive areas for the application of blockchain may include digital identity management, transfer of assets (clearance and settlement), trade and supply chain processing and finance and smart contracts.

**In the foreseeable future, distributed ledger technology is likely to be used to enhance processes already in place, whether involving payments within an organization or made to external parties.**

**Figure 12** shows some of the many players actively using or exploring blockchain today and where they apply the technology in financial services.



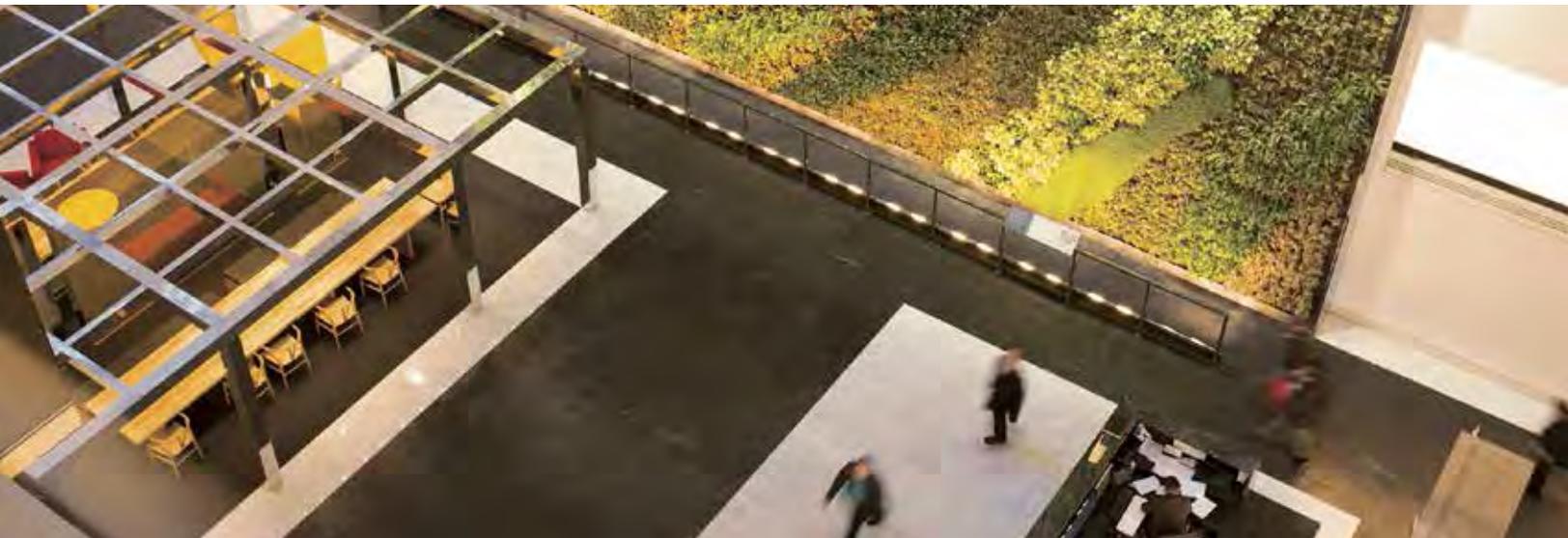
**FIGURE 12:** Blockchain applications and providers in the financial services industry.  
 Source: William Mougayar, Global Landscape of Blockchain Companies in Financial Services <http://startupmanagement.org/2015/12/08/update-to-the-global-landscape-of-blockchain-companies-in-financial-services/> (December 2015)

Depending on how blockchain would be leveraged, rollout of a commercial application with a significant network effect could feasibly take five years or more. In an area such as cross-border payments, it will probably take longer due to the complexity of the process. Some other use cases in financial services—like trade—may see more traction potential over a shorter time period.

## POTENTIAL FOR SUCCESS

Based on the current state of blockchain development, it is difficult to say whether it will ultimately have a transformative impact on the payments ecosystem. That is not to suggest banks should stop all work in this area, but that we should proceed with caution. Measured against the three criteria BNY Mellon believes are necessary to support success, there appears to be work to be done.

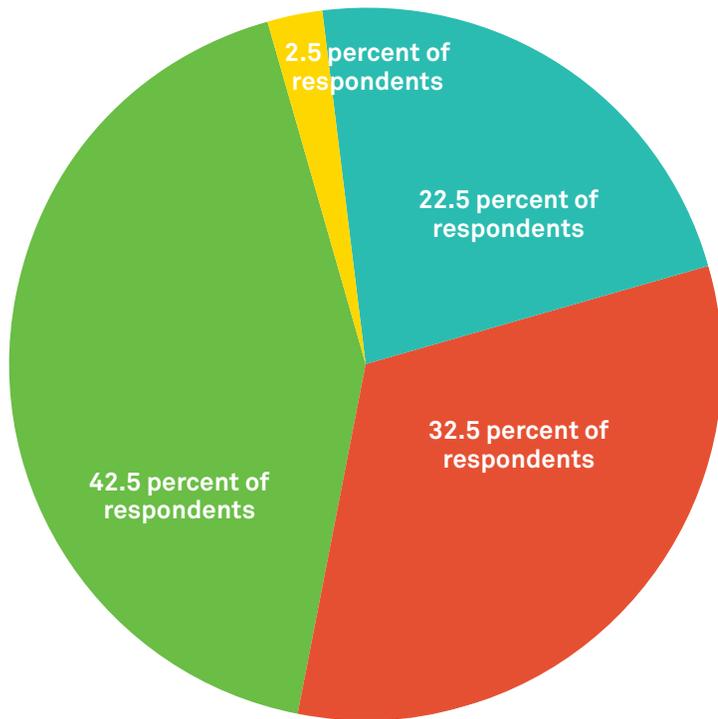
- **Network effect** – At this time, many different Fintech companies, consortiums, and banks are working independently or in small groups to advance blockchain applications. In our view, a far larger number of market participants will have to coalesce around a single blockchain effort, focused on a small number of related use cases before sufficient network effect is achieved to enable meaningful change. It may also be possible for interoperability services to emerge which enable multiple blockchain solutions to interact with one another.
- **Standards** – While various organizations and consortiums are working on blockchain standards (e.g., R3, Hyperledger as previously described) there is yet no true blockchain standard, which also impedes progress. Ripple's Interledger Protocol aims to solve this challenge by enabling diverse ledgers to seamlessly interact with each other.
- **Regulatory engagement** – While there has been some regulatory engagement in this area, little formal guidance or rules have been issued. Until such time, market participants attempting to develop live use cases without appropriate regulatory engagement or oversight do so at their own peril.



“Certainly, if blockchain’s distributive ledger technology can be successfully integrated into mainstream finance, payments may be enhanced in terms of transparency, efficiency and security, as well as cost reduction. The technology’s potential to reduce the number of participants in a transaction cycle would significantly reduce processing times, thereby streamlining the payments experience. Removing the need for intermediaries could reshape the financial services industry.”

– **Arnon Goldstein, Head of Global Sales & Relationship Management**  
– **APAC, BNY Mellon Treasury Services**





- Game changing; caused us to enter new businesses, exit others, and/or a complete re-engineering of existing businesses
- Major; caused a significant overhaul of the way we do business, but didn't substantially change our product portfolio
- Moderate; caused us to re-think and revise a number of our processes and delivery mechanisms
- Minor; caused us to tweak a number of our processes and delivery systems

**In our summer 2016 Fintech survey, BNY Mellon Treasury Services asked its bank clients: “In 10 years, how do you think emerging technology such as blockchain or distributed ledger will have affected your business?” Among the 120 respondents who hold senior positions at global financial institutions, nearly half thought the impacts would be “moderate”.**



“Though a lot of focus remains on the payments front, there are interesting challenges that distributed ledger technology brings to trade finance. Indeed, the impact on trade will be as significant as it will be on the payments space.”

**– Joon Kim, Director, Head of Global Trade Product, BNY Mellon Treasury Services**



# Section 3:

## Conclusions

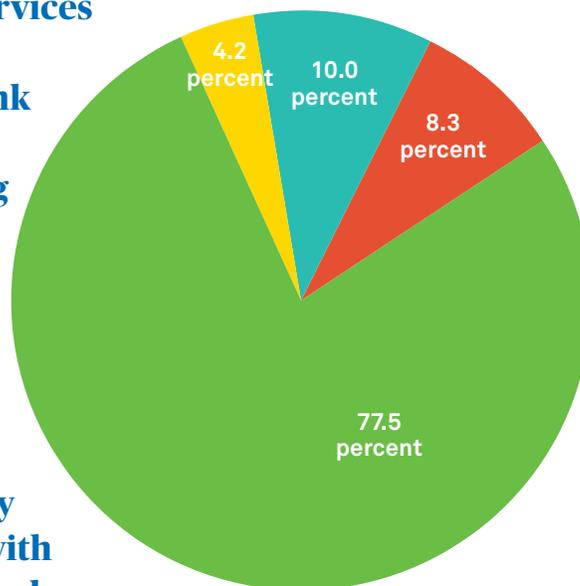
Despite the challenges that banks face, there is reason for optimism. Like never before, advances in technology have opened the door for banks to meet our clients' desire for a global real-time payment experience, characterized by *global real- or near-real time execution; complete transparency into end-to-end cost, payment status, and the parties involved in a transaction; and real-time fraud analysis*...all at reasonable cost. And, if we work together as an industry, it is very possible that we can deliver that global payment experience within the next 10 years. But we have a lot of work to do before then!

At the beginning of this paper, we posed a question: *In view of the forces disrupting the payments industry and the associated need for payments modernization, are banks best served by enhancing their solutions to compete head on with Fintechs, by collaborating with one another, or by teaming up with the very organizations that are challenging us?*

Perhaps somewhat surprisingly, BNY Mellon Treasury Services believes that all of these paths are worth pursuing, each for their own reasons:

- **Competing with Fintechs** – While Fintechs bring some advantages to the table as we have discussed earlier in this paper, we should not assume that their solutions will make sense for our clients or that they will be sufficiently scalable, secure, or value added. Our first priority is to listen to our clients and act on their priorities. Our Nexen® platform, which uses the latest technology to reengineer our interactions with our clients is a good example of investments we need to make irrespective of what competitors or Fintechs might deliver. Development of digital payments solutions is yet another.
- **Industry Collaboration** – As we have discussed in detail, industry collaboration to bring about transformative change to the global payment ecosystem is a powerful and necessary path for all payment system providers to travel with urgency. There is not a moment to lose. Examples covered in this paper, including Same-day ACH, Real-Time Payments, and SWIFT gpi illustrate where the industry is gaining momentum in this regard.

**BNY Mellon Treasury Services asked our bank clients, “What model do you think will be most useful in understanding emerging technology’s potential and developing commercially viable solutions?” Of the 120 respondents to the survey, more than three quarters told us that they thought collaboration with Fintechs and other technology companies holds the greatest potential”.**

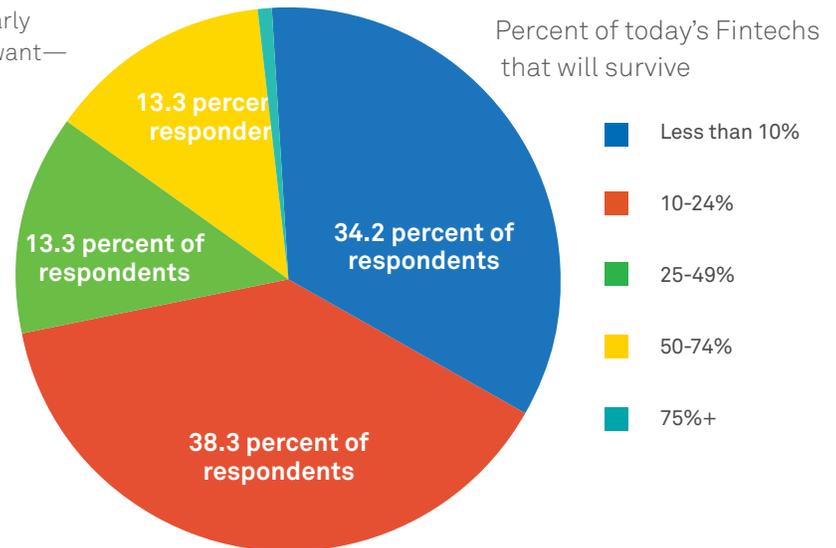


- Individual banks: banks should innovate on their own and attempt to be first to market with innovative solutions.
- Bank only consortiums: network effect is crucial; banks will be most successful if they work together and leave the Fintechs alone.
- Collaboration: Banks should work with Fintechs and other technology companies to develop the potential together.
- Buy our way in: Banks should let Fintechs do the hard work, and when a few develop successful products, buy them.

- Collaborating with Fintechs** – As mentioned, both banks and Fintechs have strengths and weaknesses that dovetail nicely. Banks offer trust, capital, safety, stability, and long-tenured client relationships. Fintechs bring the fresh ideas and technologies that we need to reinvent our payment processes. Working together to improve on our clients' experience may deliver meaningful advances to all payment system constituencies—banks, Fintechs and clients. So, it is in our best interests to engage in active dialogue with the Fintechs with the best ideas and determine if there is a way to leverage their strengths while maintaining our position in the payment industry.

The path forward will not be easy. There are many details to work out. And it is not so much a question about the new technology required. It is more about the collective will of financial institutions to work together to deliver the type of experience our clients desire. If financial institutions want to continue to operate the payment ecosystem, we have to be singularly focused on delivering the type of experience our clients want—both now and in future.

**When asked how many of the hundreds of new Fintechs attracting billions in venture funding will launch commercially successful products and survive in the longer-term, the 120 senior bank executives who responded to BNY Mellon's 2016 Fintech survey delivered mixed opinions. Just over one third of respondents said that 10 to 24 percent of Fintechs would thrive, while about one third thought less than 10 percent of Fintechs would achieve longevity.**



“As a leading payments provider, BNY Mellon Treasury Services will be directly involved in those payment initiatives which hold the greatest promise for delivering sustainable value to our clients. These initiatives range from new payment mechanisms like Real-Time Payments and clearXchange to new payment standards like ISO 20022. History suggests that the great majority of Fintech initiatives will fail. Treasury Services will continue to support, and where it makes sense, lead, payment innovation activity both at the Fintech level and at the industry collaboration level (e.g. RTP, SWIFT gpi) and will provide timely advice and thought leadership to our clients to help them navigate this rapidly evolving landscape.”

**– Paul Simons, Managing Director, Product Line Manager, Supply Chain Product Management, BNY Mellon Treasury Services**





“Many Fintechs have a partial view of how things work, or sometimes an idealized view. Sometimes this is advantageous fresh thinking, sometimes it is naive; BNY Mellon can be a pragmatic foil in those cases and supply valuable insights and requirements to the Fintechs.”

– **Mike Gardner, Managing Director and Head of BNY Mellon Silicon Valley Innovation Center**



“The journey of digital enterprise is going to force organizations to reimagine their business models and apply emerging technologies to innovate services which would accommodate changing customer behavior and expectations. This would result in:

- Emergence of value-added products built on top of vast data sets that exist in financial institutions. Organizations will no longer compete on data but they will compete on algorithms (IP) running on top of data.
- A shift towards building platforms versus applications.
- Expectations of data to be available near real time.
- Consumption of data in multiple channels (e.g., APIs).
- Technologies like Machine Learning, AI, Bots playing a huge role in enabling digitization.”

– **Saket Sharma, Chief Information Officer, BNY Mellon Treasury Services**



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